



Sant Dnyaneshwar Shikshan Sanstha's  
**Annasaheb Dange College of B Pharmacy, Ashta**  
**(B. Pharm & D. Pharm)**

# **Mandatory Disclosure**

**1. Name of the Institution:**

- **Name of the Institution :** Sant Dnyaneshwar Shikshan Sanstha's, Annasaheb Dange College of B Pharmacy, Ashta.
- **Address :** Near Old Air Port, A/P- Ashta, Tal – Walwa, Dist – Sangli. State: Maharashtra. Pin Code: 416301
- **Phone No. :** 02342 – 241125, **Mobile No:** 9158008167
- **E-Mail ID :** [principaladcbp@gmail.com](mailto:principaladcbp@gmail.com)

**2. Name and Address of the Trust / Society / Company and the Trustees**

- **Name of the Society :** Sant Dnyaneshwar Shikshan Sanstha
- **Address of the Society :** "Madhav" Niwas, Kachare Galli, A/ P- Islampur, Tal – Walwa, Dist – Sangli, State: Maharashtra. Pin Code: 416409
- **Telephone :** 02342 – 241105
- **Email ID :** [info@santdnyaneshwar.org](mailto:info@santdnyaneshwar.org)
- **Name of the Trustee :**

Details of the Trustee		
Sr. No.	Name of Trustee	Designation
01	Shri. Ramchandra Dange	Hon. President
02	Shri. Sampatrao Patil	Hon. Vice - President
03	Shri. Rajendra Dange	Hon. Secretary
04	Shri. Vitthalrao Musai	Member
05	Shri. Vishwanath Dange	Member
06	Shri. Sukumar Lavate	Member
07	Shri. Sattu Dhole	Member
08	Shri Chhaganrao Ishwara Nangare	Member
09	Shri Appasaheb Pujari	Member

**3. Name and Address of the Principal**

- **Name of the Principal :** Dr. Mahesh Govind Saralaya
- **Address :** Wing - A, 4B Siddhivinayak Puram Society; Dattanagar, 80 Ft Road; Vishrambaugh – Sangli. Tal - Miraj, Dist – Sangli. Pincode: 416416.
- **Phone No. :** 02342 – 241125 **Mobile No:** 9265789039
- **Email ID :** [mahesh.saralayaadcbp@gmail.com](mailto:mahesh.saralayaadcbp@gmail.com)

**4. Name of the Affiliating University**

- **Name of the University:** Shivaji University Kolhapur
- **Address :** Vidyanagar, Kolhapur- 416 004. Maharashtra, India.
- **Contact No. :** 0231- 2609000

## 5. Governance

### ▪ Members of the Board and their brief background

- The institution has active academic advisory body. The members of the body are –

Sr. No.	Name	Nomination	Designation
01	<b>Adv. Shri. Rajendra R. Dange</b> Secretary, Sant Dnyaneshwar Shikshan Sanstha, Islampur	Secretary of Sanstha	Chairman
02	<b>Prof. Rafiq A. Kanai</b> Executive Director, Sant Dnyaneshwar Shikshan Sanstha, Islampur	Educationist & Representative of Sanstha	Member
03	<b>Prof. (Dr.) Manish S. Bhatia</b> Professor & Vice Principal, Bharti Vidyapeeth College of Pharmacy, Kolhapur	Nominee of Shivaji University, Kolhapur	Member
04	<b>Vacant</b>	Nominee of Maharashtra State Board of Technical Education, Mumbai	Member
05	<b>Dr. Suresh Iyer</b> Retired Senior Principal Scientist National Chemical Laboratory, Pashan, Pune.	Educationist Nominated by Sanstha	Member
06	<b>Prof. (Dr.) Sunil S. Jalalpure</b> Professor & Principal, KLE's College of Pharmacy, Belgavi, Karnataka	Educationist Nominated by Sanstha	Member
07	<b>Dr. Amol S. Shete</b> Associate Professor, Department of Pharmaceutics; Krishna Institute of Pharmacy of Krishna Institute of Medical Sciences (KIMS) Deemed To Be University, Karad.	Educationist Nominated by Sanstha	Member
08	<b>Dr. Prajyot P. Naik</b> Executive, Commercial Supply Chain IPCA laboratories, Mumbai	Industrialist Nominated by Sanstha	Member
09	<b>Vacant</b>	Nominee of the State Government (Ex-officio)	Ex-Officio Member
10	<b>Vacant</b>	Industrialist / Technologist / Educationist Nominated by State Government	Member
11	<b>Mr. Shashikant S. Upadhye</b> HOD, D. Pharm, ADCBP	Faculty Member (Diploma) Nominated by Sanstha	Member
12	<b>Mr. Sachin J. Sajane</b> Vice Principal (Admin), ADCBP Ashta	Faculty Member (Degree) Nominated by Sanstha	Member

Sr. No.	Name	Nomination	Designation
13	<b>Dr. Rajesh S. Jagtap</b> Vice Principal (Academics) & Associate Professor, ADCBP Ashta	Faculty Member (Degree) Nominated by Sanstha	Member
14	<b>Prof. (Dr.) Mahesh G. Saralaya</b> Professor & Principal, ADCBP, Ashta	Principal of the Institute	Member-Secretary

▪ **Members of Academic Advisory Body**

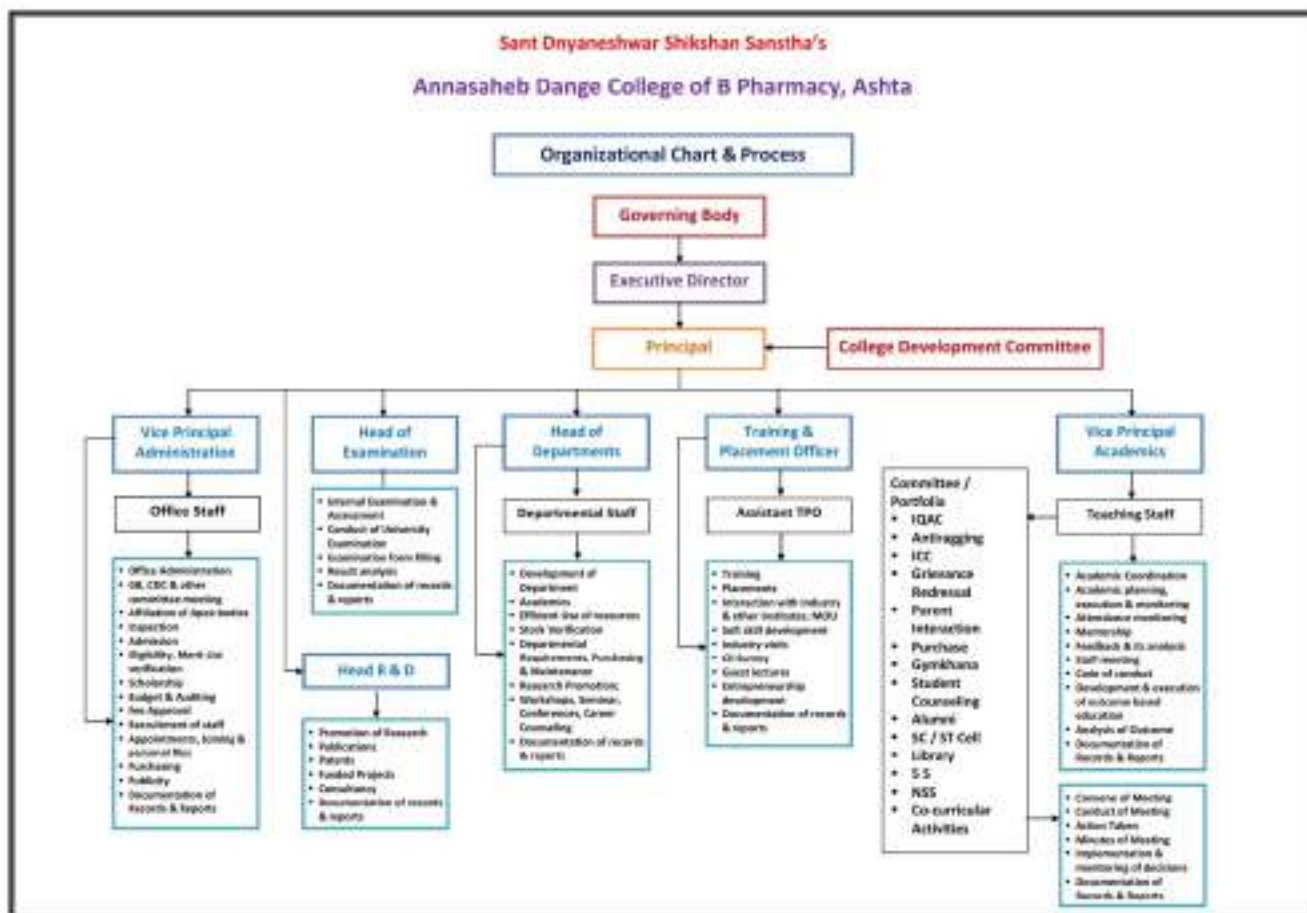
- The institution has active academic advisory body. The members of the body are -

Academic Advisory Body		
Sr. No.	Name	Designation
01	Prof. Rafiq A. Kanai Executive Director, Sant Dnyaneshwar Shikshan Sanstha, Islampur	Head
02	Prof. Shailendra B. Hivarekar, Academician	Member
03	Prof. Santosh S. Mohite, Academician	Member
04	Prof. Rajesh Jagtap, Academic Coordinator	Member
05	Mrs. Priyanka S. Gaikwad, Asst. Academic Coordinator	Member
06	Dr. Mahesh G. Saralaya, Principal, ADCBP	Member - Secretary

▪ **Frequency of the Board Meeting and Academic Advisory Body**

Sr. No.	Name of Body	Frequency of the Board Meeting
01	Governing Body	02 / Year
02	Academic Advisory Body	04 / Year

## Organizational Chart and Processes



## Nature and Extent of involvement of Faculty and students in academic affairs / improvements

### A) Faculty Members are involved in Academic Improvement by -

- i) Organizing & Re-organizing syllabus
- ii) Identifying gap between Curriculum & employment market needs
- iii) Bridging gap by conducting additional outcome based activities (teaching, assessments Assignments, visits, interviews, competitions, seminar & conferences, Magazine, Co-curricular & Extra-curricular activities, Sports, Project work, Survey etc.
- iv) Planning Outcomes using Standards (PO's)
- v) Designing & Mapping Assessments
- vi) Designing Assessment Rubrics
- vii) Designating & delivering Lectures
- viii) Designing & conducting Active Learning Session
- ix) Assessing Self-Learning
- x) Offering constructive & positive Feedback

### B) Students are involved in Academic Improvement by -

- i) Thinking critically & asking the questions

- ii) Respond positively on feedback given by the teacher on their performance
- iii) Giving feedback on teacher's performance
- iv) Giving feedback on infrastructure & facilities provided by the Institute
- v) Prepare 'Concept Maps' & 'Knowledge Organizers'
- vi) Students are open to grievances &/or suggestions for academic improvements.
- vii) Students are representing almost all committees & cells

▪ **Mechanism/ Norms and Procedure for democratic / good Governance**

<b>Norms</b>	<b>Procedures</b>
Delegation of Powers of Principal to the faculty members	Powers are delegated to faculty members by creating more than 48 portfolios.
Clarity in objectives, outcomes, documentation etc of all portfolios	For portfolios, written guidelines related with objectives, outcomes etc are given to bring clarity & avoid interference.
Representation to teaching, non-teaching staff & students on the portfolios	Depending on nature of the portfolio, the representation of teaching, non-teaching staff & students have been given to improve their participation & offer opportunity for learning.
Policies of the major activities are fixed.	Policies for Governing Body, Delegation of financial powers, Budget Allocation & Utilization, Public Accounting, Recruitment, Service Rules, Staff & Students Welfare, Staff & Students Promotion, Safety & Security, GTS, Grievances, Public Information, Academic Goals Setting, Assessments, Teaching, R & D Activities, etc are fixed.
Processes, Procedures & Mechanisms are evolved.	Processes, Procedures & Mechanisms of all activities are evolved for bringing transparency & effectiveness of resources.
Institutional leadership opted democratic processes in all kind of affairs.	Principal lead the team by putting his own example & explored distributed leadership.

▪ **Student Feedback on Institutional Governance / Faculty performance**

1. Student's feedback on Faculty performance is conducted two times in Semester (after one month of commencement & prior to one month of conclusion of Semester) in online mode by the Principal.
2. Apart from parameters related to teaching-learning processes, each feedback provides space where students can write any issues.
3. After every feedback & as per norms, faculty member with under-performance will be issued a memo from the Principal for improvements on the issues raised by the students.
4. In subsequent feedback, previous memo of same faculty is review for any improvement or not along with any new issues raised by the students.
5. Students are also giving feedback on Infrastructure & Facilities as well as Institutional Governance.
6. Any issues raised in the feedbacks are urgently cleared. For this purpose, if any new material is required is procured &/or if any corrections in existing systems, processes are attempted or new systems, processes, & mechanisms required are immediately implemented.

▪ **Grievance Redressal mechanism for Faculty, staff and students**

- Institute has an online portal where any aggrieved applicant may submit an application seeking Redressal of grievance.
- On receipt of an online complaint, the institution refers the complaint to the appropriate Grievance Redressal Committee, along with its comments within 15 days of receipt of complaint on the online portal.
- The Grievance Redressal Committee, as the case may be, shall fix a date for hearing the complaint which shall be communicated to the institution and the aggrieved applicant.
- An aggrieved applicant may appear either in person or authorize a representative to present his/her case.
- Grievances not resolved by the Grievance Redressal Committee shall be referred to the Ombudsperson, within the time period provided.
- Institutions will extend co-operation to the Ombudsperson or the Grievance Redressal Committee, in early Redressal of grievances; and failure to do so may be reported by the Ombudsperson to the Council, which shall take action in accordance with the provisions of Regulations.
- The Ombudsperson shall, after giving reasonable opportunities of being heard to both parties, on the conclusion of proceedings, pass such order, with reasons therefore as may be deemed fit to redress the grievance and provide such relief as may be appropriate to the aggrieved applicant.
- The institution, as well as the aggrieved student, shall be provided with copies of the order under the signature of the Ombudsperson, and the institution shall place it for general information on its website.
- The institution shall comply with the recommendations of the Ombudsperson; and the Ombudsperson shall report to the Council any failure on the part of the institution to comply with the recommendations.
- The Ombudsperson may recommend appropriate action against the complainant, where a complaint is found to be false or frivolous.

▪ **Establishment of Anti Ragging Committee**

- The institution has active Anti Ragging Committee and Anti Ragging Squad. The members are -

Anti Ragging Committee				
Sr. No.	Name	Designation	Mobile No.	Email ID
01	<b>Dr. M. G. Saralaya</b> Principal, ADCBP, Ashta	Head	9265789039	mahesh.saralayaadcbp@gmail.com
02	<b>Prof. Mr S. J. Sajane</b> Asst. Professor & Vice Principal, Representative of Faculty Member	Member	9158008167	sajane.sachinadcbp@gmail.com
03	<b>Prof. Mr. R. S. Jagtap</b> Asso. Professor, Representative of Faculty Member	Member	9158611311	rajeshjagtap10@gmail.com

<b>04</b>	<b>Prof. (Miss) Y. H. Momin</b> Asst. Professor, Representative of Faculty Member	Member	8668201729	momin.yasminadcbp@gmail.com
<b>05</b>	<b>Prof. (Miss) S. T. Taralekar</b> Asst. Professor, Representative of Faculty Member	Member	7709638896	taralekar.snehaadcbp@gmail.com
<b>06</b>	<b>Mr. N. S. Nalawade</b> Representative of Non- Teaching Staff	Member	9767638595	nikhilnalwade58@gmail.com
<b>07</b>	<b>Miss. D. S. Raval</b> Senior student representative	Member	9595566674	dhanashreeraval251@gmail.com
<b>08</b>	<b>Mr. G. S. Palkar</b> Junior student representative	Member	8381083680	gauravpalkar03@gmail.com
<b>09</b>	<b>Mr. P. S. Patil</b> Representative of Parents	Member	9975442824	dp4619239@gmail.com
<b>10</b>	<b>Mr. S. S. Sanadi</b> Representative of Civil & Police Administration	Member	02342243233	--
<b>11</b>	<b>Mr. S. L. Shiralkar</b> Representative of Local Media	Member	9604254109	--
<b>12</b>	<b>Mr. D. V. Adsul</b> Representative of Non- Government Organization involved in youth Activity	Member	9960674000	--
<b>13</b>	<b>Prof. (Miss) P. S. Gaikwad</b> Asst. Professor	Member Secretary	9503530883	jadhav.priyankaadcbp@gmail.com

Anti Ragging Squad				
Sr. No.	Name	Designation	Mobile No.	Email ID
<b>01</b>	<b>Dr. Mahesh G. Saralaya</b> Principal, ADCBP, Ashta	Head	9265789039	mahesh.saralayaadcbp@gmail.com
<b>02</b>	<b>Prof. Mr. S. J. Sajane</b> Asst. Professor & Vice Principal, Representative of Faculty Member	Member	9158008167	sajane.sachinadcbp@gmail.com
<b>03</b>	<b>Prof. Mr. R. S. Jagtap</b> Asso. Professor, Representative of Faculty Member	Member	9158611311	rajeshjagtap10@gmail.com



<b>04</b>	<b>Prof. (Miss) Y. H. Momin</b> Asst. Professor, Representative of Faculty Member	Member	8668201729	momin.yasminadcbp@gmail.com
<b>05</b>	<b>Prof. (Miss) S. T. Taralekar</b> Asst. Professor, Representative of Faculty Member	Member	7709638896	taralekar.snehaadcbp@gmail.com
<b>06</b>	<b>Mr. N. S. Nalawade</b> Representative of Non- Teaching Staff	Member	9767638595	nikhilnalwade58@gmail.com
<b>07</b>	<b>Prof. (Miss) P. H. Jadhav</b> Asst. Professor	Member Secretary	9503530883	jadhav.priyankaadcbp@gmail.com

▪ **Establishment of Online Grievance Redressal Mechanism**

- Institute has established online Grievance Redressal Portal for the Students, Faculty, Non-Teaching Staff, Parents, Alumni, and Management etc. The link for the online portal is –  
<https://www.vmedulife.com/institute/e-grievance/home/adcbp-sangli>.
- **Online Grievance Redressal Mechanism**
  - Institute has an online portal where any aggrieved applicant may submit an application seeking Redressal of grievance.
  - On receipt of an online complaint, the institution refers the complaint to the appropriate Grievance Redressal Committee, along with its comments within 15 days of receipt of complaint on the online portal.
  - The Grievance Redressal Committee, as the case may be, shall fix a date for hearing the complaint which shall be communicated to the institution and the aggrieved applicant.
  - An aggrieved applicant may appear either in person or authorize a representative to present his/her case.
  - Grievances not resolved by the Grievance Redressal Committee shall be referred to the Ombudsperson, within the time period provided.
  - Institutions will extend co-operation to the Ombudsperson or Grievance Redressal Committee, in early Redressal of grievances; and failure to do so may be reported by the Ombudsperson to the Council, which shall take action in accordance with the provisions of Regulations.
  - The Ombudsperson shall, after giving reasonable opportunities of being heard to both parties, on the conclusion of proceedings, pass such order, with reasons therefore as may be deemed fit to redress the grievance and provide such relief as may be appropriate to the aggrieved applicant.
  - The institution, as well as the aggrieved student, shall be provided with copies of the order under the signature of the Ombudsperson, and the institution shall place it for general information on its website.

- The institution shall comply with the recommendations of the Ombudsperson; and the Ombudsperson shall report to the Council any failure on the part of the institution to comply with the recommendations.
- The Ombudsperson may recommend appropriate action against the complainant, where a complaint is found to be false or frivolous.

▪ **Establishment of Grievance Redressal Committee in the Institution and Appointment of Ombudsman by the University**

- The institution has active Grievance Redressal Committee. The members are -

<b>Grievance Redressal Committee</b>			
<b>Sr. No.</b>	<b>Name</b>	<b>Designation</b>	<b>Mobile No.</b>
<b>01</b>	<b>Dr. M. G. Saralaya</b> Principal, ADCBP, Ashta	Head	9265789039
<b>02</b>	<b>Prof. Mr. S. J. Sajane</b> Asst. Professor & Vice Principal (Admin)	Member	9158008167
<b>03</b>	<b>Dr. R. S. Jagtap</b> Asso. Professor, Representative of Faculty Member	Member	9158611311
<b>04</b>	<b>Mr. N. V. Nalawade</b> Representative of Non- Teaching Staff	Member	9767638595
<b>05</b>	<b>Ms. S. S Sande</b> Representative of Non- Teaching Staff	Member	7066330177
<b>06</b>	<b>Prof. Ms P. R. Shelake</b> Asst. Professor	Member Secretary	8855917896

▪ **Establishment of Internal Complaint Committee (ICC)**

- The institution has active Internal Complaint Committee (ICC). The members are -

<b>Internal Complaint Committee (ICC)</b>		
<b>Sr. No.</b>	<b>Name</b>	<b>Designation</b>
<b>01</b>	<b>Prof. (Miss) Y. H. Momin</b> Asst. Professor & Head Department of Pharm. Chemistry	Chairman
<b>02</b>	<b>Dr. M. G. Saralaya</b> Principal, ADCBP, Ashta	Member
<b>03</b>	<b>Prof. Mr. S. J. Sajane</b> Asst. Professor & Vice Principal (Admin)	Member
<b>04</b>	<b>Prof. (Miss) S. P. Desai</b> Asst. Professor, Representative of Faculty Member	Member
<b>05</b>	<b>Mr. R. A. Mohite</b> Advocate	Member
<b>06</b>	<b>Mr. A. S. Shinde</b> Police Naik Ashta	Member

<b>07</b>	<b>Mrs. P. M. Patil</b> Social Worker	Member
<b>08</b>	<b>Miss S. S. Sanade</b> Lab. Technician & Representative of Non- Teaching Staff	Member
<b>09</b>	<b>Mr. A. B. Gadale</b> Lab. Technician & Representative of Non- Teaching Staff	Member
<b>10</b>	<b>Miss A. R. Jamdade</b> Student Representative	Member
<b>11</b>	<b>Miss S. G. Patil</b> Student Representative	Member

▪ **Establishment of Committee for SC/ST**

- The institution has active Committee for SC / ST. The members are -

<b>Committee for SC/ST</b>			
<b>Sr. No.</b>	<b>Name</b>	<b>Designation</b>	<b>Mobile No.</b>
<b>01</b>	Dr. M. G. Saralaya Principal, ADCBP, Ashta	Chairman	9265789039
<b>02</b>	Dr. R. S. Jagtap	Member	9158611311
<b>03</b>	Ms. S. S. Kharat	Member	7057792082
<b>04</b>	Mr. Sabale Vishwajit	Member	8530809771
<b>05</b>	Ms. Londhe Pratiksha	Member	8208348700
<b>06</b>	Mr. Dethe Prasad	Member	9607692009
<b>07</b>	Ms. Shikhare Priyanka	Member	9175355275
<b>08</b>	Ms. Chabukswar Anjali	Member	7447379599
<b>09</b>	Mr. Kamble Ritesh	Member	7745077558
<b>10</b>	Ms. Surve Pradnya	Member	7057938975
<b>11</b>	Mr. Sathe Mandar	Member	9833328803
<b>12</b>	Ms. Pawar Archana	Member	9112279580
<b>13</b>	Ms. Sarvade Arpita	Member	9970131015
<b>14</b>	Ms. Ahire Pratiksha	Member	8698609896

▪ **Internal Quality Assurance Cell**

- The institution has active Internal Quality Assurance Cell. The members are -

<b>Internal Quality Assurance Cell</b>			
<b>Sr. No.</b>	<b>Name</b>	<b>Designation</b>	<b>Mobile No.</b>
<b>01</b>	Prof. (Dr.) M. G. Saralaya	Chairman	9265789039
<b>02</b>	Prof. R. A. Kanai	Representative of Management	9730377786

<b>03</b>	Dr. R. S. Jagtap	Member	9158611311
<b>04</b>	Mr. S. M. Honmane	Member	8600392878
<b>05</b>	Miss Y. H. Momin	Member	8805280796
<b>06</b>	Mr. G. V. Sutar	Member	7721064369
<b>07</b>	Mr. S. N. Pattekari	Member	9970437359
<b>08</b>	Mrs. P. S. Gaikwad	Member	8275183504
<b>09</b>	Mr. G. S. Patil	Member	7507561365
<b>10</b>	Mr. S. S. Upadhye	Member	9423560416
<b>11</b>	Mr. S. J. Sajane	Member	9158008167
<b>12</b>	Mr. S. B. Hivarekar	Member	9689895057
<b>13</b>	Mr. R. I. Tamboli	Member	7709786186
<b>14</b>	Miss Snehal Chavan	Member	9172038795
<b>15</b>	Mr. Nimish Khandekar	Member	7385737345
<b>16</b>	Mr. Pratik Badave	member	8308001390
<b>17</b>	Dr. E. T. Tamboli	Member & Coordinator	9654681806

## 6. Programmes

- **Name of Programmes approved by AICTE** : **Pharmacy**
- **Name of Programmes Accredited by NBA** : **Nil**
- **Status of Accreditation of the Courses** : **B. Pharm:** Prequalifire Form Submitted  
**D. Pharm:** Prequalifire Form Submitted
- **Total number of Courses** : **02**
- **No. of Courses for which applied for Accreditation:** **02**
- **Status of Accreditation** : **B. Pharm:** Prequalifire Form Submitted  
(Preliminary / Applied for SAR & results awaited / Applied for SAR & visits completed / Results of the visits awaited / Rejected / Approved for . . .Courses (specify the number of courses)
- **Programme Details:**

Sr. No.	Name of Programme	Course	Number of seats	Duration	Cut off Marks / Rank of admission during the last three years			Fee (As approved by the State Government) (2021-22)
					2021-22	2020-21	2019-20	
01	Pharmacy	B. Pharmacy	100	04 Years	1.1754334 (MHT CET Percentile)	1.5249437 (MHT CET Percentile)	2.5761682 (MHT CET Percentile)	90000.00
02		D. Pharmacy	60	02 Years	41.33 (PCMB)	38.67 % (PCMB)	36.67 % (PCMB)	58000.00

- **Placement Facility:**
  - The Training and Placement Cell of the Annasaheb Dange College of B. Pharmacy, Ashta has been established to help undergraduates & diploma students to prepare, develop & groom for the needs of employment market.
  - TPC also offers campus opportunities for recruitment by inviting industries and external agencies.
  - The Placement Cell presents entire guide to the travelling agencies at each level of placement system.
  - Arrangements for Pre-Placement Talks, Written Tests, Interviews and Group Discussions are made as according to the requirement of the employment market.
  - In addition to this, advice letters are given to the students whenever demanded. Students are advocated with the aid of the faculty for accumulating the information from the internet site of the various Pharmaceutical Companies.
- A) Campus Interviews-** We have conducted the Campus Interview for Degree & Diploma students
  - i) Arranged Pool Campus Interview of 3 GEN Consulting Pvt. Ltd., Pune on 6th January 2021.
  - ii) Arranged Pool Campus Interview of IT Cube solutions, Pune on 14th March 2020.
- B) Workshops, Seminar & Guest Lectures data-** We have conducted following types of activities to promote the placements of undergraduate & diploma students

Sr. No.	Academic Year	Types of Activity	No. of Activity	No. of Participant benefited	Beneficiary
01	2019-20	Workshops	02	108	Final Year B Pharm Students
02		Seminar	02	118	Third & Final Year B Pharm Students
03		Guest Lecture	05	257	Final Year B Pharm Students
04	2020-21	Guest Lecture	02	198	Third & Final Year B Pharm Students
			02	40	Second Year D. Pharm Students
05	2021-22	Workshops	03	180	Final Year B Pharm Students
			02	120	Second Year D. Pharm Students
Seminar		01	100	Final Year B Pharm Students	
		03	110	Second Year D. Pharm Students	
Guest Lecture		02	100	Final Year B Pharm Students	
		09	400	Second Year D. Pharm Students	

- Campus Placement in last three years with minimum salary, maximum salary and average salary

Sr. No.	Academic Year	No. of Placements	Minimum salary (Rs. lac /annum)	Maximum salary (Rs. lac /annum)	Average salary (Rs. lac /annum)
<b>B. Pharmacy</b>					
01	2021-2022	Nil	Nil	Nil	Nil
02	2020-2021	58	1.5	4.40	2.47
03	2019-2020	25	0.96	3.3	1.85
04	2018-2019	NA	NA	NA	NA
<b>D. Pharmacy</b>					
01	2021-2022	Nil	Nil	Nil	Nil
02	2020-2021	41	1.2	1.8	1.5
03	2019-2020	23	1.2	6.1	3.65
04	2018-2019	NA	NA	NA	NA

## 7. Faculty

### ■ Permanent Faculty for B. Pharmacy Course

Sr. No.	Name of the Faculty	Designation	Qualification
01	Dr. Mahesh G. Saralaya	Principal	M. Pharm PhD
02	Mr. Sachin J. Sajane	Assistant Professor & Vice Principal (Admin)	M. Pharm
03	Dr. Rajesh S. Jagtap	Associate Professor & Vice Principal (Academic)	M. Pharm PhD
04	Dr. Ennus T. Tamboli	Associate Professor	M. Pharm PhD
05	Mr. Guruprasad V. Sutar	Assistant Professor	M. Pharm
06	Miss. Sneha T. Taralekar	Assistant Professor	M. Pharm
07	Miss Ayesha M. Bhajji	Assistant Professor	M. Pharm
08	Mr. Sandeep M. Honmane	Assistant Professor	M. Pharm
09	Mr. Suraj N. Pattekari	Assistant Professor	M. Pharm
10	Ms. Priyanka R. Shelake	Assistant Professor	M. Pharm
11	Ms. Shubhangi S. Kharat	Assistant Professor	M. Pharm
12	Mr. Koustubh M. Thorawade	Assistant Professor	M. Pharm
13	Mr. Swapnil S. Patil	Assistant Professor	M. Pharm
14	Mr. Rohan D. Patil	Assistant Professor	M. Pharm
15	Mr. Prakash V. Chavan	Assistant Professor	M. Pharm
16	Miss. Yasmin H. Momin	Assistant Professor	M. Pharm
17	Mr. Ashish K. Mullani	Assistant Professor	M. Pharm
18	Mr. Ganesh D. Mote	Assistant Professor	M. Pharm
19	Miss Priyanka H. Jadhav (Mrs. Priyanka Sagar Gaikwad)	Assistant Professor	M. Pharm
20	Miss Shailaja P. Desai	Assistant Professor	M. Pharm
21	Mr. Ramling D. Mali	Assistant Professor	M. Pharm
22	Miss Nisha M. Jagtap	Assistant Professor	M. Pharm
23	Miss Ashwini S. Patil	Assistant Professor	M. Pharm
24	Mr. Suraj J. Patil	Assistant Professor	M. Pharm
25	Mr. Harshad P. Khade	Assistant Professor	M. Pharm
26	Mr. Ajay R. Mali	Assistant Professor	M. Pharm
27	Mr. Nikhil D. Patil	Assistant Professor	M. Pharm
28	Mr. Gajanan S. Patil	Assistant Professor	M. Pharm

### ■ Permanent Faculty for D. Pharmacy Course

Sr. No.	Name of the Faculty	Designation	Qualification
01	Dr. Mahesh G. Saralaya	Principal	M. Pharm PhD
02	Mr. Shashikant S. Upadhye	HOD & Assistant Professor	M. Pharm
03	Mr. Nasaruddin M. Inamdar	Assistant Professor	M. Pharm
04	Miss Sheela S. Thorat	Assistant Professor	M. Pharm
05	Mr. Yogesh S. Chandanshive	Assistant Professor	M. Pharm
06	Mr. Sandeep D. Kadam	Assistant Professor	M. Pharm
07	Mr. Shivani S. Khairmode	Assistant Professor	M. Pharm

## Mandatory Disclosures

- Adjunct Faculty for B. Pharmacy Course: Nil
- Adjunct Faculty for D. Pharmacy Course: Nil
- Permanent Faculty: Student Ratio

Sr. No.	Course	No. of Faculty	Sanctioned Intake					Faculty: Student Ratio
			I	II	III	IV	Total	
01	B. Pharmacy	27	100	100	100	100	400	15
02	D. Pharmacy	06	60	60	--	--	120	20


- Number of Faculty Employed and Left during the last three years:

Sr. No.	Course	No. of Faculty Employed				No. of Faculty Left			
		2021-22	2020-21	2019-20	2018-19	2021-22	2020-21	2019-20	2018-19
01	B. Pharmacy	06	06	10	10	04	03	02	02
02	D. Pharmacy	03	01	04	03	03	00	02	00



## 8. Profile of Principal &amp; Faculty

## A) Profile of Principal

Particular	Details	
Name	Mr. Mahesh G. Saralaya	
Date of Birth	11/12/1968	
Unique id	1-10985398661	
Education Qualifications	M. Pharm., PhD	
Work Experience	<b>Teaching:</b> 25.5 Years, <b>Research:</b> 10 Years, <b>Industry:</b> 00 Year, <b>Other:</b> 00; <b>Total:</b> 25.5 Years	
Area of Specialization	Pharmacology	
Courses taught at Under Graduate	Pharmacology, Human Anatomy & Physiology, Pathophysiology	
Courses taught at Post Graduate	Cellular and Molecular Pharmacology, Advances in pharmacology	
Research guidance	08 M. Pharm & 02 PhD	
No. of papers published	<b>National:</b> 10, <b>International:</b> 23, <b>Total:</b> 33	
Master	08	
Ph.D.	02	
Projects Carried out	01 “Bioequivalence studies of NDA of Good Health Pharmaceutical Research Center Surat, Rs. 1,50,000/-	
Patents	Nil	
Technology Transfer	Nil	
Research Publications	33	
No. of Books published with details	Nil	

## B) Profile of Faculty: Attached Annexure: I

## 9. Fee

▪ **Details of Fee, as approved by State Fee Committee for the Institution**

- The details of fees approved by the Fees Regulating Authority of State Government is as follow -

Sr. No.	Name of Course	Approved Fee for the A. Y. 2020-21		
		Tuition Fee (Rs.)	Development Fee (Rs.)	Total Fee (Rs.)
01	B. Pharmacy	81081.00	8919.00	90000.00
02	D. Pharmacy	52253.00	5747.00	58000.00

▪ **Time schedule for payment of Fee for the entire Programme**

- Fee should be paid at the time of admission for respective academic years.

▪ **No. of Fee Waivers granted with amount and name of students**

- The details of students admitted under TFWS quota and tuition fee waived are as follow -

Sr. No.	Name of Course	Details of Tuition Fee Waiver Scheme (For the Academic Year 2020-21)		Amount Waived (Rs)
		No. of students	Name of the Student	
01	B. Pharmacy	05	Mohite Sakshi Dilip	81081.00
			Pathan Jainab Abdulmujib	81081.00
			Kazi Najiya Ayub	81081.00
			Katare Sneha Sanjay	81081.00
			Gouraje Omkar Rajandra	81081.00
02	D. Pharmacy	03	Inamdar Ashrafi Shahanavaj	52253.00
			Rokade Nikita Jotiram	52253.00
			Chougule Kaifiya Imtiyaj	52253.00

▪ **Number of scholarship offered by the Institution, duration and amount**

- The institute offers all the Scholarship / Freeship to the eligible students as per the State Government Norms. The details for the academic Year 2021-22 are as follows -

Sr. No.	Scheme of Scholarship	Duration	No. of Students	Total Amount (Rs)
<b>B. Pharmacy</b>				
01	EBC	01 Year	146	57,11,836.00
02	VJNT Scholarship / Freeship	01 Year	60	48,40,137.00
03	OBC Scholarship / Freeship	01 Year	46	18,58,130.00
04	SBC Scholarship / Freeship	01 Year	18	14,45,958.00
05	SC Scholarship / Freeship	01 Year	45	40,50,000.00
06	ST Scholarship / Freeship	01 Year	05	4,50,000.00
		<b>Total</b>	<b>320</b>	<b>1,83,56,061.00</b>
<b>D. Pharmacy</b>				

07	EBC	01 Year	40	10,00,000.00
08	VJNT Scholarship / Freeship	01 Year	14	7,15,771.00
09	OBC Scholarship / Freeship	01 Year	17	4,32,889.00
10	SBC Scholarship / Freeship	01 Year	03	1,50,000.00
11	SC Scholarship / Freeship	01 Year	10	5,44,000.00
12	ST Scholarship / Freeship	01 Year	00	00.00
		<b>Total</b>	<b>84</b>	<b>28,42,660.00</b>

■ **Criteria for Fee Waivers / Scholarship**

i) **Criteria for Tuition Fee Waiver Scheme (TFWS):**

Sr. No.	Particular	TFWS Details
01	<b>Scheme</b>	<ul style="list-style-type: none"> <li>Tuition Fee Waiver Scheme (TFWS) Seats will be filled in by the Competent Authority.</li> <li>Seats up to maximum 5 % of sanctioned intake per course are available.</li> <li>These seats are supernumerary in nature.</li> <li>The Waiver is limited to the tuition fee as approved by the Fee Regulation Authority &amp; All other fees except tuition fees shall be paid by the beneficiary.</li> <li>The Candidates admitted under this scheme is not allowed to change Institution/course at any stage under any circumstances.</li> <li>These seats are available for admission to First Year of B. Pharmacy &amp; D. Pharmacy course.</li> </ul>
02	<b>Eligibility</b>	<ul style="list-style-type: none"> <li>Only Maharashtra State Candidature candidates are eligible for these seats.</li> <li>Eligible Maharashtra State Candidates having their parent's annual income less than Rs. 8 Lakh (Rupees Eight Lakh only) from all sources shall only be eligible for these seats.</li> <li>- The candidate shall submit Income certificate issued by Appropriate Authority.</li> </ul>
03	<b>Admissions Procedure</b>	<ul style="list-style-type: none"> <li>These seats are allotted by the Competent Authority as per inter-se merit.</li> <li>For this purpose, the Competent Authority shall invite applications, prepare a separate merit list for this category by following the same criteria as for Maharashtra State Candidature Candidates.</li> <li>In the event of non-availability of students in this category the same shall not be given to any other category of applicants.</li> </ul>

ii) **Criteria for Scholarships:**

Sr. No.	Scheme	Scheme Details
01	Rajarshi Chhatrapati Shahu Maharaj Shikshan Shulkh Shishyavrutti Scheme	As per the State Government Norms. <a href="https://mahadbtmahait.gov.in/Home/Index">https://mahadbtmahait.gov.in/Home/Index</a>
02	Dr. Punjabrao Deshmukh Vasatigruh Nirvah Bhatta Yojna	As per the State Government Norms. <a href="https://mahadbtmahait.gov.in/Home/Index">https://mahadbtmahait.gov.in/Home/Index</a>
03	Scholarship to VJNT Students	As per the State Government Norms. <a href="https://mahadbtmahait.gov.in/Home/Index">https://mahadbtmahait.gov.in/Home/Index</a>
04	Scholarship to OBC Students	As per the State Government Norms. <a href="https://mahadbtmahait.gov.in/Home/Index">https://mahadbtmahait.gov.in/Home/Index</a>

<b>05</b>	Scholarship to SBC Students	As per the State Government Norms. <a href="https://mahadbtmahait.gov.in/Home/Index">https://mahadbtmahait.gov.in/Home/Index</a>
<b>06</b>	Scholarship Scheme for State Minority Communities	As per the State Government Norms. <a href="https://mahadbtmahait.gov.in/Home/Index">https://mahadbtmahait.gov.in/Home/Index</a>
<b>07</b>	Scholarship / Freeship Scheme for SC, ST Students	As per the State Government Norms. <a href="https://mahadbtmahait.gov.in/Home/Index">https://mahadbtmahait.gov.in/Home/Index</a>
<b>08</b>	Pragati Scholarship Scheme for Girl Students (Degree, Direct Second Year Degree & Diploma)	As per the All India Council for Technical Education Norms. <a href="https://scholarships.gov.in">https://scholarships.gov.in</a>
<b>09</b>	Saksham Scholarship Scheme for Specially Abled Student (Degree, Direct Second Year Degree & Diploma)	As per the All India Council for Technical Education Norms. <a href="https://scholarships.gov.in">https://scholarships.gov.in</a>
<b>10</b>	Post Matric Scholarships Scheme for Minorities	As per the Central Government Norms <a href="https://scholarships.gov.in">https://scholarships.gov.in</a>

▪ **Estimated Cost of Boarding and Lodging in Hostels**

<b>Sr. No.</b>	<b>Name of Hostel</b>	<b>Annual Fees (Rs.)</b>
<b>01</b>	Girl Hostel I	22000.00
<b>02</b>	Girl Hostel II	27000.00
<b>03</b>	Boys Hostel I	22000.00
<b>04</b>	Boys Hostel II	16000.00

▪ **Any other fee please specify**

- Institute does not charge any fee other than Fees sanctioned by Fees Regulating Authority of Government of Maharashtra.

## 10. Admission

- Number of seats sanctioned with the year of approval

Sr. No.	Course	No. of Seats Sanctioned	Year of Approval
01	B. Pharmacy	100	2021
02	D. Pharmacy	60	2021

- Number of Students admitted under various categories each year in the last three years

- Following are the details of the Number of students admitted under various categories -

Sr. No.	Category	Course: B. Pharmacy				Course: D. Pharmacy			
		Academic Year				Academic Year			
		2021-22	2020-21	2019-20	2018-19	2021-22	2020-21	2019-20	2018-19
01	Open	56	53	19	52	36	30	22	34
02	SEBC	NA	NA	28	NA	NA	NA	05	NA
03	SC	11	09	11	14	05	07	07	07
04	ST	01	00	00	02	00	00	00	00
05	VJNT	13	22	14	13	09	06	13	07
06	OBC +	14	12	16	13	08	16	13	09
07	SBC	05	04	02	06	02	01	00	03
	<b>Total</b>	<b>100</b>	<b>100</b>	<b>90</b>	<b>100</b>	<b>60</b>	<b>60</b>	<b>60</b>	<b>60</b>
08	EWS (Over & Above)	08	06	01	NA	05	05	00	NA
09	TFWS (Over & Above)	05	04	NA	NA	03	02	NA	NA
<b>Grand Total</b>		<b>113</b>	<b>110</b>	<b>91</b>	<b>100</b>	<b>68</b>	<b>67</b>	<b>60</b>	<b>60</b>

- Number of applications received during last two years for admission under Management Quota and number admitted

- Following are the details of the Number of applications received during last two years for admission under Management Quota and number admitted

Institute Level Admissions (Management Quota & Seats remaining vacant after CAP)							
Sr. No.	Course	No. of Applications Received			No. of Students Admitted		
		2021-22	2020 – 21	2019 - 20	2021-22	2020 – 21	2019 - 20
01	B. Pharmacy	31	27	26	31	27	26
02	D. Pharmacy	24	23	23	24	23	23

## 11. Admission Procedure

### ▪ The Competent Authority for the Admission Process

#### A) First Year & Direct Second Year B. Pharmacy:

- The **Commissioner of State Common Entrance Test Cell, Maharashtra State** has been appointed by the State Government as the Competent Authority under section 10 of the Maharashtra Unaided Private Professional Educational Institutions (Regulation of Admissions and Fees) Act, 2015 (Mah. Act XXVIII of 2015), for conducting **Common Entrance Test (MHT CET)** for the admissions into Private Professional Educational Institutions and shall be the authority for **Centralized Admission Process (CAP)** and shall direct the students as per their allotment through CAP to all institutions.

#### B) First Year D. Pharmacy:

- The **Director, Directorate of Technical Education, Maharashtra State**, has been appointed by the State Government as the Competent Authority for the **Centralized Admission Process (CAP)** and shall direct the students as per their allotment through CAP to all institutions.

### ▪ Admission Tests:

- For the admission to First Year B. Pharmacy, candidate should obtain non zero score in MHT CET (Maharashtra State Candidature Candidates) or non zero positive score in NEET (for All India Candidature Candidates).
- For the admission to Direct Second Year B. Pharmacy no any entrance test shall be conducted & admission to eligible candidate will be allotted on the basis of Total marks obtained in Second Year D. Pharmacy examination.
- For the admission to First Year D. Pharmacy course, the candidate should Pass 10+2 examinations with Physics and Chemistry as compulsory subjects along with Mathematics / Biology subject.

Details of the competent Authority for the Admission test & the Centralized Admission				
Sr. No.	Particular	Name of Competent Authority	Address of Competent Authority	Website
<b>First Year B. Pharmacy</b>				
01	<b>MHT CET</b> (for State Quota Seats)	The Commissioner, State Common Entrance Test Cell, Maharashtra State	State Common Entrance Test Cell, Maharashtra State, 8 <sup>th</sup> Floor, New Excelsior Building, A. K. Nayak Marg, Fort, Mumbai - 400001. (M.S.) Phone : 022-2016157 / 59 / 53/ 34 / 19 / 28 E-Mail : maharashtra.cetcell@gmail.com	<a href="http://cetcell.mahacet.org/CET_landing_page_2021/">http://cetcell.mahacet.org/CET_landing_page_2021/</a>
02	<b>NEET</b> (For All India Quota Seats)	Senior Director, National Testing Agency (NTA)	C-20 1A/8 ,Sector 62 IITK Outreach Centre, NOIDA-201309 Email ID: <a href="mailto:neet@nta.ac.in">neet@nta.ac.in</a> Phone: 0120-6895200 (NTA Helpdesk)	<a href="https://nta.ac.in">https://nta.ac.in</a>

<b>03</b>	<b>Centralized Admission Process (CAP)</b>	The Commissioner, State Common Entrance Test Cell, Maharashtra State	State Common Entrance Test Cell, Maharashtra State, 8 <sup>th</sup> Floor, New Excelsior Building, A. K. Nayak Marg, Fort, Mumbai - 400001. (M.S.) Phone : 022-2016157 / 59 / 53/ 34 / 19 / 28 E-Mail : maharashtra.cetcell@gmail.com	<a href="http://www.mahacet.org">http://www.mahacet.org</a>
<b>Direct Second Year B. Pharmacy</b>				
<b>04</b>	<b>Centralized Admission Process (CAP)</b>	The Commissioner, State Common Entrance Test Cell, Maharashtra State	State Common Entrance Test Cell, Maharashtra State, 8 <sup>th</sup> Floor, New Excelsior Building, A. K. Nayak Marg, Fort, Mumbai - 400001. (M.S.) Phone : 022-2016157 / 59 / 53/ 34 / 19 / 28 E-Mail : maharashtra.cetcell@gmail.com	<a href="http://www.mahacet.org">http://www.mahacet.org</a>
<b>First Year D. Pharmacy</b>				
<b>05</b>	<b>Centralized Admission Process (CAP)</b>	<b>The Director, Directorate Of Technical Education , Maharashtra State</b>	Mumbai 3, Mahapalika Marg, Post Box No.1967, Opp. Metro Cinema, Mumbai - 400 001 Phone: (022) 2264 1150, 2264 1151, 2262 0601, 2269 0602	<a href="http://www.dtemaharashtra.gov.in">http://www.dtemaharashtra.gov.in</a>

- **Number of seats allotted to different Test Qualified candidate separately (AIEEE / CET State conducted test / University tests / CMAT/ GPAT) / Association conducted test etc.)**
- Allocation of seats for MHT CET and NEET qualified students within Sanctioned Intake is as follow:

Sr. No.	Name of Test	Allocation of seats within Sanctioned Intake	
		Maharashtra State Candidates	All India Seats
First Year B. Pharmacy			
01	MHT – CET Qualified Students	<b>Total: 65 % of CAP seats</b> For Home University: 45.5 %, For Other than Home University: 19.5 %	Preference will be given to the candidate obtaining non zero positive score in NEET over the candidates who obtained non zero score in MHT-CET
02	NEET Qualified Students	00	15 % of CAP seats
Direct Second Year B. Pharmacy			
01	Total Marks obtained in S. Y. D. Pharmacy	<b>100 % of CAP seats</b> (Seats remaining Vacant at F Y. B. Pharmacy + Lateral Entry Seats 10 % of SI)	00
First Year D. Pharmacy			
01	Total marks obtained in Physics, Chemistry, Biology / Mathematics at HSc Examination	100 % of CAP seats	00

**▪ Calendar for Admission against Management / Vacant seats:**

- The Principal of the institution will be the authority to carry out the admissions for the seats of Institutional Quota & Seats remaining Vacant after the Centralized Admission process as per the directions received from the Competent authority of the respective courses.
- Admissions are made in a transparent manner and strictly as per the Inter-Se-Merit of the Candidates who have applied to the Competent Authority for verification of documents and then to the Institution.
- Aspiring Candidates fulfilling the eligibility criteria as notified by the Government and specified by the appropriate authority, from time to time, shall apply to the Principal of the respective institution for admission at the Institution level and seats remaining vacant after CAP.
- The institution after verification of all required documents will prepare and display the Inter- Se-merit lists of the Candidates
- The detail schedule for the admission to the Institutional Quota & Seats remaining Vacant after the Centralized Admission process for the **Academic Year 2021-2022** is as follow:

Sr. No.	Course	Detailed Schedule
01	First Year B. Pharmacy	Attached Annexure II
02	Direct Second Year B Pharmacy	Attached Annexure II
03	First Year D. Pharmacy	Attached Annexure III

**▪ The Policy for Cancellation of Admission, Refund of fees & Return of Documents by Institutions**

- The Candidate shall apply online for cancellation and submit duly signed copy of system generated application for cancellation of admission to the institution. Once the candidate submits online request for cancellation, his/her admission shall be treated as cancelled. The Institute will consider the online request made by Candidate for cancellation as final irrespective of whether he/she has submitted duly signed copy of system generated application to the Institute. Upon such cancellation, the candidate shall lose the claim on the seat and such seat shall become available for further allotment.
- The candidate shall then become entitled to and the Institute shall refund the entire fees to the candidate after deduction of Rs.1000/- towards processing charges and return all his/her original documents submitted to the Institute within two days from submission of duly signed copy of system generated application to the Institute.
- The institution shall not entitle to recover the fees for the subsequent years from the student seeking cancellation of his admission at any point of time



## 12. Criteria and Weightages for Admission

- The eligibility criteria for the admission to First Year B. Pharmacy, Direct Second Year B. Pharmacy & First Year D. Pharmacy will be as per the rules and regulations framed by the Competent Authority. The eligibility criteria for admission to various courses in Academic Year 2020-21 is as follow:

Sr. No.	Course	Eligibility Criteria
01	First Year B. Pharmacy	<p><b>(1) Maharashtra State Candidature Candidates</b></p> <p>(i) The candidate should be an Indian National;</p> <p>(ii) Passed HSC or its equivalent examination with Physics and Chemistry as compulsory subjects along with one of the Mathematics or Biology and obtained at least 45% marks (at least 40% marks in case of candidates of Backward class categories, Economically Weaker Section and Persons with Disability belonging only to Maharashtra State) in the above subjects taken together;</p> <p>(iii) The candidate should have appeared in all the subjects in MHT-CET 2020 and obtain non zero score in MHT-CET 2020.</p> <p><b>(2) All India Candidature Candidates. -</b></p> <p>(i) The candidate should be an Indian National;</p> <p>(ii) Passed HSC or its equivalent examination with Physics and Chemistry as compulsory subjects along with one of the Mathematics or Biology and obtained at least 45% marks (at least 40% marks in case of candidates of Backward class categories, Economically Weaker Section and Persons with Disability belonging only to Maharashtra State) in the above subjects taken together;</p> <p>(iii) Should obtain non zero positive score in NEET or the candidate should have appeared in all the subjects in MHT-CET 2020 and obtain non zero score in MHT-CET 2020. However, preference shall be given to the candidate obtaining non zero positive score in NEET over the candidates who obtained non zero score in MHT-CET 2020.</p>
02	Direct Second Year B. Pharmacy	<p><b>For Maharashtra State Candidature Candidate and All India Candidature Candidate, -</b></p> <p>(i) The candidate should be an Indian National;</p> <p>(ii) Passed Diploma Course in Pharmacy with at least 45% marks (at least 40% marks in case of candidates of Backward class categories, Economically Weaker Section and Persons with disability belonging to Maharashtra State only) from an All India Council for Technical Education or Pharmacy Council of India or Central or State Government approved Institution or its equivalent.</p> <p>(iii) Any other criterion declared from time to time by the appropriate authority as defined under the Act.</p>
03s	First Year D. Pharmacy	<p>(i) The Candidate should be an Indian National.</p> <p>(ii) Passed 10+2 examination with Physics and Chemistry as compulsory subjects along with Mathematics / Biology subject.</p>

- **Cut-off Levels of percentage and percentile score of the candidates in the admission test for the last three years**
  - The cut off marks in admission test of students admitted in respective academic year are as follow –

Item		A. Y. 2021-22	A. Y. 2020-21	A. Y. 2019-20	A. Y. 2018-19
National Level Entrance Examination <b>NEET</b>	No. of Students admitted	14	14	09	10
	Opening Score/Rank	66.1640137 (Percentile)	86.8927369	64.5521724	195
	Closing Score/Rank	17.3957584 (Percentile)	30.6668969	54.9790715	73
State Level Entrance Examination <b>MHT CET</b>	No. of Students admitted	99	96	82	90
	Opening Score/Rank	98.2436611 (Percentile)	96.8419538	97.2317662	102
	Closing Score/Rank	1.1754334 (Percentile)	1.5249437	2.5761682	46
Name of the Entrance Examination for Lateral Entry or lateral entry details <b>S. Y. D. Pharm Result</b>	No. of Students admitted	18	30	14	22
	Opening Score/Rank	93.30 %	97.50 %	84.90	86.70
	Closing Score/Rank	62.10 %	81.20 %	62.80	53.20

▪ **Display marks scored in Test etc. and in aggregate for all candidates who were admitted**

- The details of aggregate marks obtained in HSc or Diploma Examination is as follow -

Sr. No.	Course	A. Y. 2021-22	A. Y. 2020-21	A. Y. 2019-20	A. Y. 2018-19
01	<b>First Year B. Pharmacy</b> (PCM/B Marks %)	78.62 %	60.442 %	57.2092 %	59.2965 %
02	<b>Second Year B. Pharmacy</b> (Diploma Percentage)	85.12 %	91.30 %	76.1357 %	73.5818 %
03	<b>First Year D. Pharmacy</b> (PCM / B Marks %)	71.94 %	60.4497 %	56.9996 %	60.1305 %

**13. List of Applicants**

- **List of candidate whose applications have been received along with percentile / percentage score for each of the qualifying examination in separate categories for open seats.**
  - The aspirant candidate required to fill the Online Application Form and Online preference form to respective competent authority as per the notified schedule. So list of candidate who gives the preferences for our institute in CAP is not available with institute.
- **List of candidate who have applied along with percentage and percentile score for Management quota seats and seats remaining vacant after CAP (merit wise)**

Sr. No.	Course	List of Candidate
01	First Year B. Pharmacy	Attached Annexure IV
02	Direct Second Year B Pharmacy	Attached Annexure IV
03	First Year D. Pharmacy	Attached Annexure V

## 14. Results of Admission Under Management seats / Vacant seats

- Composition of selection team for admission under Management Quota with the brief profile of members.

- The selection team for the admission process under Institutional Quota Seats and Seats remaining vacant after CAP round is -

Sr. No.	Name of Member	Designation
01	<b>Dr. M. G. Saralaya</b> Principal, ADCBP Ashta	Head
02	<b>Mr. S. J. Sajane</b> Vice-Principal & Head, Admission Cell, ADCBP Ashta	Member
03	<b>Mr. S. S. Upadhye</b> HOD, D. Pharm ADCBP, Ashta	Member
04	<b>Mr. N. S. Nalawade</b> Clerk, ADCBP, Ashta	Member

- Score of the individual candidate admitted arranged in order or merit

Sr. No.	Course	List & Score of Candidate
01	First Year B. Pharmacy	Attached Annexure VI
02	Direct Second Year B Pharmacy	Attached Annexure VI
03	First Year D. Pharmacy	Attached Annexure VII

- List of candidate who have been offered admission

- A list of candidate who have been offered admission under Institutional Quota Seats and Seats remaining vacant after CAP round for various courses in the A. Y. 2021-22 is –

Sr. No.	Course	List & Score of Candidate
01	First Year B. Pharmacy	Attached Annexure VIII
02	Direct Second Year B Pharmacy	Attached Annexure VIII
03	First Year D. Pharmacy	Attached Annexure IX

- Waiting list of the candidate in order of merit to be operative from the last date of joining of the first list candidate.

- A waiting list of candidate for the admission to various courses in the Institution under Institutional Quota Seats and Seats remaining vacant after CAP round for the A. Y. 2021-22 is as follow:

Sr. No.	Course	Name of Candidate
01	First Year B. Pharmacy	Nil
02	Direct Second Year B Pharmacy	Nil
03	First Year D. Pharmacy	Nil

- List of the candidate who joined within the date, vacancy position in each category before

**operation of waiting list**

- List of candidates who have joined for various courses in the A. Y. 2021-22 under Institutional Quota Seats and Seats remaining vacant after CAP round for the **A. Y. 2021-22** is as follow:

<b>Sr. No.</b>	<b>Course</b>	<b>List of Candidate who have been Joined the Institute</b>
<b>01</b>	First Year B. Pharmacy	Attached Annexure VIII
<b>02</b>	Direct Second Year B Pharmacy	Attached Annexure VIII
<b>03</b>	First Year D. Pharmacy	Attached Annexure IX

## 15. Information of Infrastructure and Other Resources Available

- The following are the details of Infrastructure available in the institute -

**Independent Building Status** : Yes

**Separate Campus Status:** Yes

Sr. No.	Room Type	No. of Rooms	Total Carpet Area (Sqm)
01	Class Rooms	08	806.29
02	Tutorial rooms	03	50.64
03	Laboratories	13	1392.43
04	Machine Room	01	102.81
05	Preparation Room	09	127.55
06	Computer Centre	01	168.07
07	Exam Control Center	01	30.24
08	Seminar hall	01	168.07
09	Auditorium	01	168.07
10	Store Rooms	02	60.36
11	Girl's Common Room	01	103.44
12	Boy's Common Room	01	102.810
13	Toilet Blocks for Boys	10	172.10
14	Toilet Blocks for Girls	09	166.90
15	Library	01	556.00
Type of Area			Total Carpet Area (Sqm)
01	Instructional area		3715.91
02	Administrative Area		749.53
03	Amenities Area		742.45
04	Circulation Area		1310.42
05	Total Carpet Area		6518.31
06	Total Built up Area		7480.81

- Barrier Free Built Environment for disabled and elderly persons**

- Institution has barrier free environment for disabled and elderly persons. The details are –

Sr. No.	Facilities	Available (Yes / No)	Remark
01	Barrier Free Environment	Yes	Architecture Certificate
02	Ramp	Yes	At the entrance for easy access in the campus
03	Lift	Yes	For easy access on the each floor
04	Wheelchair	Yes	Number: 01
04	Special Toilets for Handicapped candidates	Yes	Available on Each Floor
05	Writer Facility for the Examination	Yes	As per the rules & regulations of the University & Board

- Occupancy Certificate**

- The institute has valid Occupancy Certificate issued by Ashta Municipal Council Ashta.

- Fire and Safety Certificate**

- The institute has valid Fire Safety Certificate issued by Indean Fire Safety System.

▪ **Hostel Facility**

- Sanstha has separate hostel facility for the Boys and Girls.

▪ **Library**

- Institute has a well-organized, ventilated, updated & computerized library and a fully furnished & beautifully illuminated reading room with ample space which attracts students for studying, learning, making notes & assignments and encourage in performing day to day activities in a serene environment. It provides easy access to books and journals. The institute has well spacious library having voluminous books covering each subject. Various national, international journals and e-journals are available in library. The library also provides the various periodicals, compact discs (CD's) and newspapers for current awareness. The information center has adequate number of computers with broadband Internet / Wi Fi connectivity along with printer is provided. We are also member of NDL. The institute also provides the basic facilities like Xerox machine, scanner etc.

- **Library at Glance**

Sr. No.	Particular		Availability	
01	Library Area		Yes	556 sq.m
02	Seating Capacity		Yes	50
03	Method of Classification		Yes	DDC
04	No. of Volumes		5201	
05	No. of Titles		550	
06	National Journals		Yes	08
07	International Journals		Yes	02
08	Magazines		Yes	03
09	Newspapers		Yes	06
10	E-Information Resources	No. of CDs	Yes	13
		No. of Online Journals	393	Del - NET
11	Digital Library	No. of PCs	10	Dell
		Internet facility available	Yes	200 mbps
12	Library Timings		Monday to Saturday: 09.00 am to 06.00 pm. During Examination: Sunday – 09.00 am to 06.00 pm	
13	Software		Yes	
14	Library Services		Book Landing Service, Book Bank Facility, Internet Service, Reading Room Facility, Reprographic Service, News Paper Section, Model Answer Papers	
15	National Digital Library(NDL) Subscription		Available	

▪ **Laboratory**

- The laboratories provide large area for experimental performance and research projects. The prerequisites of practical's and research activities are satisfied time to time. All the laboratories are equipped with sophisticated instruments and facilitated with required chemicals, glassware's, equipments and lab-ware. Major Equipments available are –

<b>List of Major Equipments Available</b>	
<b>Department of Pharmaceutics</b>	<b>Department of Pharmaceutical Chemistry</b>
Rotary Tablet Press	HPLC, FTIR
Disintegration Test Apparatus	UV- Visible Spectrophotometer
Tablet Dissolution Test Apparatus	UV Cabinet
BOD Incubator	Particle Size Analyzer
Stability Chamber	Refractometer
Ultrasonic Cleaner	Polarimeter
Brookfield Viscometer	Colorimeter
Tray Dryer	Muffle Furnace
Precision melting point	Arsenic Limit Test Apparatus
Digital balance	Nephelo Turbidity meter
Ampoule sealing machine	Flame Photometer
Magnetic stirrer 500ml & 1 Litr capacity	Potentiometer
Aseptic cabinet	Conductivity meter
Tablet coating machine	Deep Freezer
Ball mill	<b>Department of Pharmacology</b>
Double cone blender	Hutchinson's spirometer
Autoclave	Stethoscope
Capsule filling machine	Sphygmomanometer
Ampoules washing machine	Sherrington's kymograph machine
Hardness tester	Sherrington drum
Friability test apparatus	Pole climbing apparatus
Clarity test apparatus	Rotarod
BOD Incubator	Analgesiometer
Digital pH meter	Convulsiometer
Bulk density	Histamine chamber
Franz Diffusion cell	Compound Microscope
Antibiotic Zone Rader	<b>Department of Pharmacognosy</b>
Laminar Air Flow	Microtome rotary
Micropipette single & Multi Channeled	Water Distillation unit
Ultra Sonicator	Muffle Furnace
Colony Counter	Rotary Shaker

#### ▪ **Computing Facilities**

- Fully furnished computer laboratory is having 20 computers with latest Configuration connected With LAN and provide Internet speed up to 500 Mbps. Wi-Fi facility is available to Staff as Well as Student in the College Campus for 24×7. Lab is provided with Language Lab Software. Printing & scanning facility is also available for student in the Computer laboratory. The computer lab caters the Need of faculty & students for their knowledge updating of the subjects.



Sr. No.	Particular	Details
01	Internet Bandwidth	155 Mbps
02	Number and configuration of System	55
03	Total number of system connected by LAN	55
04	Major software	Language Lab, Experimental Pharmacology
05	facilities available (Conduct of online Meetings/Webinars/Workshops	Available
06	Facilities for conduct of classes/courses in online mode (Theory & Practical)	Available
07	Innovation Cell	Available
08	Social Media Cell	Available

▪ **List of facilities Available**

- **Games and Sports Facilities:** The institute encourages the students to inculcate health awareness in them and provides facilities for indoor and outdoor games. The institute has playgrounds for cricket, Kabaddi and Volleyball and also indoor stadium for Badminton, Table – Tennis, Carom, Chess, Billiards etc. Besides a ground for athletic events is also available.
- **Extra-Curricular Activities:** Institute conducts the various extracurricular activities. Institute also promote the students to participate in various activities conducted by other colleges, Sanstha, trust etc.
- **Soft Skill Development Facilities:** Institute provides the facility for the analysis of personality trait / Learning style / Employability skill analysis.

▪ **Teaching Learning Process**

- We have established clear, measurable, realistic and challenging learning goals considering gap in between current curriculum outcomes and employment market needs. We have set clear, measurable and challenging assessments with performance criteria for generating evidence of achievement. This essentially consists of diverse formative assessments and feedback apart from summative assessments. We have designed learning experiences and instructions that will facilitate the student to achieve the desired results. We have adopted model that start from results, assessments and then teaching approach which ensures desired cognitive and psychomotor skill development of students. Learning process is made transparent by offering Course Description Booklet and Learning Outcome Booklet to the students.

Sr. No.	Particular	Details
01	Curriculum and Syllabus for each of the Programmes as approved by the University (B. Pharm) and Board (D. Pharm)	Attached Annexure X
02	Academic Calendar of the University and Board	Attached Annexure XI
03	Academic Time Table with the name of the Faculty members handling the Course	Attached Annexure XII
04	Teaching Load of each Faculty	Attached Annexure XIII
05	Internal Continuous Evaluation System and place	Attached Annexure XIV
06	Assessment of Faculty by Student, System in place	Attached Annexure XV

**16. Enrolment and Placement details of students in the last 3 years**

- The Enrolment and Placement details of students are as follow -

Enrollment Data					
Sr. No.	Class	A. Y. 2021 -22	A. Y. 2020 -21	A. Y. 2019 -20	A. Y. 2018 - 19
01	First Year B. Pharmacy	113	110	90	100
02	Second Year B. Pharmacy	127	121	114	110
03	Third Year B. Pharmacy	121	116	107	55
04	Final Year B. Pharmacy	115	107	55	NA
05	First Year D. Pharmacy	68	67	60	60
06	Second Year D. Pharmacy	68	59	56	NA
Placement Data					
Sr. No.	Class	A. Y. 2021 -22	A. Y. 2020 -21	A. Y. 2019 -20	A. Y. 2018 - 19
01	B. Pharmacy	Nil	58	38	NA
02	D. Pharmacy	Nil	41	23	NA

## 17. List of Research Projects / Consultancy Works

## ▪ Number of Projects carried out, funding agency, Grant received

Sr. No.	Name of Faculty (Principal Investigator)	Title of the Project	Duration (in Months)	Amount Received (In Rupees)	Name of the Funding agency
1	Dr. P.K Pawar	Development of mucoadhesive based nanocomposite design of voriconazole loaded ocular insert for the treatment of ocular keratitis.	36	42,90,000.00 /-	SERB - DST
2	Mr. S. M. Honmane	Design and Development of surface modified nanoparticle for targeted drug delivery.	36	1,78,000.00 /-	SUK Research Initiation scheme
3	Ms. Jadhav P.H	Physiochemical, Molecular modeling and stability studies of supermolecular inclusion complexes of certain active pharmaceutical ingredients with cyclodextrin	36	11,50,000.00 /-	SPNRF BARTI PUNE

## ▪ Details of Consultancy Services

Sr. No.	Name of the Faculty	Title of the work	Duration (Days)	Name of the Institution / Industry	Amount Received (Rs)	Year
2021 - 2022						
1	Mr. Mote G.D	Particle size and Zeta potential	01	Dr. Amit Kasabe SUCOPS&RC, Kharadi	450	2021-22
2	Mr. Mote G.D	Particle size and Zeta potential	03	Mr. Kiran S. Patil , TKCP, Warnanagar	4700	2021-22
3	Mr. Mote G.D	Particle size and Zeta potential	02	Mr. Kiran S. Patil, TKCP, Warnanagar	1200	2021-22
4	Mr. Mote G.D	Particle size and Zeta potential	01	Girija Save, GNCOP, Sawarde	750	2021-22
5	Mr. Mote G.D	Particle size and Zeta potential	02	Kadam Praniti, GNCOP, Sawarde	1650	2021-22
6	Mr. Mote G.D	Particle size and Zeta potential	01	Dr. Ujma Belgami, KIMS, Karad	450	2021-22
7	Mr. Honmane S. M	Particle size	01	Manoj B. Shinde, SCOP, Satara	500	2021-22
8	Mr. Honmane S. M	Particle size and Zeta potential	02	Mr. Kiran S. Patil, TKCP, Warnanagar	2300	2021-22
9	Mr. Mote G.D	Particle size	02	Ms. Varsha Mane, SCOP, Satara	2000	2021-22
10	Mr. Mote G.D	Particle size and Zeta potential	03	Mr. Kiran S. Patil, TKCP, Warnanagar	2800	2021-22
Total					16800	2021-22

▪ **Publications (if any) out of Research in last three years**

Sr. No.	Academic Year	No. of Publications		Total
		National	International	
01	2021-22	01	09	10
02	2020 -21	04	07	11
03	2019 -20	05	13	18
04	2018 -19	01	03	04

▪ **Industry Linkage**

Sr. No.	Name of Student/Staff	Academic Year	Name of Industry linked	Type of Work	Purpose
01	Mr. Honmane Sandip M. Asst. Prof. ADCBP, Ashta	2019-20	Lipoid GmbH, Ludwigshafen, Germany	Research Project	Gift sample for Research Project
02	Miss. Kulkarni Tanuja S. Final Year B. Pharm	2019-20	S.G. Phyto pharma Kolhapur	Research Project	Gift sample for Research Project

▪ **MoUs with Industries**

Sr. No.	Name of Collaborating Organization	Nature of Collaboration	Outcome of Collaboration
1.	Dhanvantari Ayurved Pharma, Ashta, Maharashtra	Training & Internship	• Laboratory Training, Hospital visit for students & staff
2.	S. G. Phytopharma Pvt. Ltd., Kolhapur, Maharashtra	Training & Internship	• Implant training for students & staff & placement & placement of students
3.	Symbiosis Cooperative Pharmaceutical Ltd. Kupwad Block, Sangli, Maharashtra.	Training & Internship	• Implant training for students & staff & placement & placement of students
4.	Rubicon Pvt. Ltd, Pune, Maharashtra.	Training, seminar, workshop & Internship	• Training, to students on below topics: Organizational Structure, Public Speaking, Presentation Skills, E-mail Etiquette, Grooming, Group Discussion, Personal Interview, Assessment will be conducted on Group Discussion and Personal Interview
5.	Ajit Laboratories, Miraj, Sangli, Maharashtra	Training & Internship	• Implant training for students & staff & placement & placement of students
6.	Idomax Chemicals, Miraj, Sangli, Maharashtra	Training & Internship	• Implant training for students & staff & placement & placement of students
7.	Quadrant Laboratories, Sangli, Maharashtra	Research Project, Training & Internship	• Laboratory Training for students & staff. • Identifying opportunities for conducting collaborative research& development. • Exchange of academic information and materials. • Promoting collaboration in field of mutual interest.
8.	Biocyte Institute of Research & Development (BIRD), Sangli, Maharashtra	Research Project, Training & Internship	• Laboratory Training for students & staff. • Identifying opportunities for conducting collaborative research& development. • Exchange of academic information and materials. • Promoting collaboration in field of mutual interest.
9.	Saglo Research Equipments,	Training &	• Identifying opportunities for conducting collaborative

	Miraj, Sangli, Maharashtra	Internship	research & development. <ul style="list-style-type: none"><li>• Exchange of academic information and materials.</li><li>• Promoting collaboration in field of mutual interest.</li></ul>
10.	IKYA Global Consultancy Pvt. Ltd., Hyderabad	Training & Placement assistance under the advanced certification courses.	<ul style="list-style-type: none"><li>• Provide trained and certified students for medical coding and Pharmacovigilance job.</li><li>• Placement assistance for students</li></ul>
11.	Aadhar Hospital	Training	<ul style="list-style-type: none"><li>• Hospital Pharmacy</li></ul>

**18. LoA and subsequent EoA till the current Academic Year**

Sr. No.	Academic Year	LOA	EOA
01	2016 – 2017	Attached Annexure XVI	NA
02	2017 – 2018	NA	Attached Annexure XVII
03	2018 – 2019	NA	
04	2019 – 2020	NA	
05	2020 – 2021	NA	
06	2021 – 2022	NA	

**19. Accounted audited statement for the last three years**

Sr. No.	Academic Year	EOA
01	2018 – 2019	Attached Annexure XIX
02	2019 – 2020	Attached Annexure XX
03	2020 – 2021	Attached Annexure XVIII

**20. Best Practices adopted****▪ Academics**

- Re-organization of syllabus on basis of principles of knowledge organization
- In-House design of Learning Outcome Booklet (LOB)
- Library of 'Knowledge Organizers' & 'Concept Maps'
- Embedded Formative Assessments
- Differential Assignments
- In-House Teacher Training & Teacher Support System
- Question paper mapping & monitoring
- Model Answer papers (General Feedback)

**▪ Use of Technology**

- Use of Learning Management Software
- Use of Google Forms for conducting Survey, Feedbacks , demographics etc

**▪ Institutional Governance**

- Delegation of powers to teaching & support Staff
- Transparent & responsive feedbacks mechanism
- Student representation on all Cells or Committees
- Grievance Redress Cell for Internal Assessments
- Design of 'Course Description Booklet' for students



Ref. No. **ADCBP 2021-22/ 70 (a)**

Date: 22/12/2021

**Admissions Notice for filling of Vacant Seats  
(First Year B. Pharmacy & Direct Second Year B. Pharmacy  
for the Academic Year 2021-22)**

- As per the notifications issued by Government of Maharashtra State Common Entrance Test Cell, the Institute level round for First Year B. Pharm and Direct Second Year B Pharm, for the academic Year 2020-21 is scheduled between 23/12/2021 to 29/12/2021 for the Institutional Quota Seats, Seats remaining vacant after CAP Round II and due to cancellation.
- Eligibility: As per the admission notice issued by the competent authority - Government of Maharashtra State Common Entrance Test Cell.

**The activities and scheduled dates for Institute Level Round**

Sr. No.	Activity	Schedule	
		First Date	Last Date
01	Display of Provisional Vacant Seats for Institutional Quota Seats & Seats remaining vacant after CAP Round II	23/12/2021 (At 9.00 am)	23/12/2021 (At 9.00 am)
02	Registration of application by the Eligible Candidate for admission.	23/12/2021	27/12/2021 (Upto 05.00 pm)
03	Documents verification and confirmation of Application Form	23/12/2021	28/12/2021 (Upto 04.00 pm)
04	Display of the provisional merit list for Maharashtra State / All India Candidate on website & College Notice Board	28/12/2021 (At 06.00 pm)	28/12/2021 (At 06.00 pm)
05	Submission of grievances if any, for all type of Candidates	28/12/2021 (From 06.00 pm)	29/12/2021 (Upto 10.00 am)
06	Display of the Final Merit list of Maharashtra State/All India Candidates on website	29/12/2021 (At 11.00 am)	29/12/2021 (At 11.00 am)
07	Conduct of Admission Process & Reporting to the Institute	29/12/2021 (From 11.30 am)	29/12/2021 (Upto 05.00 pm)
08	Cut-off Date for all type of admissions for the Academic Year 2021-22	29/12/2021	29/12/2021

**Note:**

- Candidate must be present in person only.
- The candidate must bring Receipt cum Acknowledgment for admission.





- The candidate should bring all original documents for the admission process.
- If candidate has already taken the admission in other college, he / she shall produce the original Bonafied Certificate and Xerox copies of all such documents attested by the Head / Principal of the concerned institute. Such candidate shall required to pay the fees at the time of admission and such candidate shall be permitted to submit the required original documents on or before 29<sup>th</sup> December 2021 (05.00 pm) otherwise his / her admission will stand cancel and fees paid shall be forfeited.
- The candidate has to pay prescribed fees as finalized by Fees Regulating Authority at the time of admission.
- Candidate has to cancel his / her earlier admission. Candidate should cancel previous admission immediately at his/ her own risk and cost to confirm the allotted admission in this institute.
- The round will be conducted as per the Admission Information broacher for Academic Year 2021-22 issued by Government of Maharashtra State Common Entrance Test Cell.
- For more detail candidate can visit following websites:
  - i) First Year B Pharmacy: <https://ph2021.mahacet.org>
  - ii) Second Year B. Pharmacy: <https://cetusers21cap.mahacet.org.in/cet2021/dsp21>
  - iii) College Website: [www.adcbp.in](http://www.adcbp.in)

Date: 22/12/2021

Place: Ashta



Dr. M. G. Saralaya  
**PRINCIPAL**

Annasaheb Dange College of  
B. Pharmacy, Ashta.





Sant Dnyaneshwar Shikshan Santha's

Annexure III



# ANNASHEB DANGE COLLEGE OF B PHARMACY, ASHTA

(Approved by AICTE, New Delhi, Govt. of Maharashtra and Affiliated to Shivaji University, Kolhapur)

Ref. No. ADCBP/2021-22/10 (A)

Date: 18/10/2021

## Revised Admissions Notice for filling of Vacant Seats of First Year D. Pharmacy for the Academic Year 2021-22

- As per the notifications issued by Directorate of Technical Education Maharashtra State, the **Institute level round for First Year D. Pharm course**, for the academic Year 2021-22 is scheduled on Saturday, 23/10/2021 for the **Institutional Quota Seats & Seats remaining Vacant after CAP Round II**.
- **Eligibility:** As per the admission notice issued by the competent authority - Directorate of Technical Education Maharashtra State.

### Schedule of Activities for Admission to First Year of Diploma in Pharmacy (D. Pharmacy)

Sr. No.	Activity	Schedule	
		First Date	Last Date
01	Display of Provisional Vacant Seats for Institutional Quota Seats & Seats remaining vacant after CAP Round II.	17/10/2021	17/10/2021 (Upto 05.00 pm)
02	Registration of application by the Eligible Candidate for admission.	18/10/2021 (From 09.00 am onwards)	22/10/2021 (Upto 11.00 am)
03	Documents verification and confirmation of Application Form	18/10/2021 (From 01.00 pm onwards)	22/10/2021 (Upto 02.00 pm)
04	Display of the provisional merit list for Maharashtra State / All India Candidate on website & College Notice Board.	22/10/2021	22/10/2021 (Up to 03.00 pm)
05	Submission of grievances if any, for all type of Candidates.	22/10/2021 (From 03.00 pm)	22/10/2021 (Up to 05.00 pm)
06	Display of the Final Merit lists of Maharashtra State / All India Candidates on website.	22/10/2021	22/10/2021 (Up to 06.00 pm)
07	Conduct of Admission Process	23/10/2021 (From 09.00 am onwards)	23/10/2021 (Up to 05.00 pm)
08	Cut-off Date for all type of admissions for the Academic Year 2021-22	25/10/2021	25/10/2021



Sant Dnyaneshwar Shikshan Santha's



## ANNASAHEB DANGE COLLEGE OF B PHARMACY, ASHTA

(Approved by AICTE, New Delhi, Govt. of Maharashtra and Affiliated to Shivaji University, Kolhapur)

### Note:

- Candidate must be present in person only.
- The candidate must bring Receipt cum Acknowledgment for admission.
- If candidate has already taken admission in other college, submit Provisional Allotment Letter with Receipt cum Acknowledgment of confirmation of Admission and Bonafied Certificate.
- The candidate should bring all original documents for the admission process.
- If candidate has already taken the admission in other college, he / she shall produce the original Bonafied Certificate and Xerox copies of all such documents attested by the Head / Principal of the concerned institute. Such candidate shall required to pay the fees at the time of admission and such candidate shall be permitted to submit the required original documents on or before 25<sup>th</sup> October 2021 (05.00 pm) otherwise his / her admission will stand cancel and fees paid shall be forfeited.
- The candidate has to pay prescribed fees as finalized by Fees Regulating Authority at the time of admission.
- Candidate should cancel previous admission (if any) immediately at his/ her own risk and cost to confirm the allotted admission in this institute.
- The round will be conducted as per the Admission Information broacher for Academic Year 2021-22 issued by Government of Maharashtra Higher and Technical Education Department and Directorate of Technical Education Maharashtra State.
- For more detail candidate can visit following websites:

i) First Year D Pharmacy: <https://posthscdiploma2021.dtemaharashtra.gov.in/StaticPages/HomePage>

ii) College Website: [www.adcbp.in](http://www.adcbp.in)

Date: 18/10/2021

Place: Ashta



  
Principal  
Annasaheb Dange College of  
B. Pharmacy, Ashta.





Sant Dnyaneshwar Shikshan Santha's

**ANNA SAHEB DANGE COLLEGE OF B PHARMACY, ASHTA**

(Approved by AICTE, New Delhi, Govt. of Maharashtra and Affiliated to Shivaji University, Kolhapur)



**List for Candidates applied for the Institute Level Admission to First Year B. Pharmacy  
2021-22**

**For Institute Quota**

Sr.No.	Merit Marks (MHT CET 2021)	Application ID	Candidate Name	Category for Admission
1.	55.6358293	PH21444378	HERWADE HARSHAL ANNASO	OPEN
2.	76.1297044	PH21475795	GHULI PRERANA GURUDEV	OPEN
3.	52.5740930	PH21441780	KARVE PRATHMESH SUNIL	OPEN
4.	42.0923580	PH21421241	MAGDUM TABASSUM ISAK	OPEN
5.	65.3545203	PH21422231	PAWAR YASH PRAMOD	OPEN
6.	77.6694354	PH21440820	PATIL SANGRAM SHARAD	OPEN
7.	53.2317695	PH21457563	KALYANI SAKSHI YOGESH	OPEN
8.	68.5685433	PH21434042	HABLE PRANAV VUAY	SC
9.	52.5740930	PH21456993	PATIL OMKAR SUNIL	OPEN
10.	51.7214397	PH21466154	CHOUGULE SANIKA VIJAY	OPEN
11.	48.3091541	PH21445350	AHIR SANIKA RAJENDRA	OPEN
12.	68.1834597	PH21442928	GHATAGE SAYALI SUBHASH	OPEN
13.	39.1631040	PH21430490	SURYAWANSHI PRAGATI RAJENDRA	OPEN
14.	14.0691799	PH21442165	GHAT ANUJ ANIL	OPEN
15.	25.6953334	PH21406611	VIJAYALAKSHMI S.	OMS
16.	21.9015478	PH21425781	KOLEKAR SAKSHI SHITALNATH	OPEN
17.	35.0123329	PH21429667	PALKAR GAURAV SHIVAJI	OPEN
18.	9.7538742	PH21446487	VIBHUTE PRANAV ANIL	OPEN
19.	1.1754334	PH21442976	SALUNKHE PATIL ADITYA ARVIND	OPEN
20.	30.3311258	PH21410669	PATIL PRASHANT MANOHAR	NT2



  
**Prof (Dr) M. G. Saralaya**  
**PRINCIPAL**  
 Annasaheb Dange College of  
 B. Pharmacy, Ashta



Sant Dnyaneshwar Shikshan Santha's



# ANNASHEB DANGE COLLEGE OF B PHARMACY, ASHTA

(Approved by AICTE, New Delhi, Govt. of Maharashtra and Affiliated to Shivaji University, Kolhapur)

## List of Candidates applied for the Institute Level Admission to First Year B. Pharmacy 2021-22

For Seats Remaining Vacant After CAP Round II & Due to Cancellation of Admission

Sr.No.	Merit Marks (MHT CET 2021)	Application ID	Candidate Name	Category for Admission
1.	66.6709249	PH21433003	RAJAGE KARUNA SHANKAR	NT2
2.	27.1119965	PH21431850	MOMIN ARFIN SHAKIL	OPEN
3.	74.4320395	PH21411491	SHARMA KANAK PRASHANT	OPEN
4.	55.1017867	PH21408348	PATIL ADITYA GOPAL	OBC
5.	4.1132271	PH21458054	INGALE SHRUTI HANMANT	OPEN
6.	37.8436353	PH21444748	NANDGAONKAR OM SHIRISH	OPEN
7.	69.9360651	PH21414249	VAGE AVANI	OPEN
8.	27.0056208	PH21440320	MUDEGOL PRATIKSHA ANNAPPA	OPEN
9.	55.0083655	PH21413862	PATIL PRANJALI PRABHAKAR	OPEN
10.	17.7796283 NEET 2021	PH21430486	SARGAR SANKET BAJIRAO	NT2
11.	17.3957584 NEET 2021	PH21454174	PATIL SHREYA KESHAV	OPEN



*(Signature)*

Prof (Dr) M. G. Saralaya  
**PRINCIPAL**

Annasaheb Dange College of  
B. Pharmacy, Ashta.



Sant Dnyaneshwar Shikshan Santha's



## ANNASAHB DANGE COLLEGE OF B PHARMACY, ASHTA

(Approved by AICTE, New Delhi, Govt. of Maharashtra and Affiliated to Shivaji University, Kolhapur)

Ref. No.

Date: 29/12/2021

### List of Candidates applied for Institute Level Admission to Direct Second Year B. Pharmacy 2021-22

For Seats Remaining Vacant After CAP Round II & Due to Cancellation of Admission

Sr.No.	Merit Marks (Diploma Marks)	Application ID	Candidate Name	Category for Admission
1.	75.70	DSP21102991	PAWAR ASHUTOSH DNYANDEO	OPEN
2.	73.70	DSP21104079	PATIL SHRINIVAS JAYASING	OPEN



  
**Prof (Dr) M. G. Saralaya**  
**PRINCIPAL**  
Annasaheb Dange College of  
B. Pharmacy, Ashta.





SANT DNYANESHWAR SHIKSHAN SANSTHA'S  
**ANNASAHEB DANGE COLLEGE OF B PHARMACY**

Ashta, Tal: Walwa, Dist: Sangli, Maharashtra, India - 416301

**Provisional General Merit List for Institute Quota Seats of  
First Year D. Pharmacy Admission 2021-22**

Sr. No.	Merit No.	Application ID	Candidate Name	Candidature Type	Gender	Merit Marks PCM/B	Category For Admission
1.	1	DEN21575211	CHOPADE UTKARSHA SHITAL	A	FEMALE	75.33	OPEN
2.	2	DEN21657437	GHATULE MANASI SHIVAJI	A	FEMALE	73.00	OPEN
3.	3	DEN21518637	SHIRKE PRASAD MURARJI	A	MALE	72.67	OPEN
4.	4	DEN21570826	INAMDAR RUBINA SAMEER	A	FEMALE	70.33	OPEN
5.	5	DEN21584471	KADAM CHETAN CHANDRAKANT	A	MALE	70.00	OPEN
6.	6	DEN21569551	PAWAR SAI BALKRISHNA	A	FEMALE	66.00	OPEN
7.	7	DEN21598264	PATIL YASH DHANAJI	A	MALE	65.67	OPEN
8.	8	DEN21657510	MUJAWAR BUSHRA FARUK	A	FEMALE	65.00	OPEN
9.	9	DEN21515368	THOMBARE PRANJALI BANDOPANT	A	FEMALE	58.00	OBC
10.	10	DEN21519261	MANE ROHINI EKNATH	A	FEMALE	49.33	NT-C
11.	11	DEN21596670	SALUNKHE ABHISHEK ATUL	A	MALE	43.33	SC
12.	12	DEN21658281	DESAI ROHINI DINKAR	A	FEMALE	43.00	OPEN

Date: 22/10/2021

Place: Ashta



  
**Principal**  
**PRINCIPAL**  
 Annasaheb Dange College of  
 B. Pharmacy, Ashita.





SANT DNYANESHWAR SHIKSHAN SANSTHA'S  
**ANNASHEB DANGE COLLEGE OF B PHARMACY**

Ashta, Tal: Walwa, Dist: Sangli, Maharashtra, India - 416301

**Provisional General Merit List for Seats Remaining Vacant after CAP rounds to  
First Year D. Pharmacy Admission 2021-22**

Sr. No.	Merit No.	Application ID	Candidate Name	Candidate Type	Gender	Merit Marks PCM/B	Category For Admission
1.	1	DEN21598041	PATIL KUNDLIK SHIVAJI	A	MALE	79.67	OPEN
2.	2	DEN21609162	SHAIKH MOHAMMADJAFAR YUNUS	A	MALE	78.00	OPEN
3.	3	DEN21558693	PATIL SUSHANT SANJAY	A	MALE	74.00	OPEN
4.	4	DEN21628224	MALI SHIVPRASAD VISHWANATH	A	MALE	74.00	OPEN
5.	5	DEN21533988	SAJANE SAMMED SHASHIKANT	A	MALE	72.67	OPEN
6.	6	DEN21519602	MAHALDAR AFROJ DASTGIR	A	FEMALE	68.67	OPEN
7.	7	DEN21658867	CHAVAN SAYALI SARJERAO	A	FEAMALE	65.33	OPEN
8.	8	DEN21502267	CHOUGULE ANKITA ANNASO	A	FEMALE	64.33	OPEN
9.	9	DEN21570564	MULLA RUKSAR SAMIR	A	FEMALE	63.00	OBC
10.	10	DEN21580904	SAWANT PRAJAKTA MOHAN	A	FEMALE	58.66	OPEN
11.	11	DEN21558933	PAWAR SNEHAL DATTATRAYA	A	FEMALE	49.33	OPEN
12.	12	DEN21516990	NANGARE RAVIRAJ RAJARAM	A	MALE	41.33	OPEN

Date: 22/10/2021

Place: Ashta



  
**Principal**  
Annasaheb Dange College of  
B. Pharmacy, Ashta.



Sant Dnyaneshwar Shikshan Santha's

**ANNASHEB DANGE COLLEGE OF B PHARMACY, ASHTA**

(Approved by AICTE, New Delhi, Govt. of Maharashtra and Affiliated to Shivaji University, Kolhapur)

Ref. No. **ADCBP2021-22/79 ②**

Date: 29/12/2021

**Final Merit List for Institute Level Admission to First Year B. Pharmacy 2021-22****For Institute Quota**

Sr.No.	Institute Merit No.	Merit Marks (MHT CET 2021)	Application ID	Candidate Name	Category for Admission
1.	1	77.6694354	PH21440820	PATIL SANGRAM SHARAD	OPEN
2.	2	76.1297044	PH21475795	GHULI PRERANA GURUDEV	OPEN
3.	3	68.5685433	PH21434042	HABLE PRANAV VIJAY	SC
4.	4	68.1834597	PH21442928	GHATAGE SAYALI SUBHASH	OPEN
5.	5	65.3545203	PH21422231	PAWAR YASH PRAMOD	OPEN
6.	6	55.6358293	PH21444378	HERWADE HARSHAL ANNASO	OPEN
7.	7	53.2317695	PH21457563	KALYANI SAKSHI YOGESH	OPEN
8.	8	52.5740930	PH21441780	KARVE PRATHMESH SUNIL	OPEN
9.	9	52.5740930	PH21456993	PATIL OMKAR SUNIL	OPEN
10.	10	51.7214397	PH21466154	CHOUGULE SANIKA VIJAY	OPEN
11.	11	48.3091541	PH21445350	AHIR SANIKA RAJENDRA	OPEN
12.	12	42.0923580	PH21421241	MAGDUM TABASSUM ISAK	OPEN
13.	13	39.1631040	PH21430490	SURYAWANSHI PRAGATI RAJENDRA	OPEN
14.	14	35.0123329	PH21429667	PALKAR GAURAV SHIVAJI	OPEN
15.	15	30.3311258	PH21410669	PATIL PRASHANT MANOHAR	NT2
16.	16	21.9015478	PH21425781	KOLEKAR SAKSHI SHITALNATH	OPEN
17.	17	14.0691799	PH21442165	GHAT ANUJ ANIL	OPEN
18.	18	9.7538742	PH21446487	VIBHUTE PRANAV ANIL	OPEN
19.	19	1.1754334	PH21442976	SALUNKHE PATIL ADITYA ARVIND	OPEN
20.	20	25.6953334	PH21406611	VIJAYALAKSHMI S.	OMS

Date : 29/12/2021

Place : Ashta



**Prof (Dr) M. G. Saralaya**  
**PRINCIPAL**  
 Annasaheb Dange College of  
 B. Pharmacy, Ashta





Sant Dnyaneshwar Shikshan Santha's

**ANNASAHEB DANGE COLLEGE OF B PHARMACY, ASHTA**

(Approved by AICTE, New Delhi, Govt. of Maharashtra and Affiliated to Shivaji University, Kolhapur)



Ref. No. **ADCBP 2021-22/79**

Date: 29/12/2021

## Final Merit List for Institute Level Admission to First Year B. Pharmacy 2021-22

For Seats Remaining Vacant After CAP Round II & Due to Cancellation of Admission

Sr.No.	Institute Merit No.	Merit Marks (MHT CET 2021)	Application ID	Candidate Name	Category for Admission
1.	1	74.4320395	PH21411491	SHARMA KANAK PRASHANT	OPEN
2.	2	69.9360651	PH21414249	VAGE AVANI	OPEN
3.	3	66.6709249	PH21433003	RAJAGE KARUNA SHANKAR	NT2
4.	4	55.1017867	PH21408348	PATIL ADITYA GOPAL	OBC
5.	5	55.0083655	PH21413862	PATIL PRANJALI PRABHAKAR	OPEN
6.	6	37.8436353	PH21444748	NANDGAONKAR OM SHIRISH	OPEN
7.	7	27.1119965	PH21431850	MOMIN ARFIN SHAKIL	OPEN
8.	8	27.0056208	PH21440320	MUDEGOL PRATIKSHA ANNAPPA	OPEN
9.	9	4.1132271	PH21458054	INGALE SHRUTI HANMANT	OPEN
10.	10	17.7796283 NEET 2021	PH21430486	SARGAR SANKET BAJIRAO	NT2
11.	11	17.3957584 NEET 2021	PH21454174	PATIL SHREYA KESHAV	OPEN

Date : 29/12/2021

Place : Ashta



  
**Prof (Dr) M. G. Saralaya**  
**PRINCIPAL**  
Annasaheb Dange College of  
B. Pharmacy, Ashta.



Sant Dnyaneshwar Shikshan Santha's



# ANNASAHEB DANGE COLLEGE OF B PHARMACY, ASHTA

(Approved by AICTE, New Delhi, Govt. of Maharashtra and Affiliated to Shivaji University, Kolhapur)

Ref. No. ADCBP 2021-22/79 ①

Date: 29/12/2021

## Final Merit List for Institute Level Admission to Direct Second Year B. Pharmacy 2021-22

For Seats Remaining Vacant After CAP Round II & Due to Cancellation of Admission

Sr.No.	Institute Merit No.	Merit Marks (Diploma Marks)	Application ID	Candidate Name	Category for Admission
1.	1	75.70	DSP21102991	PAWAR ASHUTOSH DNYANDEO	OPEN
2.	2	73.70	DSP21104079	PATIL SHRINIVAS JAYASING	OPEN

Date : 20/12/2021

Place : Ashta



  
Prof (Dr) M. G. Saralaya  
**PRINCIPAL**  
Annasaheb Dange College of  
B. Pharmacy, Ashta.



SANT DNYANESHWAR SHIKSHAN SANSTHA'S

**ANNASHEB DANGE COLLEGE OF B PHARMACY**

Ashta, Tal: Walwa, Dist: Sangli, Maharashtra, India – 416301

**Final General Merit List for Institute Quota Seats of  
First Year D. Pharmacy Admission 2021-22**

Sr. No.	Merit No.	Application ID	Candidate Name	Candidature Type	Gender	Merit Marks PCM/B	Category For Admission
1.	1	DEN21575211	CHOPADE UTKARSHA SHITAL	A	FEMALE	75.33	OPEN
2.	2	DEN21657437	GHATULE MANASI SHIVAJI	A	FEMALE	73.00	OPEN
3.	3	DEN21518637	SHIRKE PRASAD MURARJI	A	MALE	72.67	OPEN
4.	4	DEN21570826	INAMDAR RUBINA SAMEER	A	FEMALE	70.33	OPEN
5.	5	DEN21584471	KADAM CHETAN CHANDRAKANT	A	MALE	70.00	OPEN
6.	6	DEN21569551	PAWAR SAI BALKRISHNA	A	FEMALE	66.00	OPEN
7.	7	DEN21598264	PATIL YASH DHANAJI	A	MALE	65.67	OPEN
8.	8	DEN21657510	MUJAWAR BUSHRA FARUK	A	FEMALE	65.00	OPEN
9.	9	DEN21515368	THOMBARE PRANJALI BANDOPANT	A	FEMALE	58.00	OBC
10.	10	DEN21519261	MANE ROHINI EKNATH	A	FEMALE	49.33	NT-C
11.	11	DEN21596670	SALUNKHE ABHISHEK ATUL	A	MALE	43.33	SC
12.	12	DEN21658281	DESAI ROHINI DINKAR	A	FEMALE	43.00	OPEN

Date: 22/10/2021

Place: Ashta



*Ashta*  
Principal  
Annasaheb Dange College of  
B. Pharmacy, Ashta.





SANT DNYANESHWAR SHIKSHAN SANSTHA'S  
**ANNASHEB DANGE COLLEGE OF B PHARMACY**

Ashta, Tal: Walwa, Dist: Sangli, Maharashtra, India - 416301

**Final General Merit List for Seats Remaining Vacant after CAP rounds to First  
Year D. Pharmacy Admission 2021-22**

Sr. No.	Merit No.	Application ID	Candidate Name	Candidate Type	Gender	Merit Marks PCM/B	Category For Admission
1.	1	DEN21598041	PATIL KUNDLIK SHIVAJI	A	MALE	79.67	OPEN
2.	2	DEN21609162	SHAIKH MOHAMMADJAFAR YUNUS	A	MALE	78.00	OPEN
3.	3	DEN21558693	PATIL SUSHANT SANJAY	A	MALE	74.00	OPEN
4.	4	DEN21628224	MALI SHIVPRASAD VISHWANATH	A	MALE	74.00	OPEN
5.	5	DEN21533988	SAJANE SAMMED SHASHIKANT	A	MALE	72.67	OPEN
6.	6	DEN21519602	MAHALDAR AFROJ DASTGIR	A	FEMALE	68.67	OPEN
7.	7	DEN21658867	CHAVAN SAYALI SARJERAO	A	FEAMALE	65.33	OPEN
8.	8	DEN21502267	CHOUGULE ANKITA ANNASO	A	FEMALE	64.33	OPEN
9.	9	DEN21570564	MULLA RUKSAR SAMIR	A	FEMALE	63.00	OBC
10.	10	DEN21580904	SAWANT PRAJAKTA MOHAN	A	FEMALE	58.66	OPEN
11.	11	DEN21558933	PAWAR SNEHAL DATTATRAYA	A	FEMALE	49.33	OPEN
12.	12	DEN21516990	NANGARE RAVIRAJ RAJARAM	A	MALE	41.33	OPEN

Date: 22/10/2021

Place: Ashta



  
**Principal**  
Annasaheb Dange College of  
B. Pharmacy, Ashta.

12:28 PM

State Common Entrance Test Cell, Government of Maharashtra

**STATE COMMON ENTRANCE TEST CELL, MAHARASHTRA STATE**  
 8th Floor, New Excelsior Building, A.K.Nayak Marg, Fort, Mumbai-400001. (M.S.)

**List of Candidates Admitted to First Year of Under Graduate Technical Course in B.Pharmacy & Post Graduate Pharm.D for the Academic Year 2021-22**
**Institution Name [Code] :- Sant Dnyaneshwar Shikshan Sanstha, Annasaheb Dange College of B.Pharmacy, Ashta, Sangli [6893]**  
**Course Name [Choice Code] :- Pharmacy [689382310]**
**List of Candidates Admitted Under Against CAP (Excluding Minority) Vacant Seats**
**Number of Seats : 11**

Sr. No.	CAP Round	Merit No	Merit Marks	Entrance Exam	Application ID	Candidate Name	Gender	Candidature Type	Home University	Category / Orphan	PH Type / Defence Type	Eligibility Percentage	Seat Type	Fees Paid (₹)	Admission Date	Uploaded Date
70	Institute Level	1	74.4320395	MHT-CET 2021	PH21411491	SHARMA KANAK PRASHANT	Female	Type A	SVJU	Open - EWS	--	90.33	ACAP	90000/-	29/12/2021	29/12/2021
71	Institute Level	2	69.9360651	MHT-CET 2021	PH21414249	VAGE AVANI	Female	Type B	SVJU	Open	--	75.00	ACAP	90000/-	29/12/2021	29/12/2021
72	Institute Level	3	66.6709249	MHT-CET 2021	PH21433003	RAJAGE KARUNA CHANKAR	Female	Type A	SVJU	NT-C	--	82.00	ACAP	90000/-	29/12/2021	29/12/2021
73	Institute Level	4	55.1017867	MHT-CET 2021	PH21408348	PATEL ADITYA GOPAL	Male	Type A	SOLU	ODC	--	85.00	ACAP	90000/-	29/12/2021	29/12/2021
74	Institute Level	5	55.0083655	MHT-CET 2021	PH21413662	PATEL PRANJALI PRABHAKAR	Female	Type A	SVJU	Open	--	86.33	ACAP	90000/-	29/12/2021	29/12/2021
75	Institute Level	6	37.8436353	MHT-CET 2021	PH21444748	NANDGAONKAR OM SHERISH	Male	Type A	SVJU	Open	--	91.66	ACAP	90000/-	29/12/2021	29/12/2021
76	Institute Level	7	27.1119965	MHT-CET 2021	PH21431850	MOMIN ARFIN SHAKIL	Male	Type A	SVJU	Open	--	67.66	ACAP	90000/-	29/12/2021	29/12/2021
77	Institute Level	8	27.0056208	MHT-CET 2021	PH21440320	MUDEGOL PRATIRSHA ANNAPPA	Female	Type A	SVJU	Open	--	74.33	ACAP	90000/-	29/12/2021	29/12/2021
78	Institute Level	9	4.1132271	MHT-CET 2021	PH21458054	INGALE SHRUTI HANANANT	Female	Type A	SVJU	Open	--	77.66	ACAP	90000/-	29/12/2021	29/12/2021
79	Institute Level	10	17.7796283	NEET 2021	PH21430486	SARGAR SANKET BAJIRAO	Male	Type A	MU	NT-C	--	45.66	ACAP	90000/-	29/12/2021	29/12/2021
80	Institute Level	11	17.3957594	NEET 2021	PH21454174	PATEL SHREYA KESHAV	Female	Type A	SVJU	Open	--	51.33	ACAP	90000/-	29/12/2021	29/12/2021

Printed On : 17/01/2022 12:28:21 PM

Seal of the Institute

Signature of the Director / Principal

Page No : 7/10

Verified by


 Annasaheb Dange College of  
 B. Pharmacy, Ashta.

 श्री. वाय. एन. गव्हाणे  
 राज्यस्तरीय प्राध्यापक  
 औषध विभाग  
 शासकीय औषध विभाग, महाराष्ट्र, बंगळूर



**STATE COMMON ENTRANCE TEST CELL, MAHARASHTRA STATE**  
8th Floor, New Excelsior Building, A.K.Nayak Marg, Fort, Mumbai-400001, (M.S.)



**List of Candidates Admitted to First Year of Under Graduate Technical Course in B.Pharmacy & Post Graduate Pharm.D for the Academic Year 2021-22**

**Institution Name [Code] :- Sant Dnyaneshwar Shikshan Sanstha, Annasaheb Dange College of B.Pharmacy, Ashta, Sangli [6893]  
Course Name [Choice Code] :- Pharmacy [689382310]**

**List of Candidates Admitted Under Institutional Seats**

**Number of Seats : 20**

Sr. No.	CAP Round	Merit No	Merit Marks	Entrance Exam	Application ID	Candidate Name	Gender	Candidature Type	Home University	Category / Orphan	PH Type / Defence Type	Eligibility Percentage	Seat Type	Fees Paid (₹)	Admission Date	Uploaded Date
81.	Institute Level	1	77.0694354	MHT-CET 2021	PH21440120	PATEL SANGRAM SHARAD	Male	Type A	SVJU	Open	--	72.33	IL	90000/-	29/12/2021	29/12/2021
82.	Institute Level	2	76.1297044	MHT-CET 2021	PH21475195	GHULI PRERANA GURUDEV	Female	Type A	SVJU	Open	--	88.66	IL	90000/-	29/12/2021	29/12/2021
83.	Institute Level	3	68.5685433	MHT-CET 2021	PH21434442	SHABLE PRANAV VIJAY	Male	Type A	SVJU	SC	--	59.33	IL	90000/-	29/12/2021	29/12/2021
84.	Institute Level	4	68.1834597	MHT-CET 2021	PH21442128	GHATAGE SAYALI SUBHASH	Female	Type A	SVJU	Open	--	79.66	IL	90000/-	29/12/2021	29/12/2021
85.	Institute Level	5	65.3545203	MHT-CET 2021	PH21422231	PAWAR YASH PRAMOD	Male	Type A	SVJU	Open - EWS	--	93.33	IL	10000/-	29/12/2021	29/12/2021
86.	Institute Level	6	55.6358293	MHT-CET 2021	PH21444378	HERWADE HARSHAL ANNASO	Male	Type A	SVJU	Open - EWS	--	86.00	IL	10000/-	29/12/2021	29/12/2021
87.	Institute Level	7	53.2317695	MHT-CET 2021	PH21437563	KALYANI SAKSHI YOGESH	Female	Type A	SVJU	Open - EWS	--	87.33	IL	90000/-	29/12/2021	29/12/2021
88.	Institute Level	8	52.5749930	MHT-CET 2021	PH21441280	KARVE PRATHMESH SUNIL	Male	Type A	SVJU	Open	--	80.33	IL	90000/-	29/12/2021	29/12/2021
89.	Institute Level	9	52.5749930	MHT-CET 2021	PH21456993	PATIL OMKAR SUNIL	Male	Type A	SVJU	Open	--	85.66	IL	90000/-	29/12/2021	29/12/2021
90.	Institute Level	10	51.7214397	MHT-CET 2021	PH21466134	CHOGULE SARIKA VIJAY	Female	Type A	SVJU	Open	--	87.00	IL	90000/-	29/12/2021	29/12/2021
91.	Institute Level	11	48.3091541	MHT-CET 2021	PH21445350	AHER SARIKA RAJENDRA	Female	Type A	SVJU	Open	--	74.66	IL	90000/-	29/12/2021	29/12/2021
92.	Institute Level	12	42.0923580	MHT-CET 2021	PH21421241	MAGDUM TABASSUM ISAK	Female	Type A	SVJU	Open	--	82.00	IL	90000/-	29/12/2021	29/12/2021

Printed On : 17/01/2022 12:28:21 PM

Verified by

श्री. वाय. एन. गजराजे  
सहायक प्राध्यापक  
औषध निर्माणशास्त्र विभाग  
राजस्थान औषध निर्माणशास्त्र महाविद्यालय, कलकत्ता



Signature of the Director/Principal  
  
Annasaheb Dange College of  
B. Pharmacy, Ashta

Page No : 8/10



**STATE COMMON ENTRANCE TEST CELL, MAHARASHTRA STATE**

8th Floor, New Excelsior Building, A.K.Nayak Marg, Fort, Mumbai-400001. (M.S.)



**List of Candidates Admitted to First Year of Under Graduate Technical Course in B.Pharmacy & Post Graduate Pharm.D for the Academic Year 2021-22**

**Institution Name [Code] :- Sant Dnyaneshwar Shikshan Sanstha, Annasaheb Dange College of B.Pharmacy, Ashta, Sangli [6893]**  
**Course Name [Choice Code] :- Pharmacy [689382310]**

**List of Candidates Admitted Under Institutional Seats****Number of Seats : 20**

Sr. No.	CAP Round	Merit No	Merit Marks	Entrance Exam	Application ID	Candidate Name	Gender	Candidature Type	Home University	Category / Orphan	Pri Type / Defence Type	Eligibility Percentage	Seat Type	Fees Paid (₹)	Admission Date	Uploaded Date
93.	Institute Level	13	39.1631040	MHT-CET 2021	PH21430496	SURYAWANSHI PLAGATI RAJENDRA	Female	Type A	SVJU	Open - EWS	--	62.00	IL	90000/-	29/12/2021	29/12/2021
94.	Institute Level	14	35.0123329	MHT-CET 2021	PH21429667	PALKAR GAURAV SHIVAJI	Male	Type A	SVJU	Open	--	73.00	IL	90000/-	29/12/2021	29/12/2021
95.	Institute Level	15	30.3311258	MHT-CET 2021	PH21410669	PATIL PRASHANT MANOHAR	Male	Type A	SVJU	NT-C	--	60.66	IL	90000/-	29/12/2021	29/12/2021
96.	Institute Level	16	21.9015478	MHT-CET 2021	PH21425781	KOLEKAR SAKSHI SHITALNATH	Female	Type A	SOLU	Open	--	61.66	IL	90000/-	29/12/2021	29/12/2021
97.	Institute Level	17	14.0691799	MHT-CET 2021	PH21442365	GHAT ANUJ ANIL	Male	Type A	SVJU	Open - EWS	--	81.33	IL	90000/-	29/12/2021	29/12/2021
98.	Institute Level	18	5.7538742	MHT-CET 2021	PH21446487	VIBHUTE PRARAV ANIL	Male	Type A	SVJU	Open	--	51.33	IL	90000/-	29/12/2021	29/12/2021
99.	Institute Level	19	1.1754334	MHT-CET 2021	PH21442976	SALUNKHE PATIL ADITYA ARVIND	Male	Type A	SVJU	Open	--	72.33	IL	90000/-	29/12/2021	29/12/2021
100.	Institute Level	20	25.6953334	MHT-CET 2021	PH21406611	VIJAYALAKSHMI S	Female	ONS	NA	NA	--	52.33	IL	90000/-	29/12/2021	29/12/2021

Printed On : 17/01/2022 12:28:21 PM

Seal of the Institute



Signature of the Director/Principal

Annasaheb Dange College of  
B. Pharmacy, Ashta,

Page No : 9/10

Verified by

18.01.22

श्री. का. एन. बाबाय

सहायक प्राध्यापक

औद्योगिक विभाग

राजस्थान औद्योगिक निगम, बडोदा, कच्छ

**State Common Entrance Test Cell, Maharashtra State, Mumbai.**

8th Floor, New Excelsior Building, Mumbai-400001.(M.S.).

Institution Name [Code] : Sant Dnyaneshwar Shikshan Sanstha, Annasaheb Dange College of B.Pharmacy, Ashta, Sangli[6893]

Course Name [Choice Code] : Pharmacy[689382310]

List of admitted candidates to Direct Second Year Pharmacy AY 2021 - 2022

**CAP Seats : 13****List of Admitted Candidates Against CAP(Excluding Minority)**

Sr.No.	Round	Diploma	Application ID	Candidate Name	Gender	Candidature Type	Category	PWD/ DEF Type	Mode of Admission	Seat Type	Fees Paid (₹)	Admission Date	Reported Date
17	Against CAP	75.70 %	DSP21102991	PAWAR ASHUTOSH DNYANDEO	M	Type A	OPEN	-	Diploma [Pharmacy]	ACAP	90000/-	29/12/2021	29/12/2021 12:12:24
18	Against CAP	73.70 %	DSP21104079	PATIL SHRINIVAS JAYASING	M	Type A	OPEN	-	Diploma [Pharmacy]	ACAP	90000/-	29/12/2021	29/12/2021 12:17:25

Printed on: 17/01/2022 14:47:20



Signature of The Director/Principal  
**PRINCIPAL**  
 Annasaheb Dange College of  
 B. Pharmacy, Ashta.

Page 3/3

Verified by

श्री. वाय. एन. गव्हाणे  
 सहायक प्राध्यापक  
 औषध निर्माणशास्त्र विभाग  
 शास्त्रिक औषध निर्माणशास्त्र महाविद्यालय, सांगली



**Directorate of Technical Education, Maharashtra State**  
3, Mahapalika Marg, Elphinstone Technical Institute Campus, Mumbai 400 001

**List of Candidates Admitted to First Year of Post HSC Diploma Technical Courses in Pharmacy, Surface Coating Technology and Hotel Management & Catering Technology for the Academic Year 2021-22**

**Institution Name [Code] :- Sant Dnyaneshwar Shikshan Sanstha, Annasaheb Dange College of B.Pharmacy, Ashta, Sangli [6893]**

**Course Name [Choice Code] :- Pharmacy [689382310]**

**List of Candidates Admitted Under Against CAP (Excluding Minority) Vacant Seats**

**Number of Seats : 12**

Sr. No.	CAP Round	Merit No	Merit Marks	Entrance Exam	Application ID	Candidate Name	Gender	Candidature Type	Category / Orphan	PH Type / Defiance Type	Eligibility Percentage	Seat Type	Fees Paid (₹)	Admission Date	Uploaded Date
37.	Institute Level	1	79.67	HSC Percentage	DEN21598041	PATIL KUNDLIK SHIVAJI	Male	Type A	Open	--	78.83	ACAP	50000/-	23/10/2021	23/10/2021
38.	Institute Level	2	NA	NA	DEN21609162	MOHAMMADJAFAR YUNUS SHAJIKH	Male	Type A	Open	--	73.83	ACAP	50000/-	23/10/2021	23/10/2021
39.	Institute Level	3	74.00	HSC Percentage	DEN21558693	PATIL SLISHANT SANJAY	Male	Type A	Open	--	72.83	ACAP	50000/-	23/10/2021	23/10/2021
40.	Institute Level	4	74.00	HSC Percentage	DEN21628224	MALI SHIVPRASAD VISHWANATH	Male	Type A	Open	--	75.67	ACAP	50000/-	23/10/2021	23/10/2021
41.	Institute Level	5	72.67	HSC Percentage	DEN21533988	SAJANE SANMED SHASHIKANT	Male	Type A	Open	--	72.33	ACAP	50000/-	23/10/2021	23/10/2021
42.	Institute Level	6	68.67	HSC Percentage	DEN21519602	HAHALDAR AFROJ DASTAGIR	Female	Type A	Open	--	74.33	ACAP	50000/-	23/10/2021	23/10/2021
43.	Institute Level	7	NA	NA	DEN21658867	CHAVAN SAYALI SARJERAO	Female	Type A	Open	--	69.50	ACAP	50000/-	23/10/2021	23/10/2021
44.	Institute Level	8	64.33	HSC Percentage	DEN21502267	CHOUGULE ANKITA ANNAGO	Female	Type A	Open	--	68.31	ACAP	50000/-	23/10/2021	23/10/2021
45.	Institute Level	9	63.00	HSC Percentage	DEN21570564	MULLA RUKSAR SAMIR	Female	Type A	DBC	--	65.50	ACAP	50000/-	23/10/2021	23/10/2021
46.	Institute Level	10	NA	NA	DEN21580904	SAWANT PRAJAKTA MOHAN	Female	Type A	Open	--	60.46	ACAP	50000/-	23/10/2021	23/10/2021
47.	Institute Level	11	49.33	HSC Percentage	DEN21558933	PAWAR SNEHAL DATTATRAY	Female	Type A	Open	--	61.85	ACAP	50000/-	23/10/2021	23/10/2021
48.	Institute Level	12	41.33	HSC Percentage	DEN21516990	NANGARE RAVIRAJ RAJARAM	Male	Type A	Open	--	56.92	ACAP	50000/-	23/10/2021	23/10/2021

Printed On : 12/01/2022 10:12:15 AM

Document Verified & Scrutinised by

*(Signature)*  
**(Dr. K. D. Bansod)**  
Lecturer in Pharmacy  
Govt. College of Pharmacy, Karad

Seal of the Institute



Signature of the Director/Principal

*(Signature)*  
**Annasaheb Dange College of  
B. Pharmacy, Ashta.**

Page No : 4/6





# Directorate of Technical Education, Maharashtra State

3, Mahapalika Marg, Elphinstone Technical Institute Campus, Mumbai 400 061

## List of Candidates Admitted to First Year of Post HSC Diploma Technical Courses in Pharmacy, Surface Coating Technology and Hotel Management & Catering Technology for the Academic Year 2021-22

Institution Name [Code] :- Sant Dnyaneshwar Shikshan Sanstha, Annasaheb Dange College of B.Pharmacy, Ashta, Sangli [6893]

Course Name [Choice Code] :- Pharmacy [689382310]

### List of Candidates Admitted Under Institutional Seats

#### Number of Seats : 12

Sr. No.	CAP Round	Merit No	Merit Marks	Entrance Exam	Application ID	Candidate Name	Gender	Candidature Type	Category / Orphan	PH Type / Defence Type	Eligibility Percentage	Seat Type	Fees Paid (₹)	Admission Date	Uploaded Date
49.	Institute Level	1	75.33	HSC Percentage	DEN21575211	CHOPADE UTKARSHA SHITAL	Female	Type A	Open	--	76.83	IL	50000/-	23/10/2021	23/10/2021
50.	Institute Level	2	NA	NA	DEN21657437	GHATULE MANASI SHIVAJI	Male	Type A	Open	--	78.50	IL	50000/-	23/10/2021	23/10/2021
51.	Institute Level	3	72.67	HSC Percentage	DEN21518637	SHIRKE PRASAD MURARI	Male	Type A	Open	--	75.00	IL	50000/-	23/10/2021	23/10/2021
52.	Institute Level	4	70.33	HSC Percentage	DEN21570826	INAMDAR RUBINA SAMEER	Female	Type A	Open	--	69.33	IL	50000/-	23/10/2021	23/10/2021
53.	Institute Level	5	70.00	HSC Percentage	DEN21584471	KADAN CHETAN CHANDRAKANT	Male	Type A	Open	--	72.00	IL	50000/-	23/10/2021	23/10/2021
54.	Institute Level	6	66.00	HSC Percentage	DEN21569551	PAWAR SAI BALAKRISHNA	Female	Type A	Open	--	71.00	IL	50000/-	23/10/2021	23/10/2021
55.	Institute Level	7	65.67	HSC Percentage	DEN21598264	PATIL YASH DHANAJI	Male	Type A	Open	--	68.83	IL	50000/-	23/10/2021	23/10/2021
56.	Institute Level	8	NA	NA	DEN21657510	MUJAWAR BUSHRA FARUK	Female	Type A	Open	--	67.17	IL	50000/-	23/10/2021	23/10/2021
57.	Institute Level	9	58.00	HSC Percentage	DEN21515388	THOMBARE PRANALI BARDOPANT	Female	Type A	OBC	--	66.00	IL	50000/-	23/10/2021	23/10/2021
58.	Institute Level	10	49.33	HSC Percentage	DEN21519261	HANE ROHINI EKNATH	Female	Type A	NT-C	--	61.54	IL	50000/-	23/10/2021	23/10/2021
59.	Institute Level	11	43.33	HSC Percentage	DEN21596673	SALUNKHE ABHISHEK ATUL	Male	Type A	SC	--	53.23	IL	50000/-	23/10/2021	23/10/2021
60.	Institute Level	12	NA	NA	DEN21658281	DESAI ROHINI DINKAR	Female	Type A	Open	--	53.23	IL	50000/-	23/10/2021	23/10/2021

Printed On : 12/01/2022 10:12:15 AM

Seal of the Institute

Signature of the Director/Principal

Page No : 5/6

Document Verified & Scrutinised by



Annasaheb Dange College of B. Pharmacy, Ashta.

Dr. K. V. Bansod  
Lecturer in Pharmacy  
Govt. College of Pharmacy, Karad

Pharmacy Council of India  
New Delhi

Rules & Syllabus for the Bachelor  
of Pharmacy (B. Pharm) Course

---

[Framed under Regulation 6, 7 & 8 of the Bachelor of  
Pharmacy (B. Pharm) course regulations 2014]

## **CHAPTER- I: REGULATIONS**

### **1. Short Title and Commencement**

These regulations shall be called as “The Revised Regulations for the B. Pharm. Degree Program (CBCS) of the Pharmacy Council of India, New Delhi”. They shall come into effect from the Academic Year 2016-17. The regulations framed are subject to modifications from time to time by Pharmacy Council of India.

### **2. Minimum qualification for admission**

#### **2.1 First year B. Pharm:**

Candidate shall have passed 10+2 examination conducted by the respective state/central government authorities recognized as equivalent to 10+2 examination by the Association of Indian Universities (AIU) with English as one of the subjects and Physics, Chemistry, Mathematics (P.C.M) and or Biology (P.C.B / P.C.M.B.) as optional subjects individually. Any other qualification approved by the Pharmacy Council of India as equivalent to any of the above examinations.

#### **2.2. B. Pharm lateral entry (to third semester):**

A pass in D. Pharm. course from an institution approved by the Pharmacy Council of India under section 12 of the Pharmacy Act.

### **3. Duration of the program**

The course of study for B.Pharm shall extend over a period of eight semesters (four academic years) and six semesters (three academic years) for lateral entry students. The curricula and syllabi for the program shall be prescribed from time to time by Pharmacy Council of India, New Delhi.

### **4. Medium of instruction and examinations**

Medium of instruction and examination shall be in English.

### **5. Working days in each semester**

Each semester shall consist of not less than 100 working days. The odd semesters shall be conducted from the month of June/July to November/December and the even semesters shall be conducted from December/January to May/June in every calendar year.

### **6. Attendance and progress**

A candidate is required to put in at least 80% attendance in individual courses considering theory and practical separately. The candidate shall complete the prescribed course satisfactorily to be eligible to appear for the respective examinations.

## **7. Program/Course credit structure**

As per the philosophy of Credit Based Semester System, certain quantum of academic work viz. theory classes, tutorial hours, practical classes, etc. are measured in terms of credits. On satisfactory completion of the courses, a candidate earns credits. The amount of credit associated with a course is dependent upon the number of hours of instruction per week in that course. Similarly, the credit associated with any of the other academic, co/extra-curricular activities is dependent upon the quantum of work expected to be put in for each of these activities per week.

### **7.1. Credit assignment**

#### **7.1.1. Theory and Laboratory courses**

Courses are broadly classified as Theory and Practical. Theory courses consist of lecture (L) and /or tutorial (T) hours, and Practical (P) courses consist of hours spent in the laboratory. Credits (C) for a course is dependent on the number of hours of instruction per week in that course, and is obtained by using a multiplier of one (1) for lecture and tutorial hours, and a multiplier of half (1/2) for practical (laboratory) hours. Thus, for example, a theory course having three lectures and one tutorial per week throughout the semester carries a credit of 4. Similarly, a practical having four laboratory hours per week throughout semester carries a credit of 2.

### **7.2. Minimum credit requirements**

The minimum credit points required for award of a B. Pharm. degree is 208. These credits are divided into Theory courses, Tutorials, Practical, Practice School and Project over the duration of eight semesters. The credits are distributed semester-wise as shown in Table IX. Courses generally progress in sequences, building competencies and their positioning indicates certain academic maturity on the part of the learners. Learners are expected to follow the semester-wise schedule of courses given in the syllabus.

The lateral entry students shall get 52 credit points transferred from their D. Pharm program. Such students shall take up additional remedial courses of 'Communication Skills' (Theory and Practical) and 'Computer Applications in Pharmacy' (Theory and Practical) equivalent to 3 and 4 credit points respectively, a total of 7 credit points to attain 59 credit points, the maximum of I and II semesters.

## **8. Academic work**

A regular record of attendance both in Theory and Practical shall be maintained by the teaching staff of respective courses.

### 9. Course of study

The course of study for B. Pharm shall include Semester Wise Theory & Practical as given in Table – I to VIII. The number of hours to be devoted to each theory, tutorial and practical course in any semester shall not be less than that shown in Table – I to VIII.

**Table-I: Course of study for semester I**

Course code	Name of the course	No. of hours	Tutorial	Credit points
BP101T	Human Anatomy and Physiology I– Theory	3	1	4
BP102T	Pharmaceutical Analysis I – Theory	3	1	4
BP103T	Pharmaceutics I – Theory	3	1	4
BP104T	Pharmaceutical Inorganic Chemistry – Theory	3	1	4
BP105T	Communication skills – Theory *	2	-	2
BP106RBT BP106RMT	Remedial Biology/ Remedial Mathematics – Theory*	2	-	2
BP107P	Human Anatomy and Physiology – Practical	4	-	2
BP108P	Pharmaceutical Analysis I – Practical	4	-	2
BP109P	Pharmaceutics I – Practical	4	-	2
BP110P	Pharmaceutical Inorganic Chemistry – Practical	4	-	2
BP111P	Communication skills – Practical*	2	-	1
BP112RBP	Remedial Biology – Practical*	2	-	1
<b>Total</b>		<b>32/34<sup>§</sup>/36<sup>#</sup></b>	<b>4</b>	<b>27/29<sup>§</sup>/30<sup>#</sup></b>

<sup>#</sup>Applicable ONLY for the students who have studied Mathematics / Physics / Chemistry at HSC and appearing for Remedial Biology (RB)course.

<sup>§</sup>Applicable ONLY for the students who have studied Physics / Chemistry / Botany / Zoology at HSC and appearing for Remedial Mathematics (RM)course.

\* Non University Examination (NUE)



**Table-II: Course of study for semester II**

<b>Course Code</b>	<b>Name of the course</b>	<b>No. of hours</b>	<b>Tutorial</b>	<b>Credit points</b>
BP201T	Human Anatomy and Physiology II – Theory	3	1	4
BP202T	Pharmaceutical Organic Chemistry I – Theory	3	1	4
BP203T	Biochemistry – Theory	3	1	4
BP204T	Pathophysiology – Theory	3	1	4
BP205T	Computer Applications in Pharmacy – Theory *	3	-	3
BP206T	Environmental sciences – Theory *	3	-	3
BP207P	Human Anatomy and Physiology II –Practical	4	-	2
BP208P	Pharmaceutical Organic Chemistry I– Practical	4	-	2
BP209P	Biochemistry – Practical	4	-	2
BP210P	Computer Applications in Pharmacy – Practical*	2	-	1
<b>Total</b>		<b>32</b>	<b>4</b>	<b>29</b>

\*Non University Examination (NUE)

**Table-III: Course of study for semester III**

<b>Course code</b>	<b>Name of the course</b>	<b>No. of hours</b>	<b>Tutorial</b>	<b>Credit points</b>
BP301T	Pharmaceutical Organic Chemistry II – Theory	3	1	4
BP302T	Physical Pharmaceutics I – Theory	3	1	4
BP303T	Pharmaceutical Microbiology – Theory	3	1	4
BP304T	Pharmaceutical Engineering – Theory	3	1	4
BP305P	Pharmaceutical Organic Chemistry II – Practical	4	-	2
BP306P	Physical Pharmaceutics I – Practical	4	-	2
BP307P	Pharmaceutical Microbiology – Practical	4	-	2
BP 308P	Pharmaceutical Engineering –Practical	4	-	2
<b>Total</b>		<b>28</b>	<b>4</b>	<b>24</b>

**Table-IV: Course of study for semester IV**

<b>Course code</b>	<b>Name of the course</b>	<b>No. of hours</b>	<b>Tutorial</b>	<b>Credit points</b>
BP401T	Pharmaceutical Organic Chemistry III– Theory	3	1	4
BP402T	Medicinal Chemistry I – Theory	3	1	4
BP403T	Physical Pharmaceutics II – Theory	3	1	4
BP404T	Pharmacology I – Theory	3	1	4
BP405T	Pharmacognosy and Phytochemistry I– Theory	3	1	4
BP406P	Medicinal Chemistry I – Practical	4	-	2
BP407P	Physical Pharmaceutics II – Practical	4		2
BP408P	Pharmacology I – Practical	4	-	2
BP409P	Pharmacognosy and Phytochemistry I – Practical	4	-	2
<b>Total</b>		<b>31</b>	<b>5</b>	<b>28</b>

**Table-V: Course of study for semester V**

<b>Course code</b>	<b>Name of the course</b>	<b>No. of hours</b>	<b>Tutorial</b>	<b>Credit points</b>
BP501T	Medicinal Chemistry II – Theory	3	1	4
BP502T	Industrial PharmacyI– Theory	3	1	4
BP503T	Pharmacology II – Theory	3	1	4
BP504T	Pharmacognosy and Phytochemistry II– Theory	3	1	4
BP505T	Pharmaceutical Jurisprudence – Theory	3	1	4
BP506P	Industrial PharmacyI – Practical	4	-	2
BP507P	Pharmacology II – Practical	4	-	2
BP508P	Pharmacognosy and Phytochemistry II – Practical	4	-	2
<b>Total</b>		<b>27</b>	<b>5</b>	<b>26</b>

**Table-VI: Course of study for semester VI**

<b>Course code</b>	<b>Name of the course</b>	<b>No. of hours</b>	<b>Tutorial</b>	<b>Credit points</b>
BP601T	Medicinal Chemistry III – Theory	3	1	4
BP602T	Pharmacology III – Theory	3	1	4
BP603T	Herbal Drug Technology – Theory	3	1	4
BP604T	Biopharmaceutics and Pharmacokinetics – Theory	3	1	4
BP605T	Pharmaceutical Biotechnology – Theory	3	1	4
BP606T	Quality Assurance –Theory	3	1	4
BP607P	Medicinal chemistry III – Practical	4	-	2
BP608P	Pharmacology III – Practical	4	-	2
BP609P	Herbal Drug Technology – Practical	4	-	2
<b>Total</b>		<b>30</b>	<b>6</b>	<b>30</b>

**Table-VII: Course of study for semester VII**

<b>Course code</b>	<b>Name of the course</b>	<b>No. of hours</b>	<b>Tutorial</b>	<b>Credit points</b>
BP701T	Instrumental Methods of Analysis – Theory	3	1	4
BP702T	Industrial PharmacyII – Theory	3	1	4
BP703T	Pharmacy Practice – Theory	3	1	4
BP704T	Novel Drug Delivery System – Theory	3	1	4
BP705P	Instrumental Methods of Analysis – Practical	4	-	2
BP706PS	Practice School*	12	-	6
<b>Total</b>		<b>28</b>	<b>5</b>	<b>24</b>

\* Non University Examination (NUE)

**Table-VIII: Course of study for semester VIII**

Course code	Name of the course	No. of hours	Tutorial	Credit points
BP801T	Biostatistics and Research Methodology	3	1	4
BP802T	Social and Preventive Pharmacy	3	1	4
BP803ET	Pharma Marketing Management	3 + 3 = 6	1 + 1 = 2	4 + 4 = 8
BP804ET	Pharmaceutical Regulatory Science			
BP805ET	Pharmacovigilance			
BP806ET	Quality Control and Standardization of Herbals			
BP807ET	Computer Aided Drug Design			
BP808ET	Cell and Molecular Biology			
BP809ET	Cosmetic Science			
BP810ET	Experimental Pharmacology			
BP811ET	Advanced Instrumentation Techniques			
BP812ET	Dietary Supplements and Nutraceuticals			
BP813PW	Project Work	12	-	6
<b>Total</b>		<b>24</b>	<b>4</b>	<b>22</b>

**Table-IX: Semester wise credits distribution**

Semester	Credit Points
I	27/29 <sup>§</sup> /30 <sup>#</sup>
II	29
III	26
IV	28
V	26
VI	26
VII	24
VIII	22
Extracurricular/ Co curricular activities	01*
<b>Total credit points for the program</b>	<b>209/211<sup>§</sup>/212<sup>#</sup></b>

\* The credit points assigned for extracurricular and or co-curricular activities shall be given by the Principals of the colleges and the same shall be submitted to the University. The criteria to acquire this credit point shall be defined by the colleges from time to time.

<sup>§</sup>Applicable ONLY for the students studied Physics / Chemistry / Botany / Zoology at HSC and appearing for Remedial Mathematics course.

<sup>#</sup>Applicable ONLY for the students studied Mathematics / Physics / Chemistry at HSC and appearing for Remedial Biology course.

## **10. Program Committee**

1. The B. Pharm. program shall have a Program Committee constituted by the Head of the institution in consultation with all the Heads of the departments.

2. The composition of the Program Committee shall be as follows:

A senior teacher shall be the Chairperson; One Teacher from each department handling B.Pharm courses; and four student representatives of the program (one from each academic year), nominated by the Head of the institution.

3. Duties of the Program Committee:

- i. Periodically reviewing the progress of the classes.
- ii. Discussing the problems concerning curriculum, syllabus and the conduct of classes.
- iii. Discussing with the course teachers on the nature and scope of assessment for the course and the same shall be announced to the students at the beginning of respective semesters.
- iv. Communicating its recommendation to the Head of the institution on academic matters.
- v. The Program Committee shall meet at least thrice in a semester preferably at the end of each Sessionalexam (Internal Assessment) and before the end semester exam.

## **11. Examinations/Assessments**

The scheme for internal assessment and end semester examinations is given in Table – X.

### **11.1. End semester examinations**

The End Semester Examinations for each theory and practical coursethrough semesters I to VIII shall be conducted by the university except for the subjects with asterix symbol (\*) in table I and II for which examinations shall be conducted by the subject experts at college level and the marks/grades shall be submitted to the university.

**Tables-X: Schemes for internal assessments and end semester examinations semester wise**

**Semester I**

Course code	Name of the course	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration	
			Marks	Duration				
BP101T	Human Anatomy and Physiology I– Theory	10	15	1 Hr	25	75	3 Hrs	100
BP102T	Pharmaceutical Analysis I – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP103T	Pharmaceutics I – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP104T	Pharmaceutical Inorganic Chemistry – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP105T	Communication skills – Theory *	5	10	1 Hr	15	35	1.5 Hrs	50
BP106RBT BP106RMT	Remedial Biology/ Mathematics – Theory*	5	10	1 Hr	15	35	1.5 Hrs	50
BP107P	Human Anatomy and Physiology – Practical	5	10	4 Hrs	15	35	4 Hrs	50
BP108P	Pharmaceutical Analysis I – Practical	5	10	4 Hrs	15	35	4 Hrs	50
BP109P	Pharmaceutics I – Practical	5	10	4 Hrs	15	35	4 Hrs	50
BP110P	Pharmaceutical Inorganic Chemistry – Practical	5	10	4 Hrs	15	35	4 Hrs	50
BP111P	Communication skills – Practical*	5	5	2 Hrs	10	15	2 Hrs	25
BP112RBP	Remedial Biology – Practical*	5	5	2 Hrs	10	15	2 Hrs	25
Total		70/75 <sup>\$</sup> /80 <sup>#</sup>	115/125 <sup>\$</sup> /130 <sup>#</sup>	23/24 <sup>\$</sup> /26 <sup>#</sup> Hrs	185/200 <sup>\$</sup> /210 <sup>#</sup>	490/525 <sup>\$</sup> / 540 <sup>#</sup>	31.5/33 <sup>\$</sup> / 35 <sup>#</sup> Hrs	675/725 <sup>\$</sup> / 750 <sup>#</sup>

<sup>#</sup>Applicable ONLY for the students studied Mathematics / Physics / Chemistry at HSC and appearing for Remedial Biology (RB)course.

<sup>\$</sup>Applicable ONLY for the students studied Physics / Chemistry / Botany / Zoology at HSC and appearing for Remedial Mathematics (RM)course.

\* Non University Examination (NUE)

## Semester II

Course code	Name of the course	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration	
			Marks	Duration				
BP201T	Human Anatomy and Physiology II – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP202T	Pharmaceutical Organic Chemistry I – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP203T	Biochemistry – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP204T	Pathophysiology – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP205T	Computer Applications in Pharmacy – Theory*	10	15	1 Hr	25	50	2 Hrs	75
BP206T	Environmental sciences – Theory*	10	15	1 Hr	25	50	2 Hrs	75
BP207P	Human Anatomy and Physiology II –Practical	5	10	4 Hrs	15	35	4 Hrs	50
BP208P	Pharmaceutical Organic Chemistry I– Practical	5	10	4 Hrs	15	35	4 Hrs	50
BP209P	Biochemistry – Practical	5	10	4 Hrs	15	35	4 Hrs	50
BP210P	Computer Applications in Pharmacy – Practical*	5	5	2 Hrs	10	15	2 Hrs	25
Total		80	125	20 Hrs	205	520	30 Hrs	725

\* The subject experts at college level shall conduct examinations

### Semester III

Course code	Name of the course	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration	
			Marks	Duration				
BP301T	Pharmaceutical Organic Chemistry II – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP302T	PhysicalPharmaceuticsI –Theory	10	15	1 Hr	25	75	3 Hrs	100
BP303T	Pharmaceutical Microbiology – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP304T	Pharmaceutical Engineering – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP305P	Pharmaceutical Organic Chemistry II – Practical	5	10	4 Hr	15	35	4 Hrs	50
BP306P	Physical Pharmaceutics I – Practical	5	10	4 Hr	15	35	4 Hrs	50
BP307P	Pharmaceutical Microbiology – Practical	5	10	4 Hr	15	35	4 Hrs	50
BP308P	Pharmaceutical Engineering – Practical	5	10	4 Hr	15	35	4 Hrs	50
Total		60	100	20	160	440	28Hrs	600



### Semester IV

Course code	Name of the course	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration	
			Marks	Duration				
BP401T	Pharmaceutical Organic Chemistry III– Theory	10	15	1 Hr	25	75	3 Hrs	100
BP402T	Medicinal Chemistry I – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP403T	Physical Pharmaceutics II – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP404T	Pharmacology I – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP405T	Pharmacognosy I – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP406P	Medicinal Chemistry I – Practical	5	10	4 Hr	15	35	4 Hrs	50
BP407P	Physical Pharmaceutics II – Practical	5	10	4 Hrs	15	35	4 Hrs	50
BP408P	Pharmacology I – Practical	5	10	4 Hrs	15	35	4 Hrs	50
BP409P	Pharmacognosy I – Practical	5	10	4 Hrs	15	35	4 Hrs	50
Total		70	115	21 Hrs	185	515	31 Hrs	700

### Semester V

Course code	Name of the course	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration	
			Marks	Duration				
BP501T	Medicinal Chemistry II – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP502T	Industrial PharmacyI– Theory	10	15	1 Hr	25	75	3 Hrs	100
BP503T	Pharmacology II – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP504T	Pharmacognosy II – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP505T	Pharmaceutical Jurisprudence – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP506P	Industrial PharmacyI– Practical	5	10	4 Hr	15	35	4 Hrs	50
BP507P	Pharmacology II – Practical	5	10	4 Hr	15	35	4 Hrs	50
BP508P	Pharmacognosy II – Practical	5	10	4 Hr	15	35	4 Hrs	50
Total		65	105	17 Hr	170	480	27 Hrs	650

## Semester VI

Course code	Name of the course	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration	
			Marks	Duration				
BP601T	Medicinal Chemistry III – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP602T	Pharmacology III – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP603T	Herbal Drug Technology – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP604T	Biopharmaceutics and Pharmacokinetics – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP605T	Pharmaceutical Biotechnology– Theory	10	15	1 Hr	25	75	3 Hrs	100
BP606T	Quality Assurance– Theory	10	15	1 Hr	25	75	3 Hrs	100
BP607P	Medicinal chemistry III – Practical	5	10	4 Hrs	15	35	4 Hrs	50
BP608P	Pharmacology III – Practical	5	10	4 Hrs	15	35	4 Hrs	50
BP609P	Herbal Drug Technology – Practical	5	10	4 Hrs	15	35	4 Hrs	50
Total		75	120	18 Hrs	195	555	30 Hrs	750

## Semester VII

Course code	Name of the course	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration	
			Marks	Duration				
BP701T	Instrumental Methods of Analysis – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP702T	Industrial Pharmacy – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP703T	Pharmacy Practice – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP704T	Novel Drug Delivery System – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP705 P	Instrumental Methods of Analysis – Practical	5	10	4 Hrs	15	35	4 Hrs	50
BP706 PS	Practice School*	25	-	-	25	125	5 Hrs	150
Total		70	70	8Hrs	140	460	21 Hrs	600

\* The subject experts at college level shall conduct examinations

### Semester VIII

Course code	Name of the course	Internal Assessment				End Semester Exams		Total Marks
		Continuous Mode	Sessional Exams		Total	Marks	Duration	
			Marks	Duration				
BP801T	Biostatistics and Research Methodology – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP802T	Social and Preventive Pharmacy – Theory	10	15	1 Hr	25	75	3 Hrs	100
BP803ET	Pharmaceutical Marketing – Theory	10 + 10 = 20	15 + 15 = 30	1 + 1 = 2 Hrs	25 + 25 = 50	75 + 75 = 150	3 + 3 = 6 Hrs	100 + 100 = 200
BP804ET	Pharmaceutical Regulatory Science – Theory							
BP805ET	Pharmacovigilance – Theory							
BP806ET	Quality Control and Standardization of Herbals – Theory							
BP807ET	Computer Aided Drug Design – Theory							
BP808ET	Cell and Molecular Biology – Theory							
BP809ET	Cosmetic Science – Theory							
BP810ET	Experimental Pharmacology – Theory							
BP811ET	Advanced Instrumentation Techniques – Theory							
BP812PW	Project Work	-	-	-	-	150	4 Hrs	150

<b>Total</b>	<b>40</b>	<b>60</b>	<b>4 Hrs</b>	<b>100</b>	<b>450</b>	<b>16 Hrs</b>	<b>550</b>
--------------	-----------	-----------	--------------	------------	------------	---------------	------------



### 11.2. Internal assessment: Continuous mode

The marks allocated for Continuous mode of Internal Assessment shall be awarded as per the scheme given below.

**Table-XI: Scheme for awarding internal assessment: Continuous mode**

<b>Theory</b>		
<b>Criteria</b>	<b>Maximum Marks</b>	
Attendance (Refer Table – XII)	4	2
Academic activities (Average of any 3 activities e.g. quiz, assignment, open book test, field work, group discussion and seminar)	3	1.5
Student – Teacher interaction	3	1.5
<b>Total</b>	<b>10</b>	<b>5</b>
<b>Practical</b>		
Attendance (Refer Table – XII)	2	
Based on Practical Records, Regular viva voce, etc.	3	
<b>Total</b>	<b>5</b>	

**Table- XII: Guidelines for the allotment of marks for attendance**

<b>Percentage of Attendance</b>	<b>Theory</b>	<b>Practical</b>
95 – 100	4	2
90 – 94	3	1.5
85 – 89	2	1
80 – 84	1	0.5
Less than 80	0	0

#### 11.2.1. Sessional Exams

Two Sessional exams shall be conducted for each theory / practical course as per the schedule fixed by the college(s). The scheme of question paper for theory and practical Sessional examinations is given below. The average marks of two Sessional exams shall be computed for internal assessment as per the requirements given in tables – X.

Sessional exam shall be conducted for 30 marks for theory and shall be computed for 15 marks. Similarly Sessional exam for practical shall be conducted for 40 marks and shall be computed for 10 marks.

#### Question paper pattern for theory Sessional examinations

##### For subjects having University examination

I. Multiple Choice Questions (MCQs)	=	10 x 1 = 10
OR		OR
Objective Type Questions (5 x 2)	=	05 x 2 = 10
(Answer all the questions)		
I. Long Answers (Answer 1 out of 2)	=	1 x 10 = 10
II. Short Answers (Answer 2 out of 3)	=	2 x 5 = 10
		-----
Total	=	30 marks

**For subjects having Non University Examination**

I. Long Answers (Answer 1 out of 2)	=	1 x 10 = 10
II. Short Answers (Answer 4 out of 6)	=	4 x 5 = 20
		-----
Total	=	30 marks
		-----

**Question paper pattern for practical sessional examinations**

I. Synopsis	=	10
II. Experiments	=	25
III. Viva voce	=	05
		-----
Total	=	40 marks
		-----

**12. Promotion and award of grades**

A student shall be declared PASS and eligible for getting grade in a course of B.Pharm. program if he/she secures at least 50% marks in that particular course including internal assessment. For example, to be declared as PASS and to get grade, the student has to secure a minimum of 50 marks for the total of 100 including continuous mode of assessment and end semester theory examination and has to secure a minimum of 25 marks for the total 50 including internal assessment and end semester practical examination.

**13. Carry forward of marks**

In case a student fails to secure the minimum 50% in any Theory or Practical course as specified in 12, then he/she shall reappear for the end semester examination of that course. However his/her marks of the Internal Assessment shall be carried over and he/she shall be entitled for grade obtained by him/her on passing.

**14. Improvement of internal assessment**

A student shall have the opportunity to improve his/her performance only once in the Sessional exam component of the internal assessment. The re-conduct of the Sessional exam shall be completed before the commencement of next end semester theory examinations.

**15. Re-examination of end semester examinations**

Reexamination of end semester examinations shall be conducted as per the schedule given in table XIII. The exact dates of examinations shall be notified from time to time.



**Table-XIII: Tentative schedule of end semester examinations**

Semester	For Regular Candidates	For Failed Candidates
I, III, V and VII	November / December	May / June
II, IV, VI and VIII	May / June	November / December

**Question paper pattern for end semester theory examinations****For 75 marks paper**

I. Multiple Choice Questions(MCQs) = 20 x 1 = 20  
OR

Objective Type Questions (10 x 2) = 10 x 2 = 20  
(Answer all the questions)

II. Long Answers (Answer 2 out of 3) = 2 x 10 = 20

III. Short Answers (Answer 7 out of 9) = 7 x 5 = 35

Total = 75 marks

**For 50 marks paper**

I. Long Answers (Answer 2 out of 3) = 2 x 10 = 20

II. Short Answers (Answer 6 out of 8) = 6 x 5 = 30

Total = 50 marks

**For 35 marks paper**

I. Long Answers (Answer 1 out of 2) = 1 x 10 = 10

II. Short Answers (Answer 5 out of 7) = 5 x 5 = 25

Total = 35 marks

**Question paper pattern for end semester practical examinations**

I. Synopsis = 5

II. Experiments = 25

III. Viva voce = 5

Total = 35 marks

**16. Academic Progression:**

No student shall be admitted to any examination unless he/she fulfills the norms given in

6. Academic progression rules are applicable as follows:

A student shall be eligible to carry forward all the courses of I, II and III semesters till the IV semester examinations. However, he/she shall not be eligible to attend the courses of V semester until all the courses of I and II semesters are successfully completed.

A student shall be eligible to carry forward all the courses of III, IV and V semesters till the VI semester examinations. However, he/she shall not be eligible to attend the courses of VII semester until all the courses of I, II, III and IV semesters are successfully completed.

A student shall be eligible to carry forward all the courses of V, VI and VII semesters till the VIII semester examinations. However, he/she shall not be eligible to get the course completion certificate until all the courses of I, II, III, IV, V and VI semesters are successfully completed.

A student shall be eligible to get his/her CGPA upon successful completion of the courses of I to VIII semesters within the stipulated time period as per the norms specified in 26.

A lateral entry student shall be eligible to carry forward all the courses of III, IV and V semesters till the VI semester examinations. However, he/she shall not be eligible to attend the courses of VII semester until all the courses of III and IV semesters are successfully completed.

A lateral entry student shall be eligible to carry forward all the courses of V, VI and VII semesters till the VIII semester examinations. However, he/she shall not be eligible to get the course completion certificate until all the courses of III, IV, V and VI semesters are successfully completed.

A lateral entry student shall be eligible to get his/her CGPA upon successful completion of the courses of III to VIII semesters within the stipulated time period as per the norms specified in 26.

Any student who has given more than 4 chances for successful completion of I / III semester courses and more than 3 chances for successful completion of II / IV semester courses shall be permitted to attend V / VII semester classes ONLY during the subsequent academic year as the case may be. In simpler terms there shall NOT be any ODD BATCH for any semester.

Note: Grade AB should be considered as failed and treated as one head for deciding academic progression. Such rules are also applicable for those students who fail to register for examination(s) of any course in any semester.

## 17. Grading of performances

### 17.1. Letter grades and grade points allocations:

Based on the performances, each student shall be awarded a final letter grade at the end of the semester for each course. The letter grades and their corresponding grade points are given in Table – XII.

**Table – XII: Letter grades and grade points equivalent to Percentage of marks and performances**

Percentage of Marks Obtained	Letter Grade	Grade Point	Performance
90.00 – 100	O	10	Outstanding
80.00 – 89.99	A	9	Excellent
70.00 – 79.99	B	8	Good
60.00 – 69.99	C	7	Fair
50.00 – 59.99	D	6	Average
Less than 50	F	0	Fail
Absent	AB	0	Fail

A learner who remains absent for any end semester examination shall be assigned a letter grade of AB and a corresponding grade point of zero. He/she should reappear for the said evaluation/examination in due course.

## 18. The Semester grade point average (SGPA)

The performance of a student in a semester is indicated by a number called ‘Semester Grade Point Average’ (SGPA). The SGPA is the weighted average of the grade points obtained in all the courses by the student during the semester. For example, if a student takes five courses (Theory/Practical) in a semester with credits C<sub>1</sub>, C<sub>2</sub>, C<sub>3</sub>, C<sub>4</sub> and C<sub>5</sub> and the student’s grade points in these courses are G<sub>1</sub>, G<sub>2</sub>, G<sub>3</sub>, G<sub>4</sub> and G<sub>5</sub>, respectively, and then students’ SGPA is equal to:

$$\text{SGPA} = \frac{C_1G_1 + C_2G_2 + C_3G_3 + C_4G_4 + C_5G_5}{C_1 + C_2 + C_3 + C_4 + C_5}$$

The SGPA is calculated to two decimal points. It should be noted that, the SGPA for any semester shall take into consideration the F and AB grade awarded in that semester. For example if a learner has a F or AB grade in course 4, the SGPA shall then be computed as:

$$\text{SGPA} = \frac{C_1G_1 + C_2G_2 + C_3G_3 + C_4* \text{ZERO} + C_5G_5}{C_1 + C_2 + C_3 + C_4 + C_5}$$

### 19. Cumulative Grade Point Average (CGPA)

The CGPA is calculated with the SGPA of all the VIII semesters to two decimal points and is indicated in final grade report card/final transcript showing the grades of all VIII semesters and their courses. The CGPA shall reflect the failed status in case of F grade(s), till the course(s) is/are passed. When the course(s) is/are passed by obtaining a pass grade on subsequent examination(s) the CGPA shall only reflect the new grade and not the fail grades earned earlier. The CGPA is calculated as:

$$\text{CGPA} = \frac{C_1S_1 + C_2S_2 + C_3S_3 + C_4S_4 + C_5S_5 + C_6S_6 + C_7S_7 + C_8S_8}{C_1 + C_2 + C_3 + C_4 + C_5 + C_6 + C_7 + C_8}$$

where  $C_1, C_2, C_3, \dots$  is the total number of credits for semester I, II, III, .... and  $S_1, S_2, S_3, \dots$  is the SGPA of semester I, II, III, ....

### 20. Declaration of class

The class shall be awarded on the basis of CGPA as follows:

First Class with Distinction	= CGPA of 7.50 and above
First Class	= CGPA of 6.00 to 7.49
Second Class	= CGPA of 5.00 to 5.99

### 21. Project work

All the students shall undertake a project under the supervision of a teacher and submit a report. The area of the project shall directly relate any one of the elective subject opted by the student in semester VIII. The project shall be carried out in group not exceeding 5 in number. The project report shall be submitted in triplicate (typed & bound copy not less than 25 pages).

The internal and external examiner appointed by the University shall evaluate the project at the time of the Practical examinations of other semester(s). Students shall be evaluated in groups for four hours (i.e., about half an hour for a group of five students). The projects shall be evaluated as per the criteria given below.

***Evaluation of Dissertation Book:***

Objective(s) of the work done	15 Marks
Methodology adopted	20 Marks
Results and Discussions	20 Marks
Conclusions and Outcomes	20 Marks

---

<b>Total</b>	<b>75 Marks</b>
--------------	-----------------

---

***Evaluation of Presentation:***

Presentation of work	25 Marks
Communication skills	20 Marks
Question and answer skills	30 Marks

---

<b>Total</b>	<b>75 Marks</b>
--------------	-----------------

---

*Explanation:* The 75 marks assigned to the dissertation book shall be same for all the students in a group. However, the 75 marks assigned for presentation shall be awarded based on the performance of individual students in the given criteria.

**22. Industrial training (Desirable)**

Every candidate shall be required to work for at least 150 hours spread over four weeks in a Pharmaceutical Industry/Hospital. It includes Production unit, Quality Control department, Quality Assurance department, Analytical laboratory, Chemical manufacturing unit, Pharmaceutical R&D, Hospital (Clinical Pharmacy), Clinical Research Organization, Community Pharmacy, etc. After the Semester – VI and before the commencement of Semester – VII, and shall submit satisfactory report of such work and certificate duly signed by the authority of training organization to the head of the institute.

**23. Practice School**

In the VII semester, every candidate shall undergo practice school for a period of 150 hours evenly distributed throughout the semester. The student shall opt any one of the domains for practice school declared by the program committee from time to time.

At the end of the practice school, every student shall submit a printed report (in triplicate) on the practice school he/she attended (not more than 25 pages). Along with the exams of semester VII, the report submitted by the student, knowledge and skills acquired by the student through practice school shall be evaluated by the subject experts at college level and grade point shall be awarded.

**24. Award of Ranks**

Ranks and Medals shall be awarded on the basis of final CGPA. However, candidates who fail in one or more courses during the B.Pharm program shall not be eligible for award of ranks. Moreover, the candidates should have completed the B. Pharm program in minimum prescribed number of years, (four years) for the award of Ranks.

**25. Award of degree**

Candidates who fulfill the requirements mentioned above shall be eligible for award of degree during the ensuing convocation.

**26. Duration for completion of the program of study**

The duration for the completion of the program shall be fixed as double the actual duration of the program and the students have to pass within the said period, otherwise they have to get fresh Registration.

**27. Re-admission after break of study**

Candidate who seeks re-admission to the program after break of study has to get the approval from the university by paying a condonation fee.

No condonation is allowed for the candidate who has more than 2 years of break up period and he/she has to rejoin the program by paying the required fees.

## **CHAPTER - II: SYLLABUS**

## **Semester I**



## **BP101T. HUMAN ANATOMY AND PHYSIOLOGY-I (Theory)**

**45 Hours**

**Scope:** This subject is designed to impart fundamental knowledge on the structure and functions of the various systems of the human body. It also helps in understanding both homeostatic mechanisms. The subject provides the basic knowledge required to understand the various disciplines of pharmacy.

**Objectives:** Upon completion of this course the student should be able to

1. Explain the gross morphology, structure and functions of various organs of the human body.
2. Describe the various homeostatic mechanisms and their imbalances.
3. Identify the various tissues and organs of different systems of human body.
4. Perform the various experiments related to special senses and nervous system.
5. Appreciate coordinated working pattern of different organs of each system

### **Course Content:**

#### **Unit I**

**10 hours**

- **Introduction to human body**

Definition and scope of anatomy and physiology, levels of structural organization and body systems, basic life processes, homeostasis, basic anatomical terminology.

- **Cellular level of organization**

Structure and functions of cell, transport across cell membrane, cell division, cell junctions. General principles of cell communication, intracellular signaling pathway activation by extracellular signal molecule, Forms of intracellular signaling: a) Contact-dependent b) Paracrine c) Synaptic d) Endocrine

- **Tissue level of organization**

Classification of tissues, structure, location and functions of epithelial, muscular and nervous and connective tissues.

#### **Unit II**

**10 hours**

- **Integumentary system**

Structure and functions of skin

- **Skeletal system**

Divisions of skeletal system, types of bone, salient features and functions of bones of axial and appendicular skeletal system

Organization of skeletal muscle, physiology of muscle contraction, neuromuscular junction

- **Joints**

Structural and functional classification, types of joints movements and its articulation

### **Unit III**

**10 hours**

- **Body fluids and blood**

- Body fluids, composition and functions of blood, hemopoiesis, formation of hemoglobin, anemia, mechanisms of coagulation, blood grouping, Rh factors, transfusion, its significance and disorders of blood, Reticulo endothelial system.

- **Lymphatic system**

Lymphatic organs and tissues, lymphatic vessels, lymph circulation and functions of lymphatic system

### **Unit IV**

**08 hours**

**Peripheral nervous system:**

Classification of peripheral nervous system: Structure and functions of sympathetic and parasympathetic nervous system.

Origin and functions of spinal and cranial nerves.

- **Special senses**

Structure and functions of eye, ear, nose and tongue and their disorders.

### **Unit V**

**07 hours**

- **Cardiovascular system**

Heart – anatomy of heart, blood circulation, blood vessels, structure and functions of artery, vein and capillaries, elements of conduction system of heart and heart beat, its regulation by autonomic nervous system, cardiac output, cardiac cycle. Regulation of blood pressure, pulse, electrocardiogram and disorders of heart.

## **BP107P. HUMAN ANATOMY AND PHYSIOLOGY (Practical)**

**4 Hours/week**

Practical physiology is complimentary to the theoretical discussions in physiology. Practicals allow the verification of physiological processes discussed in theory classes through experiments on living tissue, intact animals or normal human beings. This is helpful for developing an insight on the subject.

1. Study of compound microscope.
2. Microscopic study of epithelial and connective tissue
3. Microscopic study of muscular and nervous tissue
4. Identification of axial bones
5. Identification of appendicular bones
6. Introduction to hemocytometry.
7. Enumeration of white blood cell (WBC) count
8. Enumeration of total red blood corpuscles (RBC) count
9. Determination of bleeding time
10. Determination of clotting time
11. Estimation of hemoglobin content
12. Determination of blood group.
13. Determination of erythrocyte sedimentation rate (ESR).
14. Determination of heart rate and pulse rate.
15. Recording of blood pressure.

### **Recommended Books (Latest Editions)**

1. Essentials of Medical Physiology by K. Sembulingam and P. Sembulingam. Jaypee brothers medical publishers, New Delhi.
2. Anatomy and Physiology in Health and Illness by Kathleen J.W. Wilson, Churchill Livingstone, New York
3. Physiological basis of Medical Practice-Best and Tailor. Williams & Wilkins Co, Riverview, MI USA
4. Text book of Medical Physiology- Arthur C, Guyton and John E. Hall. Miamisburg, OH, U.S.A.
5. Principles of Anatomy and Physiology by Tortora Grabowski. Palmetto, GA, U.S.A.

6. Textbook of Human Histology by Inderbir Singh, Jaypee brother's medical publishers, New Delhi.
7. Textbook of Practical Physiology by C.L. Ghai, Jaypee brother's medical publishers, New Delhi.
8. Practical workbook of Human Physiology by K. Srinageswari and Rajeev Sharma, Jaypee brother's medical publishers, New Delhi.

**Reference Books (Latest Editions)**

1. Physiological basis of Medical Practice-Best and Taylor. Williams & Wilkins Co, Riverview, MI USA
2. Text book of Medical Physiology- Arthur C, Guyton and John. E. Hall. Miamisburg, OH, U.S.A.
3. Human Physiology (vol 1 and 2) by Dr. C.C. Chatterrje ,Academic Publishers Kolkata

## BP102T. PHARMACEUTICAL ANALYSIS (Theory)

45 Hours

**Scope:** This course deals with the fundamentals of analytical chemistry and principles of electrochemical analysis of drugs

**Objectives:** Upon completion of the course student shall be able to

- understand the principles of volumetric and electro chemical analysis
- carryout various volumetric and electrochemical titrations
- develop analytical skills

### Course Content:

#### UNIT-I

10 Hours

(a) **Pharmaceutical analysis**- Definition and scope

- i) Different techniques of analysis
- ii) Methods of expressing concentration
- iii) Primary and secondary standards.
- iv) Preparation and standardization of various molar and normal solutions- Oxalic acid, sodium hydroxide, hydrochloric acid, sodium thiosulphate, sulphuric acid, potassium permanganate and ceric ammonium sulphate

(b)**Errors:** Sources of errors, types of errors, methods of minimizing errors, accuracy, precision and significant figures

(c)Pharmacopoeia, Sources of impurities in medicinal agents,limit tests.

#### UNIT-II

10 Hours

- **Acid base titration:** Theories of acid base indicators, classification of acid base titrations and theory involved in titrations of strong, weak, and very weak acids and bases, neutralization curves
- **Non aqueous titration:** Solvents, acidimetry and alkalimetry titration and estimation of Sodium benzoate and Ephedrine HCl

#### UNIT-III

10 Hours

- **Precipitation titrations:** Mohr's method, Volhard's, Modified Volhard's, Fajans method, estimation of sodium chloride.
- **Complexometric titration:** Classification, metal ion indicators, masking and demasking reagents, estimation of Magnesium sulphate, and calcium gluconate.
- **Gravimetry:** Principle and steps involved in gravimetric analysis. Purity of the precipitate: co-precipitation and post precipitation, Estimation of barium sulphate.
- Basic Principles,methods and application of diazotisation titration.

## **UNIT-IV**

**08 Hours**

### **Redox titrations**

(a) Concepts of oxidation and reduction

(b) Types of redox titrations (Principles and applications)

Cerimetry, Iodimetry, Iodometry, Bromatometry, Dichrometry, Titration with potassium iodate

## **UNIT-V**

**07 Hours**

- **Electrochemical methods of analysis**
  - **Conductometry**- Introduction, Conductivity cell, Conductometric titrations, applications.
  - **Potentiometry** - Electrochemical cell, construction and working of reference (Standard hydrogen, silver chloride electrode and calomel electrode) and indicator electrodes (metal electrodes and glass electrode), methods to determine end point of potentiometric titration and applications.
  - **Polarography** - Principle, Ilkovic equation, construction and working of dropping mercury electrode and rotating platinum electrode, applications

## **BP108P. PHARMACEUTICAL ANALYSIS (Practical)**

**4 Hours / Week**

### **I Limit Test of the following**

- (1) Chloride
- (2) Sulphate
- (3) Iron
- (4) Arsenic

### **II Preparation and standardization of**

- (1) Sodium hydroxide
- (2) Sulphuric acid
- (3) Sodium thiosulfate
- (4) Potassium permanganate
- (5) Ceric ammonium sulphate

### **III Assay of the following compounds along with Standardization of Titrant**

- (1) Ammonium chloride by acid base titration
- (2) Ferrous sulphate by Cerimetry
- (3) Copper sulphate by Iodometry
- (4) Calcium gluconate by complexometry
- (5) Hydrogen peroxide by Permanganometry
- (6) Sodium benzoate by non-aqueous titration
- (7) Sodium Chloride by precipitation titration

### **IV Determination of Normality by electro-analytical methods**

- (1) Conductometric titration of strong acid against strong base
- (2) Conductometric titration of strong acid and weak acid against strong base
- (3) Potentiometric titration of strong acid against strong base

### **Recommended Books: (Latest Editions)**

1. A.H. Beckett & J.B. Stenlake's, Practical Pharmaceutical Chemistry Vol I & II, Stahlone Press of University of London
2. A.I. Vogel, Text Book of Quantitative Inorganic analysis
3. P. Gundu Rao, Inorganic Pharmaceutical Chemistry
4. Bentley and Driver's Textbook of Pharmaceutical Chemistry
5. John H. Kennedy, Analytical chemistry principles
6. Indian Pharmacopoeia.



## **BP103T. PHARMACEUTICS- I (Theory)**

**45 Hours**

**Scope:** This course is designed to impart a fundamental knowledge on the preparatory pharmacy with arts and science of preparing the different conventional dosage forms.

**Objectives:** Upon completion of this course the student should be able to:

- Know the history of profession of pharmacy
- Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations
- Understand the professional way of handling the prescription
- Preparation of various conventional dosage forms

### **Course Content:**

#### **UNIT – I**

**10 Hours**

- **Historical background and development of profession of pharmacy:** History of profession of Pharmacy in India in relation to pharmacy education, industry and organization, Pharmacy as a career, Pharmacopoeias: Introduction to IP, BP, USP and Extra Pharmacopoeia.
- **Dosage forms:** Introduction to dosage forms, classification and definitions
- **Prescription:** Definition, Parts of prescription, handling of Prescription and Errors in prescription.
- **Posology:** Definition, Factors affecting posology. Pediatric dose calculations based on age, body weight and body surface area.

#### **UNIT – II**

**10 Hours**

- **Pharmaceutical calculations:** Weights and measures – Imperial & Metric system, Calculations involving percentage solutions, alligation, proof spirit and isotonic solutions based on freezing point and molecular weight.
- **Powders:** Definition, classification, advantages and disadvantages, Simple & compound powders – official preparations, dusting powders, effervescent, efflorescent and hygroscopic powders, eutectic mixtures. Geometric dilutions.
- **Liquid dosage forms:** Advantages and disadvantages of liquid dosage forms. Excipients used in formulation of liquid dosage forms. Solubility enhancement techniques

### UNIT – III

**08 Hours**

- **Monophasic liquids:** Definitions and preparations of Gargles, Mouthwashes, Throat Paint, Eardrops, Nasal drops, Enemas, Syrups, Elixirs, Liniments and Lotions.
- **Biphasic liquids:**
- **Suspensions:** Definition, advantages and disadvantages, classifications, Preparation of suspensions; Flocculated and Deflocculated suspension & stability problems and methods to overcome.
- **Emulsions:** Definition, classification, emulsifying agent, test for the identification of type of Emulsion, Methods of preparation & stability problems and methods to overcome.

### UNIT – IV

**08 Hours**

- **Suppositories:** Definition, types, advantages and disadvantages, types of bases, methods of preparations. Displacement value & its calculations, evaluation of suppositories.
- **Pharmaceutical incompatibilities:** Definition, classification, physical, chemical and therapeutic incompatibilities with examples.

### UNIT – V

**07 Hours**

- **Semisolid dosage forms:** Definitions, classification, mechanisms and factors influencing dermal penetration of drugs. Preparation of ointments, pastes, creams and gels. Excipients used in semi solid dosage forms. Evaluation of semi solid dosage forms

**1 . Syrups**

- a) Syrup IP'66
- b) Compound syrup of Ferrous Phosphate BPC'68

**2. Elixirs**

- a) Piperazine citrate elixir
- b) Paracetamol pediatric elixir

**3.Linctus**

- a) Terpin Hydrate Linctus IP'66
- b) Iodine Throat Paint (Mandles Paint)

**4. Solutions**

- a) Strong solution of ammonium acetate
- b) Cresol with soap solution
- c) Lugol's solution

**5. Suspensions**

- a) Calamine lotion
- b) Magnesium Hydroxide mixture
- c) Aluminium Hydroxide gel

**6. Emulsions**

- a) Turpentine Liniment
- b) Liquid paraffin emulsion

**7. Powders and Granules**

- a) ORS powder (WHO)
- b) Effervescent granules
- c) Dusting powder
- d) Divided powders

**8. Suppositories**

- a) Glycero gelatin suppository
- b) Cocoa butter suppository
- c) Zinc Oxide suppository

**8. Semisolids**

- a) Sulphur ointment
- b) Non staining-iodine ointment with methyl salicylate
- c) Carbopal gel

**9. Gargles and Mouthwashes**

- a) Iodine gargle
- b) Chlorhexidine mouthwash

**Recommended Books: (Latest Editions)**

1. H.C. Ansel et al., Pharmaceutical Dosage Form and Drug Delivery System, Lippincott Williams and Walkins, New Delhi.
2. Carter S.J., Cooper and Gunn's-Dispensing for Pharmaceutical Students, CBS publishers, New Delhi.
3. M.E. Aulton, Pharmaceutics, The Science & Dosage Form Design, Churchill Livingstone, Edinburgh.
4. Indian pharmacopoeia.
5. British pharmacopoeia.
6. Lachmann. Theory and Practice of Industrial Pharmacy, Lea & Febiger Publisher, The University of Michigan.
7. Alfonso R. Gennaro Remington. The Science and Practice of Pharmacy, Lippincott Williams, New Delhi.
8. Carter S.J., Cooper and Gunn's. Tutorial Pharmacy, CBS Publications, New Delhi.
9. E.A. Rawlins, Bentley's Text Book of Pharmaceutics, English Language Book Society, Elsevier Health Sciences, USA.
10. Isaac Ghebre Sellassie: Pharmaceutical Pelletization Technology, Marcel Dekker, INC, New York.
11. Dilip M. Parikh: Handbook of Pharmaceutical Granulation Technology, Marcel Dekker, INC, New York.
12. Francoise Nieloud and Gilberte Marti-Mestres: Pharmaceutical Emulsions and Suspensions, Marcel Dekker, INC, New York.

## **BP104T. PHARMACEUTICAL INORGANIC CHEMISTRY (Theory)**

**45 Hours**

**Scope:** This subject deals with the monographs of inorganic drugs and pharmaceuticals.

**Objectives:** Upon completion of course student shall be able to

- know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals
- understand the medicinal and pharmaceutical importance of inorganic compounds

### **Course Content:**

#### **UNIT I**

**10 Hours**

- **Impurities in pharmaceutical substances:** History of Pharmacopoeia, Sources and types of impurities, principle involved in the limit test for Chloride, Sulphate, Iron, Arsenic, Lead and Heavy metals, modified limit test for Chloride and Sulphate

**General methods of preparation,** assay for the compounds superscripted with **asterisk (\*)**, properties and medicinal uses of inorganic compounds belonging to the following classes

#### **UNIT II**

**10 Hours**

- **Acids, Bases and Buffers:** Buffer equations and buffer capacity in general, buffers in pharmaceutical systems, preparation, stability, buffered isotonic solutions, measurements of tonicity, calculations and methods of adjusting isotonicity.
- **Major extra and intracellular electrolytes:** Functions of major physiological ions, Electrolytes used in the replacement therapy: Sodium chloride\*, Potassium chloride, Calcium gluconate\* and Oral Rehydration Salt (ORS), Physiological acid base balance.
- **Dental products:** Dentifrices, role of fluoride in the treatment of dental caries, Desensitizing agents, Calcium carbonate, Sodium fluoride, and Zinc eugenol cement.

#### **UNIT III**

**10 Hours**

- **Gastrointestinal agents**

**Acidifiers:** Ammonium chloride\* and Dil. HCl

**Antacid:** Ideal properties of antacids, combinations of antacids, Sodium

Bicarbonate\*, Aluminum hydroxide gel, Magnesium hydroxide mixture

**Cathartics:** Magnesium sulphate, Sodium orthophosphate, Kaolin and Bentonite

**Antimicrobials:** Mechanism, classification, Potassium permanganate, Boric acid, Hydrogen peroxide\*, Chlorinated lime\*, Iodine and its preparations

#### UNIT IV

08 Hours

- **Miscellaneous compounds**

**Expectorants:** Potassium iodide, Ammonium chloride\*.

**Emetics:** Copper sulphate\*, Sodium potassium tartarate

**Haematinics:** Ferrous sulphate\*, Ferrous gluconate

**Poison and Antidote:** Sodium thiosulphate\*, Activated charcoal, Sodium nitrite

**Astringents:** Zinc Sulphate, Potash Alum

#### UNIT V

07 Hours

- **Radiopharmaceuticals:** Radio activity, Measurement of radioactivity, Properties of  $\alpha$ ,  $\beta$ ,  $\gamma$  radiations, Half life, radio isotopes and study of radio isotopes - Sodium iodide  $I^{131}$ , Storage conditions, precautions & pharmaceutical application of radioactive substances.

## **BP110P. PHARMACEUTICAL INORGANIC CHEMISTRY (Practical)**

**4 Hours / Week**

### **I Limit tests for following ions**

Limit test for Chlorides and Sulphates  
Modified limit test for Chlorides and Sulphates  
Limit test for Iron  
Limit test for Heavy metals  
Limit test for Lead  
Limit test for Arsenic

### **II Identification test**

Magnesium hydroxide  
Ferrous sulphate  
Sodium bicarbonate  
Calcium gluconate  
Copper sulphate

### **III Test for purity**

Swelling power of Bentonite  
Neutralizing capacity of aluminum hydroxide gel  
Determination of potassium iodate and iodine in potassium Iodide

### **IV Preparation of inorganic pharmaceuticals**

Boric acid  
Potash alum  
Ferrous sulphate

### **Recommended Books (Latest Editions)**

1. A.H. Beckett & J.B. Stenlake's, Practical Pharmaceutical Chemistry Vol I & II, Stahlone Press of University of London, 4<sup>th</sup> edition.
2. A.I. Vogel, Text Book of Quantitative Inorganic analysis
3. P. Gundu Rao, Inorganic Pharmaceutical Chemistry, 3<sup>rd</sup> Edition
4. M.L Schroff, Inorganic Pharmaceutical Chemistry
5. Bentley and Driver's Textbook of Pharmaceutical Chemistry
6. Anand & Chatwal, Inorganic Pharmaceutical Chemistry
7. Indian

Pharmacopoeia



## **BP105T.COMMUNICATION SKILLS (Theory)**

**30 Hours**

**Scope:** This course will prepare the young pharmacy student to interact effectively with doctors, nurses, dentists, physiotherapists and other health workers. At the end of this course the student will get the soft skills set to work cohesively with the team as a team player and will add value to the pharmaceutical business.

### **Objectives:**

Upon completion of the course the student shall be able to

1. Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation
2. Communicate effectively (Verbal and Non Verbal)
3. Effectively manage the team as a team player
4. Develop interview skills
5. Develop Leadership qualities and essentials

### **Course content:**

#### **UNIT – I**

**07 Hours**

- **Communication Skills:** Introduction, Definition, The Importance of Communication, The Communication Process – Source, Message, Encoding, Channel, Decoding, Receiver, Feedback, Context
- **Barriers to communication:** Physiological Barriers, Physical Barriers, Cultural Barriers, Language Barriers, Gender Barriers, Interpersonal Barriers, Psychological Barriers, Emotional barriers
- **Perspectives in Communication:** Introduction, Visual Perception, Language, Other factors affecting our perspective - Past Experiences, Prejudices, Feelings, Environment

#### **UNIT – II**

**07 Hours**

- **Elements of Communication:** Introduction, Face to Face Communication - Tone of Voice, Body Language (Non-verbal communication), Verbal Communication, Physical Communication
- **Communication Styles:** Introduction, The Communication Styles Matrix with example for each -Direct Communication Style, Spirited Communication Style, Systematic Communication Style, Considerate Communication Style

### UNIT – III

**07 Hours**

- **Basic Listening Skills:** Introduction, Self-Awareness, Active Listening, Becoming an Active Listener, Listening in Difficult Situations
- **Effective Written Communication:** Introduction, When and When Not to Use Written Communication - Complexity of the Topic, Amount of Discussion' Required, Shades of Meaning, Formal Communication
- **Writing Effectively:** Subject Lines, Put the Main Point First, Know Your Audience, Organization of the Message

### UNIT – IV

**05 Hours**

- **Interview Skills:** Purpose of an interview, Do's and Dont's of an interview
- **Giving Presentations:** Dealing with Fears, Planning your Presentation, Structuring Your Presentation, Delivering Your Presentation, Techniques of Delivery

### UNIT – V

**04 Hours**

- **Group Discussion:** Introduction, Communication skills in group discussion, Do's and Dont's of group discussion

## **BP111P.COMMUNICATION SKILLS (Practical)**

**2 Hours / week**

The following learning modules are to be conducted using wordsworth<sup>®</sup> English language lab software

### **Basic communication covering the following topics**

Meeting People

Asking Questions

Making Friends

What did you do?

Do's and Dont's

### **Pronunciations covering the following topics**

Pronunciation (Consonant Sounds)

Pronunciation and Nouns

Pronunciation (Vowel Sounds)

### **Advanced Learning**

Listening Comprehension / Direct and Indirect Speech

Figures of Speech

Effective Communication

Writing Skills

Effective Writing

Interview Handling Skills

E-Mail etiquette

Presentation Skills

**Recommended Books: (Latest Edition)**

1. Basic communication skills for Technology, Andreja. J. Ruther Ford, 2<sup>nd</sup> Edition, Pearson Education, 2011
2. Communication skills, Sanjay Kumar, Pushpalata, 1<sup>st</sup> Edition, Oxford Press, 2011
3. Organizational Behaviour, Stephen .P. Robbins, 1<sup>st</sup> Edition, Pearson, 2013
4. Brilliant- Communication skills, Gill Hasson, 1<sup>st</sup> Edition, Pearson Life, 2011
5. The Ace of Soft Skills: Attitude, Communication and Etiquette for success, Gopala Swamy Ramesh, 5<sup>th</sup> Edition, Pearson, 2013
6. Developing your influencing skills, Deborah Dalley, Lois Burton, Margaret, Green hall, 1st Edition Universe of Learning LTD, 2010
7. Communication skills for professionals, Konar nira, 2<sup>nd</sup> Edition, New arrivals – PHI, 2011
8. Personality development and soft skills, Barun K Mitra, 1<sup>st</sup> Edition, Oxford Press, 2011
9. Soft skill for everyone, Butter Field, 1st Edition, Cengage Learning india pvt.ltd, 2011
10. Soft skills and professional communication, Francis Peters SJ, 1<sup>st</sup> Edition, Mc Graw Hill Education, 2011
11. Effective communication, John Adair, 4<sup>th</sup> Edition, Pan Mac Millan, 2009
12. Bringing out the best in people, Aubrey Daniels, 2<sup>nd</sup> Edition, Mc Graw Hill, 1999

## **BP 106RBT.REMEDIAL BIOLOGY (Theory)**

**30 Hours**

**Scope:** To learn and understand the components of living world, structure and functional system of plant and animal kingdom.

**Objectives:** Upon completion of the course, the student shall be able to

- know the classification and salient features of five kingdoms of life
- understand the basic components of anatomy & physiology of plant
- know understand the basic components of anatomy & physiology animal with special reference to human

### **UNIT I**

**07 Hours**

#### **Living world:**

- Definition and characters of living organisms
- Diversity in the living world
- Binomial nomenclature
- Five kingdoms of life and basis of classification. Salient features of Monera, Protista, Fungi, Animalia and Plantae, Virus,

#### **Morphology of Flowering plants**

- Morphology of different parts of flowering plants – Root, stem, inflorescence, flower, leaf, fruit, seed.
- General Anatomy of Root, stem, leaf of monocotyledons & Dicotyledones.

### **UNIT II**

**07 Hours**

#### **Body fluids and circulation**

- Composition of blood, blood groups, coagulation of blood
- Composition and functions of lymph
- Human circulatory system
- Structure of human heart and blood vessels
- Cardiac cycle, cardiac output and ECG

#### **Digestion and Absorption**

- Human alimentary canal and digestive glands
- Role of digestive enzymes
- Digestion, absorption and assimilation of digested food

#### **Breathing and respiration**

- Human respiratory system
- Mechanism of breathing and its regulation
- Exchange of gases, transport of gases and regulation of respiration
- Respiratory volumes

### **UNIT III**

**07 Hours**

#### **Excretory products and their elimination**

- Modes of excretion
- Human excretory system- structure and function
- Urine formation
- Rennin angiotensin system

#### **Neural control and coordination**

- Definition and classification of nervous system
- Structure of a neuron
- Generation and conduction of nerve impulse
- Structure of brain and spinal cord
- Functions of cerebrum, cerebellum, hypothalamus and medulla oblongata

#### **Chemical coordination and regulation**

- Endocrine glands and their secretions
- Functions of hormones secreted by endocrine glands

#### **Human reproduction**

- Parts of female reproductive system
- Parts of male reproductive system
- Spermatogenesis and Oogenesis
- Menstrual cycle

### **UNIT IV**

**05 Hours**

#### **Plants and mineral nutrition:**

- Essential mineral, macro and micronutrients
- Nitrogen metabolism, Nitrogen cycle, biological nitrogen fixation

#### **Photosynthesis**

- Autotrophic nutrition, photosynthesis, Photosynthetic pigments, Factors affecting photosynthesis.

### **UNIT V**

**04 Hours**

**Plant respiration:**Respiration, glycolysis, fermentation (anaerobic).

#### **Plant growth and development**

- Phases and rate of plant growth, Condition of growth,Introduction to plant growth regulators

#### **Cell - The unit of life**

- Structure and functions of cell and cell organelles.Cell division

#### **Tissues**

- Definition, types of tissues, location and functions.

**Text Books**

- a. Text book of Biology by S. B. Gokhale
- b. A Text book of Biology by Dr. Thulajappa and Dr. Seetaram.

**Reference Books**

- a. A Text book of Biology by B.V. Sreenivasa Naidu
- b. A Text book of Biology by Naidu and Murthy
- c. Botany for Degree students By A.C.Dutta.
- d.Outlines of Zoology by M. Ekambaranatha ayyer and T. N. Ananthakrishnan.
- e. A manual for pharmaceutical biology practical by S.B. Gokhale and C. K. Kokate



## **BP112RBP.REMEDIAL BIOLOGY (Practical)**

**30 Hours**

1. Introduction to experiments in biology
  - a) Study of Microscope
  - b) Section cutting techniques
  - c) Mounting and staining
  - d) Permanent slide preparation
2. Study of cell and its inclusions
3. Study of Stem, Root, Leaf, seed, fruit, flower and their modifications
4. Detailed study of frog by using computer models
5. Microscopic study and identification of tissues pertinent to Stem, Root  
Leaf, seed, fruit and flower
6. Identification of bones
7. Determination of blood group
8. Determination of blood pressure
9. Determination of tidal volume

### **Reference Books**

1. Practical human anatomy and physiology. by S.R.Kale and R.R.Kale.
2. A Manual of pharmaceutical biology practical by S.B.Gokhale, C.K.Kokate and S.P.Shriwastava.
3. Biology practical manual according to National core curriculum .Biology forum of Karnataka. Prof .M.J.H.Shafi

## BP 106RMT.REMEDIAL MATHEMATICS (Theory)

30 Hours

**Scope:** This is an introductory course in mathematics. This subject deals with the introduction to Partial fraction, Logarithm, matrices and Determinant, Analytical geometry, Calculus, differential equation and Laplace transform.

**Objectives:** Upon completion of the course the student shall be able to:-

1. Know the theory and their application in Pharmacy
2. Solve the different types of problems by applying theory
3. Appreciate the important application of mathematics in Pharmacy

### Course Content:

#### UNIT – I

06 Hours

- **Partial fraction**

Introduction, Polynomial, Rational fractions, Proper and Improper fractions, Partial fraction, Resolving into Partial fraction, Application of Partial Fraction in Chemical Kinetics and Pharmacokinetics

- **Logarithms**

Introduction, Definition, Theorems/Properties of logarithms, Common logarithms, Characteristic and Mantissa, worked examples, application of logarithm to solve pharmaceutical problems.

- **Function:**

Real Valued function, Classification of real valued functions,

- **Limits and continuity :**

Introduction, Limit of a function, Definition of limit of a function ( $\epsilon - \delta$

definition),  $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a} = na^{n-1}$ ,  $\lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$ ,

#### UNIT –II

06 Hours

- **Matrices and Determinant:**

Introduction matrices, Types of matrices, Operation on matrices, Transpose of a matrix, Matrix Multiplication, Determinants, Properties of determinants, Product of determinants, Minors and co-Factors, Adjoint or adjugate of a square matrix, Singular and non-singular matrices, Inverse of a matrix, Solution of system of linear equations using matrix method, Cramer's rule, Characteristic equation and roots of a square matrix, Cayley-Hamilton theorem, Application of Matrices in solving Pharmacokinetic equations

### UNIT – III

06 Hours

- **Calculus**

**Differentiation** : Introductions, Derivative of a function, Derivative of a constant, Derivative of a product of a constant and a function, Derivative of the sum or difference of two functions, Derivative of the product of two functions (product formula), Derivative of the quotient of two functions (Quotient formula) – **Without Proof**, Derivative of  $x^n$  w.r.t  $x$ , where  $n$  is any rational number, Derivative of  $e^x$ , Derivative of  $\log_e x$ , Derivative of  $a^x$ , Derivative of trigonometric functions from first principles (**without Proof**), Successive Differentiation, Conditions for a function to be a maximum or a minimum at a point. Application

### UNIT – IV

06 Hours

- **Analytical Geometry**

**Introduction:** Signs of the Coordinates, Distance formula,

**Straight Line** : Slope or gradient of a straight line, Conditions for parallelism and perpendicularity of two lines, Slope of a line joining two points, Slope – intercept form of a straight line

**Integration:**

Introduction, Definition, Standard formulae, Rules of integration, Method of substitution, Method of Partial fractions, Integration by parts, definite integrals, application

### UNIT-V

06 Hours

- **Differential Equations** : Some basic definitions, Order and degree, Equations in separable form, Homogeneous equations, Linear Differential equations, Exact equations, **Application in solving Pharmacokinetic equations**
- **Laplace Transform** : Introduction, Definition, Properties of Laplace transform, Laplace Transforms of elementary functions, Inverse Laplace transforms, Laplace transform of derivatives, Application to solve Linear differential equations, **Application in solving Chemical kinetics and Pharmacokinetics equations**

### Recommended Books (Latest Edition)

1. Differential Calculus by Shanthinarayan
2. Pharmaceutical Mathematics with application to Pharmacy by Panchaksharappa Gowda D.H.
3. Integral Calculus by Shanthinarayan
4. Higher Engineering Mathematics by Dr.B.S.Grewal

## **Semester II**

## **BP 201T. HUMAN ANATOMY AND PHYSIOLOGY-II (Theory)**

**45 Hours**

**Scope:** This subject is designed to impart fundamental knowledge on the structure and functions of the various systems of the human body. It also helps in understanding both homeostatic mechanisms. The subject provides the basic knowledge required to understand the various disciplines of pharmacy.

**Objectives:** Upon completion of this course the student should be able to:

1. Explain the gross morphology, structure and functions of various organs of the human body.
2. Describe the various homeostatic mechanisms and their imbalances.
3. Identify the various tissues and organs of different systems of human body.
4. Perform the hematological tests like blood cell counts, haemoglobin estimation, bleeding/clotting time etc and also record blood pressure, heart rate, pulse and respiratory volume.
5. Appreciate coordinated working pattern of different organs of each system
6. Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.

### **Course Content:**

#### **Unit I**

**10 hours**

- **Nervous system**

Organization of nervous system, neuron, neuroglia, classification and properties of nerve fibre, electrophysiology, action potential, nerve impulse, receptors, synapse, neurotransmitters.

Central nervous system: Meninges, ventricles of brain and cerebrospinal fluid. structure and functions of brain (cerebrum, brain stem, cerebellum), spinal cord (gross structure, functions of afferent and efferent nerve tracts, reflex activity)

#### **Unit II**

**06 hours**

- **Digestive system**

Anatomy of GI Tract with special reference to anatomy and functions of stomach, ( Acid production in the stomach, regulation of acid production through parasympathetic nervous system, pepsin role in protein digestion) small intestine

and large intestine, anatomy and functions of salivary glands, pancreas and liver, movements of GIT, digestion and absorption of nutrients and disorders of GIT.

- **Energetics**

Formation and role of ATP, Creatinine Phosphate and BMR.

### **Unit III**

- **Respiratory system**

**10 hours**

Anatomy of respiratory system with special reference to anatomy of lungs, mechanism of respiration, regulation of respiration

Lung Volumes and capacities transport of respiratory gases, artificial respiration, and resuscitation methods.

- **Urinary system**

Anatomy of urinary tract with special reference to anatomy of kidney and nephrons, functions of kidney and urinary tract, physiology of urine formation, micturition reflex and role of kidneys in acid base balance, role of RAS in kidney and disorders of kidney.

### **Unit IV**

**10 hours**

- **Endocrine system**

Classification of hormones, mechanism of hormone action, structure and functions of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas, pineal gland, thymus and their disorders.

### **Unit V**

**09 hours**

- **Reproductive system**

Anatomy of male and female reproductive system, Functions of male and female reproductive system, sex hormones, physiology of menstruation, fertilization, spermatogenesis, oogenesis, pregnancy and parturition

- **Introduction to genetics**

Chromosomes, genes and DNA, protein synthesis, genetic pattern of inheritance

## **BP 207 P. HUMAN ANATOMY AND PHYSIOLOGY (Practical)**

**4 Hours/week**

Practical physiology is complimentary to the theoretical discussions in physiology. Practicals allow the verification of physiological processes discussed in theory classes through experiments on living tissue, intact animals or normal human beings. This is helpful for developing an insight on the subject.

1. To study the integumentary and special senses using specimen, models, etc.,
2. To study the nervous system using specimen, models, etc.,
3. To study the endocrine system using specimen, models, etc
4. To demonstrate the general neurological examination
5. To demonstrate the function of olfactory nerve
6. To examine the different types of taste.
7. To demonstrate the visual acuity
8. To demonstrate the reflex activity
9. Recording of body temperature
10. To demonstrate positive and negative feedback mechanism.
11. Determination of tidal volume and vital capacity.
12. Study of digestive, respiratory, cardiovascular systems, urinary and reproductive systems with the help of models, charts and specimens.
13. Recording of basal mass index .
14. Study of family planning devices and pregnancy diagnosis test.
15. Demonstration of total blood count by cell analyser
16. Permanent slides of vital organs and gonads.

### **Recommended Books (Latest Editions)**

1. Essentials of Medical Physiology by K. Sembulingam and P. Sembulingam. Jaypee brothers medical publishers, New Delhi.
2. Anatomy and Physiology in Health and Illness by Kathleen J.W. Wilson, Churchill Livingstone, New York
3. Physiological basis of Medical Practice-Best and Tailor. Williams & Wilkins Co,Riverview,MI USA



4. Text book of Medical Physiology- Arthur C, Guyton and John. E. Hall. Miamisburg, OH, U.S.A.
5. Principles of Anatomy and Physiology by Tortora Grabowski. Palmetto, GA, U.S.A.
6. Textbook of Human Histology by Inderbir Singh, Jaypee brothers medical publishers, New Delhi.
7. Textbook of Practical Physiology by C.L. Ghai, Jaypee brothers medical publishers, New Delhi.
8. Practical workbook of Human Physiology by K. Srinageswari and Rajeev Sharma, Jaypee brother's medical publishers, New Delhi.

**Reference Books:**

1. Physiological basis of Medical Practice-Best and Taylor. Williams & Wilkins Co, Riverview, MI USA
2. Text book of Medical Physiology- Arthur C, Guyton and John. E. Hall. Miamisburg, OH, U.S.A.
3. Human Physiology (vol 1 and 2) by Dr. C.C. Chatterrje ,Academic Publishers Kolkata

## BP202T. PHARMACEUTICAL ORGANIC CHEMISTRY –I (Theory)

**45 Hours**

**Scope:** This subject deals with classification and nomenclature of simple organic compounds, structural isomerism, intermediates forming in reactions, important physical properties, reactions and methods of preparation of these compounds. The syllabus also emphasizes on mechanisms and orientation of reactions.

**Objectives:** Upon completion of the course the student shall be able to

1. write the structure, name and the type of isomerism of the organic compound
2. write the reaction, name the reaction and orientation of reactions
3. account for reactivity/stability of compounds,
4. identify/confirm the identification of organic compound

### Course Content:

General methods of preparation and reactions of compounds superscripted with asterisk (\*) to be explained

To emphasize on definition, types, classification, principles/mechanisms, applications, examples and differences

### UNIT-I

**07 Hours**

- **Classification, nomenclature and isomerism**

Classification of Organic Compounds

Common and IUPAC systems of nomenclature of organic compounds

(up to 10 Carbons open chain and carbocyclic compounds)

Structural isomerisms in organic compounds

### UNIT-II 10 Hours

- **Alkanes\*, Alkenes\* and Conjugated dienes\***

SP<sup>3</sup> hybridization in alkanes, Halogenation of alkanes, uses of paraffins.

Stabilities of alkenes, SP<sup>2</sup> hybridization in alkenes

E<sub>1</sub> and E<sub>2</sub> reactions – kinetics, order of reactivity of alkyl halides, rearrangement of carbocations, Saytzeffs orientation and evidences. E<sub>1</sub> versus E<sub>2</sub> reactions, Factors affecting E<sub>1</sub> and E<sub>2</sub> reactions. Ozonolysis, electrophilic addition reactions of alkenes, Markownikoff's orientation, free radical addition reactions of alkenes, Anti Markownikoff's orientation.

Stability of conjugated dienes, Diel-Alder, electrophilic addition, free radical addition reactions of conjugated dienes, allylic rearrangement

### UNIT-III 10 Hours

- **Alkyl halides\***

SN<sub>1</sub> and SN<sub>2</sub> reactions - kinetics, order of reactivity of alkyl halides, stereochemistry and rearrangement of carbocations.

SN<sub>1</sub> versus SN<sub>2</sub> reactions, Factors affecting SN<sub>1</sub> and SN<sub>2</sub> reactions

Structure and uses of ethylchloride, Chloroform, trichloroethylene, tetrachloroethylene, dichloromethane, tetrachloromethane and iodoform.

- **Alcohols\***- Qualitative tests, Structure and uses of Ethyl alcohol, Methyl alcohol, chlorobutanol, Cetosteryl alcohol, Benzyl alcohol, Glycerol, Propylene glycol

#### **UNIT-IV 10 Hours**

- **Carbonyl compounds\* (Aldehydes and ketones)**

Nucleophilic addition, Electromeric effect, aldol condensation, Crossed Aldol condensation, Cannizzaro reaction, Crossed Cannizzaro reaction, Benzoin condensation, Perkin condensation, qualitative tests, Structure and uses of Formaldehyde, Paraldehyde, Acetone, Chloral hydrate, Hexamine, Benzaldehyde, Vanilin, Cinnamaldehyde.

#### **UNIT-V**

**08 Hours**

- **Carboxylic acids\***

Acidity of carboxylic acids, effect of substituents on acidity, inductive effect and qualitative tests for carboxylic acids, amide and ester

Structure and Uses of Acetic acid, Lactic acid, Tartaric acid, Citric acid, Succinic acid. Oxalic acid, Salicylic acid, Benzoic acid, Benzyl benzoate, Dimethyl phthalate, Methyl salicylate and Acetyl salicylic acid

- **Aliphatic amines\*** - Basicity, effect of substituent on Basicity. Qualitative test, Structure and uses of Ethanolamine, Ethylenediamine, Amphetamine

## **BP208P. PHARMACEUTICAL ORGANIC CHEMISTRY -I (Practical)**

**4 Hours / week**

1. Systematic qualitative analysis of unknown organic compounds like
  1. Preliminary test: Color, odour, aliphatic/aromatic compounds, saturation and unsaturation, etc.
  2. Detection of elements like Nitrogen, Sulphur and Halogen by Lassaigne's test
  3. Solubility test
  4. Functional group test like Phenols, Amides/ Urea, Carbohydrates, Amines, Carboxylic acids, Aldehydes and Ketones, Alcohols, Esters, Aromatic and Halogenated Hydrocarbons, Nitro compounds and Anilides.
  5. Melting point/Boiling point of organic compounds
  6. Identification of the unknown compound from the literature using melting point/ boiling point.
  7. Preparation of the derivatives and confirmation of the unknown compound by melting point/ boiling point.
  8. Minimum 5 unknown organic compounds to be analysed systematically.
2. Preparation of suitable solid derivatives from organic compounds
3. Construction of molecular models

### **Recommended Books (Latest Editions)**

1. Organic Chemistry by Morrison and Boyd
2. Organic Chemistry by I.L. Finar , Volume-I
3. Textbook of Organic Chemistry by B.S. Bahl & Arun Bahl.
4. Organic Chemistry by P.L.Soni
5. Practical Organic Chemistry by Mann and Saunders.
6. Vogel's text book of Practical Organic Chemistry
7. Advanced Practical organic chemistry by N.K.Vishnoi.
8. Introduction to Organic Laboratory techniques by Pavia, Lampman and Kriz.
9. Reaction and reaction mechanism by Ahluwaliah/Chatwal.

## **BP203 T. BIOCHEMISTRY (Theory)**

**45 Hours**

**Scope:** Biochemistry deals with complete understanding of the molecular levels of the chemical process associated with living cells. The scope of the subject is providing biochemical facts and the principles to understand metabolism of nutrient molecules in physiological and pathological conditions. It is also emphasizing on genetic organization of mammalian genome and hetero & autocatalytic functions of DNA.

**Objectives:** Upon completion of course student shall be able to

1. Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes.
2. Understand the metabolism of nutrient molecules in physiological and pathological conditions.
3. Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.

### **Course Content:**

#### **UNIT I**

**08 Hours**

- **Biomolecules**

Introduction, classification, chemical nature and biological role of carbohydrate, lipids, nucleic acids, amino acids and proteins.

- **Bioenergetics**

Concept of free energy, endergonic and exergonic reaction, Relationship between free energy, enthalpy and entropy; Redox potential.

Energy rich compounds; classification; biological significances of ATP and cyclic AMP

#### **UNIT II**

**10 Hours**

- **Carbohydrate metabolism**

Glycolysis – Pathway, energetics and significance

Citric acid cycle- Pathway, energetics and significance

HMP shunt and its significance; Glucose-6-Phosphate dehydrogenase (G6PD) deficiency

Glycogen metabolism Pathways and glycogen storage diseases (GSD)

Gluconeogenesis- Pathway and its significance

Hormonal regulation of blood glucose level and Diabetes mellitus

- **Biological oxidation**

Electron transport chain (ETC) and its mechanism.

Oxidative phosphorylation & its mechanism and substrate level phosphorylation

Inhibitors ETC and oxidative phosphorylation/Uncouplers

### **UNIT III**

**10 Hours**

- **Lipid metabolism**

- Oxidation of saturated fatty acid (Palmitic acid)

Formation and utilization of ketone bodies; ketoacidosis

De novo synthesis of fatty acids (Palmitic acid)

Biological significance of cholesterol and conversion of cholesterol into bile acids, steroid hormone and vitamin D

Disorders of lipid metabolism: Hypercholesterolemia, atherosclerosis, fatty liver and obesity.

- **Amino acid metabolism**

General reactions of amino acid metabolism: Transamination, deamination & decarboxylation, urea cycle and its disorders

Catabolism of phenylalanine and tyrosine and their metabolic disorders (Phenylketonuria, Albinism, alcaptonuria, tyrosinemia)

Synthesis and significance of biological substances; 5-HT, melatonin, dopamine, noradrenaline, adrenaline

Catabolism of heme; hyperbilirubinemia and jaundice

#### **UNIT IV**

**10 Hours**

- **Nucleic acid metabolism and genetic information transfer**

Biosynthesis of purine and pyrimidine nucleotides

Catabolism of purine nucleotides and Hyperuricemia and Gout disease

Organization of mammalian genome

Structure of DNA and RNA and their functions

DNA replication (semi conservative model)

Transcription or RNA synthesis

Genetic code, Translation or Protein synthesis and inhibitors

## UNIT V

**07 Hours**

- **Enzymes**

Introduction, properties, nomenclature and IUB classification of enzymes

Enzyme kinetics (Michaelis plot, Line Weaver Burke plot)

Enzyme inhibitors with examples

Regulation of enzymes: enzyme induction and repression, allosteric enzymes regulation

Therapeutic and diagnostic applications of enzymes and isoenzymes

Coenzymes –Structure and biochemical functions

### **BP 209 P. BIOCHEMISTRY (Practical)**

**4 Hours / Week**

1. Qualitative analysis of carbohydrates (Glucose, Fructose, Lactose, Maltose, Sucrose and starch)
2. Identification tests for Proteins (albumin and Casein)
3. Quantitative analysis of reducing sugars (DNSA method) and Proteins (Biuret method)
4. Qualitative analysis of urine for abnormal constituents
5. Determination of blood creatinine
6. Determination of blood sugar
7. Determination of serum total cholesterol
8. Preparation of buffer solution and measurement of pH
9. Study of enzymatic hydrolysis of starch
10. Determination of Salivary amylase activity
11. Study the effect of Temperature on Salivary amylase activity.
12. Study the effect of substrate concentration on salivary amylase activity.



### **Recommended Books (Latest Editions)**

1. Principles of Biochemistry by Lehninger.
2. Harper's Biochemistry by Robert K. Murry, Daryl K. Granner and Victor W. Rodwell.
3. Biochemistry by Stryer.
4. Biochemistry by D. Satyanarayan and U.Chakrapani
5. Textbook of Biochemistry by Rama Rao.
6. Textbook of Biochemistry by Deb.
7. Outlines of Biochemistry by Conn and Stumpf
8. Practical Biochemistry by R.C. Gupta and S. Bhargavan.
9. Introduction of Practical Biochemistry by David T. Plummer. (3rd Edition)
10. Practical Biochemistry for Medical students by Rajagopal and Ramakrishna.
11. Practical Biochemistry by Harold Varley.

## **BP 204T.PATHOPHYSIOLOGY (THEORY)**

**45Hours**

**Scope:** Pathophysiology is the study of causes of diseases and reactions of the body to such disease producing causes. This course is designed to impart a thorough knowledge of the relevant aspects of pathology of various conditions with reference to its pharmacological applications, and understanding of basic pathophysiological mechanisms. Hence it will not only help to study the syllabus of pathology, but also to get baseline knowledge required to practice medicine safely, confidently, rationally and effectively.

**Objectives:** Upon completion of the subject student shall be able to –

1. Describe the etiology and pathogenesis of the selected disease states;
2. Name the signs and symptoms of the diseases; and
3. Mention the complications of the diseases.

### **Course content:**

#### **Unit I**

**10Hours**

- **Basic principles of Cell injury and Adaptation:**  
Introduction, definitions, Homeostasis, Components and Types of Feedback systems, Causes of cellular injury, Pathogenesis (Cell membrane damage, Mitochondrial damage, Ribosome damage, Nuclear damage), Morphology of cell injury – Adaptive changes (Atrophy, Hypertrophy, hyperplasia, Metaplasia, Dysplasia), Cell swelling, Intra cellular accumulation, Calcification, Enzyme leakage and Cell Death Acidosis & Alkalosis, Electrolyte imbalance

- **Basic mechanism involved in the process of inflammation and repair:**

Introduction, Clinical signs of inflammation, Different types of Inflammation, Mechanism of Inflammation – Alteration in vascular permeability and blood flow, migration of WBC's, Mediators of inflammation, Basic principles of wound healing in the skin, Pathophysiology of Atherosclerosis

## Unit II

**10Hours**

- **Cardiovascular System:**

Hypertension, congestive heart failure, ischemic heart disease (angina, myocardial infarction, atherosclerosis and arteriosclerosis)

- **Respiratory system:** Asthma, Chronic obstructive airways diseases.
- **Renal system:** Acute and chronic renal failure .

## Unit II

**10Hours**

- **Haematological Diseases:**

Iron deficiency, megaloblastic anemia (Vit B12 and folic acid), sickle cell anemia, thalasemia, hereditary acquired anemia, hemophilia

- **Endocrine system:** Diabetes, thyroid diseases, disorders of sex hormones
- **Nervous system:** Epilepsy, Parkinson's disease, stroke, psychiatric disorders: depression, schizophrenia and Alzheimer's disease.
- **Gastrointestinal system:** Peptic Ulcer
- 

## Unit IV

**8 Hours**

- Inflammatory bowel diseases, jaundice, hepatitis (A,B,C,D,E,F) alcoholic liver disease.
- **Disease of bones and joints:** Rheumatoid arthritis, osteoporosis and gout
- **Principles of cancer:** classification, etiology and pathogenesis of cancer
- **Diseases of bones and joints:** Rheumatoid Arthritis, Osteoporosis, Gout
- **Principles of Cancer:** Classification, etiology and pathogenesis of Cancer

## Unit V

**7 Hours**

- **Infectious diseases:** Meningitis, Typhoid, Leprosy, Tuberculosis

Urinary tract infections

- **Sexually transmitted diseases:** AIDS, Syphilis, Gonorrhea

## Recommended Books (Latest Editions)

1. Vinay Kumar, Abul K. Abas, Jon C. Aster; Robbins & Cotran Pathologic Basis of Disease; South Asia edition; India; Elsevier; 2014.
2. Harsh Mohan; Text book of Pathology; 6<sup>th</sup> edition; India; Jaypee Publications; 2010.
3. Laurence B, Bruce C, Bjorn K. ; Goodman Gilman's The Pharmacological Basis of Therapeutics; 12<sup>th</sup> edition; New York; McGraw-Hill; 2011.
4. Best, Charles Herbert 1899-1978; Taylor, Norman Burke 1885-1972; West, John B (John Burnard); Best and Taylor's Physiological basis of medical practice; 12th ed; united states;
5. William and Wilkins, Baltimore; 1991 [1990 printing].
6. Nicki R. Colledge, Brian R. Walker, Stuart H. Ralston; Davidson's Principles and Practice of Medicine; 21<sup>st</sup> edition; London; ELBS/Churchill Livingstone; 2010.
7. Guyton A, John .E Hall; Textbook of Medical Physiology; 12<sup>th</sup> edition; WB Saunders Company; 2010.
8. Joseph DiPiro, Robert L. Talbert, Gary Yee, Barbara Wells, L. Michael Posey; Pharmacotherapy: A Pathophysiological Approach; 9<sup>th</sup> edition; London; McGraw-Hill Medical; 2014.
9. V. Kumar, R. S. Cotran and S. L. Robbins; Basic Pathology; 6<sup>th</sup> edition; Philadelphia; WB Saunders Company; 1997.
10. Roger Walker, Clive Edwards; Clinical Pharmacy and Therapeutics; 3<sup>rd</sup> edition; London; Churchill Livingstone publication; 2003.

#### **Recommended Journals**

1. The Journal of Pathology. ISSN: 1096-9896 (Online)
2. The American Journal of Pathology. ISSN: 0002-9440
3. Pathology. 1465-3931 (Online)
4. International Journal of Physiology, Pathophysiology and Pharmacology. ISSN: 1944-8171 (Online)
5. Indian Journal of Pathology and Microbiology. ISSN-0377-4929.

## **BP205 T. COMPUTER APPLICATIONS IN PHARMACY (Theory)**

**30 Hrs (2 Hrs/Week)**

**Scope:** This subject deals with the introduction Database, Database Management system, computer application in clinical studies and use of databases.

**Objectives:** Upon completion of the course the student shall be able to

1. know the various types of application of computers in pharmacy
2. know the various types of databases
3. know the various applications of databases in pharmacy

### **Course content:**

#### **UNIT – I**

**06 hours**

**Number system:** Binary number system, Decimal number system, Octal number system, Hexadecimal number systems, conversion decimal to binary, binary to decimal, octal to binary etc, binary addition, binary subtraction – One's complement, Two's complement method, binary multiplication, binary division

**Concept of Information Systems and Software :** Information gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, planning and managing the project

#### **UNIT –II**

**06 hours**

**Web technologies:** Introduction to HTML, XML, CSS and Programming languages, introduction to web servers and Server Products

Introduction to databases, MYSQL, MS ACCESS, Pharmacy Drug database

#### **UNIT – III**

**06 hours**

**Application of computers in Pharmacy** – Drug information storage and retrieval, Pharmacokinetics, Mathematical model in Drug design, Hospital and Clinical Pharmacy, Electronic Prescribing and discharge (EP) systems, barcode medicine identification and automated dispensing of drugs, mobile technology and adherence monitoring

Diagnostic System, Lab-diagnostic System, Patient Monitoring System, Pharma Information System

#### **UNIT – IV**

**06 hours**

**Bioinformatics:** Introduction, Objective of Bioinformatics, Bioinformatics Databases, Concept of Bioinformatics, Impact of Bioinformatics in Vaccine Discovery

#### **UNIT-V**

**06 hours**

**Computers as data analysis in Preclinical development:**  
Chromatographic data analysis(CDS), Laboratory Information management System (LIMS) and Text Information Management System(TIMs)

### **BP210P. COMPUTER APPLICATIONS IN PHARMACY (Practical)**

1. Design a questionnaire using a word processing package to gather information about a particular disease.
2. Create a HTML web page to show personal information.
3. Retrieve the information of a drug and its adverse effects using online tools
4. Creating mailing labels Using Label Wizard , generating label in MS WORD
5. Create a database in MS Access to store the patient information with the required fields Using access
6. Design a form in MS Access to view, add, delete and modify the patient record in the database
7. Generating report and printing the report from patient database
8. Creating invoice table using – MS Access
9. Drug information storage and retrieval using MS Access
10. Creating and working with queries in MS Access
11. Exporting Tables, Queries, Forms and Reports to web pages
12. Exporting Tables, Queries, Forms and Reports to XML pages

### **Recommended books (Latest edition):**

1. Computer Application in Pharmacy – William E.Fassett –Lea and Febiger, 600 South Washington Square, USA, (215) 922-1330.
2. Computer Application in Pharmaceutical Research and Development –Sean Ekins – Wiley-Interscience, A John Willey and Sons, INC., Publication, USA
3. Bioinformatics (Concept, Skills and Applications) – S.C.Rastogi-CBS Publishers and Distributors, 4596/1- A, 11 Darya Gani, New Delhi – 110 002(INDIA)
4. Microsoft office Access - 2003, Application Development Using VBA, SQL Server, DAP and Infopath – Cary N.Prague – Wiley Dreamtech India (P) Ltd., 4435/7, Ansari Road, Daryagani, New Delhi - 110002

## **BP 206 T. ENVIRONMENTAL SCIENCES (Theory)**

**30 hours**

**Scope:**Environmental Sciences is the scientific study of the environmental system and the status of its inherent or induced changes on organisms. It includes not only the study of physical and biological characters of the environment but also the social and cultural factors and the impact of man on environment.

**Objectives:** Upon completion of the course the student shall be able to:

1. Create the awareness about environmental problems among learners.
2. Impart basic knowledge about the environment and its allied problems.
3. Develop an attitude of concern for the environment.
4. Motivate learner to participate in environment protection and environment improvement.
5. Acquire skills to help the concerned individuals in identifying and solving environmental problems.
6. Strive to attain harmony with Nature.

### **Course content:**

#### **Unit-I**

**10hours**

The Multidisciplinary nature of environmental studies

Natural Resources

Renewable and non-renewable resources:

Natural resources and associated problems

a) Forest resources; b) Water resources; c) Mineral resources; d) Food resources; e) Energy resources; f) Land resources: Role of an individual in conservation of natural resources.

#### **Unit-II**

**10hours**

Ecosystems

- Concept of an ecosystem.
- Structure and function of an ecosystem.
- Introduction, types, characteristic features, structure and function of the ecosystems: Forest ecosystem; Grassland ecosystem; Desert ecosystem; Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

#### **Unit- III**

**10hours**

Environmental Pollution: Air pollution; Water pollution; Soil pollution

**Recommended Books (Latest edition):**

1. Y.K. Sing, Environmental Science, New Age International Pvt, Publishers, Bangalore
2. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
3. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380 013, India,
4. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
5. Clark R.S., Marine Pollution, Clarendon Press Oxford
6. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p
7. De A.K., Environmental Chemistry, Wiley Eastern Ltd.
8. Down of Earth, Centre for Science and Environment



## **SEMESTER III**

## BP301T. PHARMACEUTICAL ORGANIC CHEMISTRY –II (Theory)

**45 Hours**

**Scope:** This subject deals with general methods of preparation and reactions of some organic compounds. Reactivity of organic compounds are also studied here. The syllabus emphasizes on mechanisms and orientation of reactions. Chemistry of fats and oils are also included in the syllabus.

**Objectives:** Upon completion of the course the student shall be able to

1. write the structure, name and the type of isomerism of the organic compound
2. write the reaction, name the reaction and orientation of reactions
3. account for reactivity/stability of compounds,
4. prepare organic compounds

### Course Content:

General methods of preparation and reactions of compounds superscripted with asterisk (\*) to be explained

To emphasize on definition, types, classification, principles/mechanisms, applications, examples and differences

### UNIT I

**10 Hours**

- **Benzene and its derivatives**

- A. Analytical, synthetic and other evidences in the derivation of structure of benzene, Orbital picture, resonance in benzene, aromatic characters, Huckel's rule
- B. Reactions of benzene - nitration, sulphonation, halogenation- reactivity, Friedelcrafts alkylation- reactivity, limitations, Friedelcrafts acylation.
- C. Substituents, effect of substituents on reactivity and orientation of mono substituted benzene compounds towards electrophilic substitution reaction
- D. Structure and uses of DDT, Saccharin, BHC and Chloramine

### UNIT II

**10 Hours**

- **Phenols\*** - Acidity of phenols, effect of substituents on acidity, qualitative tests, Structure and uses of phenol, cresols, resorcinol, naphthols
- **Aromatic Amines\*** - Basicity of amines, effect of substituents on basicity, and synthetic uses of aryl diazonium salts
- **Aromatic Acids\*** –Acidity, effect of substituents on acidity and important reactions of benzoic acid.

### UNIT III

**10 Hours**

- **Fats and Oils**
  - a. Fatty acids – reactions.

- b. Hydrolysis, Hydrogenation, Saponification and Rancidity of oils, Drying oils.
- c. Analytical constants – Acid value, Saponification value, Ester value, Iodine value, Acetyl value, Reichert Meissl (RM) value – significance and principle involved in their determination.

#### **UNIT IV**

**08 Hours**

- **Polynuclear hydrocarbons:**

- a. Synthesis, reactions
- b. Structure and medicinal uses of Naphthalene, Phenanthrene, Anthracene, Diphenylmethane, Triphenylmethane and their derivatives

#### **UNIT V**

**07 Hours**

- **Cyclo alkanes\***

Stabilities – Baeyer's strain theory, limitation of Baeyer's strain theory, Coulson and Moffitt's modification, Sachse Mohr's theory (Theory of strainless rings), reactions of cyclopropane and cyclobutane only

## **BP305P. PHARMACEUTICAL ORGANIC CHEMISTRY -II (Practical)**

**4 Hrs/week**

### **I Experiments involving laboratory techniques**

- Recrystallization
- Steam distillation

### **II Determination of following oil values (including standardization of reagents)**

- Acid value
- Saponification value
- Iodine value

### **III Preparation of compounds**

- Benzanilide/Phenyl benzoate/Acetanilide from Aniline/ Phenol /Aniline by acylation reaction.
- 2,4,6-Tribromo aniline/Para bromo acetanilide from Aniline/
- Acetanilide by halogenation (Bromination) reaction.
- 5-Nitro salicylic acid/Meta di nitro benzene from Salicylic acid / Nitro benzene by nitration reaction.
- Benzoic acid from Benzyl chloride by oxidation reaction.
- Benzoic acid/ Salicylic acid from alkyl benzoate/ alkyl salicylate by hydrolysis reaction.
- 1-Phenyl azo-2-naphthol from Aniline by diazotization and coupling reactions.
- Benzil from Benzoin by oxidation reaction.
- Dibenzal acetone from Benzaldehyde by Claisen Schmidt reaction
- Cinnamic acid from Benzaldehyde by Perkin reaction
- *P*-Iodo benzoic acid from *P*-amino benzoic acid

### **Recommended Books (Latest Editions)**

1. Organic Chemistry by Morrison and Boyd
2. Organic Chemistry by I.L. Finar , Volume-I
3. Textbook of Organic Chemistry by B.S. Bahl & Arun Bahl.
4. Organic Chemistry by P.L.Soni
5. Practical Organic Chemistry by Mann and Saunders.
6. Vogel's text book of Practical Organic Chemistry
7. Advanced Practical organic chemistry by N.K.Vishnoi.

8. Introduction to Organic Laboratory techniques by Pavia, Lampman and Kriz.

**BP302T. PHYSICAL PHARMACEUTICS-I (Theory)**

**45Hours**

**Scope:** The course deals with the various physical and physicochemical properties, and principles involved in dosage forms/formulations. Theory and practical components of the subject help the student to get a better insight into various areas of formulation research and development, and stability studies of pharmaceutical dosage forms.

**Objectives:** Upon the completion of the course student shall be able to

1. Understand various physicochemical properties of drug molecules in the designing the dosage forms
2. Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
3. Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.

**Course Content:**

**UNIT-I**

**10 Hours**

**Solubility of drugs:** Solubility expressions, mechanisms of solute solvent interactions, ideal solubility parameters, solvation & association, quantitative approach to the factors influencing solubility of drugs, diffusion principles in biological systems. Solubility of gas in liquids, solubility of liquids in liquids, (Binary solutions, ideal solutions) Raoult's law, real solutions. Partially miscible liquids, Critical solution temperature and applications. Distribution law, its limitations and applications

**UNIT-II**

**10Hours**

**States of Matter and properties of matter:** State of matter, changes in the state of matter, latent heats, vapour pressure, sublimation critical point, eutectic mixtures, gases, aerosols – inhalers, relative humidity, liquid complexes, liquid crystals, glassy states, solid-crystalline, amorphous & polymorphism.

**Physicochemical properties of drug molecules:** Refractive index, optical rotation, dielectric constant, dipole moment, dissociation constant, determinations and applications

**UNIT-III**

**08 Hours**

**Surface and interfacial phenomenon:** Liquid interface, surface & interfacial tensions,

surface free energy, measurement of surface & interfacial tensions, spreading coefficient, adsorption at liquid interfaces, surface active agents, HLB Scale, solubilisation, detergency, adsorption at solid interface.

#### **UNIT-IV**

**08Hours**

**Complexation and protein binding:** Introduction, Classification of Complexation, Applications, methods of analysis, protein binding, Complexation and drug action, crystalline structures of complexes and thermodynamic treatment of stability constants.

#### **UNIT-V**

**07 Hours**

**pH, buffers and Isotonic solutions:** Sorensen's pH scale, pH determination (electrometric and calorimetric), applications of buffers, buffer equation, buffer capacity, buffers in pharmaceutical and biological systems, buffered isotonic solutions.

### **BP306P. PHYSICAL PHARMACEUTICS – I (Practical)**

**4 Hrs/week**

1. Determination the solubility of drug at room temperature
2. Determination of pKa value by Half Neutralization/ Henderson Hasselbalch equation.
3. Determination of Partition co- efficient of benzoic acid in benzene and water
4. Determination of Partition co- efficient of Iodine in CCl<sub>4</sub> and water
5. Determination of % composition of NaCl in a solution using phenol-water system by CST method
6. Determination of surface tension of given liquids by drop count and drop weight method
7. Determination of HLB number of a surfactant by saponification method
8. Determination of Freundlich and Langmuir constants using activated char coal
9. Determination of critical micellar concentration of surfactants
10. Determination of stability constant and donor acceptor ratio of PABA-Caffeine complex by solubility method
11. Determination of stability constant and donor acceptor ratio of Cupric-Glycine complex by pH titration method

#### **Recommended Books: (Latest Editions)**

1. Physical Pharmacy by Alfred Martin
2. Experimental Pharmaceutics by Eugene, Parott.
3. Tutorial Pharmacy by Cooper and Gunn.
4. Stocklosam J. Pharmaceutical Calculations, Lea &Febiger, Philadelphia.
5. Liberman H.A, Lachman C., Pharmaceutical Dosage forms, Tablets, Volume-1 to 3, MarcelDekkar Inc.
6. Liberman H.A, Lachman C, Pharmaceutical Dosage forms. Disperse systems, volume 1, 2, 3. Marcel Dekkar Inc.
7. Physical Pharmaceutics by Ramasamy C and ManavalanR.
8. Laboratory Manual of Physical Pharmaceutics, C.V.S. Subramanyam, J. Thimma settee
9. Physical Pharmaceutics by C.V.S. Subramanyam
10. Test book of Physical Phramacy, by Gaurav Jain & Roop K. Khar

## **BP 303 T. PHARMACEUTICAL MICROBIOLOGY (Theory)**

**45Hours**

### **Scope:**

- Study of all categories of microorganisms especially for the production of alcohol antibiotics, vaccines, vitamins enzymes etc..

**Objectives:** Upon completion of the subject student shall be able to;

1. Understand methods of identification, cultivation and preservation of various microorganisms
2. To understand the importance and implementation of sterilization in pharmaceutical processing and industry
3. Learn sterility testing of pharmaceutical products.
4. Carried out microbiological standardization of Pharmaceuticals.
5. Understand the cell culture technology and its applications in pharmaceutical industries.

### **Course content:**

#### **Unit I**

**10 Hours**

Introduction, history of microbiology, its branches, scope and its importance.

Introduction to Prokaryotes and Eukaryotes

Study of ultra-structure and morphological classification of bacteria, nutritional requirements, raw materials used for culture media and physical parameters for growth, growth curve, isolation and preservation methods for pure cultures, cultivation of anaerobes, quantitative measurement of bacterial growth (total & viable count).

Study of different types of phase contrast microscopy, dark field microscopy and electron microscopy.

#### **Unit II**

**10 Hours**

Identification of bacteria using staining techniques (simple, Gram's & Acid fast staining) and biochemical tests (IMViC).

Study of principle, procedure, merits, demerits and applications of physical, chemical gaseous, radiation and mechanical method of sterilization.

Evaluation of the efficiency of sterilization methods.



Equipments employed in large scale sterilization.

Sterility indicators.

### **Unit III**

**10 Hours**

Study of morphology, classification, reproduction/replication and cultivation of Fungi and Viruses.

Classification and mode of action of disinfectants

Factors influencing disinfection, antiseptics and their evaluation. For bacteriostatic and bactericidal actions

Evaluation of bactericidal & Bacteriostatic.

Sterility testing of products (solids, liquids, ophthalmic and other sterile products) according to IP, BP and USP.

### **Unit IV**

**08 Hours**

Designing of aseptic area, laminar flow equipments; study of different sources of contamination in an aseptic area and methods of prevention, clean area classification.

Principles and methods of different microbiological assay. Methods for standardization of antibiotics, vitamins and amino acids.

Assessment of a new antibiotic.

### **Unit V**

**07Hours**

Types of spoilage, factors affecting the microbial spoilage of pharmaceutical products, sources and types of microbial contaminants, assessment of microbial contamination and spoilage.

Preservation of pharmaceutical products using antimicrobial agents, evaluation of microbial stability of formulations.

Growth of animal cells in culture, general procedure for cell culture, Primary, established and transformed cell cultures.

Application of cell cultures in pharmaceutical industry and research.

## **BP 307P.PHARMACEUTICAL MICROBIOLOGY (Practical)**

**4 Hrs/week**

1. Introduction and study of different equipments and processing, e.g., B.O.D. incubator, laminar flow, aseptic hood, autoclave, hot air sterilizer, deep freezer, refrigerator, microscopes used in experimental microbiology.
2. Sterilization of glassware, preparation and sterilization of media.
3. Sub culturing of bacteria and fungus. Nutrient stabs and slants preparations.
4. Staining methods- Simple, Grams staining and acid fast staining (Demonstration with practical).
5. Isolation of pure culture of micro-organisms by multiple streak plate technique and other techniques.
6. Microbiological assay of antibiotics by cup plate method and other methods
7. Motility determination by Hanging drop method.
8. Sterility testing of pharmaceuticals.
9. Bacteriological analysis of water
10. Biochemical test.

### **Recommended Books (Latest edition)**

1. W.B. Hugo and A.D. Russel: Pharmaceutical Microbiology, Blackwell Scientific publications, Oxford London.
2. Prescott and Dunn., Industrial Microbiology, 4<sup>th</sup> edition, CBS Publishers & Distributors, Delhi.
3. Pelczar, Chan Kreig, Microbiology, Tata McGraw Hill edn.
4. Malcolm Harris, Balliere Tindall and Cox: Pharmaceutical Microbiology.
5. Rose: Industrial Microbiology.
6. Probisher, Hinsdill et al: Fundamentals of Microbiology, 9th ed. Japan
7. Cooper and Gunn's: Tutorial Pharmacy, CBS Publisher and Distribution.
8. Pepler: Microbial Technology.
9. I.P., B.P., U.S.P.- latest editions.
10. Ananthnarayan : Text Book of Microbiology, Orient-Longman, Chennai
11. Edward: Fundamentals of Microbiology.
12. N.K.Jain: Pharmaceutical Microbiology, Vallabh Prakashan, Delhi
13. Bergeys manual of systematic bacteriology, Williams and Wilkins- A Waverly company

## **BP 304 T. PHARMACEUTICAL ENGINEERING (Theory)**

**45 Hours**

**Scope:** This course is designed to impart a fundamental knowledge on the art and science of various unit operations used in pharmaceutical industry.

**Objectives:** Upon completion of the course student shall be able:

1. To know various unit operations used in Pharmaceutical industries.
2. To understand the material handling techniques.
3. To perform various processes involved in pharmaceutical manufacturing process.
4. To carry out various test to prevent environmental pollution.
5. To appreciate and comprehend significance of plant lay out design for optimum use of resources.
6. To appreciate the various preventive methods used for corrosion control in Pharmaceutical industries.

### **Course content:**

#### **UNIT-I**

**10 Hours**

- **Flow of fluids:** Types of manometers, Reynolds number and its significance, Bernoulli's theorem and its applications, Energy losses, Orifice meter, Venturimeter, Pitot tube and Rotometer.
- **Size Reduction:** Objectives, Mechanisms & Laws governing size reduction, factors affecting size reduction, principles, construction, working, uses, merits and demerits of Hammer mill, ball mill, fluid energy mill, Edge runner mill & end runner mill.
- **Size Separation:** Objectives, applications & mechanism of size separation, official standards of powders, sieves, size separation Principles, construction, working, uses, merits and demerits of Sieve shaker, cyclone separator, Air separator, Bag filter & elutriation tank.

#### **UNIT-II**

**10 Hours**

- **Heat Transfer:** Objectives, applications & Heat transfer mechanisms. Fourier's law, Heat transfer by conduction, convection & radiation. Heat interchangers & heat exchangers.

- **Evaporation:** Objectives, applications and factors influencing evaporation, differences between evaporation and other heat process. principles, construction, working, uses, merits and demerits of Steam jacketed kettle, horizontal tube evaporator, climbing film evaporator, forced circulation evaporator, multiple effect evaporator& Economy of multiple effect evaporator.
- **Distillation:** Basic Principles and methodology of simple distillation,flash distillation, fractional distillation, distillation under reduced pressure, steam distillation & molecular distillation

### UNIT- III

**08 Hours**

- **Drying:** Objectives, applications & mechanism of drying process, measurements & applications of Equilibrium Moisture content, rate of drying curve. principles, construction, working, uses, merits and demerits of Tray dryer, drum dryer spray dryer, fluidized bed dryer, vacuum dryer, freeze dryer.
- **Mixing:** Objectives, applications & factors affecting mixing, Difference between solid and liquid mixing, mechanism of solid mixing, liquids mixing and semisolids mixing. Principles, Construction, Working, uses, Merits and Demerits of Double cone blender, twin shell blender, ribbon blender, Sigma blade mixer, planetary mixers, Propellers, Turbines, Paddles & Silverson Emulsifier,

### UNIT-IV

**08 Hours**

- **Filtration:** Objectives, applications, Theories & Factors influencing filtration, filter aids, filter medias. Principle, Construction, Working, Uses, Merits and demerits of plate & frame filter, filter leaf, rotary drum filter, Meta filter & Cartridge filter, membrane filters and Seidtz filter.
- **Centrifugation:** Objectives, principle & applications of Centrifugation, principles, construction, working, uses, merits and demerits of Perforated basket centrifuge, Non-perforated basket centrifuge, semi continuous centrifuge & super centrifuge.

### UNIT- V

**07 Hours**

- **Materials of pharmaceutical plant construction, Corrosion and its prevention:** Factors affecting during materials selected for Pharmaceutical plant construction, Theories of corrosion, types of corrosion and there prevention. Ferrous and nonferrous metals, inorganic and organic non metals, basic of material handling systems.

**Recommended Books: (Latest Editions)**

1. Introduction to chemical engineering – Walter L Badger & Julius Banchero, Latest edition.
2. Solid phase extraction, Principles, techniques and applications by Nigel J.K. Simpson- Latest edition.
3. Unit operation of chemical engineering – McCabe Smith, Latest edition.
4. Pharmaceutical engineering principles and practices – C.V.S Subrahmanyam et al., Latest edition.
5. Remington practice of pharmacy- Martin, Latest edition.
6. Theory and practice of industrial pharmacy by Lachmann., Latest edition.
7. Physical pharmaceuticals- C.V.S Subrahmanyam et al., Latest edition.
8. Cooper and Gunn's Tutorial pharmacy, S.J. Carter, Latest edition.

## **BP308P - PHARMACEUTICAL ENGINEERING (Practical)**

**4 Hours/week**

- I. Determination of radiation constant of brass, iron, unpainted and painted glass.
- II. Steam distillation – To calculate the efficiency of steam distillation.
- III. To determine the overall heat transfer coefficient by heat exchanger.
- IV. Construction of drying curves (for calcium carbonate and starch).
- V. Determination of moisture content and loss on drying.
- VI. Determination of humidity of air – i) From wet and dry bulb temperatures –use of Dew point method.
- VII. Description of Construction working and application of Pharmaceutical Machinery such as rotary tablet machine, fluidized bed coater, fluid energy mill, de humidifier.
- VIII. Size analysis by sieving – To evaluate size distribution of tablet granulations – Construction of various size frequency curves including arithmetic and logarithmic probability plots.
- IX. Size reduction: To verify the laws of size reduction using ball mill and determining Kicks, Rittinger's, Bond's coefficients, power requirement and critical speed of Ball Mill.
- X. Demonstration of colloid mill, planetary mixer, fluidized bed dryer, freeze dryer and such other major equipment.
- XI. Factors affecting Rate of Filtration and Evaporation (Surface area, Concentration and Thickness/ viscosity
- XII. To study the effect of time on the Rate of Crystallization.
- XIII. To calculate the uniformity Index for given sample by using Double Cone Blender.

## **SEMESTER IV**

## **BP401T. PHARMACEUTICAL ORGANIC CHEMISTRY –III (Theory)**

**45 Hours**

**Scope:** This subject imparts knowledge on stereo-chemical aspects of organic compounds and organic reactions, important named reactions, chemistry of important hetero cyclic compounds. It also emphasizes on medicinal and other uses of organic compounds.

**Objectives:** At the end of the course, the student shall be able to

1. understand the methods of preparation and properties of organic compounds
2. explain the stereo chemical aspects of organic compounds and stereo chemical reactions
3. know the medicinal uses and other applications of organic compounds

### **Course Content:**

**Note: To emphasize on definition, types, mechanisms, examples, uses/applications**

#### **UNIT-I**

**10 Hours**

##### **Stereo isomerism**

Optical isomerism –

Optical activity, enantiomerism, diastereoisomerism, meso compounds

Elements of symmetry, chiral and achiral molecules

DL system of nomenclature of optical isomers, sequence rules, RS system of nomenclature of optical isomers

Reactions of chiral molecules

Racemic modification and resolution of racemic mixture.

Asymmetric synthesis: partial and absolute

#### **UNIT-II**

**10 Hours**

Geometrical isomerism

Nomenclature of geometrical isomers (Cis Trans, EZ, Syn Anti systems)

Methods of determination of configuration of geometrical isomers.

Conformational isomerism in Ethane, n-Butane and Cyclohexane.

Stereo isomerism in biphenyl compounds (Atropisomerism) and conditions for optical activity.

Stereospecific and stereoselective reactions

#### **UNIT-III**

**10 Hours**



**Heterocyclic compounds:**

Nomenclature and classification

Synthesis, reactions and medicinal uses of following compounds/derivatives

Pyrrole, Furan, and Thiophene

Relative aromaticity and reactivity of Pyrrole, Furan and Thiophene

**UNIT-IV****8 Hours**

Synthesis, reactions and medicinal uses of following compounds/derivatives

Pyrazole, Imidazole, Oxazole and Thiazole.

Pyridine, Quinoline, Isoquinoline, Acridine and Indole. Basicity of pyridine

Synthesis and medicinal uses of Pyrimidine, Purine, azepines and their derivatives

**UNIT-V****07 Hours****Reactions of synthetic importance**

Metal hydride reduction ( $\text{NaBH}_4$  and  $\text{LiAlH}_4$ ), Clemmensen reduction, Birch reduction, Wolff Kishner reduction.

Oppenauer-oxidation and Dakin reaction.

Beckmanns rearrangement and Schmidt rearrangement.

Claisen-Schmidt condensation

**Recommended Books (Latest Editions)**

1. Organic chemistry by I.L. Finar, Volume-I & II.
2. A text book of organic chemistry – Arun Bahl, B.S. Bahl.
3. Heterocyclic Chemistry by Raj K. Bansal
4. Organic Chemistry by Morrison and Boyd
5. Heterocyclic Chemistry by T.L. Gilchrist

## **BP402T. MEDICINAL CHEMISTRY – I (Theory)**

**45 Hours**

**Scope:** This subject is designed to impart fundamental knowledge on the structure, chemistry and therapeutic value of drugs. The subject emphasizes on structure activity relationships of drugs, importance of physicochemical properties and metabolism of drugs. The syllabus also emphasizes on chemical synthesis of important drugs under each class.

**Objectives:** Upon completion of the course the student shall be able to

1. understand the chemistry of drugs with respect to their pharmacological activity
2. understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
3. know the Structural Activity Relationship (SAR) of different class of drugs
4. write the chemical synthesis of some drugs

### **Course Content:**

**Study of the development of the following classes of drugs, Classification, mechanism of action, uses of drugs mentioned in the course, Structure activity relationship of selective class of drugs as specified in the course and synthesis of drugs superscripted (\*)**

### **UNIT- I**

**10 Hours**

#### **Introduction to Medicinal Chemistry**

#### **History and development of medicinal chemistry**

#### **Physicochemical properties in relation to biological action**

Ionization, Solubility, Partition Coefficient, Hydrogen bonding, Protein binding, Chelation, Bioisosterism, Optical and Geometrical isomerism.

#### **Drug metabolism**

Drug metabolism principles- Phase I and Phase II.

Factors affecting drug metabolism including stereo chemical aspects.

### **UNIT- II**

**10 Hours**

#### **Drugs acting on Autonomic Nervous System**

#### **Adrenergic Neurotransmitters:**

Biosynthesis and catabolism of catecholamine.

Adrenergic receptors (Alpha & Beta) and their distribution.

#### **Sympathomimetic agents: SAR of Sympathomimetic agents**

Direct acting: Nor-epinephrine, Epinephrine, Phenylephrine\*, Dopamine,

Methyldopa, Clonidine, Dobutamine, Isoproterenol, Terbutaline, Salbutamol\*, Bitolterol, Naphazoline, Oxymetazoline and Xylometazoline.

- Indirect acting agents: Hydroxyamphetamine, Pseudoephedrine, Propylhexedrine.
- Agents with mixed mechanism: Ephedrine, Metaraminol.

#### **Adrenergic Antagonists:**

**Alpha adrenergic blockers:** Tolazoline\*, Phentolamine, Phenoxybenzamine, Prazosin, Dihydroergotamine, Methysergide.

**Beta adrenergic blockers:** SAR of beta blockers, Propranolol\*, Metibranolol, Atenolol, Betazolol, Bisoprolol, Esmolol, Metoprolol, Labetolol, Carvedilol.

### **UNIT-III**

**10 Hours**

#### **Cholinergic neurotransmitters:**

Biosynthesis and catabolism of acetylcholine.

Cholinergic receptors (Muscarinic & Nicotinic) and their distribution.

#### **Parasympathomimetic agents: SAR of Parasympathomimetic agents**

**Direct acting agents:** Acetylcholine, Carbachol\*, Bethanechol, Methacholine, Pilocarpine.

**Indirect acting/ Cholinesterase inhibitors (Reversible & Irreversible):** Physostigmine, Neostigmine\*, Pyridostigmine, Edrophonium chloride, Tacrine hydrochloride, Ambenonium chloride, Isofluorophate, Echothiophate iodide, Parathion, Malathion.

**Cholinesterase reactivator:** Pralidoxime chloride.

#### **Cholinergic Blocking agents: SAR of cholinolytic agents**

**Solanaceous alkaloids and analogues:** Atropine sulphate, Hyoscyamine sulphate, Scopolamine hydrobromide, Homatropine hydrobromide, Ipratropium bromide\*.

**Synthetic cholinergic blocking agents:** Tropicamide, Cyclopentolate hydrochloride, Clidinium bromide, Dicyclomine hydrochloride\*, Glycopyrrolate, Methantheline bromide, Propantheline bromide, Benztropine mesylate, Orphenadrine citrate, Biperidine hydrochloride, Procyclidine hydrochloride\*, Tridihexethyl chloride, Isopropamide iodide, Ethopropazine hydrochloride.

### **UNIT- IV**

**08 Hours**

#### **Drugs acting on Central Nervous System**

### **A. Sedatives and Hypnotics:**

**Benzodiazepines:** SAR of Benzodiazepines, Chlordiazepoxide, Diazepam\*, Oxazepam, Chlorazepate, Lorazepam, Alprazolam, Zolpidem

**Barbiturates:** SAR of barbiturates, Barbitol\*, Phenobarbital, Mephobarbital, Amobarbital, Butobarbital, Pentobarbital, Secobarbital

#### **Miscellaneous:**

Amides & imides: Glutethimide.

Alcohol & their carbamate derivatives: Meprobamate, Ethchlorvynol.

Aldehyde & their derivatives: Triclofos sodium, Paraldehyde.

### **B. Antipsychotics**

**Phenothiazines:** SAR of Phenothiazines - Promazine hydrochloride, Chlorpromazine hydrochloride\*, Triflupromazine, Thioridazine hydrochloride, Piperacetazine hydrochloride, Prochlorperazine maleate, Trifluoperazine hydrochloride.

**Ring Analogues of Phenothiazines:** Chlorprothixene, Thiothixene, Loxapine succinate, Clozapine.

**Fluorobutyrophenones:** Haloperidol, Droperidol, Risperidone.

**Beta amino ketones:** Molindone hydrochloride.

**Benzamides:** Sulpieride.

**C. Anticonvulsants:** SAR of Anticonvulsants, mechanism of anticonvulsant action

**Barbiturates:** Phenobarbitone, Methobarbital. **Hydantoins:**

Phenytoin\*, Mephenytoin, Ethytoin **Oxazolidine diones:**

Trimethadione, Paramethadione **Succinimides:**

Phensuximide, Methsuximide, Ethosuximide\* **Urea and**

**monoacylureas:** Phenacemide, Carbamazepine\*

**Benzodiazepines:** Clonazepam

**Miscellaneous:** Primidone, Valproic acid, Gabapentin, Felbamate

**UNIT – V**

**07 Hours**

**Drugs acting on Central Nervous System**

**General anesthetics:**

**Inhalation anesthetics:** Halothane\*, Methoxyflurane, Enflurane, Sevoflurane, Isoflurane, Desflurane.

**Ultra short acting barbiturates:** Methohexital sodium\*, Thiopental sodium, Thiopental sodium.

**Dissociative anesthetics:** Ketamine hydrochloride.\*

**Narcotic and non-narcotic analgesics**

**Morphine and related drugs:** SAR of Morphine analogues, Morphine sulphate, Codeine, Meperidine hydrochloride, Anileridine hydrochloride, Diphenoxylate hydrochloride, Loperamide hydrochloride, Fentanyl citrate\*, Methadone hydrochloride\*, Propoxyphene hydrochloride, Pentazocine, Levorphanol tartarate.

**Narcotic antagonists:** Nalorphine hydrochloride, Levallorphan tartarate, Naloxone hydrochloride.

**Anti-inflammatory agents:** Sodium salicylate, Aspirin, Mefenamic acid\*, Meclofenamate, Indomethacin, Sulindac, Tolmetin, Zomepirac, Diclofenac, Ketorolac, Ibuprofen\*, Naproxen, Piroxicam, Phenacetin, Acetaminophen, Antipyrine, Phenylbutazone.

## **BP406P. MEDICINAL CHEMISTRY – I (Practical)**

**4 Hours/Week**

### **I Preparation of drugs/ intermediates**

- 1 1,3-pyrazole
- 2 1,3-oxazole
- 3 Benzimidazole
- 4 Benztriazole
- 5 2,3- diphenyl quinoxaline
- 6 Benzocaine
- 7 Phenytoin
- 8 Phenothiazine
- 9 Barbiturate

### **II Assay of drugs**

- 1 Chlorpromazine
- 2 Phenobarbitone
- 3 Atropine
- 4 Ibuprofen
- 5 Aspirin
- 6 Furosemide

### **III Determination of Partition coefficient for any two drugs**

#### **Recommended Books (Latest Editions)**

1. Wilson and Giswold's Organic medicinal and Pharmaceutical Chemistry.
2. Foye's Principles of Medicinal Chemistry.
3. Burger's Medicinal Chemistry, Vol I to IV.
4. Introduction to principles of drug design- Smith and Williams.
5. Remington's Pharmaceutical Sciences.
6. Martindale's extra pharmacopoeia.

7. Organic Chemistry by I.L. Finar, Vol. II.
8. The Organic Chemistry of Drug Synthesis by Lednicer, Vol. 1-5.
9. Indian Pharmacopoeia.
10. Text book of practical organic chemistry- A.I.Vogel.

## **BP 403 T. PHYSICAL PHARMACEUTICS-II (Theory)**

**45Hours**

**Scope:** The course deals with the various physical and physicochemical properties, and principles involved in dosage forms/formulations. Theory and practical components of the subject help the student to get a better insight into various areas of formulation research and development, and stability studies of pharmaceutical dosage forms.

**Objectives:** Upon the completion of the course student shall be able to

1. Understand various physicochemical properties of drug molecules in the designing the dosage forms
2. Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
3. Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.

### **Course Content:**

#### **UNIT-I**

**07 Hours**

**Colloidal dispersions:** Classification of dispersed systems & their general characteristics, size & shapes of colloidal particles, classification of colloids & comparative account of their general properties. Optical, kinetic & electrical properties. Effect of electrolytes, coacervation, peptization & protective action.

#### **UNIT-II**

**10 Hours**

**Rheology:** Newtonian systems, law of flow, kinematic viscosity, effect of temperature, non-Newtonian systems, pseudoplastic, dilatant, plastic, thixotropy, thixotropy in formulation, determination of viscosity, capillary, falling Sphere, rotational viscometers

**Deformation of solids:** Plastic and elastic deformation, Heckel equation, Stress, Strain, Elastic Modulus

#### **UNIT-III**

**10 Hours**

**Coarse dispersion:** Suspension, interfacial properties of suspended particles, settling in suspensions, formulation of flocculated and deflocculated suspensions. Emulsions and theories of emulsification, microemulsion and multiple emulsions; Stability of emulsions, preservation of emulsions, rheological properties of emulsions and emulsion formulation by HLB method.



#### **UNIT-IV**

**10Hours**

**Micromeretics:** Particle size and distribution, mean particle size, number and weight distribution, particle number, methods for determining particle size by different methods, counting and separation method, particle shape, specific surface, methods for determining surface area, permeability, adsorption, derived properties of powders, porosity, packing arrangement, densities, bulkiness & flow properties.

#### **UNIT-V**

**10 Hours**

**Drug stability:** Reaction kinetics: zero, pseudo-zero, first & second order, units of basic rate constants, determination of reaction order. Physical and chemical factors influencing the chemical degradation of pharmaceutical product: temperature, solvent, ionic strength, dielectric constant, specific & general acid base catalysis, Simple numerical problems. Stabilization of medicinal agents against common reactions like hydrolysis & oxidation. Accelerated stability testing in expiration dating of pharmaceutical dosage forms. Photolytic degradation and its prevention

## **BP 407P. PHYSICAL PHARMACEUTICS- II (Practical)**

**3 Hrs/week**

1. Determination of particle size, particle size distribution using sieving method
2. Determination of particle size, particle size distribution using Microscopic method
3. Determination of bulk density, true density and porosity
4. Determine the angle of repose and influence of lubricant on angle of repose
5. Determination of viscosity of liquid using Ostwald's viscometer
6. Determination sedimentation volume with effect of different suspending agent
7. Determination sedimentation volume with effect of different concentration of single suspending agent
8. Determination of viscosity of semisolid by using Brookfield viscometer
9. Determination of reaction rate constant first order.
10. Determination of reaction rate constant second order
11. Accelerated stability studies

### **Recommended Books: (Latest Editions)**

1. Physical Pharmacy by Alfred Martin, Sixth edition
2. Experimental pharmaceutics by Eugene, Parott.
3. Tutorial pharmacy by Cooper and Gunn.
4. Stocklosam J. Pharmaceutical calculations, Lea & Febiger, Philadelphia.
5. Liberman H.A, Lachman C., Pharmaceutical Dosage forms, Tablets, Volume-1 to 3, Marcel Dekkar Inc.
6. Liberman H.A, Lachman C, Pharmaceutical dosage forms. Disperse systems, volume 1, 2, 3. Marcel Dekkar Inc.
7. Physical Pharmaceutics by Ramasamy C, and Manavalan R.

## **BP 404 T. PHARMACOLOGY-I (Theory)**

**45 Hrs**

**Scope:** The main purpose of the subject is to understand what drugs do to the living organisms and how their effects can be applied to therapeutics. The subject covers the information about the drugs like, mechanism of action, physiological and biochemical effects (pharmacodynamics) as well as absorption, distribution, metabolism and excretion (pharmacokinetics) along with the adverse effects, clinical uses, interactions, doses, contraindications and routes of administration of different classes of drugs.

**Objectives:** Upon completion of this course the student should be able to

1. Understand the pharmacological actions of different categories of drugs
2. Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.
3. Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
4. Observe the effect of drugs on animals by simulated experiments
5. Appreciate correlation of pharmacology with other bio medical sciences

### **Course Content:**

#### **UNIT-I**

**08 hours**

##### **1. General Pharmacology**

- a. Introduction to Pharmacology- Definition, historical landmarks and scope of pharmacology, nature and source of drugs, essential drugs concept and routes of drug administration, Agonists, antagonists( competitive and non competitive), spare receptors, addiction, tolerance, dependence, tachyphylaxis, idiosyncrasy, allergy.
- b. Pharmacokinetics- Membrane transport, absorption, distribution, metabolism and excretion of drugs .Enzyme induction, enzyme inhibition, kinetics of elimination

#### **UNIT-II**

**12 Hours**

##### **General Pharmacology**

- a. Pharmacodynamics- Principles and mechanisms of drug action. Receptor theories and classification of receptors, regulation of receptors. drug receptors interactions signal transduction mechanisms, G-protein–coupled receptors, ion channel receptor, transmembrane enzyme linked receptors, transmembrane JAK-STAT binding receptor and receptors that regulate transcription factors, dose response relationship, therapeutic index, combined effects of drugs and factors modifying drug action.
- b. Adverse drug reactions.
- c. Drug interactions (pharmacokinetic and pharmacodynamic)
- d. Drug discovery and clinical evaluation of new drugs -Drug discovery phase, preclinical evaluation phase, clinical trial phase, phases of clinical trials and pharmacovigilance.

**UNIT-III****10 Hours****2. Pharmacology of drugs acting on peripheral nervous system**

- a. Organization and function of ANS.
- b. Neurohumoral transmission, co-transmission and classification of neurotransmitters.
- c. Parasympathomimetics, Parasympatholytics, Sympathomimetics, sympatholytics.
- d. Neuromuscular blocking agents and skeletal muscle relaxants (peripheral).
- e. Local anesthetic agents.
- f. Drugs used in myasthenia gravis and glaucoma

**UNIT-IV****08 Hours****3. Pharmacology of drugs acting on central nervous system**

- a. Neurohumoral transmission in the C.N.S. special emphasis on importance of various neurotransmitters like with GABA, Glutamate, Glycine, serotonin, dopamine.
- b. General anesthetics and pre-anesthetics.
- c. Sedatives, hypnotics and centrally acting muscle relaxants.
- d. Anti-epileptics
- e. Alcohols and disulfiram

**UNIT-V****07 Hours****3. Pharmacology of drugs acting on central nervous system**

- a. Psychopharmacological agents: Antipsychotics, antidepressants, anti-anxiety agents, anti-manics and hallucinogens.
- b. Drugs used in Parkinson's disease and Alzheimer's disease.
- c. CNS stimulants and nootropics.
- d. Opioid analgesics and antagonists
- e. Drug addiction, drug abuse, tolerance and dependence.

## **BP 408 P.PHARMACOLOGY-I (Practical)**

**4Hrs/Week**

1. Introduction to experimental pharmacology.
2. Commonly used instruments in experimental pharmacology.
3. Study of common laboratory animals.
4. Maintenance of laboratory animals as per CPCSEA guidelines.
5. Common laboratory techniques. Blood withdrawal, serum and plasma separation, anesthetics and euthanasia used for animal studies.
6. Study of different routes of drugs administration in mice/rats.
7. Study of effect of hepatic microsomal enzyme inducers on the phenobarbitone sleeping time in mice.
8. Effect of drugs on ciliary motility of frog oesophagus
9. Effect of drugs on rabbit eye.
10. Effects of skeletal muscle relaxants using rota-rod apparatus.
11. Effect of drugs on locomotor activity using actophotometer.
12. Anticonvulsant effect of drugs by MES and PTZ method.
13. Study of stereotype and anti-catatonic activity of drugs on rats/mice.
14. Study of anxiolytic activity of drugs using rats/mice.
15. Study of local anesthetics by different methods

*Note: All laboratory techniques and animal experiments are demonstrated by simulated experiments by softwares and videos*

### **Recommended Books (Latest Editions)**

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchill Livingstone Elsevier
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill
3. Goodman and Gilman's, The Pharmacological Basis of Therapeutics
4. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs, The Point Lippincott Williams & Wilkins
5. Mycek M.J, Gelnet S.B and Perper M.M. Lippincott's Illustrated Reviews- Pharmacology

6. K.D.Tripathi. Essentials of Medical Pharmacology, JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.
7. Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher
8. Modern Pharmacology with clinical Applications, by Charles R.Craig & Robert,
9. Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata.
10. Kulkarni SK. Handbook of experimental pharmacology. VallabhPrakashan,

## **BP 405 T.PHARMACOGNOSY AND PHYTOCHEMISTRY I (Theory)**

**45 Hours**

**Scope:** The subject involves the fundamentals of Pharmacognosy like scope, classification of crude drugs, their identification and evaluation, phytochemicals present in them and their medicinal properties.

**Objectives:** Upon completion of the course, the student shall be able

1. to know the techniques in the cultivation and production of crude drugs
2. to know the crude drugs, their uses and chemical nature
3. know the evaluation techniques for the herbal drugs
4. to carry out the microscopic and morphological evaluation of crude drugs

### **Course Content:**

#### **UNIT-I**

**10 Hours**

##### **Introduction to Pharmacognosy:**

- (a) Definition, history, scope and development of Pharmacognosy
- (b) Sources of Drugs – Plants, Animals, Marine & Tissue culture
- (c) Organized drugs, unorganized drugs (dried latex, dried juices, dried extracts, gums and mucilages, oleoresins and oleo- gum -resins).

##### **Classification of drugs:**

Alphabetical, morphological, taxonomical, chemical, pharmacological, chemo and sero taxonomical classification of drugs

##### **Quality control of Drugs of Natural Origin:**

Adulteration of drugs of natural origin. Evaluation by organoleptic, microscopic, physical, chemical and biological methods and properties.

Quantitative microscopy of crude drugs including lycopodium spore method, leaf constants, camera lucida and diagrams of microscopic objects to scale with camera lucida.

#### **UNIT-II**

**10 Hours**

##### **Cultivation, Collection, Processing and storage of drugs of natural origin:**

Cultivation and Collection of drugs of natural origin

Factors influencing cultivation of medicinal plants.

Plant hormones and their applications.

Polyploidy, mutation and hybridization with reference to medicinal plants

##### **Conservation of medicinal plants**

#### **UNIT-III**

**07 Hours**

##### **Plant tissue culture:**

Historical development of plant tissue culture, types of cultures, Nutritional requirements, growth and their maintenance.

Applications of plant tissue culture in pharmacognosy.

Edible vaccines

#### **UNIT IV**

**10 Hours**

##### **Pharmacognosy in various systems of medicine:**

Role of Pharmacognosy in allopathy and traditional systems of medicine namely, Ayurveda, Unani, Siddha, Homeopathy and Chinese systems of medicine.

##### **Introduction to secondary metabolites:**

Definition, classification, properties and test for identification of Alkaloids, Glycosides, Flavonoids, Tannins, Volatile oil and Resins

#### **UNIT V**

**08 Hours**

Study of biological source, chemical nature and uses of drugs of natural origin containing following drugs

##### **Plant Products:**

Fibers - Cotton, Jute, Hemp

Hallucinogens, Teratogens, Natural allergens

##### **Primary metabolites:**

General introduction, detailed study with respect to chemistry, sources, preparation, evaluation, preservation, storage, therapeutic used and commercial utility as Pharmaceutical Aids and/or Medicines for the following Primary metabolites:

**Carbohydrates:** Acacia, Agar, Tragacanth, Honey

**Proteins and Enzymes :** Gelatin, casein, proteolytic enzymes (Papain, bromelain, serratiopeptidase, urokinase, streptokinase, pepsin).

**Lipids(Waxes, fats, fixed oils) :** Castor oil, Chaulmoogra oil, Wool Fat, Bees Wax

##### **Marine Drugs:**

Novel medicinal agents from marine sources





### **BP408 P. PHARMACOGNOSY AND PHYTOCHEMISTRY I (Practical)**

**4 Hours/Week**

1. Analysis of crude drugs by chemical tests: (i) Tragacanth (ii) Acacia (iii) Agar (iv) Gelatin (v) starch (vi) Honey (vii) Castor oil
2. Determination of stomatal number and index
3. Determination of vein islet number, vein islet termination and palisade ratio.
4. Determination of size of starch grains, calcium oxalate crystals by eye piece micrometer
5. Determination of Fiber length and width
6. Determination of number of starch grains by Lycopodium spore method
7. Determination of Ash value
8. Determination of Extractive values of crude drugs
9. Determination of moisture content of crude drugs
10. Determination of swelling index and foaming

#### **Recommended Books: (Latest Editions)**

1. W.C. Evans, Trease and Evans Pharmacognosy, 16<sup>th</sup> edition, W.B. Saunders & Co., London, 2009.
2. Tyler, V.E., Brady, L.R. and Robbers, J.E., Pharmacognosy, 9<sup>th</sup> Edn., Lea and Febiger, Philadelphia, 1988.
3. Text Book of Pharmacognosy by T.E. Wallis
4. Mohammad Ali. Pharmacognosy and Phytochemistry, CBS Publishers & Distribution, New Delhi.
5. Text book of Pharmacognosy by C.K. Kokate, Purohit, Gokhale (2007), 37<sup>th</sup> Edition, Nirali Prakashan, New Delhi.
6. Herbal drug industry by R.D. Choudhary (1996), 1<sup>st</sup> Edn, Eastern Publisher, New Delhi.
7. Essentials of Pharmacognosy, Dr. S.H. Ansari, 1<sup>st</sup> edition, Birla publications, New Delhi, 2007
8. Practical Pharmacognosy: C.K. Kokate, Purohit, Gokhale
9. Anatomy of Crude Drugs by M.A. Iyengar

## **SEMESTER V**

## BP501T. MEDICINAL CHEMISTRY – II (Theory)

45 Hours

**Scope:** This subject is designed to impart fundamental knowledge on the structure, chemistry and therapeutic value of drugs. The subject emphasizes on structure activity relationships of drugs, importance of physicochemical properties and metabolism of drugs. The syllabus also emphasizes on chemical synthesis of important drugs under each class.

**Objectives:** Upon completion of the course the student shall be able to

1. Understand the chemistry of drugs with respect to their pharmacological activity
2. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
3. Know the Structural Activity Relationship of different class of drugs
4. Study the chemical synthesis of selected drugs

<b>Course Content:</b>
------------------------

**Study of the development of the following classes of drugs, Classification, mechanism of action, uses of drugs mentioned in the course, Structure activity relationship of selective class of drugs as specified in the course and synthesis of drugs superscripted (\*)**

### UNIT- I

10 Hours

**Antihistaminic agents:** Histamine, receptors and their distribution in the humanbody

**H<sub>1</sub>-antagonists:** Diphenhydramine hydrochloride\*, Dimenhydrinate, Doxylamines succinate, Clemastine fumarate, Diphenylpyraline hydrochloride, Tripelenamine hydrochloride, Chlorcyclizine hydrochloride, Meclizine hydrochloride, Buclizine hydrochloride, Chlorpheniramine maleate, Triprolidine hydrochloride\*, Phenidamine tartarate, Promethazine hydrochloride\*, Trimeprazine tartrate, Cyproheptadine hydrochloride, Azatidine maleate, Astemizole, Loratadine, Cetirizine, Levocetrazine Cromolyn sodium

**H<sub>2</sub>-antagonists:** Cimetidine\*, Famotidine, Ranitidin.

**Gastric Proton pump inhibitors:** Omeprazole, Lansoprazole, Rabeprazole, Pantoprazole

**Anti-neoplastic agents:**

**Alkylating agents:** Meclorethamine\*, Cyclophosphamide, Melphalan,

Chlorambucil, Busulfan, Thiotepa

**Antimetabolites:** Mercaptopurine\*, Thioguanine, Fluorouracil, Floxuridine, Cytarabine, Methotrexate\*, Azathioprine

**Antibiotics:** Dactinomycin, Daunorubicin, Doxorubicin, Bleomycin

**Plant products:** Etoposide, Vinblastin sulphate, Vincristin sulphate

**Miscellaneous:** Cisplatin, Mitotane.

## UNIT – II

10 Hours

### Anti-anginal:

**Vasodilators:** Amyl nitrite, Nitroglycerin\*, Pentaerythritol tetranitrate, Isosorbide dinitrite\*, Dipyridamole.

**Calcium channel blockers:** Verapamil, Bepridil hydrochloride, Diltiazem hydrochloride, Nifedipine, Amlodipine, Felodipine, Nicardipine, Nimodipine.

### Diuretics:

Carbonic anhydrase inhibitors: Acetazolamide\*, Methazolamide, Dichlorphenamide.

Thiazides: Chlorthiazide\*, Hydrochlorothiazide, Hydroflumethiazide, Cyclothiazide,

Loop diuretics: Furosemide\*, Bumetanide, Ethacrynic acid.

Potassium sparing Diuretics: Spironolactone, Triamterene, Amiloride.

Osmotic Diuretics: Mannitol

**Anti-hypertensive Agents:** Timolol, Captopril, Lisinopril, Enalapril, Benazepril hydrochloride, Quinapril hydrochloride, Methyldopate hydrochloride,\* Clonidine hydrochloride, Guanethidine monosulphate, Guanabenz acetate, Sodium nitroprusside, Diazoxide, Minoxidil, Reserpine, Hydralazine hydrochloride.

## UNIT- III

10 Hours

**Anti-arrhythmic Drugs:** Quinidine sulphate, Procainamide hydrochloride, Disopyramide phosphate\*, Phenytoin sodium, Lidocaine hydrochloride, Tocainide hydrochloride, Mexiletine hydrochloride, Lorcanide hydrochloride, Amiodarone, Sotalol.

**Anti-hyperlipidemic agents:** Clofibrate, Lovastatin, Cholesteramine and Cholestipol

**Coagulant & Anticoagulants:** Menadione, Acetomenadione, Warfarin\*, Anisindione, clopidogrel

**Drugs used in Congestive Heart Failure:** Digoxin, Digitoxin, Nesiritide, Bosentan, Tezosentan.



## UNIT- IV

08 Hours

### Drugs acting on Endocrine system

Nomenclature, Stereochemistry and metabolism of steroids

**Sex hormones:** Testosterone, Nandralone, Progestrones, Oestriol, Oestradiol, Oestrione, Diethyl stilbestrol.

**Drugs for erectile dysfunction:** Sildenafil, Tadalafil.

**Oral contraceptives:** Mifepristone, Norgestril, Levonorgestrol

**Corticosteroids:** Cortisone, Hydrocortisone, Prednisolone, Betamethasone, Dexamethasone

**Thyroid and antithyroid drugs:** L-Thyroxine, L-Thyronine, Propylthiouracil, Methimazole.

## UNIT – V

07 Hours

### Antidiabetic agents:

Insulin and its preparations

Sulfonyl ureas: Tolbutamide\*, Chlorpropamide, Glipizide, Glimepiride.

Biguanides: Metformin.

Thiazolidinediones: Pioglitazone, Rosiglitazone.

Meglitinides: Repaglinide, Nateglinide.

Glucosidase inhibitors: Acarbose, Voglibose.

### Local Anesthetics: SAR of Local anesthetics

**Benzoic Acid derivatives;** Cocaine, Hexylcaine, Mepylcaine, Cyclomethycaine, Piperocaine.

**Amino Benzoic acid derivatives:** Benzocaine\*, Butamben, Procaine\*, Butacaine, Propoxycaine, Tetracaine, Benoxinate.

**Lidocaine/Anilide derivatives:** Lignocaine, Mepivacaine, Prilocaine, Etidocaine.

**Miscellaneous:** Phenacaine, Dipreron, Dibucaine.\*

### Recommended Books (Latest Editions)

1. Wilson and Giswold's Organic medicinal and Pharmaceutical Chemistry.
2. Foye's Principles of Medicinal Chemistry.
3. Burger's Medicinal Chemistry, Vol I to IV.
4. Introduction to principles of drug design- Smith and Williams.
5. Remington's Pharmaceutical Sciences.
6. Martindale's extra pharmacopoeia.
7. Organic Chemistry by I.L. Finar, Vol. II.
8. The Organic Chemistry of Drug Synthesis by Lednicer, Vol. 1to 5.
9. Indian Pharmacopoeia.
10. Text book of practical organic chemistry- A.I.Vogel.





## BP 502 T. Industrial PharmacyI (Theory)

**45 Hours**

**Scope:** Course enables the student to understand and appreciate the influence of pharmaceutical additives and various pharmaceutical dosage forms on the performance of the drug product.

**Objectives:** Upon completion of the course the student shall be able to

1. Know the various pharmaceutical dosage forms and their manufacturing techniques.
2. Know various considerations in development of pharmaceutical dosage forms
3. Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality

### Course content:

**3 hours/ week**

#### UNIT-I

**07 Hours**

**Preformulation Studies:** Introduction to preformulation, goals and objectives, study of physicochemical characteristics of drug substances.

**a. Physical properties:** Physical form (crystal & amorphous), particle size, shape, flow properties, solubility profile (pKa, pH, partition coefficient), polymorphism

**b. Chemical Properties:** Hydrolysis, oxidation, reduction, racemisation, polymerization

BCS classification of drugs & its significant

Application of preformulation considerations in the development of solid, liquid oral and parenteral dosage forms and its impact on stability of dosage forms.

#### UNIT-II

**10 Hours**

##### Tablets:

- a. Introduction, ideal characteristics of tablets, classification of tablets. Excipients, Formulation of tablets, granulation methods, compression and processing problems. Equipments and tablet tooling.
- b. Tablet coating: Types of coating, coating materials, formulation of coating composition, methods of coating, equipment employed and defects in coating.
- c. Quality control tests: In process and finished product tests

**Liquid orals:** Formulation and manufacturing consideration of syrups and elixirs suspensions and emulsions; Filling and packaging; evaluation of liquid orals official in pharmacopoeia

### UNIT-III

08 Hours

#### Capsules:

- a. **Hard gelatin capsules:** Introduction, Production of hard gelatin capsule shells. size of capsules, Filling, finishing and special techniques of formulation of hard gelatin capsules, manufacturing defects. In process and final product quality control tests for capsules.
- b. **Soft gelatin capsules:** Nature of shell and capsule content, size of capsules, importance of base adsorption and minim/gram factors, production, in process and final product quality control tests. Packing, storage and stability testing of soft gelatin capsules and their applications.

**Pellets:** Introduction, formulation requirements, pelletization process, equipments for manufacture of pellets

### UNIT-IV

10 Hours

#### Parenteral Products:

- a. Definition, types, advantages and limitations. Preformulation factors and essential requirements, vehicles, additives, importance of isotonicity
- b. Production procedure, production facilities and controls, aseptic processing
- c. Formulation of injections, sterile powders, large volume parenterals and lyophilized products.
- d. Containers and closures selection, filling and sealing of ampoules, vials and infusion fluids. Quality control tests of parenteral products.

**Ophthalmic Preparations:** Introduction, formulation considerations; formulation of eye drops, eye ointments and eye lotions; methods of preparation; labeling, containers; evaluation of ophthalmic preparations

### UNIT-V

10 Hours

**Cosmetics:** Formulation and preparation of the following cosmetic preparations: lipsticks, shampoos, cold cream and vanishing cream, tooth pastes, hair dyes and sunscreens.

**Pharmaceutical Aerosols:** Definition, propellants, containers, valves, types of aerosol systems; formulation and manufacture of aerosols; Evaluation of aerosols; Quality control and stability studies.

**Packaging Materials Science:** Materials used for packaging of pharmaceutical products, factors influencing choice of containers, legal and official requirements for containers, stability aspects of packaging materials, quality control tests.

## **BP 506 P. Industrial PharmacyI (Practical)**

**4 Hours/week**

1. Preformulation studies on paracetamol/asparin/or any other drug
2. Preparation and evaluation of Paracetamol tablets
3. Preparation and evaluation of Aspirin tablets
4. Coating of tablets- film coating of tables/granules
5. Preparation and evaluation of Tetracycline capsules
6. Preparation of Calcium Gluconate injection
7. Preparation of Ascorbic Acid injection
8. Qulaity control test of (as per IP) marketed tablets and capsules
9. Preparation of Eye drops/ and Eye ointments
10. Preparation of Creams (cold / vanishing cream)
11. Evaluation of Glass containers (as per IP)

### **Recommended Books: (Latest Editions)**

1. Pharmaceutical dosage forms - Tablets, volume 1 -3 by H.A. Liberman, Leon Lachman &J.B.Schwartz
2. Pharmaceutical dosage form - Parenteral medication vol- 1&2 by Liberman & Lachman
3. Pharmaceutical dosage form disperse system VOL-1 by Liberman & Lachman
4. Modern Pharmaceutics by Gilbert S. Banker & C.T. Rhodes, 3rd Edition
5. Remington: The Science and Practice of Pharmacy, 20th edition Pharmaceutical Science (RPS)
6. Theory and Practice of Industrial Pharmacy by Liberman & Lachman
7. Pharmaceutics- The science of dosage form design by M.E.Aulton, Churchill livingstone, Latest edition
8. Introduction to Pharmaceutical Dosage Forms by H. C.Ansel, Lea &Febiger, Philadelphia, 5<sup>th</sup>edition, 2005
9. Drug stability - Principles and practice by Cartensen & C.J. Rhodes, 3rd Edition, Marcel Dekker Series, Vol 107.

## **BP503.T. PHARMACOLOGY-II (Theory)**

**45 Hours**

**Scope:** This subject is intended to impart the fundamental knowledge on various aspects (classification, mechanism of action, therapeutic effects, clinical uses, side effects and contraindications) of drugs acting on different systems of body and in addition, emphasis on the basic concepts of bioassay.

**Objectives:** Upon completion of this course the student should be able to

1. Understand the mechanism of drug action and its relevance in the treatment of different diseases
2. Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments
3. Demonstrate the various receptor actions using isolated tissue preparation
4. Appreciate correlation of pharmacology with related medical sciences

### **Course Content:**

#### **UNIT-I**

**10hours**

##### **1. Pharmacology of drugs acting on cardio vascular system**

- a. Introduction to hemodynamic and electrophysiology of heart.
- b. Drugs used in congestive heart failure
- c. Anti-hypertensive drugs.
- d. Anti-anginal drugs.
- e. Anti-arrhythmic drugs.
- f. Anti-hyperlipidemic drugs.

#### **UNIT-II**

**10hours**

##### **1. Pharmacology of drugs acting on cardio vascular system**

- a. Drug used in the therapy of shock.
- b. Hematinics, coagulants and anticoagulants.
- c. Fibrinolytics and anti-platelet drugs
- d. Plasma volume expanders

##### **2. Pharmacology of drugs acting on urinary system**

- a. Diuretics
- b. Anti-diuretics.

#### **UNIT-III**

**10hours**

##### **3. Autocoids and related drugs**

- a. Introduction to autocoids and classification
- b. Histamine, 5-HT and their antagonists.
- c. Prostaglandins, Thromboxanes and Leukotrienes.
- d. Angiotensin, Bradykinin and Substance P.
- e. Non-steroidal anti-inflammatory agents
- f. Anti-gout drugs
- g. Antirheumatic drugs

**UNIT-IV****08hours****5. Pharmacology of drugs acting on endocrine system**

- a. Basic concepts in endocrine pharmacology.
- b. Anterior Pituitary hormones- analogues and their inhibitors.
- c. Thyroid hormones- analogues and their inhibitors.
- d. Hormones regulating plasma calcium level- Parathormone, Calcitonin and Vitamin-D.
- d. Insulin, Oral Hypoglycemic agents and glucagon.
- e. ACTH and corticosteroids.

**UNIT-V****07hours****5. Pharmacology of drugs acting on endocrine system**

- a. Androgens and Anabolic steroids.
- b. Estrogens, progesterone and oral contraceptives.
- c. Drugs acting on the uterus.

**6. Bioassay**

- a. Principles and applications of bioassay.
- b. Types of bioassay
- c. Bioassay of insulin, oxytocin, vasopressin, ACTH, d-tubocurarine, digitalis, histamine and 5-HT

## BP 507 P. PHARMACOLOGY-II (Practical)

4Hrs/Week

1. Introduction to *in-vitro* pharmacology and physiological salt solutions.
2. Effect of drugs on isolated frog heart.
3. Effect of drugs on blood pressure and heart rate of dog.
4. Study of diuretic activity of drugs using rats/mice.
5. DRC of acetylcholine using frog rectus abdominis muscle.
6. Effect of physostigmine and atropine on DRC of acetylcholine using frog rectus abdominis muscle and rat ileum respectively.
7. Bioassay of histamine using guinea pig ileum by matching method.
8. Bioassay of oxytocin using rat uterine horn by interpolation method.
9. Bioassay of serotonin using rat fundus strip by three point bioassay.
10. Bioassay of acetylcholine using rat ileum/colon by four point bioassay.
11. Determination of  $PA_2$  value of prazosin using rat anococcygeus muscle (by Schild's plot method).
12. Determination of  $PD_2$  value using guinea pig ileum.
13. Effect of spasmogens and spasmolytics using rabbit jejunum.
14. Anti-inflammatory activity of drugs using carrageenan induced paw-edema model.
15. Analgesic activity of drug using central and peripheral methods

*Note: All laboratory techniques and animal experiments are demonstrated by simulated experiments by softwares and videos*

### Recommended Books (Latest Editions)

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchill Livingstone Elsevier
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill.
3. Goodman and Gilman's, The Pharmacological Basis of Therapeutics
4. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs, The Point Lippincott Williams & Wilkins.
5. Mycek M.J, Gelnet S.B and Perper M.M. Lippincott's Illustrated Reviews- Pharmacology.
6. K.D.Tripathi. Essentials of Medical Pharmacology, , JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.
7. Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher
8. Modern Pharmacology with clinical Applications, by Charles R.Craig & Robert.
9. Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata.
10. Kulkarni SK. Handbook of experimental pharmacology. Vallabh Prakashan.



## **BP504 T. PHARMACOGNOSY AND PHYTOCHEMISTRY II (Theory)**

**45Hours**

**Scope:** The main purpose of subject is to impart the students the knowledge of how the secondary metabolites are produced in the crude drugs, how to isolate and identify and produce them industrially. Also this subject involves the study of producing the plants and phytochemicals through plant tissue culture, drug interactions and basic principles of traditional system of medicine

**Objectives:** Upon completion of the course, the student shall be able

1. to know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
2. to understand the preparation and development of herbal formulation.
3. to understand the herbal drug interactions
4. to carryout isolation and identification of phytoconstituents

### **Course Content:**

#### **UNIT-I**

**7 Hours**

##### **Metabolic pathways in higher plants and their determination**

- a) Brief study of basic metabolic pathways and formation of different secondary metabolites through these pathways- Shikimic acid pathway, Acetate pathways and Amino acid pathway.
- b) Study of utilization of radioactive isotopes in the investigation of Biogenetic studies.

#### **UNIT-II**

**14 Hours**

General introduction, composition, chemistry & chemical classes, biosources, therapeutic uses and commercial applications of following secondary metabolites:

**Alkaloids:** Vinca, Rauwolfia, Belladonna, Opium,

**Phenylpropanoids and Flavonoids:** Lignans, Tea, Ruta

**Steroids, Cardiac Glycosides & Triterpenoids:** Liquorice, Dioscorea, Digitalis

**Volatile oils:** Mentha, Clove, Cinnamon, Fennel, Coriander,

**Tannins:** Catechu, Pterocarpus

**Resins:** Benzoin, Guggul, Ginger, Asafoetida, Myrrh, Colophony

**Glycosides:** Senna, Aloes, Bitter Almond

**Iridoids, Other terpenoids & Naphthaquinones:** Gentian, Artemisia, taxus, carotenoids

#### **UNIT-III**

**06 Hours**

Isolation, Identification and Analysis of Phytoconstituents

- a) Terpenoids: Menthol, Citral, Artemisin
- b) Glycosides: Glycyrrhetic acid & Rutin
- c) Alkaloids: Atropine, Quinine, Reserpine, Caffeine
- d) Resins: Podophyllotoxin, Curcumin

#### **UNIT-IV**

**10 Hours**

Industrial production, estimation and utilization of the following phytoconstituents:

Forskolin, Sennoside, Artemisinin, Diosgenin, Digoxin, Atropine, Podophyllotoxin, Caffeine, Taxol, Vincristine and Vinblastine

#### **UNIT V**

**8 Hours**

##### **Basics of Phytochemistry**

Modern methods of extraction, application of latest techniques like Spectroscopy, chromatography and electrophoresis in the isolation, purification and identification of crude drugs.



**BP 508 P. PHARMACOGNOSY AND PHYTOCHEMISTRY II (Practical)**  
**4 Hours/Week**

1. Morphology, histology and powder characteristics & extraction & detection of: Cinchona, Cinnamon, Senna, Clove, Ephedra, Fennel and Coriander
2. Exercise involving isolation & detection of active principles
  - a. Caffeine - from tea dust.
  - b. Diosgenin from Dioscorea
  - c. Atropine from Belladonna
  - d. Sennosides from Senna
3. Separation of sugars by Paper chromatography
4. TLC of herbal extract
5. Distillation of volatile oils and detection of phytoconstituents by TLC
6. Analysis of crude drugs by chemical tests: (i) Asafoetida (ii) Benzoin (iii) Colophony (iv) Aloes (v) Myrrh

**Recommended Books: (Latest Editions)**

1. W.C.Evans, Trease and Evans Pharmacognosy, 16<sup>th</sup> edition, W.B. Saunders & Co., London, 2009.
2. Mohammad Ali. Pharmacognosy and Phytochemistry, CBS Publishers & Distribution, New Delhi.
3. Text book of Pharmacognosy by C.K. Kokate, Purohit, Gokhale (2007), 37<sup>th</sup> Edition, Nirali Prakashan, New Delhi.
4. Herbal drug industry by R.D. Choudhary (1996), 1<sup>st</sup> Edn, Eastern Publisher, New Delhi.
5. Essentials of Pharmacognosy, Dr.SH.Ansari, 2<sup>nd</sup> edition, Birla publications, New Delhi, 2007
6. Herbal Cosmetics by H.Pande, Asia Pacific Business press, Inc, New Delhi.
7. A.N. Kalia, Textbook of Industrial Pharmacognosy, CBS Publishers, New Delhi, 2005.
8. R Endress, Plant cell Biotechnology, Springer-Verlag, Berlin, 1994.
9. Pharmacognosy & Pharmacobiotechnology. James Bobbers, Marilyn KS, VE Tylor.
10. The formulation and preparation of cosmetic, fragrances and flavours.
11. Remington's Pharmaceutical sciences.
12. Text Book of Biotechnology by Vyas and Dixit.
13. Text Book of Biotechnology by R.C. Dubey.



## **BP 505 T. PHARMACEUTICAL JURISPRUDENCE (Theory)**

**45 Hours**

**Scope:** This course is designed to impart basic knowledge on important legislations related to the profession of pharmacy in India.

**Objectives:** Upon completion of the course, the student shall be able to understand:

1. The Pharmaceutical legislations and their implications in the development and marketing of pharmaceuticals.
2. Various Indian pharmaceutical Acts and Laws
3. The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
4. The code of ethics during the pharmaceutical practice

### **Course Content:**

#### **UNIT-I**

**10 Hours**

##### **Drugs and Cosmetics Act, 1940 and its rules 1945:**

Objectives, Definitions, Legal definitions of schedules to the Act and Rules

Import of drugs – Classes of drugs and cosmetics prohibited from import, Import under license or permit. Offences and penalties.

Manufacture of drugs – Prohibition of manufacture and sale of certain drugs,

Conditions for grant of license and conditions of license for manufacture of drugs, Manufacture of drugs for test, examination and analysis, manufacture of new drug, loan license and repacking license.

#### **UNIT-II**

**10 Hours**

##### **Drugs and Cosmetics Act, 1940 and its rules 1945.**

Detailed study of Schedule G, H, M, N, P,T,U, V, X, Y, Part XII B, Sch F & DMR (OA)

Sale of Drugs – Wholesale, Retail sale and Restricted license. Offences and penalties

Labeling & Packing of drugs- General labeling requirements and specimen labels for drugs and cosmetics, List of permitted colors. Offences and penalties.

Administration of the Act and Rules – Drugs Technical Advisory Board, Central drugs Laboratory, Drugs Consultative Committee, Government drug analysts, Licensing authorities, controlling authorities, Drugs Inspectors

#### **UNIT-III**

**10 Hours**

- **Pharmacy Act –1948:** Objectives, Definitions, Pharmacy Council of India; its constitution and functions, Education Regulations, State and Joint state pharmacy councils; constitution and functions, Registration of Pharmacists, Offences and

## Penalties

- **Medicinal and Toilet Preparation Act –1955:** Objectives, Definitions, Licensing, Manufacture In bond and Outside bond, Export of alcoholic preparations, Manufacture of Ayurvedic, Homeopathic, Patent & Proprietary Preparations. Offences and Penalties.
- **Narcotic Drugs and Psychotropic substances Act-1985 and Rules:** Objectives, Definitions, Authorities and Officers, Constitution and Functions of narcotic & Psychotropic Consultative Committee, National Fund for Controlling the Drug Abuse, Prohibition, Control and Regulation, opium poppy cultivation and production of poppy straw, manufacture, sale and export of opium, Offences and Penalties

## UNIT-IV

**08 Hours**

- **Study of Salient Features of Drugs and Magic Remedies Act and its rules:** Objectives, Definitions, Prohibition of certain advertisements, Classes of Exempted advertisements, Offences and Penalties
- **Prevention of Cruelty to animals Act-1960:** Objectives, Definitions, Institutional Animal Ethics Committee, CPCSEA guidelines for Breeding and Stocking of Animals, Performance of Experiments, Transfer and acquisition of animals for experiment, Records, Power to suspend or revoke registration, Offences and Penalties
- **National Pharmaceutical Pricing Authority:** Drugs Price Control Order (DPCO)-2013. Objectives, Definitions, Sale prices of bulk drugs, Retail price of formulations, Retail price and ceiling price of scheduled formulations, National List of Essential Medicines (NLEM)

## UNIT-V

**07 Hours**

- **Pharmaceutical Legislations** – A brief review, Introduction, Study of drugs enquiry committee, Health survey and development committee, Hathi committee and Mudaliar committee
- **Code of Pharmaceutical ethics** Definition, Pharmacist in relation to his job, trade, medical profession and his profession, Pharmacist's oath
- **Medical Termination of Pregnancy Act**
- **Right to Information Act**
- **Introduction to Intellectual Property Rights (IPR)**

## Recommended books: (Latest Edition)

1. Forensic Pharmacy by B. Suresh

2. Text book of Forensic Pharmacy by B.M. Mithal
3. Hand book of drug law-by M.L. Mehra
4. A text book of Forensic Pharmacy by N.K. Jain
5. Drugs and Cosmetics Act/Rules by Govt. of India publications.
6. Medicinal and Toilet preparations act 1955 by Govt. of India publications.
7. Narcotic drugs and psychotropic substances act by Govt. of India publications
8. Drugs and Magic Remedies act by Govt. of India publication
9. Bare Acts of the said laws published by Government. Reference books (Theory)

## **SEMESTER VI**

## BP601T. MEDICINAL CHEMISTRY – III (Theory)

**45 Hours**

**Scope:** This subject is designed to impart fundamental knowledge on the structure, chemistry and therapeutic value of drugs. The subject emphasis on modern techniques of rational drug design like quantitative structure activity relationship (QSAR), Prodrug concept, combinatorial chemistry and Computer aided drug design (CADD). The subject also emphasizes on the chemistry, mechanism of action, metabolism, adverse effects, Structure Activity Relationships (SAR), therapeutic uses and synthesis of important drugs.

**Objectives:** Upon completion of the course student shall be able to

1. Understand the importance of drug design and different techniques of drug design.
2. Understand the chemistry of drugs with respect to their biological activity.
3. Know the metabolism, adverse effects and therapeutic value of drugs.
4. Know the importance of SAR of drugs.

### Course Content:

**Study of the development of the following classes of drugs, Classification, mechanism of action, uses of drugs mentioned in the course, Structure activity relationship of selective class of drugs as specified in the course and synthesis of drugs superscripted by (\*)**

### UNIT – I

**10 Hours**

#### Antibiotics

Historical background, Nomenclature, Stereochemistry, Structure activity relationship, Chemical degradation classification and important products of the following classes.

**-Lactam antibiotics:** Penicillin, Cephalosporins, - Lactamase inhibitors, Monobactams

**Aminoglycosides:** Streptomycin, Neomycin, Kanamycin

**Tetracyclines:** Tetracycline, Oxytetracycline, Chlortetracycline, Minocycline, Doxycycline

### UNIT – II

**10 Hours**

#### Antibiotics

Historical background, Nomenclature, Stereochemistry, Structure activity relationship, Chemical degradation classification and important products of the following classes.

**Macrolide:** Erythromycin Clarithromycin, Azithromycin.

**Miscellaneous:** Chloramphenicol\*, Clindamycin.

**Prodrugs:** Basic concepts and application of prodrugs design.

**Antimalarials:** Etiology of malaria.

**Quinolines:** SAR, Quinine sulphate, Chloroquine\*, Amodiaquine, Primaquine phosphate, Pamaquine\*, Quinacrine hydrochloride, Mefloquine.

**Biguanides and dihydro triazines:** Cycloguanil pamoate, Proguanil.

**Miscellaneous:** Pyrimethamine, Artesunate, Artemether, Atovaquone.

### UNIT – III

**10 Hours**

#### **Anti-tubercular Agents**

**Synthetic anti tubercular agents:** Isoniazid\*, Ethionamide, Ethambutol, Pyrazinamide, Para amino salicylic acid.\*

**Anti tubercular antibiotics:** Rifampicin, Rifabutin, Cycloserine Streptomycin, Capreomycin sulphate.

#### **Urinary tract anti-infective agents**

**Quinolones:** SAR of quinolones, Nalidixic Acid, Norfloxacin, Enoxacin, Ciprofloxacin\*, Ofloxacin, Lomefloxacin, Sparfloxacin, Gatifloxacin, Moxifloxacin

**Miscellaneous:** Furazolidine, Nitrofurantoin\*, Methanamine.

#### **Antiviral agents:**

Amantadine hydrochloride, Rimantadine hydrochloride, Idoxuridine trifluoride, Acyclovir\*, Gancyclovir, Zidovudine, Didanosine, Zalcitabine, Lamivudine, Loviride, Delavirdine, Ribavirin, Saquinavir, Indinavir, Ritonavir.

### UNIT – IV

**08 Hours**

#### **Antifungal agents:**

**Antifungal antibiotics:** Amphotericin-B, Nystatin, Natamycin, Griseofulvin.

**Synthetic Antifungal agents:** Clotrimazole, Econazole, Butoconazole, Oxiconazole, Tioconazole, Miconazole\*, Ketoconazole, Terconazole, Itraconazole, Fluconazole, Naftifine hydrochloride, Tolnaftate\*.

**Anti-protozoal Agents:** Metronidazole\*, Tinidazole, Ornidazole, Diloxanide, Iodoquinol, Pentamidine Isethionate, Atovaquone, Eflornithine.

**Anthelmintics:** Diethylcarbamazine citrate\*, Thiabendazole, Mebendazole\*, Albendazole, Niclosamide, Oxamniquine, Praziquantel, Ivermectin.



### **Sulphonamides and Sulfones**

Historical development, chemistry, classification and SAR of Sulfonamides: Sulphamethizole, Sulfisoxazole, Sulphamethizine, Sulfacetamide\*, Sulphapyridine, Sulfamethoxazole\*, Sulphadiazine, Mefenide acetate, Sulfasalazine.

**Folate reductase inhibitors:** Trimethoprim\*, Cotrimoxazole.

**Sulfones:** Dapsone\*.

## **UNIT – V**

**07 Hours**

### **Introduction to Drug Design**

Various approaches used in drug design.

Physicochemical parameters used in quantitative structure activity relationship (QSAR) such as partition coefficient, Hammett's electronic parameter, Taft's steric parameter and Hansch analysis.

Pharmacophore modeling and docking techniques.

**Combinatorial Chemistry:** Concept and applications of combinatorial chemistry: solid phase and solution phase synthesis.

## **BP607P. MEDICINAL CHEMISTRY- III (Practical)**

**4 Hours / week**

### **I Preparation of drugs and intermediates**

- 1 Sulphanilamide
- 2 7-Hydroxy, 4-methyl coumarin
- 3 Chlorobutanol
- 4 Triphenyl imidazole
- 5 Tolbutamide
- 6 Hexamine

### **II Assay of drugs**

- 1 Isonicotinic acid hydrazide
- 2 Chloroquine
- 3 Metronidazole
- 4 Dapsone
- 5 Chlorpheniramine maleate
- 6 Benzyl penicillin

### **III Preparation of medicinally important compounds or intermediates by Microwave irradiation technique**

### **IV Drawing structures and reactions using chem draw®**

### **V Determination of physicochemical properties such as logP, clogP, MR, Molecular weight, Hydrogen bond donors and acceptors for class of drugs course content using drug design software Drug likeliness screening (Lipinskies RO5)**

### **Recommended Books (Latest Editions)**

1. Wilson and Giswold's Organic medicinal and Pharmaceutical Chemistry.
2. Foye's Principles of Medicinal Chemistry.
3. Burger's Medicinal Chemistry, Vol I to IV.
4. Introduction to principles of drug design- Smith and Williams.
5. Remington's Pharmaceutical Sciences.
6. Martindale's extra pharmacopoeia.

7. Organic Chemistry by I.L. Finar, Vol. II.
8. The Organic Chemistry of Drug Synthesis by Lednicer, Vol. 1-5.
9. Indian Pharmacopoeia.
10. Text book of practical organic chemistry- A.I.Vogel.

## **BP602 T. PHARMACOLOGY-III (Theory)**

**45 Hours**

**Scope:** This subject is intended to impart the fundamental knowledge on various aspects (classification, mechanism of action, therapeutic effects, clinical uses, side effects and contraindications) of drugs acting on respiratory and gastrointestinal system, infectious diseases, immuno-pharmacology and in addition, emphasis on the principles of toxicology and chronopharmacology.

**Objectives:** Upon completion of this course the student should be able to:

1. understand the mechanism of drug action and its relevance in the treatment of different infectious diseases
2. comprehend the principles of toxicology and treatment of various poisonings and
3. appreciate correlation of pharmacology with related medical sciences.

### **Course Content:**

#### **UNIT-I**

**10hours**

##### **1. Pharmacology of drugs acting on Respiratory system**

- a. Anti -asthmatic drugs
- b. Drugs used in the management of COPD
- c. Expectorants and antitussives
- d. Nasal decongestants
- e. Respiratory stimulants

##### **2. Pharmacology of drugs acting on the Gastrointestinal Tract**

- a. Antiulcer agents.
- b. Drugs for constipation and diarrhoea.
- c. Appetite stimulants and suppressants.
- d. Digestants and carminatives.
- e. Emetics and anti-emetics.

#### **UNIT-II**

**10hours**

##### **3. Chemotherapy**

- a. General principles of chemotherapy.
- b. Sulfonamides and cotrimoxazole.
- c. Antibiotics- Penicillins, cephalosporins, chloramphenicol, macrolides, quinolones and fluoroquinolones, tetracycline and aminoglycosides

#### **UNIT-III**

**10hours**

##### **3. Chemotherapy**

- a. Antitubercular agents
- b. Antileprotic agents

- c. Antifungal agents
- d. Antiviral drugs
- e. Anthelmintics
- f. Antimalarial drugs
- g. Antiamoebic agents

#### **UNIT-IV**

**08hours**

#### **3. Chemotherapy**

- l. Urinary tract infections and sexually transmitted diseases.
- m. Chemotherapy of malignancy.

#### **4. Immunopharmacology**

- a. Immunostimulants
- b. Immunosuppressant

Protein drugs, monoclonal antibodies, target drugs to antigen, biosimilars

#### **UNIT-V**

**07hours**

#### **5. Principles of toxicology**

- a. Definition and basic knowledge of acute, subacute and chronic toxicity.
- b. Definition and basic knowledge of genotoxicity, carcinogenicity, teratogenicity and mutagenicity
- c. General principles of treatment of poisoning
- d. Clinical symptoms and management of barbiturates, morphine, organophosphorus compound and lead, mercury and arsenic poisoning.

#### **6. Chronopharmacology**

- a. Definition of rhythm and cycles.
- b. Biological clock and their significance leading to chronotherapy.

### BP 608 P. PHARMACOLOGY-III (Practical)

4Hrs/Week

1. Dose calculation in pharmacological experiments
2. Antiallergic activity by mast cell stabilization assay
3. Study of anti-ulcer activity of a drug using pylorus ligand (SHAY) rat model and NSAIDS induced ulcer model.
4. Study of effect of drugs on gastrointestinal motility
5. Effect of agonist and antagonists on guinea pig ileum
6. Estimation of serum biochemical parameters by using semi- autoanalyser
7. Effect of saline purgative on frog intestine
8. Insulin hypoglycemic effect in rabbit
9. Test for pyrogens ( rabbit method)
10. Determination of acute oral toxicity (LD50) of a drug from a given data
11. Determination of acute skin irritation / corrosion of a test substance
12. Determination of acute eye irritation / corrosion of a test substance
13. Calculation of pharmacokinetic parameters from a given data
14. Biostatistics methods in experimental pharmacology( student's t test, ANOVA)
15. Biostatistics methods in experimental pharmacology (Chi square test, Wilcoxon Signed Rank test)

*\*Experiments are demonstrated by simulated experiments/videos*

#### **Recommended Books (Latest Editions)**

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchill Livingstone Elsevier
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill
3. Goodman and Gilman's, The Pharmacological Basis of Therapeutics
4. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs. The Point Lippincott Williams & Wilkins
5. Mycek M.J, Gelnet S.B and Perper M.M. Lippincott's Illustrated Reviews- Pharmacology
6. K.D.Tripathi. Essentials of Medical Pharmacology, , JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.
7. Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher Modern Pharmacology with clinical Applications, by Charles R.Craig & Robert,
8. Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata,
9. Kulkarni SK. Handbook of experimental pharmacology. VallabhPrakashan,
10. N.Udupa and P.D. Gupta, Concepts in Chronopharmacology.

## **BP 603 T. HERBAL DRUG TECHNOLOGY (Theory)**

**45 hours**

**Scope:** This subject gives the student the knowledge of basic understanding of herbal drug industry, the quality of raw material, guidelines for quality of herbal drugs, herbal cosmetics, natural sweeteners, nutraceutical etc. The subject also emphasizes on Good Manufacturing Practices (GMP), patenting and regulatory issues of herbal drugs

**Objectives:** Upon completion of this course the student should be able to:

1. understand raw material as source of herbal drugs from cultivation to herbal drug product
2. know the WHO and ICH guidelines for evaluation of herbal drugs
3. know the herbal cosmetics, natural sweeteners, nutraceuticals
4. appreciate patenting of herbal drugs, GMP .

### **Course content:**

#### **UNIT-I**

**11 Hours**

##### **Herbs as raw materials**

Definition of herb, herbal medicine, herbal medicinal product, herbal drug preparation

Source of Herbs

Selection, identification and authentication of herbal materials

Processing of herbal raw material

##### **Biodynamic Agriculture**

Good agricultural practices in cultivation of medicinal plants including Organic farming.

Pest and Pest management in medicinal plants: Biopesticides/Bioinsecticides.

##### **Indian Systems of Medicine**

a) Basic principles involved in Ayurveda, Siddha, Unani and Homeopathy

b) Preparation and standardization of Ayurvedic formulations viz Aristas and Asawas, Ghutika, Churna, Lehya and Bhasma.

#### **UNIT-II**

**7 Hours**

##### **Nutraceuticals**

General aspects, Market, growth, scope and types of products available in the market. Health benefits and role of Nutraceuticals in ailments like Diabetes, CVS diseases, Cancer, Irritable bowel syndrome and various Gastro intestinal diseases.

Study of following herbs as health food: Alfaalfa, Chicory, Ginger, Fenugreek, Garlic, Honey, Amla, Ginseng, Ashwagandha, Spirulina

**Herbal-Drug and Herb-Food Interactions:** General introduction to interaction and classification. Study of following drugs and their possible side effects and interactions: Hypercium, kava-kava, Ginkobiloba, Ginseng, Garlic, Pepper & Ephedra.

#### **UNIT-III**

**10 Hours**

##### **Herbal Cosmetics**

Sources and description of raw materials of herbal origin used via, fixed oils, waxes, gums colours, perfumes, protective agents, bleaching agents, antioxidants in products such as skin care, hair care and oral hygiene products.

**Herbal excipients:**

Herbal Excipients – Significance of substances of natural origin as excipients – colorants, sweeteners, binders, diluents, viscosity builders, disintegrants, flavors & perfumes.

**Herbal formulations :**

Conventional herbal formulations like syrups, mixtures and tablets and Novel dosage forms like phytosomes

**UNIT- IV**

**10 Hours**

**Evaluation of Drugs** WHO & ICH guidelines for the assessment of herbal drugs  
Stability testing of herbal drugs.

**Patenting and Regulatory requirements of natural products:**

- a) Definition of the terms: Patent, IPR, Farmers right, Breeder's right, Bioprospecting and Biopiracy
- b) Patenting aspects of Traditional Knowledge and Natural Products. Case study of Curcuma & Neem.

**Regulatory Issues** - Regulations in India (ASU DTAB, ASU DCC), Regulation of manufacture of ASU drugs - Schedule Z of Drugs & Cosmetics Act for ASU drugs.

**UNIT-V**

**07 Hours**

**General Introduction to Herbal Industry**

Herbal drugs industry: Present scope and future prospects.

A brief account of plant based industries and institutions involved in work on medicinal and aromatic plants in India.

**Schedule T – Good Manufacturing Practice of Indian systems of medicine**

Components of GMP (Schedule – T) and its objectives

Infrastructural requirements, working space, storage area, machinery and equipments, standard operating procedures, health and hygiene, documentation and records.



## **BP 609 P. HERBAL DRUG TECHNOLOGY (Practical)**

**4 hours/ week**

1. To perform preliminary phytochemical screening of crude drugs.
2. Determination of the alcohol content of Asava and Arista
3. Evaluation of excipients of natural origin
4. Incorporation of prepared and standardized extract in cosmetic formulations like creams, lotions and shampoos and their evaluation.
5. Incorporation of prepared and standardized extract in formulations like syrups, mixtures and tablets and their evaluation as per Pharmacopoeial requirements.
6. Monograph analysis of herbal drugs from recent Pharmacopoeias
7. Determination of Aldehyde content
8. Determination of Phenol content
9. Determination of total alkaloids

### **Recommended Books: (Latest Editions)**

1. Textbook of Pharmacognosy by Trease & Evans.
2. Textbook of Pharmacognosy by Tyler, Brady & Robber.
3. Pharmacognosy by Kokate, Purohit and Gokhale
4. Essential of Pharmacognosy by Dr.S.H.Ansari
5. Pharmacognosy & Phytochemistry by V.D.Rangari
6. Pharmacopoeal standards for Ayurvedic Formulation (Council of Research in Indian Medicine & Homeopathy)
7. Mukherjee, P.W. Quality Control of Herbal Drugs: An Approach to Evaluation of Botanicals. Business Horizons Publishers, New Delhi, India, 2002.

## BP 604 T. BIOPHARMACEUTICS AND PHARMACOKINETICS (Theory)

45 Hours

**Scope:** This subject is designed to impart knowledge and skills of Biopharmaceutics and pharmacokinetics and their applications in pharmaceutical development, design of dose and dosage regimen and in solving the problems arising therein.

**Objectives:** Upon completion of the course student shall be able to:

1. Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance.
2. Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination.
3. To understand the concepts of bioavailability and bioequivalence of drug products and their significance.
4. Understand various pharmacokinetic parameters, their significance & applications.

### Course Content:

#### UNIT-I 10 Hours

##### Introduction to Biopharmaceutics

**Absorption;** Mechanisms of drug absorption through GIT, factors influencing drug absorption through GIT, absorption of drug from Non per oral extra-vascular routes, **Distribution** Tissue permeability of drugs, binding of drugs, apparent, volume of drug distribution, plasma and tissue protein binding of drugs, factors affecting protein-drug binding. Kinetics of protein binding, Clinical significance of protein binding of drugs

#### UNIT- II 10 Hours

**Elimination:** Drug metabolism and basic understanding metabolic pathways renal excretion of drugs, factors affecting renal excretion of drugs, renal clearance, Non renal routes of drug excretion of drugs

**Bioavailability and Bioequivalence:** Definition and Objectives of bioavailability, absolute and relative bioavailability, measurement of bioavailability, *in-vitro* drug dissolution models, *in-vitro-in-vivo* correlations, bioequivalence studies, methods to enhance the dissolution rates and bioavailability of poorly soluble drugs.

#### UNIT- III 10 Hours

**Pharmacokinetics:** Definition and introduction to Pharmacokinetics, Compartment models, Non compartment models, physiological models, One compartment open model. (a). Intravenous Injection (Bolus) (b). Intravenous infusion and (c) Extra vascular administrations. Pharmacokinetics parameters -  $K_E$ ,  $t_{1/2}$ ,  $V_d$ ,  $AUC$ ,  $K_a$ ,  $Cl_t$  and  $CL_R$ - definitions methods of eliminations, understanding of their significance and application

**UNIT- IV****08 Hours**

**Multicompartment models:** Two compartment open model. IV bolus

Kinetics of multiple dosing, steady state drug levels, calculation of loading and maintenance doses and their significance in clinical settings.

**UNIT- V****07 Hours**

**Nonlinear Pharmacokinetics:** a. Introduction, b. Factors causing Non-linearity.  
c. Michaelis-menton method of estimating parameters, Explanation with example of drugs.

**Recommended Books: (Latest Editions)**

1. Biopharmaceutics and Clinical Pharmacokinetics by, Milo Gibaldi.
2. Biopharmaceutics and Pharmacokinetics; By Robert F Notari
3. Applied biopharmaceutics and pharmacokinetics, Leon Shargel and Andrew B.C.YU 4th edition, Prentice-Hall International edition. USA
4. Bio pharmaceutics and Pharmacokinetics-A Treatise, By D. M. Brahmanekar and Sunil B. Jaiswal, Vallabh Prakashan Pitampura, Delhi
5. Pharmacokinetics: By Milo Gibaldi Donald, R. Marcel Dekker Inc.
6. Hand Book of Clinical Pharmacokinetics, By Milo Gibaldi and Laurie Prescott by ADIS Health Science Press.
7. Biopharmaceutics; By Swarbrick
8. Clinical Pharmacokinetics, Concepts and Applications: By Malcolm Rowland and Thomas, N. Tozen, Lea and Febrger, Philadelphia, 1995.
10. Dissolution, Bioavailability and Bioequivalence, By Abdou H.M, Mack, Publishing Company, Pennsylvania 1989.
11. Biopharmaceutics and Clinical Pharmacokinetics-An introduction 4th edition Revised and expanded by Robert F Notari Marcel Dekker Inc, New York and Basel, 1987.
12. Remington's Pharmaceutical Sciences, By Mack Publishing Company, Pennsylvania



## **BP 605 T. PHARMACEUTICAL BIOTECHNOLOGY (Theory)**

**45 Hours**

### **Scope:**

- Biotechnology has a long promise to revolutionize the biological sciences and technology.
- Scientific application of biotechnology in the field of genetic engineering, medicine and fermentation technology makes the subject interesting.
- Biotechnology is leading to new biological revolutions in diagnosis, prevention and cure of diseases, new and cheaper pharmaceutical drugs.
- Biotechnology has already produced transgenic crops and animals and the future promises lot more.
- It is basically a research-based subject.

**Objectives:** Upon completion of the subject student shall be able to;

1. Understanding the importance of Immobilized enzymes in Pharmaceutical Industries
2. Genetic engineering applications in relation to production of pharmaceuticals
3. Importance of Monoclonal antibodies in Industries
4. Appreciate the use of microorganisms in fermentation technology

### **Unit I**

**10 Hours**

- a) Brief introduction to Biotechnology with reference to Pharmaceutical Sciences.
- b) Enzyme Biotechnology- Methods of enzyme immobilization and applications.
- c) Biosensors- Working and applications of biosensors in Pharmaceutical Industries.
- d) Brief introduction to Protein Engineering.
- e) Use of microbes in industry. Production of Enzymes- General consideration - Amylase, Catalase, Peroxidase, Lipase, Protease, Penicillinase.
- f) Basic principles of genetic engineering.

### **Unit II**

**10 Hours**

- a) Study of cloning vectors, restriction endonucleases and DNA ligase.
- b) Recombinant DNA technology. Application of genetic engineering in medicine.
- c) Application of r DNA technology and genetic engineering in the production of:
  - i) Interferon
  - ii) Vaccines- hepatitis- B
  - iii) Hormones-Insulin.
- d) Brief introduction to PCR

### **Unit III**

**10 Hours**

Types of immunity- humoral immunity, cellular immunity

- a) Structure of Immunoglobulins
- b) Structure and Function of MHC
- c) Hypersensitivity reactions, Immune stimulation and Immune suppressions.
- d) General method of the preparation of bacterial vaccines, toxoids, viral vaccine, antitoxins, serum-immune blood derivatives and other products relative to immunity.
- e) Storage conditions and stability of official vaccines
- f) Hybridoma technology- Production, Purification and Applications
- g) Blood products and Plasma Substitutes.

### **Unit IV**

**08Hours**

- a) Immuno blotting techniques- ELISA, Western blotting, Southern blotting.
- b) Genetic organization of Eukaryotes and Prokaryotes
- c) Microbial genetics including transformation, transduction, conjugation, plasmids and transposons.
- d) Introduction to Microbial biotransformation and applications.
- e) Mutation: Types of mutation/mutants.

### **Unit V**

**07 Hours**

- a) Fermentation methods and general requirements, study of media, equipments, sterilization methods, aeration process, stirring.
- b) Large scale production fermenter design and its various controls.
- c) Study of the production of - penicillins, citric acid, Vitamin B12, Glutamic acid, Griseofulvin,
- d) Blood Products: Collection, Processing and Storage of whole human blood, dried human plasma, plasma Substitutes.

### **Recommended Books (Latest edition):**

1. B.R. Glick and J.J. Pasternak: Molecular Biotechnology: Principles and Applications of Recombinant DNA: ASM Press Washington D.C.
2. RA Goldsby et. al., : Kuby Immunology.
3. J.W. Goding: Monoclonal Antibodies.
4. J.M. Walker and E.B. Gingold: Molecular Biology and Biotechnology by Royal

Society of Chemistry.

5. Zaborsky: Immobilized Enzymes, CRC Press, Degraland, Ohio.
6. S.B. Primrose: Molecular Biotechnology (Second Edition) Blackwell Scientific Publication.
7. Stanbury F., P., Whitakar A., and Hall J., S., Principles of fermentation technology, 2nd edition, Aditya books Ltd., New Delhi

## **BP606TPHARMACEUTICAL QUALITY ASSURANCE (Theory)**

**45 Hours**

**Scope:** This course deals with the various aspects of quality control and quality assurance aspects of pharmaceutical industries. It deals with the important aspects like cGMP, QC tests, documentation, quality certifications and regulatory affairs.

**Objectives:** Upon completion of the course student shall be able to:

- understand the cGMP aspects in a pharmaceutical industry
- appreciate the importance of documentation
- understand the scope of quality certifications applicable to pharmaceutical industries
- understand the responsibilities of QA & QC departments

**Course content:**

### **UNIT – I**

**10 Hours**

**Quality Assurance and Quality Management concepts:** Definition and concept of Quality control, Quality assurance and GMP

**Total Quality Management (TQM):** Definition, elements, philosophies

**ICH Guidelines:** purpose, participants, process of harmonization, Brief overview of QSEM, with special emphasis on Q-series guidelines, ICH stability testing guidelines

**Quality by design (QbD):** Definition, overview, elements of QbD program, tools

**ISO 9000 & ISO14000:** Overview, Benefits, Elements, steps for registration

**NABL accreditation :** Principles and procedures

### **UNIT - II**

**10 Hours**

**Organization and personnel:** Personnel responsibilities, training, hygiene and personal records.

**Premises:** Design, construction and plant layout, maintenance, sanitation, environmental control, utilities and maintenance of sterile areas, control of contamination.

**Equipments and raw materials:** Equipment selection, purchase specifications, maintenance, purchase specifications and maintenance of stores for raw materials.

### **UNIT – III**

**10 Hours**

**Quality Control:** Quality control test for containers, rubber closures and secondary packing



materials.

**Good Laboratory Practices:** General Provisions, Organization and Personnel, Facilities, Equipment, Testing Facilities Operation, Test and Control Articles, Protocol for Conduct of a Nonclinical Laboratory Study, Records and Reports, Disqualification of Testing Facilities

#### **UNIT – IV**

**08 Hours**

**Complaints:** Complaints and evaluation of complaints, Handling of return good, recalling and waste disposal.

**Document maintenance in pharmaceutical industry:** Batch Formula Record, Master Formula Record, SOP, Quality audit, Quality Review and Quality documentation, Reports and documents, distribution records.

#### **UNIT – V**

**07 Hours**

**Calibration and Validation:** Introduction, definition and general principles of calibration, qualification and validation, importance and scope of validation, types of validation, validation master plan. Calibration of pH meter, Qualification of UV-Visible spectrophotometer, General principles of Analytical method Validation.

**Warehousing:** Good warehousing practice, materials management

#### **Recommended Books: (Latest Edition)**

1. Quality Assurance Guide by organization of Pharmaceutical Products of India.
2. Good Laboratory Practice Regulations, 2<sup>nd</sup> Edition, Sandy Weinberg Vol. 69.
3. Quality Assurance of Pharmaceuticals- A compendium of Guide lines and Related materials Vol I WHO Publications.
4. A guide to Total Quality Management- Kushik Maitra and Sedhan K Ghosh
5. How to Practice GMP's – P P Sharma.
6. ISO 9000 and Total Quality Management – Sadhank G Ghosh
7. The International Pharmacopoeia – Vol I, II, III, IV- General Methods of Analysis and Quality specification for Pharmaceutical Substances, Excipients and Dosage forms
8. Good laboratory Practices – Marcel Deckker Series
9. ICH guidelines, ISO 9000 and 14000 guidelines

## **SEMESTER VII**

## **BP701T. INSTRUMENTAL METHODS OF ANALYSIS (Theory)**

**45 Hours**

**Scope:** This subject deals with the application of instrumental methods in qualitative and quantitative analysis of drugs. This subject is designed to impart a fundamental knowledge on the principles and instrumentation of spectroscopic and chromatographic technique. This also emphasizes on theoretical and practical knowledge on modern analytical instruments that are used for drug testing.

**Objectives:** Upon completion of the course the student shall be able to

1. Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis
2. Understand the chromatographic separation and analysis of drugs.
3. Perform quantitative & qualitative analysis of drugs using various analytical instruments.

### **Course Content:**

#### **UNIT –I**

**10 Hours**

##### **UV Visible spectroscopy**

Electronic transitions, chromophores, auxochromes, spectral shifts, solvent effect on absorption spectra, Beer and Lambert's law, Derivation and deviations.

Instrumentation - Sources of radiation, wavelength selectors, sample cells, detectors- Photo tube, Photomultiplier tube, Photo voltaic cell, Silicon Photodiode.

Applications - Spectrophotometric titrations, Single component and multi component analysis

##### **Fluorimetry**

Theory, Concepts of singlet, doublet and triplet electronic states, internal and external conversions, factors affecting fluorescence, quenching, instrumentation and applications

#### **UNIT –II**

**10 Hours**

##### **IR spectroscopy**

Introduction, fundamental modes of vibrations in poly atomic molecules, sample handling, factors affecting vibrations

Instrumentation - Sources of radiation, wavelength selectors, detectors - Golay cell, Bolometer, Thermocouple, Thermister, Pyroelectric detector and applications

**Flame Photometry**-Principle, interferences, instrumentation and applications

**Atomic absorption spectroscopy-** Principle, interferences, instrumentation and applications

**Nepheloturbidometry-** Principle, instrumentation and applications

### **UNIT –III**

**10 Hours**

**Introduction to chromatography**

**Adsorption and partition column chromatography-**Methodology, advantages, disadvantages and applications.

**Thin layer chromatography-** Introduction, Principle, Methodology, R<sub>f</sub> values, advantages, disadvantages and applications.

**Paper chromatography-**Introduction, methodology, development techniques, advantages, disadvantages and applications

**Electrophoresis–** Introduction, factors affecting electrophoretic mobility, Techniques of paper, gel, capillary electrophoresis, applications

### **UNIT –IV**

**08 Hours**

**Gas chromatography -** Introduction, theory, instrumentation, derivatization, temperature programming, advantages, disadvantages and applications

**High performance liquid chromatography (HPLC)-**Introduction, theory, instrumentation, advantages and applications.

### **UNIT –V**

**07 Hours**

**Ion exchange chromatography-** Introduction, classification, ion exchange resins, properties, mechanism of ion exchange process, factors affecting ion exchange, methodology and applications

**Gel chromatography-** Introduction, theory, instrumentation and applications

**Affinity chromatography-** Introduction, theory, instrumentation and applications

## **BP705P. INSTRUMENTAL METHODS OF ANALYSIS (Practical)**

**4 Hours/Week**

- 1 Determination of absorption maxima and effect of solvents on absorption maxima of organic compounds
- 2 Estimation of dextrose by colorimetry
- 3 Estimation of sulfanilamide by colorimetry
- 4 Simultaneous estimation of ibuprofen and paracetamol by UV spectroscopy
- 5 Assay of paracetamol by UV- Spectrophotometry
- 6 Estimation of quinine sulfate by fluorimetry
- 7 Study of quenching of fluorescence
- 8 Determination of sodium by flame photometry
- 9 Determination of potassium by flame photometry
- 10 Determination of chlorides and sulphates by nephelo turbidometry
- 11 Separation of amino acids by paper chromatography
- 12 Separation of sugars by thin layer chromatography
- 13 Separation of plant pigments by column chromatography
- 14 Demonstration experiment on HPLC
- 15 Demonstration experiment on Gas Chromatography

### **Recommended Books (Latest Editions)**

1. Instrumental Methods of Chemical Analysis by B.K Sharma
2. Organic spectroscopy by Y.R Sharma
3. Text book of Pharmaceutical Analysis by Kenneth A. Connors
4. Vogel's Text book of Quantitative Chemical Analysis by A.I. Vogel
5. Practical Pharmaceutical Chemistry by A.H. Beckett and J.B. Stenlake
6. Organic Chemistry by I. L. Finar
7. Organic spectroscopy by William Kemp
8. Quantitative Analysis of Drugs by D. C. Garrett
9. Quantitative Analysis of Drugs in Pharmaceutical Formulations by P. D. Sethi
10. Spectrophotometric identification of Organic Compounds by Silverstein

## **BP 702 T. INDUSTRIAL PHARMACYII (Theory)**

**45 Hours**

**Scope:** This course is designed to impart fundamental knowledge on pharmaceutical product development and translation from laboratory to market

**Objectives:** Upon completion of the course, the student shall be able to:

1. Know the process of pilot plant and scale up of pharmaceutical dosage forms
2. Understand the process of technology transfer from lab scale to commercial batch
3. Know different Laws and Acts that regulate pharmaceutical industry
4. Understand the approval process and regulatory requirements for drug products

### **Course Content:**

#### **UNIT-I**

**10 Hours**

**Pilot plant scale up techniques:** General considerations - including significance of personnel requirements, space requirements, raw materials, Pilot plant scale up considerations for solids, liquid orals, semi solids and relevant documentation, SUPAC guidelines, Introduction to platform technology

#### **UNIT-II**

**10 Hours**

**Technology development and transfer:** WHO guidelines for Technology Transfer(TT): Terminology, Technology transfer protocol, Quality risk management, Transfer from R & D to production (Process, packaging and cleaning), Granularity of TT Process (API, excipients, finished products, packaging materials) Documentation, Premises and equipments, qualification and validation, quality control, analytical method transfer, Approved regulatory bodies and agencies, Commercialization - practical aspects and problems (case studies), TT agencies in India - APCTD, NRDC, TIFAC, BCIL, TBSE / SIDBI; TT related documentation - confidentiality agreement, licensing, MoUs, legal issues

#### **UNIT-III**

**10 Hours**

**Regulatory affairs:** Introduction, Historical overview of Regulatory Affairs, Regulatory authorities, Role of Regulatory affairs department, Responsibility of Regulatory Affairs Professionals

**Regulatory requirements for drug approval:** Drug Development Teams, Non-Clinical Drug Development, Pharmacology, Drug Metabolism and Toxicology, General considerations of Investigational New Drug (IND) Application, Investigator's Brochure (IB) and New Drug Application (NDA), Clinical research / BE studies, Clinical Research Protocols, Biostatistics in Pharmaceutical Product Development, Data Presentation for FDA Submissions, Management of Clinical Studies.

**UNIT-IV****08 Hours**

**Quality management systems:** Quality management & Certifications: Concept of Quality, Total Quality Management, Quality by Design (QbD), Six Sigma concept, Out of Specifications (OOS), Change control, Introduction to ISO 9000 series of quality systems standards, ISO 14000, NABL, GLP

**UNIT-V****07 Hours**

**Indian Regulatory Requirements:** Central Drug Standard Control Organization (CDSCO) and State Licensing Authority: Organization, Responsibilities, Certificate of Pharmaceutical Product (COPP), Regulatory requirements and approval procedures for New Drugs.

**Recommended Books: (Latest Editions)**

1. Regulatory Affairs from Wikipedia, the free encyclopedia modified on 7<sup>th</sup> April available at [http://en.wikipedia.org/wiki/Regulatory\\_Affairs](http://en.wikipedia.org/wiki/Regulatory_Affairs).
2. International Regulatory Affairs Updates, 2005. available at <http://www.iraup.com/about.php>
3. Douglas J Pisano and David S. Mantus. Text book of FDA Regulatory Affairs A Guide for Prescription Drugs, Medical Devices, and Biologics' Second Edition.
4. Regulatory Affairs brought by learning plus, inc. available at <http://www.cgmp.com/ra.htm>.

## **BP 703T. PHARMACY PRACTICE (Theory)**

**45 Hours**

**Scope:** In the changing scenario of pharmacy practice in India, for successful practice of Hospital Pharmacy, the students are required to learn various skills like drug distribution, drug information, and therapeutic drug monitoring for improved patient care. In community pharmacy, students will be learning various skills such as dispensing of drugs, responding to minor ailments by providing suitable safe medication, patient counselling for improved patient care in the community set up.

**Objectives:** Upon completion of the course, the student shall be able to

1. know various drug distribution methods in a hospital
2. appreciate the pharmacy stores management and inventory control
3. monitor drug therapy of patient through medication chart review and clinical review
4. obtain medication history interview and counsel the patients
5. identify drug related problems
6. detect and assess adverse drug reactions
7. interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states
8. know pharmaceutical care services
9. do patient counseling in community pharmacy;
10. appreciate the concept of Rational drug therapy.

### **Unit I:**

**10 Hours**

#### **a) Hospital and its organization**

Definition, Classification of hospital- Primary, Secondary and Tertiary hospitals, Classification based on clinical and non- clinical basis, Organization Structure of a Hospital, and Medical staffs involved in the hospital and their functions.

#### **b) Hospital pharmacy and its organization**

Definition, functions of hospital pharmacy, Organization structure, Location, Layout and staff requirements, and Responsibilities and functions of hospital pharmacists.

#### **c) Adverse drug reaction**

Classifications - Excessive pharmacological effects, secondary pharmacological effects, idiosyncrasy, allergic drug reactions, genetically determined toxicity, toxicity following sudden withdrawal of drugs, Drug interaction- beneficial interactions, adverse interactions, and pharmacokinetic drug interactions, Methods for detecting



drug interactions, spontaneous case reports and record linkage studies, and Adverse drug reaction reporting and management.

**d) Community Pharmacy**

Organization and structure of retail and wholesale drug store, types and design, Legal requirements for establishment and maintenance of a drug store, Dispensing of proprietary products, maintenance of records of retail and wholesale drug store.

**Unit II:**

**10 Hours**

**a) Drug distribution system in a hospital**

Dispensing of drugs to inpatients, types of drug distribution systems, charging policy and labelling, Dispensing of drugs to ambulatory patients, and Dispensing of controlled drugs.

**b) Hospital formulary**

Definition, contents of hospital formulary, Differentiation of hospital formulary and Drug list, preparation and revision, and addition and deletion of drug from hospital formulary.

**c) Therapeutic drug monitoring**

Need for Therapeutic Drug Monitoring, Factors to be considered during the Therapeutic Drug Monitoring, and Indian scenario for Therapeutic Drug Monitoring.

**d) Medication adherence**

Causes of medication non-adherence, pharmacist role in the medication adherence, and monitoring of patient medication adherence.

**e) Patient medication history interview**

Need for the patient medication history interview, medication interview forms.

**f) Community pharmacy management**

Financial, materials, staff, and infrastructure requirements.

**Unit III:**

**10 Hours**

**a) Pharmacy and therapeutic committee**

Organization, functions, Policies of the pharmacy and therapeutic committee in including drugs into formulary, inpatient and outpatient prescription, automatic stop order, and emergency drug list preparation.

**b)  
information services**

**Drug**

Drug and Poison information centre, Sources of drug information, Computerised services, and storage and retrieval of information.

**c) Patient counseling**

Definition of patient counseling; steps involved in patient counseling, and Special cases that require the pharmacist

**d) Education and training program in the hospital**

Role of pharmacist in the education and training program, Internal and external training program, Services to the nursing homes/clinics, Code of ethics for community pharmacy, and Role of pharmacist in the interdepartmental communication and community health education.

**e) Prescribed medication order and communication skills**

Prescribed medication order- interpretation and legal requirements, and Communication skills- communication with prescribers and patients.

**Unit IV 8 Hours**

**a) Budget preparation and implementation**

Budget preparation and implementation

**b) Clinical Pharmacy**

Introduction to Clinical Pharmacy, Concept of clinical pharmacy, functions and responsibilities of clinical pharmacist, Drug therapy monitoring - medication chart review, clinical review, pharmacist intervention, Ward round participation, Medication history and Pharmaceutical care.

Dosing pattern and drug therapy based on Pharmacokinetic & disease pattern.

**c) Over the counter (OTC) sales**

Introduction and sale of over the counter, and Rational use of common over the counter medications.

**Unit V 7 Hours**

**a) Drug store management and inventory control**

Organisation of drug store, types of materials stocked and storage conditions, Purchase and inventory control: principles, purchase procedure, purchase order, procurement and stocking, Economic order quantity, Reorder quantity level, and Methods used for the analysis of the drug expenditure

**b) Investigational use of drugs**

Description, principles involved, classification, control, identification, role of hospital pharmacist, advisory committee.

**c) Interpretation of Clinical Laboratory Tests**

Blood chemistry, hematology, and urinalysis

**Recommended Books (Latest Edition):**

1. Merchant S.H. and Dr. J.S.Quadry. *A textbook of hospital pharmacy*, 4th ed. Ahmadabad: B.S. Shah Prakakshan; 2001.
2. Parthasarathi G, Karin Nyfort-Hansen, Milap C Nahata. *A textbook of Clinical Pharmacy Practice- essential concepts and skills*, 1<sup>st</sup> ed. Chennai: Orient Longman Private Limited; 2004.
3. William E. Hassan. *Hospital pharmacy*, 5th ed. Philadelphia: Lea & Febiger; 1986.
4. Tipnis Bajaj. *Hospital Pharmacy*, 1<sup>st</sup> ed. Maharashtra: Career Publications; 2008.
5. Scott LT. *Basic skills in interpreting laboratory data*, 4th ed. American Society of Health System Pharmacists Inc; 2009.
6. Parmar N.S. *Health Education and Community Pharmacy*, 18th ed. India: CBS Publishers & Distributers; 2008.

**Journals:**

1. Therapeutic drug monitoring. ISSN: 0163-4356
2. Journal of pharmacy practice. ISSN : 0974-8326
3. American journal of health system pharmacy. ISSN: 1535-2900 (online)
4. Pharmacy times (Monthly magazine)

## **BP 704T: NOVEL DRUG DELIVERY SYSTEMS (Theory)**

**45 Hours**

**Scope:** This subject is designed to impart basic knowledge on the area of novel drug delivery systems.

**Objectives:** Upon completion of the course student shall be able

1. To understand various approaches for development of novel drug delivery systems.
2. To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation

### **Course content:**

#### **Unit-I**

**10 Hours**

**Controlled drug delivery systems:** Introduction, terminology/definitions and rationale, advantages, disadvantages, selection of drug candidates. Approaches to design controlled release formulations based on diffusion, dissolution and ion exchange principles. Physicochemical and biological properties of drugs relevant to controlled release formulations

**Polymers:** Introduction, classification, properties, advantages and application of polymers in formulation of controlled release drug delivery systems.

#### **Unit-II**

**10 Hours**

**Microencapsulation:** Definition, advantages and disadvantages, microspheres /microcapsules, microparticles, methods of microencapsulation, applications

**Mucosal Drug Delivery system:** Introduction, Principles of bioadhesion / mucoadhesion, concepts, advantages and disadvantages, transmucosal permeability and formulation considerations of buccal delivery systems

**Implantable Drug Delivery Systems:** Introduction, advantages and disadvantages, concept of implants and osmotic pump

#### **Unit-III**

**10 Hours**

**Transdermal Drug Delivery Systems:** Introduction, Permeation through skin, factors affecting permeation, permeation enhancers, basic components of TDDS, formulation approaches

**Gastroretentive drug delivery systems:** Introduction, advantages, disadvantages, approaches for GRDDS – Floating, high density systems, inflatable and gastroadhesive systems and their applications

**Nasopulmonary drug delivery system:** Introduction to Nasal and Pulmonary routes of drug delivery, Formulation of Inhalers (dry powder and metered dose), nasal sprays, nebulizers

#### **Unit-IV**

**08 Hours**

**Targeted drug Delivery:** Concepts and approaches advantages and disadvantages, introduction to liposomes, niosomes, nanoparticles, monoclonal antibodies and their applications

## **Unit-V**

**07 Hours**

**Ocular Drug Delivery Systems:** Introduction, intra ocular barriers and methods to overcome –Preliminary study, ocular formulations and ocuserts

**Intrauterine Drug Delivery Systems:** Introduction, advantages and disadvantages, development of intra uterine devices (IUDs) and applications

### **Recommended Books: (Latest Editions)**

1. Y W. Chien, Novel Drug Delivery Systems, 2<sup>nd</sup> edition, revised and expanded, Marcel Dekker, Inc., New York, 1992.
2. Robinson, J. R., Lee V. H. L, Controlled Drug Delivery Systems, Marcel Dekker, Inc., New York, 1992.
3. Encyclopedia of Controlled Delivery. Edith Mathiowitz, Published by Wiley Interscience Publication, John Wiley and Sons, Inc, New York. Chichester/Weinheim
4. N.K. Jain, Controlled and Novel Drug Delivery, CBS Publishers & Distributors, New Delhi, First edition 1997 (reprint in 2001).
5. S.P. Vyas and R.K. Khar, Controlled Drug Delivery -concepts and advances, Vallabh Prakashan, New Delhi, First edition 2002.

### **Journals**

1. Indian Journal of Pharmaceutical Sciences (IPA)
2. Indian Drugs (IDMA)
3. Journal of Controlled Release (Elsevier Sciences)
4. Drug Development and Industrial Pharmacy (Marcel & Decker)
5. International Journal of Pharmaceutics (Elsevier Sciences)

## **SEMESTER VIII**

## **BP801T. BIOSTATISTICS AND RESEARCH METHODOLOGY (Theory)**

**45 Hours**

**Scope:** To understand the applications of Biostatistics in Pharmacy. This subject deals with descriptive statistics, Graphics, Correlation, Regression, logistic regression Probability theory, Sampling technique, Parametric tests, Non Parametric tests, ANOVA, Introduction to Design of Experiments, Phases of Clinical trials and Observational and Experimental studies, SPSS, R and MINITAB statistical software's, analyzing the statistical data using Excel.

**Objectives:** Upon completion of the course the student shall be able to

- Know the operation of M.S. Excel, SPSS, R and MINITAB<sup>®</sup>, DoE (Design of Experiment)
- Know the various statistical techniques to solve statistical problems
- Appreciate statistical techniques in solving the problems.

### **Course content:**

#### **Unit-I**

**10 Hours**

**Introduction:** Statistics, Biostatistics, Frequency distribution

**Measures of central tendency:** Mean, Median, Mode- Pharmaceutical examples

**Measures of dispersion:** Dispersion, Range, standard deviation, Pharmaceutical problems

**Correlation:** Definition, Karl Pearson's coefficient of correlation, Multiple correlation - Pharmaceuticals examples

#### **Unit-II**

**10 Hours**

**Regression:** Curve fitting by the method of least squares, fitting the lines  $y = a + bx$  and  $x = a + by$ , Multiple regression, standard error of regression- Pharmaceutical Examples

**Probability:** Definition of probability, Binomial distribution, Normal distribution, Poisson's distribution, properties - problems

Sample, Population, large sample, small sample, Null hypothesis, alternative hypothesis, sampling, essence of sampling, types of sampling, Error-I type, Error-II type, Standard error of mean (SEM) - Pharmaceutical examples

**Parametric test:** t-test (Sample, Pooled or Unpaired and Paired), ANOVA, (One way and Two way), Least Significance difference

#### **Unit-III**

**10 Hours**

**Non Parametric tests:** Wilcoxon Rank Sum Test, Mann-Whitney U test, Kruskal-Wallis test, Friedman Test

**Introduction to Research:** Need for research, Need for design of Experiments, Experiential Design Technique, plagiarism

**Graphs:** Histogram, Pie Chart, Cubic Graph, response surface plot, Counter Plot graph

**Designing the methodology:** Sample size determination and Power of a study, Report writing and presentation of data, Protocol, Cohorts studies, Observational studies, Experimental studies, Designing clinical trial, various phases.

#### **Unit-IV**

**8 Hours**

Blocking and confounding system for Two-level factorials

**Regression modeling:** Hypothesis testing in Simple and Multiple regression models

**Introduction to Practical components of Industrial and Clinical Trials Problems:**

Statistical Analysis Using Excel, SPSS, MINITAB®, DESIGN OF EXPERIMENTS, R - Online Statistical Software's to Industrial and Clinical trial approach

#### **Unit-V**

**7Hours**

**Design and Analysis of experiments:**

**Factorial Design:** Definition,  $2^2$ ,  $2^3$  design. Advantage of factorial design

**Response Surface methodology:** Central composite design, Historical design, Optimization Techniques

#### **Recommended Books (Latest edition):**

1. Pharmaceutical statistics- Practical and clinical applications, Sanford Bolton, publisher Marcel Dekker Inc. New York.
2. Fundamental of Statistics – Himalaya Publishing House- S.C.Guptha
3. Design and Analysis of Experiments –PHI Learning Private Limited, R. Pannerselvam,
4. Design and Analysis of Experiments – Wiley Students Edition, Douglas and C. Montgomery



## **BP 802T SOCIAL AND PREVENTIVE PHARMACY**

**Hours: 45**

### **Scope:**

The purpose of this course is to introduce to students a number of health issues and their challenges. This course also introduced a number of national health programmes. The roles of the pharmacist in these contexts are also discussed.

### **Objectives:**

After the successful completion of this course, the student shall be able to:

- Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.
- Have a critical way of thinking based on current healthcare development.
- Evaluate alternative ways of solving problems related to health and pharmaceutical issues

### **Course content:**

#### **Unit I:**

**10 Hours**

**Concept of health and disease:** Definition, concepts and evaluation of public health. Understanding the concept of prevention and control of disease, social causes of diseases and social problems of the sick.

**Social and health education:** Food in relation to nutrition and health, Balanced diet, Nutritional deficiencies, Vitamin deficiencies, Malnutrition and its prevention.

**Sociology and health:** Socio cultural factors related to health and disease, Impact of urbanization on health and disease, Poverty and health

**Hygiene and health:** personal hygiene and health care; avoidable habits

#### **Unit II:**

**10 Hours**

**Preventive medicine:** General principles of prevention and control of diseases such as cholera, SARS, Ebola virus, influenza, acute respiratory infections, malaria, chicken guinea, dengue, lymphatic filariasis, pneumonia, hypertension, diabetes mellitus, cancer, drug addiction-drug substance abuse

#### **Unit III:**

**10 Hours**

**National health programs, its objectives, functioning and outcome of the following:** HIV AND AIDS control programme, TB, Integrated disease surveillance program (IDSP), National leprosy control programme, National mental health program, National

programme for prevention and control of deafness, Universal immunization programme, National programme for control of blindness, Pulse polio programme.

**Unit IV:**

**08 Hours**

National health intervention programme for mother and child, National family welfare programme, National tobacco control programme, National Malaria Prevention Program, National programme for the health care for the elderly, Social health programme; role of WHO in Indian national program

**Unit V:**

**07 Hours**

Community services in rural, urban and school health: Functions of PHC, Improvement in rural sanitation, national urban health mission, Health promotion and education in school.

**Recommended Books (Latest edition):**

1. Short Textbook of Preventive and Social Medicine, Prabhakara GN, 2<sup>nd</sup> Edition, 2010, ISBN: 9789380704104, JAYPEE Publications
2. Textbook of Preventive and Social Medicine (Mahajan and Gupta), Edited by Roy Rabindra Nath, Saha Indranil, 4<sup>th</sup> Edition, 2013, ISBN: 9789350901878, JAYPEE Publications
3. Review of Preventive and Social Medicine (Including Biostatistics), Jain Vivek, 6<sup>th</sup> Edition, 2014, ISBN: 9789351522331, JAYPEE Publications
4. Essentials of Community Medicine—A Practical Approach, Hiremath Lalita D, Hiremath Dhananjaya A, 2<sup>nd</sup> Edition, 2012, ISBN: 9789350250440, JAYPEE Publications
5. Park Textbook of Preventive and Social Medicine, K Park, 21<sup>st</sup> Edition, 2011, ISBN-14: 9788190128285, BANARSIDAS BHANOT PUBLISHERS.
6. Community Pharmacy Practice, Ramesh Adepu, BSP publishers, Hyderabad

**Recommended Journals:**

1. Research in Social and Administrative Pharmacy, Elsevier, Ireland

## **BP803ET. PHARMA MARKETING MANAGEMENT (Theory)**

**45 Hours**

### **Scope:**

The pharmaceutical industry not only needs highly qualified researchers, chemists and, technical people, but also requires skilled managers who can take the industry forward by managing and taking the complex decisions which are imperative for the growth of the industry. The Knowledge and Know-how of marketing management groom the people for taking a challenging role in Sales and Product management.

**Course Objective:** The course aims to provide an understanding of marketing concepts and techniques and their applications in the pharmaceutical industry.

### **Unit I**

**10 Hours**

#### **Marketing:**

Definition, general concepts and scope of marketing; Distinction between marketing & selling; Marketing environment; Industry and competitive analysis; Analyzing consumer buying behavior; industrial buying behavior.

#### **Pharmaceutical market:**

Quantitative and qualitative aspects; size and composition of the market; demographic descriptions and socio-psychological characteristics of the consumer; market segmentation & targeting. Consumer profile; Motivation and prescribing habits of the physician; patients' choice of physician and retail pharmacist. Analyzing the Market; Role of market research.

### **Unit II**

**10 Hours**

#### **Product decision:**

Classification, product line and product mix decisions, product life cycle, product portfolio analysis; product positioning; New product decisions; Product branding, packaging and labeling decisions, Product management in pharmaceutical industry.

### **Unit III**

**10 Hours**

#### **Promotion:**

Methods, determinants of promotional mix, promotional budget; An overview of personal selling, advertising, direct mail, journals, sampling, retailing, medical exhibition, public relations, online promotional techniques for OTC Products.

#### **Unit IV**

**10 Hours**

##### **Pharmaceutical marketing channels:**

Designing channel, channel members, selecting the appropriate channel, conflict in channels, physical distribution management: Strategic importance, tasks in physical distribution management.

##### **Professional sales representative (PSR):**

Duties of PSR, purpose of detailing, selection and training, supervising, norms for customer calls, motivating, evaluating, compensation and future prospects of the PSR.

#### **Unit V**

**10 Hours**

##### **Pricing:**

Meaning, importance, objectives, determinants of price; pricing methods and strategies, issues in price management in pharmaceutical industry. An overview of DPCO (Drug Price Control Order) and NPPA (National Pharmaceutical Pricing Authority).

##### **Emerging concepts in marketing:**

Vertical & Horizontal Marketing; Rural Marketing; Consumerism; Industrial Marketing; Global Marketing.

##### **Recommended Books: (Latest Editions)**

1. Philip Kotler and Kevin Lane Keller: Marketing Management, Prentice Hall of India, New Delhi
2. Walker, Boyd and Larreche : Marketing Strategy- Planning and Implementation, Tata MC GrawHill, New Delhi.
3. Dhruv Grewal and Michael Levy: Marketing, Tata MC Graw Hill
4. Arun Kumar and N Menakshi: Marketing Management, Vikas Publishing, India
5. Rajan Saxena: Marketing Management; Tata MC Graw-Hill (India Edition)
6. Ramaswamy, U.S & Nanakamari, S: Marketing Managemnt:Global Perspective, IndianContext,Macmilan India, New Delhi.
7. Shanker, Ravi: Service Marketing, Excell Books, New Delhi
8. Subba Rao Changanti, Pharmaceutical Marketing in India (GIFT – Excel series) Excel Publications.



## **BP804 ET: PHARMACEUTICAL REGULATORY SCIENCE (Theory)**

**45Hours**

**Scope:** This course is designed to impart the fundamental knowledge on the regulatory requirements for approval of new drugs, and drug products in regulated markets of India & other countries like US, EU, Japan, Australia, UK etc. It prepares the students to learn in detail on the regulatory requirements, documentation requirements, and registration procedures for marketing the drug products.

**Objectives:** Upon completion of the subject student shall be able to;

1. Know about the process of drug discovery and development
2. Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
3. Know the regulatory approval process and their registration in Indian and international markets

### **Course content:**

#### **Unit I**

**10Hours**

##### **New Drug Discovery and development**

Stages of drug discovery, Drug development process, pre-clinical studies, non-clinical activities, clinical studies, Innovator and generics, Concept of generics, Generic drug product development.

#### **Unit II**

**10Hours**

##### **Regulatory Approval Process**

Approval processes and timelines involved in Investigational New Drug (IND), New Drug Application (NDA), Abbreviated New Drug Application (ANDA). Changes to an approved NDA / ANDA.

##### **Regulatory authorities and agencies**

Overview of regulatory authorities of India, United States, European Union, Australia, Japan, Canada (Organization structure and types of applications)

#### **Unit III**

**10Hours**

##### **Registration of Indian drug product in overseas market**

Procedure for export of pharmaceutical products, Technical documentation, Drug Master Files (DMF), Common Technical Document (CTD), electronic Common Technical

Document (eCTD), ASEAN Common Technical Document (ACTD) research.

#### **Unit IV**

**08Hours**

##### **Clinical trials**

Developing clinical trial protocols, Institutional Review Board / Independent Ethics committee - formation and working procedures, Informed consent process and procedures, GCP obligations of Investigators, sponsors & Monitors, Managing and Monitoring clinical trials, Pharmacovigilance - safety monitoring in clinical trials

#### **Unit V**

**07Hours**

##### **Regulatory Concepts**

Basic terminology, guidance, guidelines, regulations, Laws and Acts, Orange book, Federal Register, Code of Federal Regulatory, Purple book

##### **Recommended books (Latest edition):**

1. Drug Regulatory Affairs by Sachin Itkar, Dr. N.S. Vyawahare, Nirali Prakashan.
2. The Pharmaceutical Regulatory Process, Second Edition Edited by Ira R. Berry and Robert P. Martin, Drugs and the Pharmaceutical Sciences, Vol.185. Informa Health care Publishers.
3. New Drug Approval Process: Accelerating Global Registrations By Richard A Guarino, MD, 5<sup>th</sup> edition, Drugs and the Pharmaceutical Sciences, Vol.190.
4. Guidebook for drug regulatory submissions / Sandy Weinberg. By John Wiley & Sons. Inc.
5. FDA Regulatory Affairs: a guide for prescription drugs, medical devices, and biologics /edited by Douglas J. Pisano, David Mantus.
6. Generic Drug Product Development, Solid Oral Dosage forms, Leon Shargel and Isader Kaufer, Marcel Dekker series, Vol.143
7. Clinical Trials and Human Research: A Practical Guide to Regulatory Compliance By Fay A. Rozovsky and Rodney K. Adams
8. Principles and Practices of Clinical Research, Second Edition Edited by John I. Gallin and Frederick P. Ognibene
9. Drugs: From Discovery to Approval, Second Edition By Rick Ng

## **BP 805T: PHARMACOVIGILANCE (Theory)**

**45 hours**

**Scope:** This paper will provide an opportunity for the student to learn about development of pharmacovigilance as a science, basic terminologies used in pharmacovigilance, global scenario of Pharmacovigilance, train students on establishing pharmacovigilance programme in an organization, various methods that can be used to generate safety data and signal detection. This paper also develops the skills of classifying drugs, diseases and adverse drug reactions.

### **Objectives:**

*At completion of this paper it is expected that students will be able to (know, do, and appreciate):*

1. Why drug safety monitoring is important?
2. History and development of pharmacovigilance
3. National and international scenario of pharmacovigilance
4. Dictionaries, coding and terminologies used in pharmacovigilance
5. Detection of new adverse drug reactions and their assessment
6. International standards for classification of diseases and drugs
7. Adverse drug reaction reporting systems and communication in pharmacovigilance
8. Methods to generate safety data during pre clinical, clinical and post approval phases of drugs' life cycle
9. Drug safety evaluation in paediatrics, geriatrics, pregnancy and lactation
10. Pharmacovigilance Program of India (PvPI) requirement for ADR reporting in India
11. ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning
12. CIOMS requirements for ADR reporting
13. Writing case narratives of adverse events and their quality.

## **Course Content**

### **Unit I**

**10 Hours**

#### **Introduction to Pharmacovigilance**

- History and development of Pharmacovigilance
- Importance of safety monitoring of Medicine
- WHO international drug monitoring programme
- Pharmacovigilance Program of India(PvPI)

#### **Introduction to adverse drug reactions**

- Definitions and classification of ADRs
- Detection and reporting
- Methods in Causality assessment
- Severity and seriousness assessment
- Predictability and preventability assessment
- Management of adverse drug reactions

#### **Basic terminologies used in pharmacovigilance**



- Terminologies of adverse medication related events
- Regulatory terminologies

## **Unit II**

**10 hours**

### **Drug and disease classification**

- Anatomical, therapeutic and chemical classification of drugs
- International classification of diseases
- Daily defined doses
- International Non proprietary Names for drugs

### **Drug dictionaries and coding in pharmacovigilance**

- WHO adverse reaction terminologies
- MedDRA and Standardised MedDRA queries
- WHO drug dictionary
- Eudravigilance medicinal product dictionary

### **Information resources in pharmacovigilance**

- Basic drug information resources
- Specialised resources for ADRs

### **Establishing pharmacovigilance programme**

- Establishing in a hospital
- Establishment & operation of drug safety department in industry
- Contract Research Organisations (CROs)
- Establishing a national programme

## **Unit III**

**10 Hours**

### **Vaccine safety surveillance**

- Vaccine Pharmacovigilance
- Vaccination failure
- Adverse events following immunization

### **Pharmacovigilance methods**

- Passive surveillance – Spontaneous reports and case series
- Stimulated reporting
- Active surveillance – Sentinel sites, drug event monitoring and registries
- Comparative observational studies – Cross sectional study, case control study and cohort study
- Targeted clinical investigations

### **Communication in pharmacovigilance**

- Effective communication in Pharmacovigilance
- Communication in Drug Safety Crisis management
- Communicating with Regulatory Agencies, Business Partners, Healthcare facilities & Media

## **Unit IV**

**8 Hours**

### **Safety data generation**

- Pre clinical phase
- Clinical phase
- Post approval phase (PMS)

### **ICH Guidelines for Pharmacovigilance**

- Organization and objectives of ICH
- Expedited reporting
- Individual case safety reports
- Periodic safety update reports
- Post approval expedited reporting
- Pharmacovigilance planning
- Good clinical practice in pharmacovigilance studies

## **Unit V**

**7 hours**

### **Pharmacogenomics of adverse drug reactions**

- Genetics related ADR with example focusing PK parameters.

### **Drug safety evaluation in special population**

- Paediatrics
- Pregnancy and lactation
- Geriatrics

### **CIOMS**

- CIOMS Working Groups
- CIOMS Form

### **CDSCO (India) and Pharmacovigilance**

- D&C Act and Schedule Y
- Differences in Indian and global pharmacovigilance requirements

### **Recommended Books (Latest edition):**

1. Textbook of Pharmacovigilance: S K Gupta, Jaypee Brothers, Medical Publishers.
2. Practical Drug Safety from A to Z By Barton Cobert, Pierre Biron, Jones and Bartlett Publishers.
3. Mann's Pharmacovigilance: Elizabeth B. Andrews, Nicholas, Wiley Publishers.
4. Stephens' Detection of New Adverse Drug Reactions: John Talbot, Patrick Walle, Wiley Publishers.
5. An Introduction to Pharmacovigilance: Patrick Waller, Wiley Publishers.
6. Cobert's Manual of Drug Safety and Pharmacovigilance: Barton Cobert, Jones & Bartlett Publishers.
7. Textbook of Pharmacoepidemiology edited by Brian L. Strom, Stephen E Kimmel, Sean Hennessy, Wiley Publishers.
8. A Textbook of Clinical Pharmacy Practice -Essential Concepts and Skills: G. Parthasarathi, Karin Nyfort Hansen, Milap C. Nahata
9. National Formulary of India
10. Text Book of Medicine by Yashpal Munjal

11. Text book of Pharmacovigilance: concept and practice by GP Mohanta and PK Manna

12. <http://www.who.unc.org/DynPage.aspx?id=105825&mn1=7347&mn2=7259&mn3=7297>
13. <http://www.ich.org/>
14. <http://www.cioms.ch/>
15. <http://cdsco.nic.in/>
16. [http://www.who.int/vaccine\\_safety/en/](http://www.who.int/vaccine_safety/en/)
17. [http://www.ipc.gov.in/PvPI/pv\\_home.html](http://www.ipc.gov.in/PvPI/pv_home.html)

## **BP 806 ET. QUALITY CONTROL AND STANDARDIZATION OF HERBALS (Theory)**

**Scope:** In this subject the student learns about the various methods and guidelines for evaluation and standardization of herbs and herbal drugs. The subject also provides an opportunity for the student to learn cGMP, GAP and GLP in traditional system of medicines.

**Objectives:** Upon completion of the subject student shall be able to;

1. know WHO guidelines for quality control of herbal drugs
2. know Quality assurance in herbal drug industry
3. know the regulatory approval process and their registration in Indian and international markets
4. appreciate EU and ICH guidelines for quality control of herbal drugs

### **Unit I**

**10 hours**

Basic tests for drugs – Pharmaceutical substances, Medicinal plants materials and dosage forms

WHO guidelines for quality control of herbal drugs.

Evaluation of commercial crude drugs intended for use

### **Unit II**

**10 hours**

**Quality assurance in herbal drug industry** of cGMP, GAP, GMP and GLP in traditional system of medicine.

WHO Guidelines on current good manufacturing Practices (cGMP) for Herbal Medicines

WHO Guidelines on GACP for Medicinal Plants.

### **Unit III**

**10 hours**

EU and ICH guidelines for quality control of herbal drugs.

Research Guidelines for Evaluating the Safety and Efficacy of Herbal Medicines

### **Unit IV**

**08 hours**

Stability testing of herbal medicines. Application of various chromatographic techniques in standardization of herbal products.

Preparation of documents for new drug application and export registration

GMP requirements and Drugs & Cosmetics Act provisions.

## **Unit V**

**07 hours**

Regulatory requirements for herbal medicines.

WHO guidelines on safety monitoring of herbal medicines in pharmacovigilance systems

Comparison of various Herbal Pharmacopoeias.

Role of chemical and biological markers in standardization of herbal products

### **Recommended Books: (Latest Editions)**

1. Pharmacognosy by Trease and Evans
2. Pharmacognosy by Kokate, Purohit and Gokhale
3. Rangari, V.D., Text book of Pharmacognosy and Phytochemistry Vol. I , Carrier Pub., 2006.
4. Aggrawal, S.S., Herbal Drug Technology. Universities Press, 2002.
5. EMEA. Guidelines on Quality of Herbal Medicinal Products/Traditional Medicinal Products,
6. Mukherjee, P.W. Quality Control of Herbal Drugs: An Approach to Evaluation of Botanicals. Business Horizons Publishers, New Delhi, India, 2002.
7. Shinde M.V., Dhalwal K., Potdar K., Mahadik K. Application of quality control principles to herbal drugs. International Journal of Phytomedicine 1(2009); p. 4-8.
8. WHO. Quality Control Methods for Medicinal Plant Materials, World Health Organization, Geneva, 1998. WHO. Guidelines for the Appropriate Use of Herbal Medicines. WHO Regional Publications, Western Pacific Series No 3, WHO Regional office for the Western Pacific, Manila, 1998.
9. WHO. The International Pharmacopeia, Vol. 2: Quality Specifications, 3rd edn. World Health Organization, Geneva, 1981.
10. WHO. Quality Control Methods for Medicinal Plant Materials. World Health Organization, Geneva, 1999.
11. WHO. WHO Global Atlas of Traditional, Complementary and Alternative Medicine. 2 vol. set. Vol. 1 contains text and Vol. 2, maps. World Health Organization, Geneva, 2005.
12. WHO. Guidelines on Good Agricultural and Collection Practices (GACP) for Medicinal Plants. World Health Organization, Geneva, 2004.

## BP 807 ET. COMPUTER AIDED DRUG DESIGN (Theory)

**45 Hours**

**Scope:** This subject is designed to provide detailed knowledge of rational drug design process and various techniques used in rational drug design process.

**Objectives:** Upon completion of the course, the student shall be able to understand

- Design and discovery of lead molecules
- The role of drug design in drug discovery process
- The concept of QSAR and docking
- Various strategies to develop new drug like molecules.
- The design of new drug molecules using molecular modeling software

### Course Content:

#### UNIT-I

**10 Hours**

##### **Introduction to Drug Discovery and Development**

Stages of drug discovery and development

##### **Lead discovery and Analog Based Drug Design**

Rational approaches to lead discovery based on traditional medicine, Random screening, Non-random screening, serendipitous drug discovery, lead discovery based on drug metabolism, lead discovery based on clinical observation.

**Analog Based Drug Design:** Bioisosterism, Classification, Bioisosteric replacement. Any three case studies

#### UNIT-II

**10 Hours**

##### **Quantitative Structure Activity Relationship (QSAR)**

SAR versus QSAR, History and development of QSAR, Types of physicochemical parameters, experimental and theoretical approaches for the determination of physicochemical parameters such as Partition coefficient, Hammett's substituent constant and Taft's steric constant. Hansch analysis, Free Wilson analysis, 3D-QSAR approaches like COMFA and COMSIA.

#### UNIT-III

**10 Hours**

##### **Molecular Modeling and virtual screening techniques**

**Virtual Screening techniques:** Drug likeness screening, Concept of pharmacophore mapping and pharmacophore based Screening,

**Molecular docking:** Rigid docking, flexible docking, manual docking, Docking based screening. *De novo* drug design.

**UNIT-IV****08 Hours****Informatics & Methods in drug design**

Introduction to Bioinformatics, chemoinformatics. ADME databases, chemical, biochemical and pharmaceutical databases.

**UNIT-V****07 Hours**

**Molecular Modeling:** Introduction to molecular mechanics and quantum mechanics. Energy Minimization methods and Conformational Analysis, global conformational minima determination.

**Recommended Books (Latest Editions)**

1. Robert GCK, ed., "Drug Action at the Molecular Level" University Park Press Baltimore.
2. Martin YC. "Quantitative Drug Design" Dekker, New York.
3. Delgado JN, Remers WA eds "Wilson & Gisvolds's Text Book of Organic Medicinal & Pharmaceutical Chemistry" Lippincott, New York.
4. Foye WO "Principles of Medicinal chemistry" Lea & Febiger.
5. Koro Ikova A, Burckhalter JH. "Essentials of Medicinal Chemistry" Wiley Interscience.
6. Wolf ME, ed "The Basis of Medicinal Chemistry, Burger's Medicinal Chemistry" John Wiley & Sons, New York.
7. Patrick Graham, L., An Introduction to Medicinal Chemistry, Oxford University Press.
8. Smith HJ, Williams H, eds, "Introduction to the principles of Drug Design" Wright Boston.
9. Silverman R.B. "The organic Chemistry of Drug Design and Drug Action" Academic Press New York.



## **BP808ET: CELL AND MOLECULAR BIOLOGY (Elective subject)**

**45 Hours**

### **Scope:**

- Cell biology is a branch of biology that studies cells – their physiological properties, their structure, the organelles they contain, interactions with their environment, their life cycle, division, death and cell function.
- This is done both on a microscopic and molecular level.
- Cell biology research encompasses both the great diversity of single-celled organisms like bacteria and protozoa, as well as the many specialized cells in multi-cellular organisms such as humans, plants, and sponges.

### **Objectives:** Upon completion of the subject student shall be able to;

- Summarize cell and molecular biology history.
- Summarize cellular functioning and composition.
- Describe the chemical foundations of cell biology.
- Summarize the DNA properties of cell biology.
- Describe protein structure and function.
- Describe cellular membrane structure and function.
- Describe basic molecular genetic mechanisms.
- Summarize the Cell Cycle

### **Course content:**

#### **Unit I**

**10Hours**

- a) Cell and Molecular Biology: Definitions theory and basics and Applications.
- b) Cell and Molecular Biology: History and Summation.
- c) Properties of cells and cell membrane.
- d) Prokaryotic versus Eukaryotic
- e) Cellular Reproduction
- f) Chemical Foundations – an Introduction and Reactions (Types)

#### **Unit II**

**10 Hours**

- a) DNA and the Flow of Molecular Information
- b) DNA Functioning
- c) DNA and RNA
- d) Types of RNA
- e) Transcription and Translation

#### **Unit III**

**10 Hours**

- a) Proteins: Defined **and** Amino Acids
- b) Protein Structure

- c) Regularities in Protein Pathways
- d) Cellular Processes
- e) Positive Control and significance of Protein Synthesis

#### **Unit IV**

**08 Hours**

- a) Science of Genetics
- b) Transgenics and Genomic Analysis
- c) Cell Cycle analysis
- d) Mitosis and Meiosis
- e) Cellular Activities and Checkpoints

#### **Unit V**

**07 Hours**

- a) Cell Signals: Introduction
- b) Receptors for Cell Signals
- c) Signaling Pathways: Overview
- d) Misregulation of Signaling Pathways
- e) Protein-Kinases: Functioning

#### **Recommended Books (latest edition):**

1. W.B. Hugo and A.D. Russel: Pharmaceutical Microbiology, Blackwell Scientific publications, Oxford London.
2. Prescott and Dunn., Industrial Microbiology, 4<sup>th</sup> edition, CBS Publishers & Distributors, Delhi.
3. Pelczar, Chan Kreig, Microbiology, Tata McGraw Hill edn.
4. Malcolm Harris, Balliere Tindall and Cox: Pharmaceutical Microbiology.
5. Rose: Industrial Microbiology.
6. Probisher, Hinsdill et al: Fundamentals of Microbiology, 9th ed. Japan
7. Cooper and Gunn's: Tutorial Pharmacy, CBS Publisher and Distribution.
8. Peppler: Microbial Technology.
9. Edward: Fundamentals of Microbiology.
10. N.K.Jain: Pharmaceutical Microbiology, Vallabh Prakashan, Delhi
11. Bergeys manual of systematic bacteriology, Williams and Wilkins- A Waverly company
12. B.R. Glick and J.J. Pasternak: Molecular Biotechnology: Principles and Applications of RecombinantDNA: ASM Press Washington D.C.
13. RA Goldshy et. al., : Kuby Immunology.

## BP809ET. COSMETIC SCIENCE(Theory)

45Hours

### UNIT I

10Hours

Classification of cosmetic and cosmeceutical products

Definition of cosmetics as per Indian and EU regulations, Evolution of cosmeceuticals from cosmetics, cosmetics as quasi and OTC drugs

**Cosmetic excipients:** Surfactants, rheology modifiers, humectants, emollients, preservatives. Classification and application

**Skin:** Basic structure and function of skin.

**Hair:** Basic structure of hair. Hair growth cycle.

**Oral Cavity:** Common problem associated with teeth and gums.

### UNIT II

10 Hours

**Principles of formulation and building blocks of skin care products:**

Face wash,

Moisturizing cream, Cold Cream, Vanishing cream and their advantages and disadvantages. Application of these products in formulation of cosmeceuticals.

**Antiperspirants & deodorants-** Actives & mechanism of action.

**Principles of formulation and building blocks of Hair care products:**

Conditioning shampoo, Hair conditioner, anti-dandruff shampoo.

Hair oils.

Chemistry and formulation of Para-phenylene diamine based hair dye.

Principles of formulation and building blocks of oral care products:

Toothpaste for bleeding gums, sensitive teeth. Teeth whitening, Mouthwash.

### UNIT III

10 Hours

Sun protection, Classification of Sunscreens and SPF.

**Role of herbs in cosmetics:**

Skin Care: Aloe and turmeric

Hair care: Henna and amla.

Oral care: Neem and clove

**Analytical cosmetics:** BIS specification and analytical methods for shampoo, skin-cream and toothpaste.

### UNIT IV

08 Hours.

Principles of Cosmetic Evaluation: Principles of sebumeter, corneometer. Measurement of TEWL, Skin Color, Hair tensile strength, Hair combing properties

Soaps, and syndet bars. Evolution and skin benefits.

## **UNIT V**

**07 Hours**

Oily and dry skin, causes leading to dry skin, skin moisturisation. Basic understanding of the terms Comedogenic, dermatitis.

Cosmetic problems associated with Hair and scalp: Dandruff, Hair fall causes

Cosmetic problems associated with skin: blemishes, wrinkles, acne, prickly heat and body odor.

Antiperspirants and Deodorants- Actives and mechanism of action

### **References**

- 1) Harry's Cosmeticology, Wilkinson, Moore, Seventh Edition, George Godwin.
- 2) Cosmetics – Formulations, Manufacturing and Quality Control, P.P. Sharma, 4<sup>th</sup> Edition, Vandana Publications Pvt. Ltd., Delhi.
- 3) Text book of cosmeticology by Sanju Nanda & Roop K. Khar, Tata Publishers.

## BP810 ET. PHARMACOLOGICAL SCREENING METHODS

**45 Hours**

**Scope:** This subject is designed to impart the basic knowledge of preclinical studies in experimental animals including design, conduct and interpretations of results.

### Objectives

Upon completion of the course the student shall be able to,

- Appreciate the applications of various commonly used laboratory animals.
- Appreciate and demonstrate the various screening methods used in preclinical research
- Appreciate and demonstrate the importance of biostatistics and research methodology
- Design and execute a research hypothesis independently

<b>Unit –I</b>	<b>08 Hours</b>
<b>Laboratory Animals:</b> Study of CPCSEA and OECD guidelines for maintenance, breeding and conduct of experiments on laboratory animals, Common lab animals: Description and applications of different species and strains of animals. Popular transgenic and mutant animals. Techniques for collection of blood and common routes of drug administration in laboratory animals, Techniques of blood collection and euthanasia.	
<b>Unit –II</b>	<b>10 Hours</b>
<b>Preclinical screening models</b> a. Introduction: Dose selection, calculation and conversions, preparation of drug solution/suspensions, grouping of animals and importance of sham negative and positive control groups. Rationale for selection of animal species and sex for the study. b. <b>Study of screening animal models for</b> Diuretics, nootropics, anti-Parkinson's, antiasthmatics, <b>Preclinical screening models:</b> for CNS activity- analgesic, antipyretic, anti-inflammatory, general anaesthetics, sedative and hypnotics, antipsychotic, antidepressant, antiepileptic, antiparkinsonism, alzheimer's disease	

<b>Unit –III</b>  <b>Preclinical screening models:</b> for ANS activity, sympathomimetics, sympatholytics, parasympathomimetics, parasympatholytics, skeletal muscle relaxants, drugs acting on eye, local anaethetics	
<b>Unit –IV</b>  <b>Preclinical screening models:</b> for CVS activity- antihypertensives, diuretics, antiarrhythmic, antidyslepidemic, anti aggregatory, coagulants, and anticoagulants Preclinical screening models for other important drugs like antiulcer, antidiabetic, anticancer and antiasthmatics.	
<b>Research methodology and Bio-statistics</b> Selection of research topic, review of literature, research hypothesis and study design Pre-clinical data analysis and interpretation using Students ‘t’ test and One-way ANOVA. Graphical representation of data	<b>05 Hours</b>

**Recommended Books (latest edition):**

1. Fundamentals of experimental Pharmacology-by M.N.Ghosh
2. Hand book of Experimental Pharmacology-S.K.Kulakarni
3. CPCSEA guidelines for laboratory animal facility.
4. Drug discovery and Evaluation by Vogel H.G.
5. Drug Screening Methods by Suresh Kumar Gupta and S. K. Gupta
6. Introduction to biostatistics and research methods by PSS Sundar Rao and J Richard

## **BP 811 ET. ADVANCED INSTRUMENTATION TECHNIQUES**

**45 Hours**

**Scope:** This subject deals with the application of instrumental methods in qualitative and quantitative analysis of drugs. This subject is designed to impart advanced knowledge on the principles and instrumentation of spectroscopic and chromatographic hyphenated techniques. This also emphasizes on theoretical and practical knowledge on modern analytical instruments that are used for drug testing.

**Objectives:** Upon completion of the course the student shall be able to

- understand the advanced instruments used and its applications in drug analysis
- understand the chromatographic separation and analysis of drugs.
- understand the calibration of various analytical instruments
- know analysis of drugs using various analytical instruments.

### **Course Content:**

#### **UNIT-I**

**10 Hours**

##### **Nuclear Magnetic Resonance spectroscopy**

Principles of H-NMR and C-NMR, chemical shift, factors affecting chemical shift, coupling constant, Spin - spin coupling, relaxation, instrumentation and applications

**Mass Spectrometry-** Principles, Fragmentation, Ionization techniques – Electron impact, chemical ionization, MALDI, FAB, Analyzers-Time of flight and Quadrupole, instrumentation, applications

#### **UNIT-II**

**10 Hours**

**Thermal Methods of Analysis:** Principles, instrumentation and applications of Thermogravimetric Analysis (TGA), Differential Thermal Analysis (DTA), Differential Scanning Calorimetry (DSC)

**X-Ray Diffraction Methods:** Origin of X-rays, basic aspects of crystals, X-ray

Crystallography, rotating crystal technique, single crystal diffraction, powder diffraction, structural elucidation and applications.

#### **UNIT-III**

**10 Hours**

**Calibration and validation-**as per ICH and USFDA guidelines

##### **Calibration of following Instruments**

Electronic balance, UV-Visible spectrophotometer, IR spectrophotometer,

Fluorimeter, Flame Photometer, HPLC and GC

**UNIT-IV**

**08 Hours**

**Radio immune assay:**Importance, various components, Principle, different methods, Limitation and Applications of Radio immuno assay

**Extraction techniques:**General principle and procedure involved in the solid phase extraction and liquid-liquid extraction

**UNIT-V**

**07 Hours**

**Hyphenated techniques**-LC-MS/MS, GC-MS/MS, HPTLC-MS.

**Recommended Books (Latest Editions)**

1. Instrumental Methods of Chemical Analysis by B.K Sharma
2. Organic spectroscopy by Y.R Sharma
3. Text book of Pharmaceutical Analysis by Kenneth A. Connors
4. Vogel's Text book of Quantitative Chemical Analysis by A.I. Vogel
5. Practical Pharmaceutical Chemistry by A.H. Beckett and J.B. Stenlake
6. Organic Chemistry by I. L. Finar
7. Organic spectroscopy by William Kemp
8. Quantitative Analysis of Drugs by D. C. Garrett
9. Quantitative Analysis of Drugs in Pharmaceutical Formulations by P. D. Sethi
10. Spectrophotometric identification of Organic Compounds by Silverstein



## **BP 812 ET. DIETARY SUPPLEMENTS AND NUTRACEUTICALS**

**No. of hours :3**

**Tutorial:1**

**Credit point:4**

### **Scope :**

This subject covers foundational topic that are important for understanding the need and requirements of dietary supplements among different groups in the population.

### **Objective:**

This module aims to provide an understanding of the concepts behind the theoretical applications of dietary supplements. By the end of the course, students should be able to :

1. Understand the need of supplements by the different group of people to maintain healthy life.
2. Understand the outcome of deficiencies in dietary supplements.
3. Appreciate the components in dietary supplements and the application.
4. Appreciate the regulatory and commercial aspects of dietary supplements including health claims.

### **UNIT I**

**07 hours**

- a. Definitions of Functional foods, Nutraceuticals and Dietary supplements. Classification of Nutraceuticals, Health problems and diseases that can be prevented or cured by Nutraceuticals i.e. weight control, diabetes, cancer, heart disease, stress, osteoarthritis, hypertension etc.
- b. Public health nutrition, maternal and child nutrition, nutrition and ageing, nutrition education in community.
- c. Source, Name of marker compounds and their chemical nature, Medicinal uses and health benefits of following used as nutraceuticals/functional foods: Spirulina, Soyabean, Ginseng, Garlic, Broccoli, Gingko, Flaxseeds

### **UNIT II**

**15 hours**

Phytochemicals as nutraceuticals: Occurrence and characteristic features(chemical nature medicinal benefits) of following

- a) Carotenoids- and -Carotene, Lycopene, Xanthophylls, leutin
- b) Sulfides: Diallyl sulfides, Allyl trisulfide.
- c) Polyphenolics: Resveratrol
- d) Flavonoids- Rutin , Naringin, Quercetin, Anthocyanidins, catechins, Flavones
- e) Prebiotics / Probiotics.: Fructo oligosaccharides, Lacto bacillum
- f) Phyto estrogens : Isoflavones, daidzein, Geobustan, lignans
- g) Tocopherols
- h) Proteins, vitamins, minerals, cereal, vegetables and beverages as functional foods: oats, wheat bran, rice bran, sea foods, coffee, tea and the like.

### **UNIT III**

**07 hours**

- a) Introduction to free radicals: Free radicals, reactive oxygen species, production of free radicals in cells, damaging reactions of free radicals on lipids, proteins, Carbohydrates, nucleic acids.

- b) Dietary fibres and complex carbohydrates as functional food ingredients..

#### **UNIT IV**

**10 hours**

- a) Free radicals in Diabetes mellitus, Inflammation, Ischemic reperfusion injury, Cancer, Atherosclerosis, Free radicals in brain metabolism and pathology, kidney damage, muscle damage. Free radicals involvement in other disorders. Free radicals theory of ageing.
- b) Antioxidants: Endogenous antioxidants – enzymatic and nonenzymatic antioxidant defence, Superoxide dismutase, catalase, Glutathione peroxidase, Glutathione Vitamin C, Vitamin E, - Lipoic acid, melatonin  
Synthetic antioxidants: Butylated hydroxy Toluene, Butylated hydroxy Anisole.
- c) Functional foods for chronic disease prevention

#### **UNIT V**

**06 hours**

- a) Effect of processing, storage and interactions of various environmental factors on the potential of nutraceuticals.
- b) Regulatory Aspects; FSSAI, FDA, FPO, MPO, AGMARK. HACCP and GMPs on Food Safety. Adulteration of foods.
- c) Pharmacopoeial Specifications for dietary supplements and nutraceuticals.

#### **References:**

1. Dietetics by Sri Lakshmi
2. Role of dietary fibres and nutraceuticals in preventing diseases by K.T Agusti and P.Faizal: BSPublication.
3. Advanced Nutritional Therapies by Cooper. K.A., (1996).
4. The Food Pharmacy by Jean Carper, Simon & Schuster, UK Ltd., (1988).
5. Prescription for Nutritional Healing by James F.Balch and Phyllis A.Balch 2<sup>nd</sup> Edn., Avery Publishing Group, NY (1997).
6. G. Gibson and C.williams Editors 2000 *Functional foods* Woodhead Publ.Co.London.
7. Goldberg, I. *Functional Foods*. 1994. Chapman and Hall, New York.
8. Labuza, T.P. 2000 Functional Foods and Dietary Supplements: Safety, Good Manufacturing Practice (GMPs) and Shelf Life Testing in *Essentials of Functional Foods* M.K. Sachmidl and T.P. Labuza eds. Aspen Press.
9. Handbook of Nutraceuticals and Functional Foods, Third Edition (Modern Nutrition)
10. Shils, ME, Olson, JA, Shike, M. 1994 *Modern Nutrition in Health and Disease*. Eighth edition. Lea and Febiger

## **Semester VIII – Elective course on Pharmaceutical Product Development**

**No of Hours: 3**

**Tutorial:1**

**Credit points:4**

### **Unit-I**

**10 Hours**

Introduction to pharmaceutical product development, objectives, regulations related to preformulation, formulation development, stability assessment, manufacturing and quality control testing of different types of dosage forms

### **Unit-II**

**10 Hours**

An advanced study of Pharmaceutical Excipients in pharmaceutical product development with a special reference to the following categories

- i. Solvents and solubilizers
- ii. Cyclodextrins and their applications
- iii. Non - ionic surfactants and their applications
- iv. Polyethylene glycols and sorbitols
- v. Suspending and emulsifying agents
- vi. Semi solid excipients

### **Unit-III**

**10 Hours**

An advanced study of Pharmaceutical Excipients in pharmaceutical product development with a special reference to the following categories

- i. Tablet and capsule excipients
- ii. Directly compressible vehicles
- iii. Coat materials
- iv. Excipients in parenteral and aerosols products
- v. Excipients for formulation of NDDS

Selection and application of excipients in pharmaceutical formulations with specific industrial applications

### **Unit-IV**

**08 Hours**

Optimization techniques in pharmaceutical product development. A study of various optimization techniques for pharmaceutical product development with specific examples. Optimization by factorial designs and their applications. A study of QbD and its application in pharmaceutical product development.

### **Unit-V**

**07 Hours**

Selection and quality control testing of packaging materials for pharmaceutical product development- regulatory considerations.



**Recommended Books (Latest editions)**

1. Pharmaceutical Statistics Practical and Clinical Applications by Stanford Bolton, Charles Bon; Marcel Dekker Inc.
2. Encyclopedia of Pharmaceutical Technology, edited by James Swarbrick, Third Edition, Informa Healthcare publishers.
3. Pharmaceutical Dosage Forms, Tablets, Volume II, edited by Herbert A. Lieberman and Leon Lachman; Marcel Dekker, Inc.
4. The Theory and Practice of Industrial Pharmacy, Fourth Edition, edited by R. P. Khar, S. P. Vyas, Farhan J. Ahmad, Gaurav K. Jain; CBS Publishers and Distributors Pvt. Ltd. 2013.
5. Martin's Physical Pharmacy and Pharmaceutical Sciences, Fifth Edition, edited by Patrick J. Sinko, BI Publications Pvt. Ltd.
6. Targeted and Controlled Drug Delivery, Novel Carrier Systems by S. P. Vyas and R. K. Khar, CBS Publishers and Distributors Pvt. Ltd, First Edition 2012.
7. Pharmaceutical Dosage Forms and Drug Delivery Systems, Loyd V. Allen Jr., Nicholas B. Popovich, Howard C. Ansel, 9th Ed. 40
8. Aulton's Pharmaceutics – The Design and Manufacture of Medicines, Michael E. Aulton, 3rd Ed.
9. Remington – The Science and Practice of Pharmacy, 20th Ed.
10. Pharmaceutical Dosage Forms – Tablets Vol 1 to 3, A. Liberman, Leon Lachman and Joseph B. Schwartz
11. Pharmaceutical Dosage Forms – Disperse Systems Vol 1 to 3, H.A. Liberman, Martin, M.R. and Gilbert S. Banker.
12. Pharmaceutical Dosage Forms – Parenteral Medication Vol 1 & 2, Kenneth E. Avis and H.A. Libermann.
13. Advanced Review Articles related to the topics.

# SYLLABUS

D.Pharm.

## ORDINANCE, SCHEME & SYLLABUS FOR DIPLOMA IN PHARMACY

<b>Course Title:</b>	Diploma in Pharmacy
<b>Abbreviation:</b>	D. Pharm.
<b>Type of Course:</b>	A Two years Diploma course
<b>Pattern:</b>	Yearly
<b>Award of the Degree:</b>	Diploma will be awarded for those passing in both the years as per rules and regulations.

**O-D. Ph. 1. DURATION OF THE COURSE:** The duration of the course shall be for two academic years, with each academic year spread over a period of not less than one hundred and eighty working days in addition to 500 hours practical training spread over a period of not less than 3 months.

**O-D. Ph.2. ELIGIBILITY FOR ADMISSION:** No. Candidate shall be admitted to Diploma in Pharmacy Pt. I unless he/she had passed any of the following examinations in all the optional subjects and compulsory subjects (Physics, Chemistry, Biology and /or Mathematics including English as one of the Compulsory subjects):

- a) Intermediate examination in Science; The First Year of the three year degree course in Science; 10+2 Examination(Academic stream) in Science;
- b) Pre-degree examination; any other qualification approved by the Pharmacy Council of India as equivalent to any of the above exam.

Admission of candidates to the Diploma in Pharmacy Part - I shall be made in order of merit on the basis of 'Pre-Pharmacy Test' conducted in accordance with the scheme of Examinations and syllabus laid-down by the University.

### **O- D. Ph.3. ELIGIBILITY FOR APPEARING IN EXAMINATION**

- (a) Eligibility for appearing at the Diploma in Pharmacy Part-I Examination: Only such candidates who produce-certificate from the Head of the Academic Institution in which he/she has undergone the Diploma in Pharmacy Part-I course, in proof of his/her having regularly and satisfactorily undergone the course of study by attending not less than 75% of the classes held both in theory and in practical separately in each, shall be eligible for appearing at the Diploma in Pharmacy (Part-I) examination.
- (b) Eligibility for appearing at the Diploma in Pharmacy Part-II Examination: Only such candidates who produce certificate from the Head of the academic institution in which he/she has undergone the Diploma in Pharmacy Part-II course, in proof of his/her having regularly and satisfactorily attending not less than 75% of the classes held both in theory and practicals separately in each subject, shall be eligible for appearing at the Diploma in Pharmacy (Part-II) examination.
- (c) A candidate can have a relaxation of 10% attendance on medical ground by producing a certificate from medical officer of government hospital and a 5% relaxation by the vice chancellor on the recommendation of Dean, faculty.

**O-D. Ph. 4.GENERAL**

- (A) **Course of Study:** The course of study for Diploma in Pharmacy part-I and Diploma in pharmacy part-II shall include the subjects as given in the Tables I & II below. The number of hours devoted to each subject for its teaching is given against columns 2 and 3 of the Tables below.

**TABLE-I Diploma in Pharmacy (Part-I)**

Subject	Theory		Practical	
	hours /year	Hrs. / week	hours /year	Hrs. / week
Pharmaceutics-I	75	3	100	4
Pharmaceutical Chemistry-I	75	3	75	3
Pharmacognosy	75	3	75	3
Biochemistry & Clinical Pathology	50	2	75	3
Human Anatomy & Physiology	75	3	50	2
Health Education & community pharmacy	50	2		
	400	16	375	15

**TABLE-II Diploma in Pharmacy (Part-II)**

Subject	Theory		Practical	
	hours /year	Hrs. / week	hours /year	Hrs. / week
Pharmaceutics-II	75	3	100	4
Pharmaceutical Chemistry-II	100	4	75	3
Pharmacology & Toxicology	75	3	50	2
Pharmaceutical Jurisprudence	50	2	-	
Drug store and Business Management	75	3	-	
Hospital & Clinical Pharmacy	75	3	50	2
	450	18	275	11

- (b) Examinations: There shall be an examination for Diploma in Pharmacy (part-I) to examine students of the first year course and an examination for Diploma in Pharmacy (part-II) to examine students of the second year course. Each examination may be held twice every year. The first examination in every year shall be the annual examination and the second examination shall be supplementary examination of the Diploma in Pharmacy (part-I) or Diploma in pharmacy (Part-II) as the case may be. The examinations shall be of written and practical (including oral) nature. Carrying maximum marks for each part of subject, as indicated in Table III and IV:R-29(A) (Plan and scheme of examination for Diploma in Pharmacy).

**O-D. Ph.5. PRACTICAL TRAINING****Diploma in Pharmacy (Part-III)**

- (a) Period and other conditions of practical training:

After having appeared in Part-II examination of Diploma in Pharmacy conducted by Board/University or other approved examination Body or any other course accepted as being equivalent by the Pharmacy Council of India, a candidate shall be eligible to undergo practical training in one or more of the following institutions namely:

Hospitals/Dispensaries run by Central/State Government/Municipal corporations/ central Government Health scheme and Employees state Insurance scheme. A pharmacy, chemist and Druggist licensed under the Drugs and cosmetics Rules, 1945 made under the Drugs and Cosmetics Act, 1940 (23 of 1940). The institutions referred in sub-regulation(1) shall be eligible to impart training subject to the condition that the number of student pharmacists that may be taken in any Hospital, pharmacy, Chemist and Druggist licensed under the Drugs and cosmetics Rules, 1945 made under the



Drugs and cosmetics Act, 1940 shall not exceed two where there is one registered pharmacist engaged in the work in which the student pharmacist is undergoing practical training, where there is more than one registered pharmacist similarly engaged, the number shall not exceed one for each additional such registered pharmacist. Hospital and Dispensary other than those specified in sub-regulation (1) for the purpose of giving practical training shall have to be recognized by pharmacy council of India on fulfilling the conditions specified in Appendix-D to these regulations.

In the course of practical training, the trainees shall have exposure to: Working knowledge of keeping of records required by various acts concerning the profession of pharmacy and Practical experience in the manipulation of pharmaceutical apparatus in common use, the reading, translation and copying of prescription including checking of dose, the dispensing of prescriptions illustrating the commoner methods of administering medicaments; the storage of drugs and medical preparations. The practical training shall be not less than five hundred hours spread over a period of not less than three months provided that not less than two hundred and fifty hours and devoted to actual dispensing of prescriptions.

**(b) Procedure to be followed prior to commencing of the training:**

The head of the academic training institution, shall supply application in triplicate in 'Practical Training Contract Form for Qualification as pharmacist' to candidate eligible to undertake the said practical training, the contract form shall be as specified in Appendix-E to these regulations.

The head of an academic training institution shall fill section I of the contract Form. The trainee shall fill section II of the said contract Form and the Head of the institution agreeing to impart the training (hereinafter referred to as the Apprentice Master) shall fill section III of the said contract Form.

It shall be the responsibility of the trainee to ensure that one copy (hereinafter referred to as the first copy of the contract Form) so filled is submitted to Head of the academic training institution and the other two copies (hereinafter referred to as the second copy and the third copy) shall be filled with Apprentice Master (if he so desires) or with the trainee pending completion of the training.

- (c) Certificate of Passing Diploma in Pharmacy (part-III) on satisfactory completion of the apprentice period, the Apprentice Master shall fill Section IV of the second copy and third copy of contract form and cause it to be sent to the head of the academic training institution who shall suitably enter in the first copy of the entries from the second copy and third copy and shall fill section V of the three copies of contract form and thereafter handover both the second copy and the third copy to the trainee. Thus, if completed in all respect, shall be regarded as a certificate of having successfully completed the course of Diploma in Pharmacy (part-III).

**O-D. Ph.6. Working out of Result**

**(a) Mode of examinations:**

Each theory and practical examination in the subject mentioned in Table-III and IV shall be of three hours duration. A candidate who fails in theory or practical examination shall reappear in such theory or practical paper(s) as the case may be. Practical examination shall also consist of viva voce (oral) examination.

**(b) Award of sessional marks and maintenance of records:**

A regular record of both theory and practical class work and examinations conducted in an institution imparting training for Diploma in Pharmacy Part-I and Diploma in pharmacy Part-II courses, shall be maintained for each student in the institution and 20 marks for each theory and 20 marks for each practical subject shall be allotted as sessional.

There shall be at least three periodic sessional examinations during each academic year. The highest aggregate of any two performances shall form the basis of calculating sessional marks.

The sessional marks in practicals shall be allotted on the following basis:

Actual performance in the sessional examination.	10
Day to day assessment in the practical class work.	10

- (c) Minimum marks for passing the examination: A student shall not be declared to have passed Diploma in Pharmacy examination unless he/she secures at least 40% marks in each of the subject separately in theory examination, including sessional marks and at least 40% marks in each of the practical examination including sessional marks. The candidates securing 60% marks or above in aggregate in

all subjects in a single attempt at the Diploma in Pharmacy (part-I) or Diploma in Pharmacy (part-II) examinations shall be declared to have passed in first class the Diploma in Pharmacy (part-I) or Diploma in Pharmacy (part-II) examinations, as the case may be. Candidates securing 75% marks or above in any subject or subjects provided he/she passes in all the subjects in single attempt, will be given distinction in that subjects(s).

- (d) Eligibility for Promotion to Diploma in Pharmacy (Pt. II): All candidates who have appeared for all the subjects and passed the Diploma in pharmacy part-I class. However failure in more than two subjects (each Theory paper or practical examination shall be considered as a subject) shall debar him/her from promotion to the Diploma in Pharmacy Part-II class. Such candidates shall be examined in the failing subjects only at subsequent. A candidate who fails to pass D Pharm Part - I exam. in four attempts shall not allowed to continue the course.
- (e) Improvement of sessional marks: Candidates who wish to improve sessional marks can do so by appearing in two additional sessional examinations during the next academic year. The average score of the two examinations shall be the basis for improved sessional marks in theory. The sessional of practicals shall be improved by appearing in additional practical examinations. Marks awarded to a candidate for day to day assessment in the practical class, can not be improved unless he/she attends regular course of study again.
- (f) Certificate of passing examination for Diploma in Pharmacy (part-II): Certificate of having passes the examination for the Diploma in pharmacy Part-II shall be granted by the Examining Authority to a successful student.
- (g) Certificate of Diploma in Pharmacy: A certificate of Diploma in pharmacy shall be granted by the Examining Authority to successful candidate on producing certificate of having passed the Diploma in Pharmacy part-I and Part-II and satisfactory completion of practical training for Diploma in pharmacy (part-III).
- (h) The chairman and at least one expert member of examining committee of the Examining Authority Concerned with appointment of examiners and conduct of pharmacy examination should be persons possessing pharmacy Qualifications.

#### PLAN AND SCHEME OF EXAMINATION FOR THE DIPLOMA IN PHARMACY

(Based on effective teaching for 180 working days in one academic session)

**Table-III Diploma in pharmacy (part-I) Examination**

Subject	Max. Marks in Theory			Max. Marks in Practical		
	Examination	Sessional	Total	Examination	Sessional	Total
Pharmaceutics-I	80	20	100	80	20	100
Pharmaceutical Chemistry-I	80	20	100	80	20	100
Pharmacognosy	80	20	100	80	20	100
Biochem. & Clinical Pathology	80	20	100	80	20	100
Human Anatomy & Physiology	80	20	100	80	20	100
Health Education & community pharmacy	80	20	100			
			600			500

**TABLE-IV Diploma in Pharmacy (Part-II)**

Subject	Max. Marks in Theory			Max. Marks in Practical		
	Examination	Sessional	Total	Examination	Sessional	Total
Pharmaceutics-II	80	20	100	80	20	100
Pharmaceutical Chemistry-II	80	20	100	80	20	100
Pharmacology & Toxicology	80	20	100	80	20	100
Pharmaceutical Jurisprudence	80	20	100			
Drug store and Business Management	80	20	100			
Hospital & Clinical Pharmacy	80	20	100	80	20	100
			600			400

Note: Each paper shall consist of six questions out of which five shall be attempted. Half of the total number of papers in each year will be set and assessed by external examiners and the remaining half will be set and assessed by the internal examiners. There shall be one external and one internal examiner for each practical Examination.

# SYLLABUS

## DIPLOMA IN PHARMACY (PART-I)

### 1.1 PHARMACEUTICS I

#### Theory (75 Hours)

**Introduction of different dosage forms.** Their classification with examples-their relative applications. Familiarization with new drug delivery systems. Introduction to Pharmacopoeias with special reference to the Indian Pharmacopoeia.

**Metrology**-System of weights and measures. Calculations including conversion from one to another system. Percentage calculations and adjustment of products .Use of alligation method in calculations .Isotonic solutions.

**Packaging of pharmaceuticals**-Desirable features of a container and types of containers. Study of glass & plastics as materials for containers and rubber as a material for closure-their merits and demerits. Introduction to aerosol packaging.

Size reduction, objectives, and factors affecting size reduction, methods of size reduction- study of Hammer mill, ball mill, Fluid energy mill and Disintegrator.

**Size separation**-size separation by sifting. Official standards for powders. Sedimentation methods of size separation. Construction and working of Cyclone separator.

**Mixing and Homogenization**-Liquid mixing and powder mixing, Mixing of semisolids. Study of silverson Mixer-Homogenizer, planetary Mixer; Agitated powder mixer; Triple Roller Mill; Propeller Mixer, colloid Mill and Hand Homogeniser. Double cone mixer.

**Clarification and Filtration**-Theory of filtration, Filter media; Filter aids and selection of filters. Study of the following filtration equipments-Filter Press, sintered filters, Filter candles, Metafilter.

#### **Extraction and Galenicals-**

(a) Study of percolation and maceration and their modification, continuous hot extraction-Application in the preparation of tinctures and extracts.

(b) Introduction to Ayurvedic dosage forms.

Heat process-Evaporation-Definition-Factors affecting evaporation-study of evaporating still and Evaporating pan.

**Distillation**-Simple distillation and Fractional distillation, steam distillation and vacuum distillation. Study of vacuum still, preparation of purified water I.P. and water for Injection I.P. construction and working of the still used for the same.

**Introduction to drying process**-Study of Tray Dryers; Fluidized Bed Dryer, Vacuum Dryer and Freeze Dryer.

**Sterilization**-Concept of sterilization and its differences from disinfection-Thermal resistance of microorganisms. Detailed study of the following sterilization process.

Sterilization with moist heat, Dry heat sterilization, Sterilization by radiation, Sterilization by filtration and Gaseous sterilization.

**Aseptic techniques**-Applications of sterilization process in hospitals particularly with reference to surgical dressings and intravenous fluids. Precautions for safe and effective handling of sterilization equipment.

**Processing of Tablets**-Definition; different type of compressed tables and their properties. Processes involved in the production of tablets; Tablets excipients ; Defects in tablets; Evaluation of Tablets; Physical standards including Disintegration and Dissolution. Tablet coating-sugar coating; films coating, enteric coating and micro-encapsulation (Tablet coating may be de.. in an elementary manner).

**Processing of Capsules**-Hard and soft gelatin capsules; different sizes of capsules; filling of capsules; handling and storage of capsules. Special applications of capsules.

**Study of immunological products** like sera, vaccines, toxoids & their preparations.

### **PRACTICAL (100 hours)**

Preparation (minimum number stated against each of the following categories illustrating different techniques involved.

1. Aromatic waters<sup>3</sup>
2. Solutions <sup>4</sup>
3. Spirits<sup>2</sup>
4. Tinctures<sup>4</sup>
5. Extracts<sup>2</sup>
6. Creams<sup>2</sup>
7. Cosmetic preparations<sup>3</sup>
8. Capsules<sup>2</sup>
9. Tables<sup>2</sup>
10. Preparations involving<sup>2</sup>
11. Ophthalmic preparations<sup>2</sup>
12. Preparations involving aseptic techniques<sup>2</sup>

### **Books recommended:(Latest editions)**

- 1.) Remington's Pharmaceutical Sciences.
- 2.) The Extra Pharmacopoeia-Martindale.

## **1.2 PHARMACEUTICAL CHEMISTRY-I**

### **THEORY (75 Hours)**

General discussion on the following inorganic compounds including important physical and chemical properties, medicinal and pharmaceutical uses, storage conditions and chemical incompatibility.

**Acids, bases and buffers**-Boric acid, Hydrochloric acid, Strong Ammonium hydroxide, Sodium hydroxide and official buffers.

**Antioxidants**- Hypophosphorous acid, Sulphur dioxide, Sodium bisulphite, Sodium meta-bisulphite, Sodium thiosulphate, Nitrogen and Sodium nitrite.

### **Gastrointestinal agents-**

Acidifying agents- Dilute Hydrochloric acid.

Antacids- Sodium bicarbonate, Aluminum hydroxide gel, Aluminum phosphate, Calcium carbonate, Magnesium carbonate, Magnesium trisilicate, Magnesium oxide, Combinations of antacid preparations.

Protective and Adsorbents- Bismuth sub carbonate and Kaolin.

Saline cathartics- Sodium potassium tartrate and Magnesium sulphate.

### **Topical Agents-**

Protective- Talc, Zinc Oxide, Calamine, Zinc stearate, Titanium dioxide, silicone polymers.

**Antimicrobials and Astringents-** Hydrogen peroxide\*, Potassium permanganate, Chlorinated lime, Iodine, Solutions of Iodine, Povidone-iodine, Boric acid, Borax, Silver nitrate, Mild silver protein, Mercury yellow, Mercuric oxide, Ammoniated mercury.

Sulphur and its compounds- Sublimed sulphur, Percipitated sulphur, Selenium sulphide.

Astringents- Alum and Zinc Sulphate.

**Dental Products-** Sodium fluoride, Stannous fluoride, Calcium carbonate, Sodium meta phosphate, Di-calcium phosphate, Strontium chloride, Zinc chloride.

Inhalants- Oxygen, Carbon dioxide, Nitrous oxide.

**Respiratory stimulants-** Ammonium carbonate.

**Expectorants and Emetics-**Ammonium chloride\*, Potassium iodide, Antimony potassium tartrate.

**Antidotes-** Sodium nitrite.

**Major Intra and Extra cellular electrolytes-**

Electrolytes used for replacement therapy- Sodium chloride and its preparations, Potassium chloride and its preparations.

Physiological acid-base balance and electrolytes used- Sodium acetate, Potassium Acetate, Sodium bicarbonate Inj., Sodium citrate, Potassium citrate, Sodium lactate injection, Ammonium chloride and its injection.

Combination of oral electrolyte powders and solutions.

**Inorganic official compounds** of Iron, Iodine and Calcium, Ferrous Sulphate and Calcium Gluconate.

**Radio pharmaceuticals and contrast media-** Radio activity-Alpha; Beta and Gamma Radiations, Biological effects of radiations, Measurement of radio activity, G.M. Counter, Radio isotopes-their uses, Storage and precautions with special reference to the official preparations. Radio opaque contrast media-Barium sulfate.

**Quality control of Drugs and pharmaceuticals-**Importance of quality control, significant errors, methods used for quality control, sources of impurities in pharmaceuticals. Limit tests for Arsenic, Chloride, Sulfate, Iron and Heavy metals.

**Identification tests** for cations and anions as per Indian Pharmacopoeia.

### **PRACTICAL (75 hours)**

1. Identification tests for inorganic compounds particularly drugs and pharmaceuticals.
2. Limit test for chloride, Sulfate, Arsenic, Iron and Heavy metals.
3. Assay of inorganic pharmaceuticals involving each of the following methods of compounds marked with (\*) under theory.
  - i. Acid-Base titrations(at least 3)
  - ii. Redox titrations (one each of permanganometry and iodimetry).
  - iii. Precipitation titrations (at least 2)
  - iv. Complexometric titration (Calcium and Magnesium).

### **Books recommended (Latest editions)**

1. Indian pharmacopoeia.

## 1.3 PHARMACOGNOSY

### THEORY (75 Hours)

1. Definition, history and scope of Pharmacognosy including indigenous system of medicine.
2. Various systems of classification of drugs and natural origin.
3. Adulteration and drug evaluation; significance of pharmacopoeial standards.
4. Brief outline of occurrence, distribution, outline of isolation, identification tests, therapeutic effects and pharmaceutical application of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins.
5. Occurrence, distribution, organoleptic evaluation, chemical constituents including tests wherever applicable and therapeutic efficacy of following categories of drugs.

- (a) **Laxatives**- Aloes, Rhubarb, Castor oil, Ispaghula, Senna.
- (b) **Cardiotonics**- Digitalis, Arjuna.
- (c) **Carminatives & G.I. regulators**- Umbelliferous fruits, Coriander, Fennel, Ajowan, Cardamom, Ginger, Black pepper, Asafoetida, Nutmeg, Cinnamon, Clove.
- (d) **Astringents**- Catechu.
- (e) **Drugs acting on nervous system**- Hyoscyamus, Belladonna, Aconite, Ashwagandha, Ephedra, Opium, Cannabis, Nux-vomica.
- (f) **Antihypertensive**- Rauwolfia.
- (g) **Antitussives**- Vasaka, Tolu balsam, Tulsi.
- (h) **Antirheumatics**- Guggal, Colchicum.
- (i) **Antitumour**- Vinca.
- (j) **Antileprotics**- Chaulmoogra oil.
- (k) **Antidiabetics**- Pterocarpus, Gymnema sylvestre.
- (l) **Diuretics**- Gokhru, Punarnava.
- (m) **Antidysenterics**- Ipecacuanha.
- (n) **Antiseptics and disinfectants**- Benzoin, Myrrh, Neem, Curcuma.
- (o) **Antimalarials**- Cinchona.
- (p) **Oxytocics**- Ergot.
- (q) **Vitamins**- Shark liver oil and Amla.
- (r) **Enzymes**- Papaya, Diastase, Yeast.
- (s) **Perfumes and flavoring agents**- peppermint oil, Lemon oil, Orange oil, lemon grass oil, sandal wood.

**Pharmaceutical aids**-Honey, Arachis oil, starch, kaolin, pectin, olive oil. Lanolin, Beeswax, Acacia, Tragacanth, sodium Alginate, Agar, Guar gum, Gelatin.

**Miscellaneous**- Liquorice, Garlic, picrorhiza, Dirscorea, Linseed, shatavari, shankpushpi, pyrethrum, Tobacco.

Collection and preparation of crude drugs for the market as exemplified by Ergot, opium, Rauwolfia, Digitalis, senna.

Study of source, preparation and identification of fibers used in sutures and surgical dressings-cotton, silk, wool and regenerated fibers.

Gross anatomical studies of-senna, Datura, cinnamon, cinchona, fennel, clove, Ginger, Nuxvomica & ipecacuanha.

### PRACTICAL (75 hours)

1. Identification of drugs by morphological characters. Physical and chemical tests for evaluation of drugs wherever applicable.
2. Gross anatomical studies(t.s.)of the following drugs :Senna, Datura, cinnamon, cinchona, coriander, fennel, clove, Ginger, Nux-vomica, Ipecacuanha.
3. Identification of fibers and surgical dressing.

## 1.4 BIOCHEMISTRY AND CLINICAL PATHOLOGY

### THEORY (50 Hours)

**Introduction to biochemistry.** Brief chemistry and role of proteins, polypeptides and amino acids, classification, Qualitative tests, Biological value, Deficiency diseases.

**Carbohydrates:** Brief chemistry and role of carbohydrates, classification, qualitative tests, Diseases related to carbohydrate metabolism.

**Lipids:** Brief chemistry and role of lipids, classification and qualitative tests. Diseases related to lipids metabolism.

**Vitamins:** Brief chemistry and role of vitamins and coenzymes. Role of minerals and water in life processes.

**Enzymes:** Brief concept of enzymatic action. factors affecting it.

**Therapeutics:** Introduction to pathology of blood and urine. Lymphocytes and platelets, their role in health and disease. Erythrocytes-Abnormal cells and their significance. Abnormal constituents of urine and their significance in diseases.

### **PRACTICAL (75 Hours)**

1. Detection and identification of proteins. Amino acids, carbohydrates and lipids.
2. Analysis of normal and abnormal constituents of Blood and Urine (Glucose, urea, creatine, creatinine, cholesterol, alkaline phosphatase acid phosphatase, Bilirubin, SGPT, SGOT, calcium, Diastase, Lipase).
3. Examination of sputum and faeces (microscopic & staining).
4. Practice in injecting drugs by intramuscular, subcutaneous and intravenous routes, withdrawal of blood samples.

## **1.5 HUMAN ANATOMY AND PHYSIOLOGY**

### **THEORY(75 Hours)**

**Scope of Anatomy and physiology.** Definition of various terms used in Anatomy. Structure of cell, function of its components with special reference to mitochondria and microsomes.

**Elementary tissues:** Elementary tissues of the body, i.e. epithelial tissue, muscular tissue, connective tissue and nervous tissue.

**Skeletal System:** Structure and function of Skelton .Classification of joints and their function. Joint disorders.

**Cardiovascular System:** Composition of blood, functions of blood elements. Blood group and coagulation of blood. Brief information regarding disorders of blood. Name and functions of lymph glands. Structure and functions of various parts of the heart .Arterial and venous system with special reference to the names and positions of main arteries and veins. Blood pressure and its recording. Brief information about cardiovascular disorders.

**Respiratory system:** Various parts of respiratory system and their functions, physiology of respiration.

**Urinary System:** Various parts of urinary system and their functions, structure and functions of kidney. Physiology of urine formation. Patho-physiology of renal diseases and edema.

**Muscular System:** Structure of skeletal muscle, physiology of muscle contraction. Names, positions, attachments and functions of various skeletal muscles. physiology of neuromuscular junction.

**Central Nervous System:** Various parts of central nervous system, brain and its parts, functions and reflex action. Anatomy and physiology of automatic nervous system.

**Sensory Organs:** Elementary knowledge of structure and functions of the organs of taste, smell, ear, eye and skin. Physiology of pain.



**Digestive System:** names of various parts of digestive system and their functions. structure and functions of liver, physiology of digestion and absorption.

**Endocrine System:** Endocrine glands and Hormones. Location of glands, their hormones and functions. pituitary, thyroid. Adrenal and pancreas

**Reproductive system:** Physiology and Anatomy of Reproductive system.

### **PRACTICALS (50 hours)**

1. Study of the human Skelton.
2. Study with the help of charts and models of the following system and organs:

Digestive system	Respiratory system	Ear
Cardiovascular system	Urinary system	
Reproductive system	Eye	
3. Microscopic examination of epithelial tissue, cardiac muscle, smooth muscle, skeletal muscle. Connective tissue and nervous tissues.
4. Examination of blood films for TLC.DLC and malarial parasite.
5. Determination of RBCs, clotting time of blood, erythrocyte sedimentation rate and Hemoglobin value.
6. Recording of body temperature, pulse, heart-rate, blood pressure and ECG.

## **1.6 HEALTH EDUCATION AND COMMUNITY PHARMACY**

### **THEORY (50 hours)**

**Concept of health:** Definition of physical health, mental health, social health, spiritual health determinants of health, indicatory of health, concept of disease, natural history of diseases, the disease agents, concept of prevention of diseases.

**Nutrition and health:** Classification of foods, requirements, diseases induced due to deficiency of proteins, vitamins and minerals-treatment and prevention.

**Demography and family planning:** Demography cycle, fertility, family planning, contraceptive methods, behavioral methods, natural family planning methods, chemical methods, mechanical methods, hormonal contraceptives, population problem of India.

**First aid:** Emergency treatment in shock, snake-bite, burns, poisoning, heart disease, fractures and resuscitation methods, Elements of minor surgery and dressings.

**Environment and health:** Source of water supply, water pollution, purification of water, health and air, noise, light-solid waste disposal and control-medical entomology, arthropod borne diseases and their control. rodents, animals and diseases.

**Fundamental principles of microbiology:** Classification of microbes, isolation, staining techniques of organisms of common diseases.

**Communicable diseases:** Causative agents, mode of transmission and prevention. Respiratory infections-chicken pox, measles, influenza, diphtheria, whooping cough and tuberculosis.

**Intestinal infection-**poliomyelitis, Hepatitis, cholera, Typhoid, food poisoning, Hookworm infection.

**Arthropod borne infections-**plague, Malaria, filariases.

**Surface infection-**Rabies, Trachoma, Tetanus, Leprosy.

**Sexually transmitted diseases-**Syphilis, Gonorrhoea, AIDS.

**Non-communicable diseases:** causative agents, prevention, care and control.

**Epidemiology:** Its scope, methods, uses, dynamics of disease transmission. Immunity and immunization: Immunological products and their dose schedule. Principles of disease control and prevention, hospital acquired infection, prevention and control. Disinfection, types of disinfection procedures, for-faces, urine, sputum, room linen, dead-bodies, instruments.

## 2.1 PHARMACEUTICS II

### (Dispensing Pharmacy)

#### THEORY (75 Hours)

**Prescriptions**-Reading and understanding of prescriptions; Latin terms commonly used (Detailed study is not necessary), Modern methods of prescribing, adoption of metric system. Calculations involved in dispensing.

**Incompatibilities in prescriptions**- study of various types of incompatibilities-physical, chemical and therapeutic.

**Posology**- Dose and dosage of drugs, factors influencing dose, calculations of doses on the basis of age, sex, surface area and veterinary doses.

**Dispensed Medications:** (Note: A detailed study of the following dispensed medication is necessary. Methods of preparation with theoretical and practical aspects, use of appropriate containers and closures. special labeling requirements and storage conditions should be high-lighted).

**Powders**-Type of powders-Advantages and disadvantages of powders, Granules, cachets and tablet triturates. preparation of different types of powders encountered in prescriptions. Weighing methods, possible errors in weighing, minimum weighable amounts and weighing of a material below the minimum weighable amount, geometric dilution and proper usage and care of dispensing balance.

#### Liquid oral Dosage forms:

**Monophasic**-Theoretical aspects including commonly used vehicles, essential adjuvant like stabilizers, colorants and flavors, with examples.

Review of the following monophasic liquids with details of formulation and practical methods. Liquids for internal administration Liquids for external administration or used on mucous membranes

Mixtures and concentrates, Gargles

Syrups Mouth washes

Douches

Sprays

Throat-paints

Ear Drops

Liniments

Elixirs

Nasal drops

Lotions.

#### Biphasic Liquid Dosage Forms:

**Suspensions** (elementary study)-Suspensions containing diffusible solids and liquids and their preparations. Study of the adjuvant used like thickening agents, wetting agents, their necessity and quantity to be incorporated ,suspensions of precipitate forming liquids like tinctures, their preparations and stability. suspensions produced by chemical reaction. An introduction to flocculated /non-flocculated suspension system.

**Emulsions**-Types of emulsions, identification of emulsion system, formulation of emulsions, selection of emulsifying agent. Instabilities in emulsions, preservation of emulsions.

#### Semi-Solid Dosage Forms:

**Ointments:** Types of ointments, classification and selection of dermatological vehicles. Preparation and stability of ointments by the following processes:

Trituration

chemical reaction

fusion

Emulsification.

**Pastes:** Differences between ointments and pastes, Bases of pastes. preparation of pastes and their preservation .

**Jellies:** An introduction to the different types of jellies and their preparation.

An elementary study of poultice.

**Suppositories and pessaries**-Their relative merits and demerits, types of suppositories, suppository bases , classification, properties. preparation and packing of suppositories. Use of suppositories of drug absorption.

**Dental and cosmetic preparations:** Introduction to Dentifrices, facial cosmetics, Deodorants. Anti-perspirants, shampoo, Hair dressings and Hair removers.

**Sterile Dosage forms:**

**Parenteral dosage forms**-Definition, General requirements for parenteral dosage forms. Types of parenteral formulations, vehicles, adjuvant, processing and personnel, Facilities and quality control. Preparation of Intravenous fluids and admixtures-Total parenteral nutrition, Dialysis fluids.

**Sterility testing:** particulate matter monitoring- Faculty seal packaging.

**Ophthalmic products:** study of essential characteristics of different ophthalmic preparations. Formulation: additives, special precautions in handling and storage of ophthalmic products.

### **PRACTICAL (100 hours)**

Dispensing of at least 100 products covering a wide range of preparations such as mixtures, emulsion, solutions, liniments, E.N.T. preparations. Ointments, suppositories, powders, incompatible prescriptions etc.

#### **Books recommended: (Latest editions)**

1. Indian Pharmacopoeia.
2. British pharmacopoeia.
3. National formularies(N.F.I.,B.N.P)
4. Remington's pharmaceutical sciences.
5. Martindale's Extra pharmacopoeia.

## **2.2 PHARMACEUTICAL CHEMISTRY II**

### **THEORY (100 hours)**

1. Introduction to the nomenclature of organic chemical systems with particular reference to hetero-cyclic system containing up to 3 rings.
2. The chemistry of following pharmaceutical organic compounds covering their nomenclature, chemical structure, uses and the important physical and chemical properties(chemical structure of only those compounds marked with asterisk (\*). The stability and storage conditions and the different type of pharmaceutical formulations of these drugs and their popular brand names.

**Antiseptics and Disinfectants**-Proflavine\*, Benzalkonium chloride, Cetrimide, Phenol, chloroxylonol, Formaldehyde solution, Hexachlophene, Nitrofurantoin.

**Sulphonamides**- Sulphadiazine, Sulphaguanidine, Phthalylsulphathiazole, Succinylsulphathiazole, Sulphadimethoxine, Sulphamethoxypyridazine, Co-trimoxazole, sulfacetamide\*

**Antileprotic Drugs**- Clofazimine, Thiambutosine, Dapsone\*, solapsone,

**Anti-tubercular Drugs**- Isoniazid\*, PAS\*, Streptomycin, Rifampicin, Ethambutol\*, Thiacetazone, Ethionamide, cycloserine, pyrazinamide\*.

**Antimoebic and Anthelmintic Drugs**- Emetine, Metronidazole, Halogenated hydroxyquinolines, Diloxanide furoate, Paromomycin, Piperazine\*, Mebendazole, D.E.C.\*

**Antibiotics**- Benzyl penicillin\*, Phenoxy methyl penicillin\*, Benzathine penicillin, Ampicillin\*, Cloxacillin, Carbencicillin, Gentamicin, Neomycin, Erythromycin, Tetracycline, Cephalixin, Cephaloridine, Cephalothin, Griseofulvin, Chloramphenicol.

**Antifungal agents**- Udecylenic acid, Tolnaftate, Nystatin, Amphotericin, Hamycin.

**Antimalarial Drugs**-Chloroquine\*,Amodiaquine, Primaquine, Proguanil, Pyrimethamine\*, Quinine, Trimethoprim.

**Tranquilizers**-Chlorpromazine\*, Prochlorperazine, Trifluoperazine, Thiothixene, Haloperidol\*, Triperidol, Oxypertine, Chlordizexoxide, Diazepam\*, Lorazepam, Meprobamate.

**Hypnotics**- Phenobarbitone\*, Butobarbitone, Cylobarbitone, Nitrazepam, Glutethimide\*, Methypylon, Paraldehyde, Triclofosodium.

**General Anaesthetics**-Halothane\*, Cyclopropane\*, Diethyl ether\*, Methohexital sodium, Thiopecal sodium, Trichloroethylene .

**Antidepressant Drugs**- Amitriptyline, Nortriptyline, Imperamine\*, Phepeline, Tranylcypromine.

**Analeptics**- Theophylline, Caffeine\*, Coramine\*, Dextro-amphetamine.

**Adrenergic drugs**- Adrenaline\*, Noradrenaline, Isoprenaline\*, Phenylephrine, Salbutamol, Terbutaline, Ephedrine\*, Pseudoephedrine.

**Adrenergic antagonist**- Tolazoline, Propranolol\*, Practolol.

**Cholinergic Drugs**- Neostigmine\*, Pyridostigmine, Pralidoxime, Pilocarpine, Physostigmine\*.

**Cholinergic Antagonists**- Atropine\*, Hyoscine, Homatropine, Propantheline\*, Benztropine, Tropicamide, Biperiden\*.

**Diuretic Drugs**- Furosemide\*, Chlorothiazide, Hydrochlorothiazide\*, Benzthiazide, Urea\*, Mannitol\*, Ethacrynic Acid.

**Cardiovascular Drugs**- Ethylnitrite\*, Glyceryl trinitrate, Alpha methyl dopa, Guanethidine, Clofibrate, Quinidine.

**Hypoglycemic Agents**- Insulin, Chlorpropamide\*, Tolbutamide, Glibenclamide, Phenformin\*, Metformin.

**Coagulants and Anti coagulants**- Heparin, Thrombin, Menadione\*, Bisphydroxy-coumarin, Warfarin sodium.

**Local Anaesthetics**- Lignocaine\*, Procaine\*, Benzocaine,

**Histamine and anti Histaminic Agents**- Histamine, Diphenhydramine\*, Promethazine, Cyproheptadine, Mepyramine\*, Pheniramine, Chlorpheniramine\*,

**Analgesics and Anti-pyretics**-Morphine, Pethidine, Codeine, Methadone, Aspirin\*, Paracetamol, Analgin, Dextropropoxyphene, Pentazocine.

**Non-steroidal anti-inflammatory agents**- Indomethacin\*, Phenylbutazone\*, Oxyphenbutazone, Ibuprofen.

**Thyroxine and Antithyroids**- Thyroxine\*, Methimazole, Methyl thiouracil, Propylthiouracil.

**Diagnostic Agents**- Loperone Acid, Propyl iodone, Sulfobromophthalen-sodium, Indigotindisulfonate, Indigo Carmine, Evans blue, Congo Red, Fluorescein sodium.

**Anticonvulsants, cardiac glycosides, Antiarrhythmic, Antihypertensives & Vitamins.**

**Steroidal Drugs**- Betamethasone, Cortisone, Hydrocortisone, Prednisolone, Progesterone, Testosterone, Oestradiol, Nandrolone.

**Anti-Neoplastic Drugs**- Actinomycin, Azathioprine, Busulphan, Chlorambucil, Cisplatin, Cyclophosphamide, Daunorubicin Hydrochloride, Fluorouracil, Mercaptopurine, Methotrexate, Mytomycin.

#### **Books Recommended: (Latest editions)**

1. Pharmacopoeia of India.
2. British Pharmaceutical codex.
3. Martindale's Extra pharmacopoeia.

#### **PRACTICAL (75 hours)**

1. Systematic qualitative testing of organic drugs involving solubility determination, melting point and/or boiling point, detection of elements and functional groups (10 compounds).
2. Official identification tests for certain groups of drugs included in the I.P. like barbiturates, sulfonamides, Phenothiazines, Antibiotics etc.(8 compounds).
3. Preparation of three simple organic preparations.

## **2.3 PHARMACOLOGY & TOXICOLOGY**

### **THEORY (75 hours)**

**Introduction to pharmacology, scope of pharmacology.**

**Routes of administration of drugs**, their advantages and disadvantages. Various processes of absorption of drugs and the factors affecting them. Metabolism, distribution and excretion of drugs.

**General mechanism of drugs action** and their factors which modify drugs action. Pharmacological classification of drugs. The discussion of drugs should emphasize the following aspects:

**Drugs acting on the central Nervous system:**

General anaesthetics- adjunction to anaesthesia, intravenous anaesthetics.  
 Analgesic antipyretics and non-steroidal  
 Anti-inflammatory drugs- Narcotic analgesics.  
 Antirheumatic and anti-gout remedies.  
 Sedatives and Hypnotics, psychopharmacological agents, anticonvulsants, analeptics.  
 Centrally acting muscle relaxants and anti parkinsonism agents.  
 Local anesthetics.  
 Drugs acting on autonomic nervous system.  
 Cholinergic drugs, Anticholinergic drugs, anticholinesterase drugs.  
 Adrenergic drugs and adrenergic receptor blockers.  
 Neurone blockers and ganglion blockers.  
 Neuromuscular blockers, used in myasthenia gravis.  
 Drugs acting on eye: Mydriatics, drugs used in glaucoma.

#### **Drugs acting on respiratory system**

Respiratory stimulants, Bronchodilators, Nasal decongestants, Expectorants and Antitussive agents.

**Autocoids:** physiological role of histamine and serotonin, Histamine and Antihistamines, prostaglandins.

#### **Cardio vascular drugs**

Cardiotonics, Antiarrhythmic agents, Anti-anginal agents, Antihypertensive agents, peripheral Vasodilators and drugs used in atherosclerosis.  
 Drugs acting on the blood and blood forming organs. Haematinics, coagulants and anticoagulants, Haemostatic , Blood substitutes and plasma expanders.

**Drugs affecting renal function-** Diuretics and anti-diuretics.

**Hormones and hormone antagonists-** Hypoglycemic agents, Anti--thyroid drugs, sex hormones and oral contraceptives , corticosteroids.

**Drugs acting on digestive system-**carminatives, digest ants, Bitters, Antacids and drugs used in peptic ulcer, purgatives ,and laxatives, Antidiarrhoeals, Emetics, Anti-emetics, Antispasmodics.

#### **Chemotherapy of microbial diseases:**

Urinary antiseptics, sulphonamides, penicillin, streptomycin, Tetracyclines and other antibiotics. Anti-tubercular agents, Antifungal agents, antiviral drugs, anti-leprotic drugs.  
 Chemotherapy of protozoal diseases, Anthelmintic drugs.  
 Chemotherapy of cancer.

**Disinfectants and antiseptics.**

## **PHARMACOLOGY**

### **PRACTICAL (50 hours)**

1. The first six of the following experiments will be done by the students while
2. the remaining will be demonstrated by the teacher.
3. Effect of potassium and calcium ions, acetylcholine and adrenaline on frog's heart.
4. Effect of acetyl choline on rectus abdomens muscle of frog and guinea pig ileum.
5. Effect of spasmogens and relaxants on rabbits intestine.
6. Effect of local anaesthetics on rabbit cornea.
7. Effect of mydriatics and miotics on rabbit's eye.
8. To study the action of strychnine on frog.
9. Effect of digitalis on frog's heart.
10. Effect of hypnotics in mice.

11. Effect of convulsants and anticonvulsant in mice or rats.
12. Test for pyrogens.
13. Taming and hypnosis potentiating effect of chlorpromazine in mice/rats.
14. Effect of diphenhydramine in experimentally produced asthma in guinea pigs.

## **2.4 PHARMACEUTICAL JURISPRUDENCE**

### **THEORY (50 hours)**

**Origin and nature of pharmaceutical legislation in India**, its scope and objectives. Evolution of the "Concept of pharmacy" as an integral part of the Health care system.

**Principles and significance of professional Ethics**. Critical study of the code of pharmaceutical Ethics drafted by pharmacy council of India.

**Pharmacy Act,1948**-The General study of the pharmacy Act with special reference to Education Regulations ,Working of state and central councils, constitution of these councils and functions, Registration procedures under the Act.

**The Drugs and Cosmetics Act,1940**-General study of the Drugs and cosmetics Act and the Rules there under. Definitions and salient features related to retail and whole sale distribution of drugs. The powers of Inspectors, the sampling procedures and the procedure and formalities in obtaining licenses under the rule. Facilities to be provided for running a pharmacy effectively. General study of the schedules with special reference to schedules C,C1,F,G,J,H,P and X and salient features of labeling and storage conditions of drugs.

**The Drugs and Magic Remedies (objectionable Advertisement)Act, 1954**-General study of the Act, objectives , special reference to be laid on Advertisements, magic remedies and objections<sup>1</sup> and permitted advertisements -diseases which cannot be claimed to be cured.

**Narcotic Drugs and psychotropic substances Act,1985**-A brief study of the act with special reference to its objectives, offences and punishment.

Brief introduction to the study of the following acts:

**Latest Drugs (price control) order in force.**

**Poisons Act 1919(as amended to date)**

**Medicinal and Toilet preparations (excise Duties) Act, 1955 (as amended to date).**

**Medical Termination of Pregnancy Act, 1971(as amended to date).**

**Books recommended:(Latest editions)**

Bare Acts of the said laws published by Government.

## 2.5 DRUG STORE AND BUSINESS MANAGEMENT

### THEORY (75 hours)

#### Part I Commerce (50 hours)

**Introduction**-Trade, Industry and commerce, Functions and subdivision of commerce, Introduction to Elements for Economics and Management. Forms of Business Organizations. Channels of Distribution.

**Drug House Management**-selection of site, space Lay-out and legal requirements. Importance and objectives of purchasing, selection of suppliers, credit information, tenders, contracts and price determination and legal requirements thereto. Codification, handling of drug stores and other hospital supplies. Inventory Control-objects and importance, modern techniques like ABC, VED analysis, the lead time, inventory carrying cost, safety stock, minimum and maximum stock levels, economic order quantity, scrap and surplus disposal.

**Sales** promotion, Market Research, Salesmanship, qualities of a salesman, Advertising and Window Display.

**Recruitment, training**, evaluation and compensation of the pharmacist.

**Banking and Finance**-Service and functions of bank, Finance planning and sources of finance.

#### Part II Accountancy (25 hours)

**Introduction to the accounting** concepts and conventions. Double entry Book Keeping, Different kinds of accounts. Cash Book. General Ledger and Trial Balance. Profit and Loss Account and Balance Sheet. Simple techniques of analyzing financial statements. Introduction to Budgeting.

**Books Recommended: (Latest editions)**

## 2.6 HOSPITAL AND CLINICAL PHARMACY

### THEORY (75 hours)

#### Part-I: Hospital Pharmacy:

**Hospital**-Definition, Function, classifications based on various criteria, organization, Management and health delivery system in India.

**Hospital Pharmacy:** Definition Functions and objectives of Hospital pharmaceutical services. Location, Layout, Flow chart of materials and men.

Personnel and facilities requirements including equipments based on individual and basic needs. Requirements and abilities required for Hospital pharmacists.

**Drug Distribution system in Hospitals.** Out-patient service,

In-patient services- types of services detailed discussion of unit Dose system, Floor ward stock system, satellite pharmacy services, central sterile services, Bed side pharmacy.

**Manufacturing:** Economical considerations, estimation of demand.

**Sterile manufacture**-Large and small volume parenterals, facilities, requirements, layout production planning, man-power requirements.

**Non-sterile manufacture**-Liquid orals, externals, Bulk concentrates. Procurement of stores and testing of raw materials.

Nomenclature and uses of surgical instruments and Hospital Equipments and health accessories.

**P.T.C.(pharmacy Therapeutic Committee)**

**Hospital Formulary system** and their organization, functioning, composition.

**Drug Information service** and Drug Information Bulletin.

**Surgical dressing** like cotton, gauze, bandages and adhesive tapes including their pharmacopoeial tests for quality. Other hospital supply eg. I.V.sets, B.G. sets, Ryals tubes, Catheters, Syringes etc

**Application of computers** in maintenance of records, inventory control, medication monitoring, drug information and data storage and retrieval in hospital retail pharmacy establishment.

## **Part II: Clinical Pharmacy:**

**Introduction to Clinical pharmacy practice**- Definition, scope.

**Modern dispensing aspects**- Pharmacists and patient counseling and advice for the use of common drugs, medication history.

**Common daily terminology used in the practice of Medicine.**

**Disease, manifestation and patho-physiology** including salient symptoms to understand the disease like Tuberculosis, Hepatitis, Rheumatoid Arthritis, Cardio-vascular diseases, Epilepsy, Diabetes, Peptic Ulcer, Hypertension.

**Physiological parameters with their significance.**

**Drug Interactions:** Definition and introduction. Mechanism of Drug Interaction. Drug-drug interaction with reference to analgesics, diuretics, cardiovascular drugs, Gastro-intestinal agents. Vitamins and Hypoglycemic agents. Drug-food interaction.

**Adverse Drug Reaction:** Definition and significance. Drug-Induced diseases and Teratogenicity.

**Drugs in Clinical Toxicity**- Introduction, general treatment of poisoning, systemic antidotes, Treatment of insecticide poisoning, heavy metal poison, Narcotic drugs, Barbiturate, Organo-phosphorus poisons.

**Drug dependences**, drug abuse, addictive drugs and their treatment, complications.

**Bio-availability of drugs**, including factors affecting it.

**Books Recommended:(Latest editions)**

1. Remington's pharmaceutical sciences.
2. Testing of raw materials used in (1).
3. Evaluation of surgical dressings.
4. Sterilization of surgical instruments, glassware and other hospital supplies.
5. Handling and use of data processing equipments.





# PHARMACY COUNCIL OF INDIA

(Constituted under the Pharmacy Act, 1948)

E-MAIL : registrar@pci.nic.in  
WEBSITE : www.pci.nic.in  
Telephone : 011-61299901  
011-61299902  
011-61299903

NBCC Centre, 3<sup>rd</sup> Floor,  
Plot No.2, Community Centre  
Maa Anandamai Marg  
Okhla Phase I  
NEW DELHI - 110 020

Ref. No.14-55/2021-PCI(A) 3642-45

23 SEP 2021

✓ To

- All institutions approved for D.Pharm Course.
- All State Governments (Technical Education and Health Departments) and admission making authorities.
- All Examining Authorities.

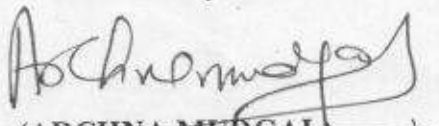
**Sub: "Syllabus framed under Regulation 7, List of prescribed equipments and apparatus under Appendix-A of The Education Regulations, 2020 for Diploma Course in Pharmacy."**

Sir/Madam

With reference to the subject cited above, it is informed that -

- With due approval of the Ministry of Health and Family Welfare, Government of India, PCI has notified the Education Regulations, 2020 for Diploma course in Pharmacy in the Gazette of India, Extraordinary No. 435, Part-III, Section-4, dt.16.10.2020.
- As empowered under regulation 7 and Appendix-A of ER-20, the PCI has framed the syllabus. A copy of the same titled as under is enclosed as **Annexure-I**.  
"Syllabus framed under Regulation 7, List of prescribed equipments and apparatus under Appendix-A of The Education Regulations, 2020 for Diploma Course in Pharmacy."
- It is for implementation and strict compliance from 2021-2022 academic session.

Yours faithfully

  
(ARCHANA MUDGAL)  
Registrar-cum-Secretary



# **Pharmacy Council of India New Delhi**

**“Syllabus framed under Regulation 7,  
List of prescribed equipments and  
apparatus under Appendix-A of  
The Education Regulations, 2020  
For Diploma Course in Pharmacy”**

## COMMITTEE MEMBERS

S. No.	Name	Affiliation	Role
1.	Dr. B. Suresh	President, Pharmacy Council of India, New Delhi	Ex-Officio
2.	Dr. Shailendra Saraf	Vice President, Pharmacy Council of India, New Delhi	Ex-Officio
3.	Dr. V. Gopal	Member, Pharmacy Council of India, (Puducherry)	Convener
4.	Dr. B. Jayakar	Member, Pharmacy Council of India, (Tamil Nadu)	Member
5.	Sri Kumar Ajay	Member, Pharmacy Council of India, (Bihar)	Member
6.	Dr. H. Lalhlenmawia	Member, Pharmacy Council of India, (Mizoram)	Member
7.	Dr. R. Debnath	Member, Pharmacy Council of India, (West Bengal)	Member
8.	Shri Annada Sankar Das	Member, Pharmacy Council of India, (Orissa)	Member
9.	Dr. Priyashree Sunita	Member, Pharmacy Council of India, (Jharkhand)	Member
10.	Dr. Mannava Radhakrishna Murthy	Member, Pharmacy Council of India, (Andhra Pradesh)	Member
11.	Shri Prakash Jeevandas Wanjari	Member, Pharmacy Council of India, (Maharashtra)	Member
12.	Shri K.R. Dinesh Kumar	Member, Pharmacy Council of India, (Kerala)	Member
13.	Mrs. Manjiri Sandeep Gharat	Principal I/c., Prin. K.M. Kundnani Pharmacy Polytechnic, Ulhasnagar, Maharashtra	Member
14.	Shri Raj Vaidya	Community Pharmacist, Hindu Pharmacy, Goa	Member
15.	Dr. R.N. Gupta	Professor, Birla Institute of Technology, Ranchi, Jharkhand.	Member
16.	Dr. K.P. Arun	Associate Professor, JSS College of Pharmacy, Ooty, Tamil Nadu	Member
17.	Dr. Neeraj Upmanyu	Professor & Dean, School of Pharmacy & Research, People's University Bhopal, Madhya Pradesh	Special Invitee

# CONTENTS

<b>S. No.</b>	<b>Contents</b>	<b>Page No.</b>
1.	Preamble	<b>1-2</b>
2.	Competencies for the Indian D.Pharm Holders	<b>3-4</b>
3.	Competency Mapping with the Courses (Part I, II & III) of Education Regulations 2020	<b>5</b>
4.	ER-2020 D.Pharm Syllabus – An Overview	<b>6-8</b>
5.	Guidelines for the conduct of theory examinations	<b>9</b>
6.	Guidelines for the conduct of practical examinations	<b>10-11</b>
7.	ER-2020 D.Pharm Syllabus – Part I	<b>12-35</b>
8.	ER-2020 D.Pharm Syllabus – Part II	<b>36-64</b>
9.	Appendices	<b>65-77</b>

## 1. Preamble

“Revamping the curriculum, pedagogy, assessment, and student support” is one of the vision statements and recommendations of the National Education Policy (NEP) of Govt. of India for attaining enhanced learning experiences by the students. In light of this, Pharmacy Council of India, the apex body regulating the pharmacy education in the country, committed to revise the education regulations of Diploma in Pharmacy (D.Pharm) program and thus, the ‘Education Regulations 2020’ (ER-2020) has been notified in the Gazette of India in October 2020. This new regulation has given due consideration for the fact that, universally the role of pharmacist has undergone continuous evolution from ‘dispenser of medicines’ to ‘medicine expert’ in the multidisciplinary health care team.

Accordingly, the courses (course means the subject) of the existing education regulations (ER-91) have been revisited, compared with the present and future needs of the society, expectations of the healthcare team and other stakeholders from the pharmacists were assessed, feedback from the experts in the pharmacy and other healthcare professions were sought. Thus, the course of study prescribed in ER-2020 is an amalgamation of all such exercises to arrive at a curriculum structure for D.Pharm that is more relevant to the current practice standards, dynamic to accommodate and address the upcoming changes.

Though the total number of courses across the program remain 21 as that of ER-91, the number of theory courses is reduced from 12 to 11 in the new regulation, while the number of practical courses is increased from 9 to 10. Further, the theory teaching hours across the program have been reduced from 850 to 825, while the practical hours have been increased from 750 to 800 in the new regulation. Three practical courses have been introduced for the first time in ER-2020. Further, about 275 hours have been assigned for the first time in D.Pharm curriculum for ‘Tutorial’ activities. All such changes explicitly reveal that the ER-2020 is intended to provide a little edge to the experiential learning through the practical courses and encourages the small group teaching-learning, self-directed learning, etc. in the tutorial hours.

Introduction of ‘Pharmacotherapeutics’ courses (theory and practical) is one of the revolutionary changes in the new curriculum, that will help the students to hone their knowledge and skills in the area of pharmaceutical care services which will certainly redefine the roles of the D.Pharm qualified pharmacists in both community and hospital settings. Also, the introduction of ‘Social Pharmacy’ courses (theory and practical) will provide insights about the primary and preventive healthcare concepts in the country and the potential roles of pharmacists in such healthcare segments.

In this backdrop, the Council has formulated a Committee which comprised of 16 Members who have rich experiences in various domains such as education, hospital

pharmacy practice, community pharmacy practice, clinical pharmacy practice, administrative and regulatory affairs to design the syllabus for the individual theory and practical courses as per the curriculum framework defined in ER-2020. The Committee with its clear understanding about the philosophy and objectives of the ER-2020, drafted the syllabus for individual theory and practical courses with utmost care to avoid repetitions, redundancy, over/under utilization of hours, etc. Every course is defined with scope, set of course objectives and course outcomes which will help to understand the significance and the expectations of the course from both teachers and students. Lots of scope has been given in the syllabus for the active learning by the students through the assignment topics and field visit activities which will enhance their critical thinking, searching scientific literatures, interpretational skills and communication skills.

According to the ER-2020 curriculum framework, the students do not earn any credits based on the academic hours they spend. However, as per the conventional methodology of credit calculations, the curriculum of ER-2020 shall be deemed equivalent to 80 credits that shall be used for the administrative purposes, wherever necessary.

Further, the 'Competencies for the Indian D.Pharm Holders' based on the knowledge, skill, attitude and value that are essential for the successful practice of the profession have been derived. These competencies have also been mapped with the individual courses of the curriculum based on the expected outcomes of the individual course. Thus, the courses and the competencies are interlaced in such a way that multiple courses contribute to build one competency and one course contributes to build more than one competency, which reveal the strength of the competency mapping.

The Council strongly believes that the ER-2020 regulations, curriculum and syllabus will uplift the knowledge and skills of the students on par with the contemporary and future professional demands and enable them to be a successful practitioner in the chosen field of pharmacy.

By considering the substantial changes and inclusion of advanced and current subject matters in the new syllabus, the Council shall conduct series of meetings, seminars, conferences, workshops, and webinars for the faculty members handling D.Pharm courses and equip them to deliver such new courses / topics more effectively and efficiently.

The Council appreciate all the efforts of the Members for successfully bringing out the Education Regulations 2020, curriculum and syllabus. Also, profound gratitude to all the stakeholders who contributed directly or indirectly in completing this task.

## 2. Competencies for the Indian D.Pharm Holders

Competency is defined as “A distinct composite of knowledge, skill, attitude and value that is essential to the practice of the profession in real life contexts”.

The candidates who successfully complete the Diploma in Pharmacy (D.Pharm) program of Education Regulations 2020 (ER-2020), from the institutions approved by the Pharmacy Council of India are expected to attain the following professional competencies.

1. Review Prescriptions
2. Dispense Prescription / Non-Prescription Medicines
3. Provide Patient Counselling / Education
4. Hospital and Community Pharmacy Management
5. Expertise on Medications
6. Proficiency on drugs / pharmaceuticals
7. Entrepreneurship and Leadership
8. Deliver Primary and Preventive Healthcare
9. Professional, Ethical and Legal Practice
10. Continuing Professional Development

**1. Review Prescriptions:** The student should receive and handle prescriptions in a professional manner and be able to check for their completeness and correctness. Also, the prescribers should be contacted for any clarifications and corrections in the prescriptions with suggestions if any.

**2. Dispense Prescription / Non-Prescription Medicines:** The student should be able to dispense the various scheduled drugs / medicines as per the implications of the Drug & Cosmetics Act and Rules thereunder. Also, the non-prescription medicines (over-the-counter drugs) should be dispensed judiciously to the patients as required.

**3. Provide Patient Counselling / Education:** The student should be able to effectively counsel / educate the patients / caretakers about the prescription / non-prescription medicines and other health related issues. Effective communication includes using both oral and written communication skills and various communication techniques.

**4. Hospital and Community Pharmacy Management:** The student should be able to manage the drug distribution system as per the policies and guidelines of the hospital pharmacy, good community pharmacy practice and the recommendations of regulatory agencies. Also, be able to manage the procurement, inventory, and distribution of medicines in hospital / community pharmacy settings.

**5. Expertise on Medications:** The student should be able to provide an expert opinion on medications to health care professionals on safe and effective medication-use, relevant policies and procedures based on available evidences.

**6. Proficiency on Pharmaceutical Formulations:** The student should be able to describe the chemistry, characteristics, types, merits and demerits of both drugs and excipients used in pharmaceutical formulations based on her/his knowledge and scientific resources.

**7. Entrepreneurship and Leadership:** The student should be able to acquire the entrepreneurial skills in the dynamic professional environments. Also, be able to achieve leadership skills through teamwork and sound decision-making skills.

**8. Deliver Primary and Preventive Healthcare:** The student should be able to contribute to various healthcare programs of the nation including disease prevention initiatives to improve public health. Also contribute to the promotion of national health policies.

**9. Professional, Ethical and Legal Practice:** The student should be able to deliver professional services in accordance with legal, ethical, and professional guidelines with integrity.

**10. Continuing Professional Development:** The student should be able to recognize the gaps in the knowledge and skills in the effective delivery of professional services from time to time and be self-motivated to bridge such gaps by attending continuing professional development programs.



### 3. Competency Mapping with the Courses (Part I, II & III) of Education Regulations 2020

Competencies	Pharmaceutics	Pharmaceutical Chemistry	Pharmacognosy	Human Anatomy & Physiology	Social Pharmacy	Pharmacology	Community Pharmacy & Management	Biochemistry & Clinical Pathology	Pharmacotherapeutics	Hospital & Clinical Pharmacy	Pharmacy Law & Ethics	Practical Training
1. Review the Prescriptions	√	√	√	√		√	√	√	√	√	√	√
2. Dispense Prescription / Non-Prescription Medicines	√	√	√		√	√	√	√	√	√	√	√
3. Provide Patient Counselling / Education	√	√	√	√	√	√	√	√	√	√	√	√
4. Hospital and Community Pharmacy Management					√		√			√	√	√
5. Expertise on Medications	√	√	√	√	√	√	√	√	√	√	√	√
6. Proficiency on Pharmaceutical Formulations	√	√	√			√			√			√
7. Entrepreneurship and Leadership							√			√		√
8. Deliver Primary and Preventive Healthcare				√	√	√	√	√	√	√	√	√
9. Professional, Ethical and Legal Practice					√		√		√	√	√	√
10. Continuing Professional Development	√	√	√		√	√	√		√	√	√	√

## 4. ER-2020 D.Pharm Syllabus – An Overview

The ER-2020 D.Pharm Syllabus has the following structure in every course. Though the theory and practical courses are not mutually exclusive, as per the Regulations, the theory and practical are to be considered as individual courses.

**Scope:** These are broader statements on the purpose of the course in the curriculum, key contents of the course that will contribute to the specific knowledge and or skill developments. The teacher is expected to orient the students about the scope of the particular course at the beginning and intermittently.

**Course Objectives:** The course objectives describe the key topics that are intended by the teacher to be covered in the course. In general, these are more specific than the scope and broader than the course outcomes. The teacher is expected to discuss the objectives of the course with the students and break-down the course objectives into micro levels as objectives of a specific topic / objectives of a specific lecture, etc. Such an exercise shall make the students to understand the significance of the course / topic / lecture and enhance their attention on the course / topic / lecture.

**Course Outcomes:** The course outcomes are more specific than the course objectives describe that describe the abilities of the students to perform/act, upon successful completion of the course. Hence, conventionally the course outcomes are described with verbs that are measurable or observable actions. The teacher is expected to describe the desired outcomes of the particular course, so that the students shall understand the various assessment criteria, modalities, and parameters. This also serves as a broader guideline for the teachers for preparing the assessment plan. A well-structured assessment plan associated with the course outcomes shall enable to mapping with the professional competencies and their attainment levels that are attributed to the program outcomes.

**Theory Courses:** The theory courses basically provide concepts and explain the relationships between the concepts. Understanding of the theoretical courses enable the students to identify the problems in real life situation and make a plan for addressing such problems. Also, the theory course helps to understand what is not known and thus is the tool for accumulation of knowledge. The syllabus of the theory courses has been systematically and logically described as different chapters and the minimum number of hours to be spent on teaching are mentioned chapter wise and course wise. The teachers shall further distribute the total hours of any given chapter among the sub-topics as required by the subject matter.

**Practical Courses:** The practical courses are designed for applying the theoretical knowledge in the given experimental / simulated conditions. The practical courses deepen the understanding of theories, develop the skills, hone professional competencies, provide opportunities to observe, think and analyse problem solving methods. Further, they help to gain experience with the real things in practice. The teachers shall train the students in actual / simulated practical conditions.

**Tutorials:** The purpose of the tutorial hour is typically to engage the students in smaller groups in order to pay a closer attention on their learning process. This is an opportunity for the students to complete their assignments, develop specific skills, discuss any problems in the study topics in a less formal way. During the tutorial hour, the students shall exchange their ideas within the small group and learn to accept constructive criticism and listen to others. Also, the tutorial hour enables the teachers to closely monitor the progress of the individual student and provide additional academic support to individuals, if necessary.

**Assignments:** The purpose the assignments are to encourage the students for self-directed learning. Further, the assignments will provoke critical thinking, enhance the skills such as literature search, data mining, data interpretation, report formatting, time-management, and written communication. This is also a mode of self-assessment for the student about the level of understanding of the concepts of a particular course. The teachers shall apply their knowledge and wisdom in choosing the assignment topics at a micro level in alignment with the topics given in the syllabus. The assignments shall be evaluated against a set of criteria. A typical format for the assessment of an assignment is given in Appendix-1.

**Field Visits:** The purpose of field visits is to provide a real-world experience to the students. The field visits will help them to realize that what they learn within the walls of the classroom / laboratory can help them solve the problems they see in the world around them. Also, this is helpful to the teachers to widen their horizons of knowledge and broadening the scope of the syllabus. Every student shall submit a report describing their objectives, experience, learning points, etc. pertaining to the field trip in the typical format given in Appendix-2.

**Recommended Books:** For each course, a list of recommended books is given in the syllabus. The list shall be considered as an important and common resource for the teaching-learning process, but not the complete list. It is always encouraged to use the latest edition of the books specified. Further, the teachers and students are encouraged to explore more primary, secondary, and tertiary resources as required.

**Practical Training:** The goal of the practical training for the students is to provide a real-time, supervised experience on the professional tasks emphasised in their course of study. Further, it helps them to apply their acquired knowledge and skills in the professional working environment. The practical training intensively prepares the students with adequate competencies and qualifications required for the career opportunity in the future.

Thus, the ER 2020 D.Pharm syllabus is designed to nurture the students in all the three domains of Bloom's Taxonomy viz. cognitive (knowledge), affective (attitude) and psychomotor (skills). Further, it also provides ample of scope to the students for different learning styles viz. visual, auditory and kinaesthetic, i.e., 'see, hear and do'.

The summary of the curriculum, courses and other activities and their metrics across the ER-2020 D.Pharm program (Part I, II & III) are given here.

Criteria	Metrics
Number of subject areas (considering both theory & practical together)	11
Number of theory courses	11
Number of practical courses	10
Number of theory hours	825
Number of practical hours	600
Number of practical training hours	500
Number of tutorial hours	275
Number of course outcomes for theory courses	45
Number of course outcomes for practical courses	40
Number of courses which have given assignments	9
Number of assignment topics given	75
Number of assignments reports each student shall submit	27
Number of courses which have field visit	5
Number of field visit reports each student shall submit	9
Number of professional competencies	10

## 5. Guidelines for the conduct of theory examinations

### Sessional Examinations

There shall be two or more periodic sessional (internal assessment) examinations during each academic year. The duration of the sessional exam shall be 90 minutes. The highest aggregate of any two performances shall form the basis of calculating the sessional marks. The scheme of the question paper for theory sessional examinations shall be as given below.

I. Long Answers (Answer 3 out of 4)	$3 \times 5 = 15$
II. Short Answers (Answer 5 out of 6)	$5 \times 3 = 15$
III. Objective type Answers (Answer all 10 out of 10) (Multiple Choice Questions / Fill-in the Blanks / One word OR one Sentence questions)	$10 \times 1 = 10$
	-----
Total =	40 marks
	-----

**Internal assessment:** The marks secured by the students out of the total 40 shall be reduced to 20 in each sessional, and then the internal assessment shall be calculated based on the best two averages for 20 marks.

### Final Board / University Examinations

The scheme of the question paper for the theory examinations conducted by the examining authority (Board / University) shall be as given below. The duration of the final examination shall be 3 hours.

I. Long Answers (Answer 6 out of 7)	=	$6 \times 5 = 30$
II. Short Answers (Answer 10 out of 11)	=	$10 \times 3 = 30$
III. Objective type Answers (Answer all 20) (Multiple Choice Questions / Fill-in the Blanks / One word OR one Sentence questions)	=	$20 \times 1 = 20$
		-----
Total =		80 marks
		-----

## 6. Guidelines for the conduct of practical examinations

### Sessional Examinations

There shall be two or more periodic sessional (internal assessment) practical examinations during each academic year. The duration of the sessional exam shall be three hours. The highest aggregate of any two performances shall form the basis of calculating the sessional marks. The scheme of the question paper for practical sessional examinations shall be as given below.

I. Synopsis	=	10
II. Experiments	=	50*
III. Viva voce	=	10
IV. Practical Record Maintenance	=	10
		-----
Total	=	80 marks
		-----

\* The marks for the experiments shall be divided into various categories, viz. major experiment, minor experiment, spotters, etc. as per the requirement of the course.

**Internal assessment:** The marks secured by the students out of the total of 80 shall be reduced to 10 in each sessional, and then the internal assessment shall be calculated based on the best two averages for 10 marks from the sessional and other 10 marks shall be awarded as per the details given below.

Actual performance in the sessional examination	=	10 marks
Assignment marks (Average of three)	=	5 marks*
Field Visit Report marks (Average for the reports)	=	5 marks\$
		-----
Total	=	20 marks
		-----

\*, \$ Only for the courses given with both assignments and field visit/s

### Note:

1. For the courses having either assignments or field visit/s, the assessments of assignments or field visit/s shall be done directly for 10 marks and added to the sessional marks.
2. For the courses not having both assignment and field visit, the whole 20 marks shall be calculated from the sessional marks.

### **Final Board / University Examinations**

The scheme of the question paper for the practical examinations conducted by the examining authority (Board / University) shall be as given below. The duration of the final examination shall be 3 hours.

I. Synopsis	=	10
II. Experiments	=	60*
III. Viva voce	=	10
		-----
Total	=	80 marks
		-----

\* The marks for the experiments shall be divided into various categories, viz. major experiment, minor experiment, spotters, etc. as per the requirement of the course.

## 7. ER-2020 D.Pharm Syllabus – Part I

S. No.	Course Code	Name of the Course	Total Theory / Practical Hours	Total Tutorial Hours	Theory / Practical Hours per Week	Tutorial Hours per Week
1.	ER20-11T	Pharmaceutics – Theory	75	25	3	1
2.	ER20-11P	Pharmaceutics – Practical	75	-	3	-
3.	ER20-12T	Pharmaceutical Chemistry – Theory	75	25	3	1
4.	ER20-12P	Pharmaceutical Chemistry – Practical	75	-	3	-
5.	ER20-13T	Pharmacognosy – Theory	75	25	3	1
6.	ER20-13P	Pharmacognosy – Practical	75	-	3	-
7.	ER20-14T	Human Anatomy & Physiology – Theory	75	25	3	1
8.	ER20-14P	Human Anatomy & Physiology – Practical	75	-	3	-
9.	ER20-15T	Social Pharmacy – Theory	75	25	3	1
10.	ER20-15P	Social Pharmacy – Practical	75	-	3	-



## PHARMACEUTICS – THEORY

**Course Code:** ER20-11T

**75 Hours (3 Hours/week)**

**Scope:** This course is designed to impart basic knowledge and skills on the art and science of formulating and dispensing different pharmaceutical dosage forms.

**Course Objectives:** This course will discuss the following aspects of pharmaceutical dosage forms

1. Basic concepts, types and need
2. Advantages and disadvantages, methods of preparation / formulation
3. Packaging and labelling requirements
4. Basic quality control tests, concepts of quality assurance and good manufacturing practices

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Describe about the different dosage forms and their formulation aspects
2. Explain the advantages, disadvantages, and quality control tests of different dosage forms
3. Discuss the importance of quality assurance and good manufacturing practices

Chapter	Topics	Hours
1	<ul style="list-style-type: none"><li>• History of the profession of Pharmacy in India in relation to Pharmacy education, industry, pharmacy practice, and various professional associations.</li><li>• Pharmacy as a career</li><li>• Pharmacopoeia: Introduction to IP, BP, USP, NF and Extra Pharmacopoeia. Salient features of Indian Pharmacopoeia</li></ul>	7
2	<b>Packaging materials:</b> Types, selection criteria, advantages and disadvantages of glass, plastic, metal, rubber as packaging materials	5
3	<b>Pharmaceutical aids:</b> Organoleptic (Colouring, flavouring, and sweetening) agents <b>Preservatives:</b> Definition, types with examples and uses	3
4	<b>Unit operations:</b> Definition, objectives/applications, principles, construction, and workings of: <b>Size reduction:</b> hammer mill and ball mill <b>Size separation:</b> Classification of powders according to IP, Cyclone separator, Sieves and standards of sieves	9

	<b>Mixing:</b> Double cone blender, Turbine mixer, Triple roller mill and Silverson mixer homogenizer <b>Filtration:</b> Theory of filtration, membrane filter and sintered glass filter <b>Drying:</b> working of fluidized bed dryer and process of freeze drying <b>Extraction:</b> Definition, Classification, method, and applications	
<b>5</b>	<b>Tablets</b> – coated and uncoated, various modified tablets (sustained release, extended-release, fast dissolving, multi-layered, etc.)	<b>8</b>
	<b>Capsules</b> - hard and soft gelatine capsules	<b>4</b>
	<b>Liquid oral preparations</b> - solution, syrup, elixir, emulsion, suspension, dry powder for reconstitution	<b>6</b>
	<b>Topical preparations</b> - ointments, creams, pastes, gels, liniments and lotions, suppositories, and pessaries	<b>8</b>
	Nasal preparations, Ear preparations	<b>2</b>
	<b>Powders and granules</b> - Insufflations, dusting powders, effervescent powders, and effervescent granules	<b>3</b>
	<b>Sterile formulations</b> – Injectables, eye drops and eye ointments	<b>6</b>
	<b>Immunological products:</b> Sera, vaccines, toxoids, and their manufacturing methods.	<b>4</b>
<b>6</b>	<b>Basic structure, layout, sections, and activities of pharmaceutical manufacturing plants</b> <b>Quality control and quality assurance:</b> Definition and concepts of quality control and quality assurance, current good manufacturing practice (cGMP), Introduction to the concept of calibration and validation	<b>5</b>
<b>7</b>	<b>Novel drug delivery systems:</b> Introduction, Classification with examples, advantages, and challenges	<b>5</b>

## PHARMACEUTICS – PRACTICAL

**Course Code:** ER20-11P

**75 Hours (3 Hours/week)**

**Scope:** This course is designed to train the students in formulating and dispensing common pharmaceutical dosage forms.

**Course Objectives:** This course will discuss and train the following aspects of preparing and dispensing various pharmaceutical dosage forms

1. Calculation of working formula from the official master formula

2. Formulation of dosage forms based on working formula
3. Appropriate Packaging and labelling requirements
4. Methods of basic quality control tests

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Calculate the working formula from the given master formula
2. Formulate the dosage form and dispense in an appropriate container
3. Design the label with the necessary product and patient information
4. Perform the basic quality control tests for the common dosage forms

## **Practicals**

1. Handling and referring the official references: Pharmacopoeias, Formularies, etc. for retrieving formulas, procedures, etc.
2. Formulation of the following dosage forms as per monograph standards and dispensing with appropriate packaging and labelling
  - **Liquid Oral:** Simple syrup, Piperazine citrate elixir, Aqueous Iodine solution
  - **Emulsion:** Castor oil emulsion, Cod liver oil emulsion
  - **Suspension:** Calamine lotion, Magnesium hydroxide mixture
  - **Ointment:** Simple ointment base, Sulphur ointment
  - **Cream:** Cetrimide cream
  - **Gel:** Sodium alginate gel
  - **Liniment:** Turpentine liniment, White liniment BPC
  - **Dry powder:** Effervescent powder granules, Dusting powder
  - **Sterile Injection:** Normal Saline, Calcium gluconate Injection
  - **Hard Gelatine Capsule:** Tetracycline capsules
  - **Tablet:** Paracetamol tablets
3. Formulation of at least five commonly used cosmetic preparations – e.g. cold cream, shampoo, lotion, toothpaste etc
4. Demonstration on various stages of tablet manufacturing processes
5. Appropriate methods of usage and storage of all dosage forms including special dosage such as different types of inhalers, spacers, insulin pens
6. Demonstration of quality control tests and evaluation of common dosage forms viz. tablets, capsules, emulsion, sterile injections as per the monographs

## Assignments

The students shall be asked to submit written assignments on the following topics (One assignment per student per sessional period. i.e., a minimum of THREE assignments per student)

1. Various systems of measures commonly used in prescribing, compounding and dispensing practices
2. Market preparations (including Fixed Dose Combinations) of each type of dosage forms, their generic name, minimum three brand names and label contents of the dosage forms mentioned in theory/practical
3. Overview of various machines / equipments / instruments involved in the formulation and quality control of various dosage forms / pharmaceutical formulations.
4. Overview of extemporaneous preparations at community / hospital pharmacy vs. manufacturing of dosage forms at industrial level
5. Basic pharmaceutical calculations: ratios, conversion to percentage fraction, alligation, proof spirit, isotonicity

## Field Visit

The students shall be taken for an industrial visit to pharmaceutical industries to witness and understand the various processes of manufacturing of any of the common dosage forms viz. tablets, capsules, liquid orals, injectables, etc. Individual reports from each student on their learning experience from the field visit shall be submitted.

## PHARMACEUTICAL CHEMISTRY – THEORY

**Course Code:** ER20-12T

**75 Hours (3 Hours/week)**

**Scope:** This course is designed to impart basic knowledge on the chemical structure, storage conditions and medicinal uses of organic and inorganic chemical substances used as drugs and pharmaceuticals. Also, this course discusses the impurities, quality control aspects of chemical substances used in pharmaceuticals.

**Course Objectives:** This course will discuss the following aspects of the chemical substances used as drugs and pharmaceuticals for various disease conditions

1. Chemical classification, chemical name, chemical structure
2. Pharmacological uses, doses, stability and storage conditions
3. Different types of formulations / dosage form available and their brand names
4. Impurity testing and basic quality control tests

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Describe the chemical class, structure and chemical name of the commonly used drugs and pharmaceuticals of both organic and inorganic nature
2. Discuss the pharmacological uses, dosage regimen, stability issues and storage conditions of all such chemical substances commonly used as drugs
3. Describe the quantitative and qualitative analysis, impurity testing of the chemical substances given in the official monographs
4. Identify the dosage form & the brand names of the drugs and pharmaceuticals popular in the marketplace

Chapter	Topic	Hours
1	<b>Introduction to Pharmaceutical chemistry:</b> Scope and objectives <b>Sources and types of errors:</b> Accuracy, precision, significant figures <b>Impurities in Pharmaceuticals:</b> Source and effect of impurities in Pharmacopoeial substances, importance of limit test, Principle and procedures of Limit tests for chlorides, sulphates, iron, heavy metals and arsenic.	8
2	<b>Volumetric analysis:</b> Fundamentals of volumetric analysis, Acid-base titration, non-aqueous titration, precipitation titration, complexometric titration, redox titration <b>Gravimetric analysis:</b> Principle and method.	8

3	<b>Inorganic Pharmaceuticals:</b> Pharmaceutical formulations, market preparations, storage conditions and uses of <ul style="list-style-type: none"> <li>• <b>Haematinics:</b> Ferrous sulphate, Ferrous fumarate, Ferric ammonium citrate, Ferrous ascorbate, Carbonyl iron</li> <li>• <b>Gastro-intestinal Agents:</b> Antacids :Aluminium hydroxide gel, Magnesium hydroxide, Magaldrate, Sodium bicarbonate, Calcium Carbonate, Acidifying agents, Adsorbents, Protectives, Cathartics</li> <li>• <b>Topical agents:</b> Silver Nitrate, Ionic Silver, Chlorhexidine Gluconate, Hydrogen peroxide, Boric acid, Bleaching powder, Potassium permanganate</li> <li>• <b>Dental products:</b> Calcium carbonate, Sodium fluoride, Denture cleaners, Denture adhesives, Mouth washes</li> <li>• <b>Medicinal gases:</b> Carbon dioxide, nitrous oxide, oxygen</li> </ul>	7
4	Introduction to nomenclature of organic chemical systems with particular reference to heterocyclic compounds containing up to Three rings	2
<b>Study of the following category of medicinal compounds with respect to classification, chemical name, chemical structure (compounds marked with*) uses, stability and storage conditions, different types of formulations and their popular brand names</b>		
5	<b>Drugs Acting on Central Nervous System</b> <ul style="list-style-type: none"> <li>• <b>Anaesthetics:</b> Thiopental Sodium*, Ketamine Hydrochloride*, Propofol</li> <li>• <b>Sedatives and Hypnotics:</b> Diazepam*, Alprazolam*, Nitrazepam, Phenobarbital*</li> <li>• <b>Antipsychotics:</b> Chlorpromazine Hydrochloride*, Haloperidol*, Risperidone*, Sulpiride*, Olanzapine, Quetiapine, Lurasidone</li> <li>• <b>Anticonvulsants:</b> Phenytoin*, Carbamazepine*, Clonazepam, Valproic Acid*, Gabapentin*, Topiramate, Vigabatrin, Lamotrigine</li> <li>• <b>Anti-Depressants:</b> Amitriptyline Hydrochloride*, Imipramine Hydrochloride*, Fluoxetine*, Venlafaxine, Duloxetine, Sertraline, Citalopram, Escitalopram, Fluvoxamine, Paroxetine</li> </ul>	9
6	<b>Drugs Acting on Autonomic Nervous System</b> <ul style="list-style-type: none"> <li>• <b>Sympathomimetic Agents: <i>Direct Acting:</i></b> Nor-Epinephrine*, Epinephrine, Phenylephrine,</li> </ul>	9

	<p>Dopamine*, Terbutaline, Salbutamol (Albuterol), Naphazoline*, Tetrahydrozoline. <b>Indirect Acting Agents:</b> Hydroxy Amphetamine, Pseudoephedrine. Agents With Mixed Mechanism: Ephedrine, Metaraminol</p> <ul style="list-style-type: none"> <li>● <b>Adrenergic Antagonists:</b> Alpha Adrenergic Blockers: Tolazoline, Phentolamine</li> <li>● Phenoxybenzamine, Prazosin. Beta Adrenergic Blockers: Propranolol*, Atenolol*, Carvedilol</li> <li>● <b>Cholinergic Drugs and Related Agents:</b> Direct Acting Agents: Acetylcholine*, Carbachol, And Pilocarpine. Cholinesterase Inhibitors: Neostigmine*, Edrophonium Chloride, Tacrine Hydrochloride, Pralidoxime Chloride, Echothiopate Iodide</li> <li>● <b>Cholinergic Blocking Agents:</b> Atropine Sulphate*, Ipratropium Bromide</li> </ul> <p><b>Synthetic Cholinergic Blocking Agents:</b> Tropicamide, Cyclopentolate Hydrochloride, Clidinium Bromide, Dicyclomine Hydrochloride*</p>	
7	<p><b>Drugs Acting on Cardiovascular System</b></p> <ul style="list-style-type: none"> <li>● <b>Anti-Arrhythmic Drugs:</b> Quinidine Sulphate, Procainamide Hydrochloride, Verapamil, Phenytoin Sodium*, Lidocaine Hydrochloride, Lorcaïnide Hydrochloride, Amiodarone and Sotalol</li> <li>● <b>Anti-Hypertensive Agents:</b> Propranolol*, Captopril*, Ramipril, Methyldopate Hydrochloride, Clonidine Hydrochloride, Hydralazine Hydrochloride, Nifedipine,</li> <li>● <b>Antianginal Agents:</b> Isosorbide Dinitrate</li> </ul>	5
8	<p><b>Diuretics:</b> Acetazolamide, Frusemide*, Bumetanide, Chlorthalidone, Benzthiazide, Metolazone, Xipamide, Spironolactone</p>	2
9	<p><b>Hypoglycemic Agents:</b> Insulin and Its Preparations, Metformin*, Glibenclamide*, Glimepiride, Pioglitazone, Repaglinide, Gliflozins, Gliptins</p>	3
10	<p><b>Analgesic And Anti-Inflammatory Agents:</b> Morphine Analogues, Narcotic Antagonists; <b>Nonsteroidal Anti-Inflammatory Agents (NSAIDs)</b> - Aspirin*, Diclofenac, Ibuprofen*, Piroxicam, Celecoxib, Mefenamic Acid, Paracetamol*, Aceclofenac</p>	3
11	<p><b>Anti-Infective Agents</b></p> <ul style="list-style-type: none"> <li>● <b>Antifungal Agents:</b> Amphotericin-B, Griseofulvin, Miconazole, Ketoconazole*, Itraconazole, Fluconazole*, Naftifine Hydrochloride</li> </ul>	8

	<ul style="list-style-type: none"> <li>● <b>Urinary Tract Anti-Infective Agents:</b> Norfloxacin, Ciprofloxacin, Ofloxacin*, Moxifloxacin,</li> <li>● <b>Anti-Tubercular Agents:</b> INH*, Ethambutol, Para Amino Salicylic Acid, Pyrazinamide, Rifampicin, Bedaquiline, Delamanid, Pretomanid*</li> <li>● <b>Antiviral Agents:</b> Amantadine Hydrochloride, Idoxuridine, Acyclovir*, Foscarnet, Zidovudine, Ribavirin, Remdesivir, Favipiravir</li> <li>● <b>Antimalarials:</b> Quinine Sulphate, Chloroquine Phosphate*, Primaquine Phosphate, Mefloquine*, Cycloguanil, Pyrimethamine, Artemisinin</li> <li>● <b>Sulfonamides:</b> Sulfanilamide, Sulfadiazine, Sulfamethoxazole, Sulfacetamide*, Mafenide Acetate, Cotrimoxazole, Dapsone*</li> </ul>	
12	<b>Antibiotics:</b> Penicillin G, Amoxicillin*, Cloxacillin, Streptomycin, <b>Tetracyclines:</b> Doxycycline, Minocycline, <b>Macrolides:</b> Erythromycin, Azithromycin, <b>Miscellaneous:</b> Chloramphenicol* Clindamycin	8
13	<b>Anti-Neoplastic Agents:</b> Cyclophosphamide*, Busulfan, Mercaptopurine, Fluorouracil*, Methotrexate, Dactinomycin, Doxorubicin Hydrochloride, Vinblastine Sulphate, Cisplatin*, Dromostanolone Propionate	3

## PHARMACEUTICAL CHEMISTRY – PRACTICAL

**Course Code: ER20-12P**

**75 Hours (3 Hours/week)**

**Scope:** This course is designed to impart basic training and hands-on experiences to synthesis chemical substances used as drugs and pharmaceuticals. Also, to perform the quality control tests, impurity testing, test for purity and systematic qualitative analysis of chemical substances used as drugs and pharmaceuticals.

**Course Objectives:** This course will provide the hands-on experience on the following aspects of chemical substances used as drugs and pharmaceuticals

1. Limit tests and assays of selected chemical substances as per the monograph
2. Volumetric analysis of the chemical substances
3. Basics of preparatory chemistry and their analysis
4. Systematic qualitative analysis for the identification of the chemical drugs



**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Perform the limit tests for various inorganic elements and report
2. Prepare standard solutions using the principles of volumetric analysis
3. Test the purity of the selected inorganic and organic compounds against the monograph standards
4. Synthesize the selected chemical substances as per the standard synthetic scheme
5. Perform qualitative tests to systematically identify the unknown chemical substances

### Practicals

S. No.	Experiment
1	<b>Limit test for</b> <ul style="list-style-type: none"><li>• Chlorides; sulphate; Iron; heavy metals</li></ul>
2	Identification tests for Anions and Cations as per Indian Pharmacopoeia
3	<b>Fundamentals of Volumetric analysis</b> Preparation of standard solution and standardization of Sodium Hydroxide, Potassium Permanganate
4	<b>Assay of the following compounds</b> <ul style="list-style-type: none"><li>• Ferrous sulphate- by redox titration</li><li>• Calcium gluconate-by complexometric</li><li>• Sodium chloride-by Modified Volhard's method</li><li>• Ascorbic acid by iodometry</li><li>• Ibuprofen by alkalimetry</li></ul>
5	<b>Fundamentals of preparative organic chemistry</b> Determination of Melting point and boiling point of organic compounds
6	<b>Preparation of organic compounds</b> <ul style="list-style-type: none"><li>• Benzoic acid from Benzamide</li><li>• Picric acid from Phenol</li></ul>
7	<b>Identification and test for purity of pharmaceuticals</b> Aspirin, Caffeine, Paracetamol, Sulfanilamide
8	Systematic Qualitative analysis experiments (4 substances)

## **Assignments**

The students shall be asked to submit the written assignments on the following topics (One assignment per student per sessional period. i.e., a minimum of THREE assignments per student)

1. Different monographs and formularies available and their major contents
2. Significance of quality control and quality assurance in pharmaceutical industries
3. Overview on Green Chemistry
4. Various software programs available for computer aided drug discovery
5. Various instrumentations used for characterization and quantification of drug

## PHARMACOGNOSY – THEORY

**Course Code: ER20-13T**

**75 Hours (3 Hours/week)**

**Scope:** This course is designed to impart knowledge on the medicinal uses of various drugs of natural origin. Also, the course emphasizes the fundamental concepts in the evaluation of crude drugs, alternative systems of medicine, nutraceuticals, and herbal cosmetics.

**Course Objectives:** This course will discuss the following aspects of drug substances derived from natural resources.

1. Occurrence, distribution, isolation, identification tests of common phytoconstituents
2. Therapeutic activity and pharmaceutical applications of various natural drug substances and phytoconstituents
3. Biological source, chemical constituents of selected crude drugs and their therapeutic efficacy in common diseases and ailments
4. Basic concepts in quality control of crude drugs and various system of medicines
5. Applications of herbs in health foods and cosmetics

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Identify the important/common crude drugs of natural origin
2. Describe the uses of herbs in nutraceuticals and cosmeceuticals
3. Discuss the principles of alternative system of medicines
4. Describe the importance of quality control of drugs of natural origin

Chapter	Topic	Hours
1	Definition, history, present status and scope of Pharmacognosy	2
2	<b>Classification of drugs:</b> <ul style="list-style-type: none"><li>• Alphabetical</li><li>• Taxonomical</li><li>• Morphological</li><li>• Pharmacological</li><li>• Chemical</li><li>• Chemo-taxonomical</li></ul>	4
3	<b>Quality control of crude drugs:</b> <ul style="list-style-type: none"><li>• Different methods of adulteration of crude drugs</li><li>• Evaluation of crude drugs</li></ul>	6

4	Brief outline of occurrence, distribution, isolation, identification tests, therapeutic activity and pharmaceutical applications of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins.		6
5	Biological source, chemical constituents and therapeutic efficacy of the following categories of crude drugs.		30
	Laxatives	Aloe, Castor oil, Ispaghula, Senna	
	Cardiotonic	Digitalis, Arjuna	
	Carminatives and G.I. regulators	Coriander, Fennel, Cardamom, Ginger, Clove, Black Pepper, Asafoetida, Nutmeg, Cinnamon	
	Astringents	Myrobalan, Black Catechu, Pale Catechu	
	Drugs acting on nervous system	Hyoscyamus, Belladonna, Ephedra, Opium, Tea leaves, Coffee seeds, Coca	
	Anti-hypertensive	Rauwolfia	
	Anti-tussive	Vasaka, Tolu Balsam	
	Anti-rheumatics	Colchicum seed	
	Anti-tumour	Vinca, Podophyllum	
	Antidiabetics	Pterocarpus, Gymnema	
	Diuretics	Gokhru, Punarnava	
	Anti-dysenteric	Ipecacuanha	
	Antiseptics and disinfectants	Benzoin, Myrrh, Neem, Turmeric	
	Antimalarials	Cinchona, Artemisia	
	Oxytocic	Ergot	
	Vitamins	Cod liver oil, Shark liver oil	
	Enzymes	Papaya, Diastase, Pancreatin, Yeast	
	Pharmaceutical Aids	Kaolin, Lanolin, Beeswax, Acacia, Tragacanth, Sodium alginate, Agar, Guar gum, Gelatine	
Miscellaneous	Squill, Galls, Ashwagandha, Tulsi, Guggul		
6	<b>Plant fibres used as surgical dressings:</b> Cotton, silk, wool and regenerated fibres Sutures – Surgical Catgut and Ligatures		3
7	<b>● Basic principles involved in the traditional systems of medicine like:</b> Ayurveda, Siddha, Unani and Homeopathy  <b>● Method of preparation of Ayurvedic formulations like:</b> Arista, Asava, Gutika, Taila, Churna, Lehya and Bhasma		8

<b>8</b>	Role of medicinal and aromatic plants in national economy and their export potential	<b>2</b>
<b>9</b>	<b>Herbs as health food:</b> Brief introduction and therapeutic applications of: Nutraceuticals, Antioxidants, Pro-biotics, Pre-biotics, Dietary fibres, Omega-3-fatty acids, Spirulina, Carotenoids, Soya and Garlic	<b>4</b>
<b>10</b>	Introduction to herbal formulations	<b>4</b>
<b>11</b>	<b>Herbal cosmetics:</b> Sources, chemical constituents, commercial preparations, therapeutic and cosmetic uses of: Aloe vera gel, Almond oil, Lavender oil, Olive oil, Rosemary oil, Sandal Wood oil	<b>4</b>
<b>12</b>	Phytochemical investigation of drugs	<b>2</b>

## PHARMACOGNOSY – PRACTICAL

**Course Code: ER20-13P**

**75 Hours (3 Hours/week)**

**Scope:** This course is designed to train the students in physical identification, morphological characterization, physical and chemical characterization, and evaluation of commonly used herbal drugs.

**Course Objectives:** This course will provide hands-on experiences to the students in

1. Identification of the crude drugs based on their morphological characteristics
2. Various characteristic anatomical characteristics of the herbal drugs studied through transverse section
3. Physical and chemical tests to evaluate the crude drugs

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Identify the given crude drugs based on the morphological characteristics
2. Take a transverse section of the given crude drugs
3. Describe the anatomical characteristics of the given crude drug under microscopical conditions
4. Carry out the physical and chemical tests to evaluate the given crude drugs

## Practicals

### 1. Morphological Identification of the following drugs:

Ispaghula, Senna, Coriander, Fennel, Cardamom, Ginger, Nutmeg, Black Pepper, Cinnamon, Clove, Ephedra, Rauwolfia, Gokhru, Punarnava, Cinchona, Agar.

### 2. Gross anatomical studies (Transverse Section) of the following drugs:

Ajwain, Datura, Cinnamon, Cinchona, Coriander, Ashwagandha, Liquorice, Clove, Curcuma, Nux\_vomica, Vasaka

### 3. Physical and chemical tests for evaluation of any FIVE of the following drugs:

Asafoetida, Benzoin, Pale catechu, Black catechu, Castor oil, Acacia, Tragacanth, Agar, Guar gum, Gelatine.

## Assignments

The students shall be asked to submit the written assignments on the following topics (One assignment per student per sessional period. i.e., a minimum of THREE assignments per student)

1. Market preparations of various dosage forms of Ayurvedic, Unani, Siddha, Homeopathic (Classical and Proprietary), indications, and their labelling requirements
2. Market preparations of various herbal formulations and herbal cosmetics, indications, and their labelling requirements
3. Herb-Drug interactions documented in the literature and their clinical significances

## Field Visit

The students shall be taken in groups to a medicinal garden to witness and understand the nature of various medicinal plants discussed in theory and practical courses. Additionally, they shall be taken in groups to the pharmacies of traditional systems of medicines to understand the availability of various dosage forms and their labelling requirements. Individual reports from each student on their learning experience from the field visit shall be submitted.

## HUMAN ANATOMY AND PHYSIOLOGY – THEORY

**Course Code: ER20-14T**

**75 Hours (3 Hours/week)**

**Scope:** This course is designed to impart basic knowledge on the structure and functions of the human body. It helps in understanding both homeostasis mechanisms and homeostatic imbalances of various systems of the human body.

**Course Objectives:** This course will discuss the following:

1. Structure and functions of the various organ systems and organs of the human body
2. Homeostatic mechanisms and their imbalances in the human body
3. Various vital physiological parameters of the human body and their significances

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Describe the various organ systems of the human body
2. Discuss the anatomical features of the important human organs and tissues
3. Explain the homeostatic mechanisms regulating the normal physiology in the human system
4. Discuss the significance of various vital physiological parameters of the human body

Chapter	Topic	Hours
1	Scope of Anatomy and Physiology Definition of various terminologies	2
2	<b>Structure of Cell:</b> Components and its functions	2
3	<b>Tissues of the human body:</b> Epithelial, Connective, Muscular and Nervous tissues – their sub-types and characteristics.	4
4	<b>Osseous system:</b> structure and functions of bones of axial and appendicular skeleton Classification, types and movements of joints, disorders of joints	3 3
5	<b>Haemopoietic system</b> <ul style="list-style-type: none"><li>• Composition and functions of blood</li><li>• Process of Hemopoiesis</li><li>• Characteristics and functions of RBCs, WBCs, and platelets</li><li>• Mechanism of Blood Clotting</li><li>• Importance of Blood groups</li></ul>	8

<b>6</b>	<b>Lymphatic system</b> <ul style="list-style-type: none"> <li>• Lymph and lymphatic system, composition, function and its formation.</li> <li>• Structure and functions of spleen and lymph node.</li> </ul>	<b>3</b>
<b>7</b>	<b>Cardiovascular system</b> <ul style="list-style-type: none"> <li>• Anatomy and Physiology of heart</li> <li>• Blood vessels and circulation (Pulmonary, coronary and systemic circulation)</li> <li>• Cardiac cycle and Heart sounds, Basics of ECG</li> <li>• Blood pressure and its regulation</li> </ul>	<b>8</b>
<b>8</b>	<b>Respiratory system</b> <ul style="list-style-type: none"> <li>• Anatomy of respiratory organs and their functions.</li> <li>• Regulation, and Mechanism of respiration.</li> <li>• Respiratory volumes and capacities – definitions</li> </ul>	<b>4</b>
<b>9</b>	<b>Digestive system</b> <ul style="list-style-type: none"> <li>• Anatomy and Physiology of the GIT</li> <li>• Anatomy and functions of accessory glands</li> <li>• Physiology of digestion and absorption</li> </ul>	<b>8</b>
<b>10</b>	<b>Skeletal muscles</b> <ul style="list-style-type: none"> <li>• Histology</li> <li>• Physiology of muscle contraction</li> <li>• Disorder of skeletal muscles</li> </ul>	<b>2</b>
<b>11</b>	<b>Nervous system</b> <ul style="list-style-type: none"> <li>• Classification of nervous system</li> <li>• Anatomy and physiology of cerebrum, cerebellum, mid brain</li> <li>• Function of hypothalamus, medulla oblongata and basal ganglia</li> <li>• Spinal cord-structure and reflexes</li> <li>• Names and functions of cranial nerves.</li> <li>• Anatomy and physiology of sympathetic and parasympathetic nervous system (ANS)</li> </ul>	<b>8</b>
<b>12</b>	<b>Sense organs - Anatomy and physiology of</b> <ul style="list-style-type: none"> <li>• Eye</li> <li>• Ear</li> <li>• Skin</li> <li>• Tongue</li> <li>• Nose</li> </ul>	<b>6</b>
<b>13</b>	<b>Urinary system</b> <ul style="list-style-type: none"> <li>• Anatomy and physiology of urinary system</li> <li>• Physiology of urine formation</li> <li>• Renin - angiotensin system</li> <li>• Clearance tests and micturition</li> </ul>	<b>4</b>



<b>14</b>	<b>Endocrine system (Hormones and their functions)</b> <ul style="list-style-type: none"> <li>● Pituitary gland</li> <li>● Adrenal gland</li> <li>● Thyroid and parathyroid gland</li> <li>● Pancreas and gonads</li> </ul>	<b>6</b>
<b>15</b>	<b>Reproductive system</b> <ul style="list-style-type: none"> <li>● Anatomy of male and female reproductive system</li> <li>● Physiology of menstruation</li> <li>● Spermatogenesis and Oogenesis</li> <li>● Pregnancy and parturition</li> </ul>	<b>4</b>

## HUMAN ANATOMY AND PHYSIOLOGY – PRACTICAL

**Course Code: ER20-14P**

**75 Hours (3 Hours/week)**

**Scope:** This course is designed to train the students and instil the skills for carrying out basic physiological monitoring of various systems and functions.

**Course Objectives:** This course will provide hands-on experience in the following:

1. General blood collection techniques and carrying out various haematological assessments and interpreting the results
2. Recording and monitoring the vital physiological parameters in human subjects and the basic interpretations of the results
3. Microscopic examinations of the various tissues permanently mounted in glass slides
4. Discuss the anatomical and physiological characteristics of various organ systems of the body using models, charts, and other teaching aids

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Perform the haematological tests in human subjects and interpret the results
2. Record, monitor and document the vital physiological parameters of human subjects and interpret the results
3. Describe the anatomical features of the important human tissues under the microscopical conditions
4. Discuss the significance of various anatomical and physiological characteristics of the human body

## Practicals

1. Study of compound microscope
2. General techniques for the collection of blood
3. Microscopic examination of Epithelial tissue, Cardiac muscle, Smooth muscle, Skeletal muscle, Connective tissue, and Nervous tissue of ready / pre-prepared slides.
4. Study of Human Skeleton-Axial skeleton and appendicular skeleton
5. Determination of
  - a. Blood group
  - b. ESR
  - c. Haemoglobin content of blood
  - d. Bleeding time and Clotting time
6. Determination of WBC count of blood
7. Determination of RBC count of blood
8. Determination of Differential count of blood
9. Recording of Blood Pressure in various postures, different arms, before and after exertion and interpreting the results
10. Recording of Body temperature (using mercury, digital and IR thermometers at various locations), Pulse rate/ Heart rate (at various locations in the body, before and after exertion), Respiratory Rate
11. Recording Pulse Oxygen (before and after exertion)
12. Recording force of air expelled using Peak Flow Meter
13. Measurement of height, weight, and BMI
14. Study of various systems and organs with the help of chart, models, and specimens
  - a) Cardiovascular system
  - b) Respiratory system
  - c) Digestive system
  - d) Urinary system
  - e) Endocrine system
  - f) Reproductive system
  - g) Nervous system
  - h) Eye
  - i) Ear
  - j) Skin

## SOCIAL PHARMACY – THEORY

**Course Code:** ER20-15T

**75 Hours (3 Hours/week)**

**Scope:** This course is designed to impart basic knowledge on public health, epidemiology, preventive care, and other social health related concepts. Also, to emphasize the roles of pharmacists in the public health programs.

**Course Objectives:** This course will discuss about basic concepts of

1. Public health and national health programs
2. Preventive healthcare
3. Food and nutrition related health issues
4. Health education and health promotion
5. General roles and responsibilities of pharmacists in public health

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Discuss about roles of pharmacists in the various national health programs
2. Describe various sources of health hazards and disease preventive measures
3. Discuss the healthcare issues associated with food and nutritional substances
4. Describe the general roles and responsibilities of pharmacists in public health

Chapter	Topic	Hours
1	<b>Introduction to Social Pharmacy</b> <ul style="list-style-type: none"><li>• Definition and Scope. Social Pharmacy as a discipline and its scope in improving the public health. Role of Pharmacists in Public Health. (2)</li><li>• Concept of Health -WHO Definition, various dimensions, determinants, and health indicators. (3)</li><li>• National Health Policy – Indian perspective (1)</li><li>• Public and Private Health System in India, National Health Mission (2)</li><li>• Introduction to Millennium Development Goals, Sustainable Development Goals, FIP Development Goals (1)</li></ul>	9
2	<b>Preventive healthcare – Role of Pharmacists in the following</b> <ul style="list-style-type: none"><li>• Demography and Family Planning (3)</li><li>• Mother and child health, importance of breastfeeding, ill effects of infant milk substitutes and bottle feeding (2)</li><li>• Overview of Vaccines, types of immunity and immunization (4)</li></ul>	18

	<ul style="list-style-type: none"> <li>• Effect of Environment on Health – Water pollution, importance of safe drinking water, waterborne diseases, air pollution, noise pollution, sewage and solid waste disposal, occupational illnesses, Environmental pollution due to pharmaceuticals (7)</li> <li>• Psychosocial Pharmacy: Drugs of misuse and abuse – psychotropics, narcotics, alcohol, tobacco products. Social Impact of these habits on social health and productivity and suicidal behaviours (2)</li> </ul>	
<b>3</b>	<b>Nutrition and Health</b> <ul style="list-style-type: none"> <li>• Basics of nutrition – Macronutrients and Micronutrients (3)</li> <li>• Importance of water and fibres in diet (1)</li> <li>• Balanced diet, Malnutrition, nutrition deficiency diseases, ill effects of junk foods, calorific and nutritive values of various foods, fortification of food (3)</li> <li>• Introduction to food safety, adulteration of foods, effects of artificial ripening, use of pesticides, genetically modified foods (1)</li> <li>• Dietary supplements, nutraceuticals, food supplements – indications, benefits, Drug-Food Interactions (2)</li> </ul>	<b>10</b>
<b>4</b>	<p>Introduction to Microbiology and common microorganisms (3)</p> <p><b>Epidemiology:</b> Introduction to epidemiology, and its applications. Understanding of terms such as epidemic, pandemic, endemic, mode of transmission, outbreak, quarantine, isolation, incubation period, contact tracing, morbidity, mortality, . (2)</p> <p>Causative agents, epidemiology and clinical presentations and Role of Pharmacists in educating the public in prevention of the following communicable diseases:</p> <ul style="list-style-type: none"> <li>• Respiratory infections – chickenpox, measles, rubella, mumps, influenza (including Avian-Flu, H1N1, SARS, MERS, COVID-19), diphtheria, whooping cough, meningococcal meningitis, acute respiratory infections, tuberculosis, Ebola (7)</li> <li>• Intestinal infections – poliomyelitis, viral hepatitis, cholera, acute diarrheal diseases, typhoid, amebiasis, worm infestations, food poisoning (7)</li> </ul>	<b>28</b>

	<ul style="list-style-type: none"> <li>• Arthropod-borne infections - dengue, malaria, filariasis and, chikungunya (4)</li> <li>• Surface infections – trachoma, tetanus, leprosy (2)</li> <li>• STDs, HIV/AIDS (3)</li> </ul>	
<b>5</b>	Introduction to health systems and <b>all ongoing National Health programs</b> in India, their objectives, functioning, outcome, and the role of pharmacists.	<b>8</b>
<b>6</b>	<b>Pharmacoeconomics</b> – Introduction, basic terminologies, importance of pharmacoeconomics	<b>2</b>

### SOCIAL PHARMACY – PRACTICAL

**Course Code: ER20-15P**

**75 Hours (3 Hours/week)**

**Scope:** This course is designed to provide simulated experience in various public health and social pharmacy activities.

**Course Objectives:** This course will train the students on various roles of pharmacists in public health and social pharmacy activities in the following areas:

1. National immunization programs
2. Reproductive and child health programs
3. Food and nutrition related health programs
4. Health education and promotion
5. General roles and responsibilities of the pharmacists in public health
6. First Aid for various emergency conditions including basic life support and cardiopulmonary resuscitation

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Describe the roles and responsibilities of pharmacists in various National health programs
2. Design promotional materials for public health awareness
3. Describe various health hazards including microbial sources
4. Advice on preventive measures for various diseases
5. Provide first aid for various emergency conditions

**Note:** Demonstration / Hands-on experience / preparation of charts / models / promotional materials / role plays / enacting / e-brochures / e-flyers / podcasts / video podcasts / any other innovative activities to understand the concept of various elements of social pharmacy listed here. (At least one activity to be carried out for each one of the following):

## Practicals

1. National immunization schedule for children, adult vaccine schedule, Vaccines which are not included in the National Immunization Program.
2. RCH – reproductive and child health – nutritional aspects, relevant national health programmes.
3. Family planning devices
4. Microscopical observation of different microbes (readymade slides)
5. Oral Health and Hygiene
6. Personal hygiene and etiquettes – hand washing techniques, Cough and sneeze etiquettes.
7. Various types of masks, PPE gear, wearing/using them, and disposal.
8. Menstrual hygiene, products used
9. First Aid – Theory, basics, demonstration, hands on training, audio-visuals, and practice, BSL (Basic Life Support) Systems [SCA - Sudden Cardiac Arrest, FBAO - Foreign Body Airway Obstruction, CPR, Defibrillation (using AED) (Includes CPR techniques, First Responder).
10. Emergency treatment for all medical emergency cases viz. snake bite, dog bite, insecticide poisoning, fractures, burns, epilepsy etc.
11. Role of Pharmacist in Disaster Management.
12. Marketed preparations of disinfectants, antiseptics, fumigating agents, antilarval agents, mosquito repellents, etc.
13. Health Communication: Audio / Video podcasts, Images, Power Point Slides, Short Films, etc. in regional language(s) for mass communication / education / Awareness on 5 different communicable diseases, their signs and symptoms, and prevention.
14. Water purification techniques, use of water testing kit, calculation of Content/percentage of  $\text{KMnO}_4$ , bleaching powder to be used for wells/tanks
15. Counselling children on junk foods, balanced diets – using Information, Education and Communication (IEC), counselling, etc. (Simulation Experiments).
16. Preparation of various charts on nutrition, sources of various nutrients from Locally available foods, calculation of caloric needs of different groups (e.g. child, mother, sedentary lifestyle, etc.). Chart of glycemic index of foods.
17. Tobacco cessation, counselling, identifying various tobacco containing products through charts/pictures

## Assignment

The students shall be asked to submit the written assignments on the following topics (One assignment per student per sessional period. i.e., a minimum of THREE assignments per student)

1. An overview of Women's Health Issues
2. Study the labels of various packed foods to understand their nutritional contents
3. Breastfeeding counselling, guidance – using Information, Education and Communication (IEC)
4. Information about the organizations working on de-addiction services in the region (city / district, etc.)
5. Role of a pharmacist in disaster management – A case study
6. Overview on the National Tuberculosis Elimination Programme (NTEP)
7. Drug disposal systems in the country, at industry level and citizen level
8. Various Prebiotics or Probiotics (dietary and market products)
9. Emergency preparedness: Study of local Government structure with respect to Fire, Police departments, health department
10. Prepare poster/presentation for general public on any one of the Health Days. e.g. Day, AIDS Day, Handwashing Day, ORS day, World Diabetes Day, World Heart Day, etc.
11. List of home medicines, their storage, safe handling, and disposal of unused medicines
12. Responsible Use of Medicines: From Purchase to Disposal
13. Collection of newspaper clips (minimum 5) relevant to any one topic and its submission in an organized form with collective summary based on the news items
14. Read a minimum of one article relevant to any theory topic, from Pharma /Science/ or other Periodicals and prepare summary of it for submission
15. Potential roles of pharmacists in rural India

## Field Visits

The students shall be taken in groups to visit any THREE of the following facilities to witness and understand the activities of such centres/facilities from the perspectives of the topics discussed in theory and/or practical courses. Individual reports from each student on their learning experience from the field visits shall be submitted.

1. Garbage Treatment Plant
2. Sewage Treatment Plant
3. Bio-medical Waste Treatment Plant
4. Effluent Treatment Plant
5. Water purification plant
6. Orphanage / Elderly-Care-Home / School and or Hostel/Home for persons with disabilities
7. Primary health care centre

## 8. ER-2020 D.Pharm Syllabus – Part II

S. No.	Course Code	Name of the Course	Total Theory / Practical Hours	Total Tutorial Hours	Theory / Practical Hours per Week	Tutorial Hours per Week
1.	ER20-21T	Pharmacology – Theory	75	25	3	1
2.	ER20-21P	Pharmacology – Practical	50	-	2	-
3.	ER20-22T	Community Pharmacy & Management – Theory	75	25	3	1
4.	ER20-22P	Community Pharmacy & Management – Practical	75	-	3	-
5.	ER20-23T	Biochemistry & Clinical Pathology – Theory	75	25	3	1
6.	ER20-23P	Biochemistry & Clinical Pathology – Practical	50	-	2	-
7.	ER20-24T	Pharmacotherapeutics – Theory	75	25	3	1
8.	ER20-24P	Pharmacotherapeutics – Practical	25	-	1	-
9.	ER20-25T	Hospital & Clinical Pharmacy – Theory	75	25	3	1
10.	ER20-25P	Hospital & Clinical Pharmacy – Practical	25	-	1	-
11.	ER20-26T	Pharmacy Law & Ethics	75	25	3	1



## PHARMACOLOGY – THEORY

**Course Code: ER20-21T**

**75 Hours (3 Hours/week)**

**Scope:** This course provides basic knowledge about different classes of drugs available for the pharmacotherapy of common diseases. The indications for use, dosage regimen, routes of administration, pharmacokinetics, pharmacodynamics, and contraindications of the drugs discussed in this course are vital for successful professional practice.

**Course Objectives:** This course will discuss the following:

1. General concepts of pharmacology including pharmacokinetics, pharmacodynamics, routes of administration, etc.
2. Pharmacological classification and indications of drugs
3. Dosage regimen, mechanisms of action, contraindications of drugs
4. Common adverse effects of drugs

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Describe the basic concepts of pharmacokinetics and pharmacodynamics
2. Enlist the various classes and drugs of choices for any given disease condition
3. Advise the dosage regimen, route of administration and contraindications for a given drug
4. Describe the common adverse drug reactions

Chapter	Topic	Hours
1	<b>General Pharmacology</b> <ul style="list-style-type: none"><li>• Introduction and scope of Pharmacology</li><li>• Various routes of drug administration - advantages and disadvantages</li><li>• Drug absorption - definition, types, factors affecting drug absorption</li><li>• Bioavailability and the factors affecting bioavailability</li><li>• Drug distribution - definition, factors affecting drug distribution</li><li>• Biotransformation of drugs - Definition, types of biotransformation reactions, factors influencing drug metabolisms</li><li>• Excretion of drugs - Definition, routes of drug excretion</li><li>• General mechanisms of drug action and factors modifying drug action</li></ul>	10

<b>2</b>	<b>Drugs Acting on the Peripheral Nervous System</b> <ul style="list-style-type: none"> <li>• Steps involved in neurohumoral transmission</li> <li>• Definition, classification, pharmacological actions, dose, indications, and contraindications of <ul style="list-style-type: none"> <li>a) Cholinergic drugs</li> <li>b) Anti-Cholinergic drugs</li> <li>c) Adrenergic drugs</li> <li>d) Anti-adrenergic drugs</li> <li>e) Neuromuscular blocking agents</li> <li>f) Drugs used in Myasthenia gravis</li> <li>g) Local anaesthetic agents</li> <li>h) Non-Steroidal Anti-Inflammatory drugs (NSAIDs)</li> </ul> </li> </ul>	<b>11</b>
<b>3</b>	<b>Drugs Acting on the Eye</b> <p>Definition, classification, pharmacological actions, dose, indications and contraindications of</p> <ul style="list-style-type: none"> <li>• Miotics</li> <li>• Mydriatics</li> <li>• Drugs used in Glaucoma</li> </ul>	<b>2</b>
<b>4</b>	<b>Drugs Acting on the Central Nervous System</b> <p>Definition, classification, pharmacological actions, dose, indications, and contraindications of</p> <ul style="list-style-type: none"> <li>• General anaesthetics</li> <li>• Hypnotics and sedatives</li> <li>• Anti-Convulsant drugs</li> <li>• Anti-anxiety drugs</li> <li>• Anti-depressant drugs</li> <li>• Anti-psychotics</li> <li>• Nootropic agents</li> <li>• Centrally acting muscle relaxants</li> <li>• Opioid analgesics</li> </ul>	<b>8</b>
<b>5</b>	<b>Drugs Acting on the Cardiovascular System</b> <p>Definition, classification, pharmacological actions, dose, indications, and contraindications of</p> <ul style="list-style-type: none"> <li>• Anti-hypertensive drugs</li> <li>• Anti-anginal drugs</li> <li>• Anti-arrhythmic drugs</li> <li>• Drugs used in atherosclerosis and</li> <li>• Congestive heart failure</li> <li>• Drug therapy for shock</li> </ul>	<b>6</b>

<b>6</b>	<b>Drugs Acting on Blood and Blood Forming Organs</b> Definition, classification, pharmacological actions, dose, indications, and contraindications of <ul style="list-style-type: none"> <li>• Hematinic agents</li> <li>• Anti-coagulants</li> <li>• Anti-platelet agents</li> <li>• Thrombolytic drugs</li> </ul>	<b>4</b>
<b>7</b>	Definition, classification, pharmacological actions, dose, indications, and contraindications of <ul style="list-style-type: none"> <li>• Bronchodilators</li> <li>• Expectorants</li> <li>• Anti-tussive agents</li> <li>• Mucolytic agents</li> </ul>	<b>2</b>
<b>8</b>	<b>Drugs Acting on the Gastro Intestinal Tract</b> Definition, classification, pharmacological actions, dose, indications, and contraindications of <ul style="list-style-type: none"> <li>• Anti-ulcer drugs</li> <li>• Anti-emetics</li> <li>• Laxatives and purgatives</li> <li>• Anti-diarrheal drugs</li> </ul>	<b>5</b>
<b>9</b>	<b>Drugs Acting on the Kidney</b> Definition, classification, pharmacological actions, dose, indications, and contraindications of <ul style="list-style-type: none"> <li>• Diuretics</li> <li>• Anti-Diuretics</li> </ul>	<b>2</b>
<b>10</b>	<b>Hormones and Hormone Antagonists</b> Physiological and pathological role and clinical uses of <ul style="list-style-type: none"> <li>• Thyroid hormones</li> <li>• Anti-thyroid drugs</li> <li>• Parathormone</li> <li>• Calcitonin</li> <li>• Vitamin D</li> <li>• Insulin</li> <li>• Oral hypoglycemic agents</li> <li>• Estrogen</li> <li>• Progesterone</li> <li>• Oxytocin</li> <li>• Corticosteroids</li> </ul>	<b>8</b>

<b>11</b>	<b>Autocoids</b> <ul style="list-style-type: none"> <li>• Physiological role of Histamine, 5 HT and Prostaglandins</li> <li>• Classification, clinical uses, and adverse effects of antihistamines and 5 HT antagonists</li> </ul>	<b>3</b>
<b>12</b>	<b>Chemotherapeutic Agents:</b> Introduction, basic principles of chemotherapy of infections, infestations and neoplastic diseases, Classification, dose, indication and contraindications of drugs belonging to following classes: <ul style="list-style-type: none"> <li>• Penicillins</li> <li>• Cephalosporins</li> <li>• Aminoglycosides</li> <li>• Fluoroquinolones</li> <li>• Macrolides</li> <li>• Tetracyclines</li> <li>• Sulphonamides</li> <li>• Anti-tubercular drugs</li> <li>• Anti-fungal drugs</li> <li>• Anti-viral drugs</li> <li>• Anti-amoebic agents</li> <li>• Anthelmintics</li> <li>• Anti-malarial agents</li> <li>• Anti-neoplastic agents</li> </ul>	<b>12</b>
<b>13</b>	<b>Biologicals</b> Definition, types, and indications of biological agents with examples	<b>2</b>

## PHARMACOLOGY – PRACTICAL

**Course Code: ER20-21P**

**50 Hours (2 Hours/week)**

**Scope:** This course provides the basic understanding about the uses, mechanisms of actions, dose dependent responses of drugs in simulated virtual animal models and experimental conditions.

**Course Objectives:** This course will demonstrate / provide hands-on experience in the virtual platform using appropriate software on the following

1. Study of pharmacological effects of drugs like local anaesthetics, mydriatic and mitotic on rabbit eye
2. Screening the effects of various drugs acting in the central nervous system
3. Study of drug effects on isolated organs / tissues
4. Study of pyrogen testing on rabbit

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Study and report the local anaesthetic, mydriatic and mitotic effects of the given drug on the rabbit eye
2. Choose appropriate animal experiment model to study the effects of the given drugs acting on the central nervous system and submit the report
3. Perform the effects of given tissues (simulated) on isolated organs / tissues and interpret the results
4. Interpret the dose dependent responses of drugs in various animal experiment models

## **Practicals**

**Introduction to the following topics pertaining to the experimental pharmacology have to be discussed and documented in the practical manuals.**

1. Introduction to experimental pharmacology
2. Study of laboratory animals  
(a) Mice; (b) Rats; (c) Guinea pigs; (d) Rabbits
3. Commonly used instruments in experimental pharmacology
4. Different routes of administration of drugs in animals
5. Types of pre-clinical experiments: In-Vivo, In-Vitro, Ex-Vivo, etc.
6. Techniques of blood collection from animals

## **Experiments**

**Note:** Animals shall not be used for doing / demonstrating any of the experiments given. The given experiments shall be carried-out / demonstrated as the case may be, ONLY with the use of software program(s) such as 'Ex Pharm' or any other suitable software

1. Study of local anaesthetics on rabbit eye
2. Study of Mydriatic effect on rabbit eye
3. Study of Miotic effect on rabbit eye
4. Effect of analgesics using Analgesiometer
5. Study of analgesic activity by writhing test
6. Screening of anti-convulsant using Electro Convulsiometer
7. Screening of Muscle relaxants using Rota-Rod apparatus
8. Screening of CNS stimulants and depressants using Actophotometer
9. Study of anxiolytic activity using elevated plus maze method
10. Study of effect of drugs (any 2) on isolated heart
11. Effect of drugs on ciliary motility on frog's buccal cavity
12. Pyrogen testing by rabbit method

## **Assignments**

The students shall be asked to submit written assignments on the following topics (One assignment per student per sessional period. i.e., a minimum of THREE assignments per student)

1. Introduction to Allergy Testing
2. Introduction to Toxicity Studies
3. Drug Facts Labels of US FDA
4. Pre-clinical studies in new drug development
5. Medicines and meals: Before or After food
6. Pre-clinical studies in new drug development
7. Drugs available as paediatric formulations
8. Drug information apps

## COMMUNITY PHARMACY AND MANAGEMENT – THEORY

**Course Code:** ER20-22T

**75 Hours (3 Hours/week)**

**Scope:** The course is designed to impart basic knowledge and skills to provide various pharmaceutical care services to patients and general practitioners in the community setup.

**Course Objectives:** This course will discuss the following:

1. Establishing and running a community pharmacy and its legal requirements
2. Professional aspects of handling and filling prescriptions
3. Patient counselling on diseases, prescription and or non-prescription medicines
4. Scope for performing basic health screening in community pharmacy settings

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Describe the establishment, legal requirements, and effective administration of a community pharmacy
2. Professionally handle prescriptions and dispense medications
3. Counsel patients about the disease, prescription and or non-prescription medicines
4. Perform basic health screening on patients and interpret the reports in the community pharmacy settings

Chapter	Topic	Hours
1	<b>Community Pharmacy Practice</b> – Definition, history and development of community pharmacy - International and Indian scenarios	2
2	Professional responsibilities of community pharmacists  Introduction to the concept of Good Pharmacy Practice and SOPs.	3
3	<b>Prescription and prescription handling</b> <ul style="list-style-type: none"><li>• Definition, parts of prescriptions, legality of prescriptions, prescription handling, labelling of dispensed medications (Main label, ancillary label, pictograms), brief instructions on medication usage</li><li>• Dispensing process, Good Dispensing Practices, dispensing errors and strategies to minimize them</li></ul>	7

<b>4</b>	<b>Communication skills</b> <ul style="list-style-type: none"> <li>• Definition, types of communication skills</li> <li>• Interactions with professionals and patients</li> <li>• Verbal communication skills (one-to-one, over the telephone)</li> <li>• Written communication skills</li> <li>• Body language</li> <li>• Patient interview techniques</li> </ul>	<b>6</b>
<b>5</b>	<b>Patient counselling</b> <ul style="list-style-type: none"> <li>• Definition and benefits of patient counselling</li> <li>• <b>Stages of patient counselling</b> - Introduction, counselling content, counselling process, and closing the counselling session</li> <li>• <b>Barriers to effective counseling</b> - Types and strategies to overcome the barriers</li> <li>• <b>Patient counselling points for chronic diseases/disorders</b> - Hypertension, Diabetes, Asthma, Tuberculosis, Chronic obstructive pulmonary disease, and AIDS</li> <li>• <b>Patient Package Inserts</b> - Definition, importance and benefits, Scenarios of PPI use in India and other countries</li> <li>• <b>Patient Information leaflets</b> - Definition and uses</li> </ul>	<b>10</b>
<b>6</b>	<b>Medication Adherence</b> Definition, factors influencing non-adherence, strategies to overcome non-adherence	<b>2</b>
<b>7</b>	<b>Health Screening Services in Community Pharmacy</b> Introduction, scope, and importance of various health screening services - for routine monitoring of patients, early detection, and referral of undiagnosed cases	<b>5</b>
<b>9</b>	<b>Over The Counter (OTC) Medications</b> <ul style="list-style-type: none"> <li>• Definition, need and role of Pharmacists in OTC medication dispensing</li> <li>• OTC medications in India, counseling for OTC products</li> <li>• Self-medication and role of pharmacists in promoting the safe practices during self-medication</li> <li>• Responding to symptoms, minor ailments, and advice for self-care in conditions such as - Pain management, Cough, Cold, Diarrhea, Constipation, Vomiting, Fever, Sore throat, Skin disorders, Oral health (mouth ulcers, dental pain, gum swelling)</li> </ul>	<b>15</b>



10	<b>Community Pharmacy Management</b> <ul style="list-style-type: none"> <li>• Legal requirements to set up a community pharmacy</li> <li>• Site selection requirements</li> <li>• Pharmacy designs and interiors</li> <li>• Vendor selection and ordering</li> <li>• Procurement, inventory control methods, and inventory management</li> <li>• Financial planning and management</li> <li>• Accountancy in community pharmacy – Day book, Cash book</li> <li>• Introduction to pharmacy operation softwares – usefulness and availability</li> <li>• Customer Relation Management (CRM)</li> <li>• Audits in Pharmacies</li> <li>• SOP of Pharmacy Management</li> <li>• Introduction to Digital Health, mHealth and Online pharmacies</li> </ul>	25
----	---	----

### COMMUNITY PHARMACY AND MANAGEMENT – PRACTICAL

**Course Code: ER20-22P**

**75 Hours (3 Hours/week)**

**Scope:** The course is designed to train the students and improve professional skills to provide various pharmaceutical care services in community pharmacy.

**Course Objectives:** This course will train the students in the following

1. Professional handling and filling prescriptions
2. Patient counselling on diseases and minor ailments
3. Patient counselling on prescription and / or non-prescription medicines
4. Preparation of counselling materials such as patient information leaflets
5. Performing basic health screening tests

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Handle and fill prescriptions in a professional manner
2. Counsel patients on various diseases and minor ailments
3. Counsel patients on prescription and or non-prescription medicines
4. Design and prepare patient information leaflets
5. Perform basic health screening tests

## Practicals

**Note:** The following practicals shall be carried out in the model community pharmacy with appropriate simulated scenarios and materials. Students shall be trained through role plays wherever necessary. The activities of the students shall be assessed / evaluated using a structured objective assessment form.

1. Handling of prescriptions with professional standards, reviewing prescriptions, checking for legal compliance and completeness (minimum 5)
2. Identification of drug-drug interactions in the prescription and follow-up actions (minimum 2)
3. Preparation of dispensing labels and auxiliary labels for the prescribed medications (minimum 5)
4. Providing the following health screening services for monitoring patients / detecting new patients (one experiment for each activity)
  - Blood Pressure Recording, Capillary Blood Glucose Monitoring, Lung function assessment using Peak Flow Meter and incentive spirometer, recording capillary oxygen level using Pulse Oximeter, BMI measurement
5. Providing counselling to simulated patients for the following chronic diseases / disorders including education on the use of devices such as insulin pen, inhalers, spacers, nebulizers, etc. where appropriate (one experiment for each disease)
  - Type 2 Diabetes Mellitus, Primary Hypertension, Asthma, Hyperlipidaemia, Rheumatoid Arthritis
6. Providing counselling to simulated patients for the following minor ailments (any three)
  - Headache, GI disturbances (Nausea, Vomiting, Dyspepsia, diarrhoea, constipation), Worm infestations, Pyrexia, Upper Respiratory Tract infections, Skin infections, Oral and dental disorders.
- 7 Appropriate handling of dummy dosage forms with correct administration techniques - oral liquids with measuring cup/cap/dropper, Eye Drops, Inhalers, Nasal drops, Insulin pen, nebulizers, different types of tablets, patches, enemas, suppositories
- 8 Use of Community Pharmacy Software and digital health tools

## Assignments

The students shall be asked to submit written assignments on the following topics (One assignment per student per sessional period. i.e., a minimum of THREE assignments per student)

1. SOPs for various activities in Community Pharmacy (as discussed in Theory and Practical)

2. List out the various abbreviations, short forms used in prescriptions and their interpretation
3. Patient Information Leaflet for a given chronic disease / disorder
4. Patient Information Leaflet for prescription / non-prescription medicines
5. Preparation of window / shelf display materials for the model community pharmacy
6. Overview of Software available for retail pharmacy management including billing, inventory, etc.
7. Dosage / Medication Reminder Aids
8. Overview on the operations and marketing strategies of various online pharmacies
9. Overview on the common fixed dose combinations
10. Overview on the medications requiring special storage conditions
11. Role of Community Pharmacists in preventing Antimicrobial Resistance
12. Jan Aushadhi and other Generic Medicine initiatives in India
13. Global Overview of Online Pharmacies
14. Community Pharmacy Practice Standards: Global Vs. Indian Scenario
15. Overview of pharmacy associations in India

### **Field Visit**

The students shall be taken in groups to visit community pharmacies and medicine distributors to understand and witness the professional activities of the community pharmacists, and supply chain logistics. Individual reports from each student on their learning experience from the field visit shall be submitted.

## BIOCHEMISTRY & CLINICAL PATHOLOGY – THEORY

**Course Code: ER20-23T**

**75 Hours (3 Hours/week)**

**Scope:** This course is designed to impart basic knowledge on the study of structure and functions of biomolecules and the chemical processes associated with living cells in normal and abnormal states. The course also emphasizes on the clinical pathology of blood and urine.

**Course Objectives:** This course will discuss the following at the fundamental level

1. Structure and functions of biomolecules
2. Catalytic activity, diagnostic and therapeutic importance of enzymes
3. Metabolic pathways of biomolecules in health and illness (metabolic disorders)
4. Biochemical principles of organ function tests and their clinical significance
5. Qualitative and quantitative determination of biomolecules / metabolites in the biological sample
6. Clinical pathology of blood and urine

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Describe the functions of biomolecules
2. Discuss the various functions of enzymes in the human system
3. Explain the metabolic pathways of biomolecules in both physiological and pathological conditions
4. Describe the principles of organ function tests and their clinical significances
5. Determine the biomolecules / metabolites in the given biological samples, both qualitatively and quantitatively
6. Describe the clinical pathology of blood and urine

Chapter	Topic	Hours
1	<b>Introduction to biochemistry:</b> Scope of biochemistry in pharmacy; Cell and its biochemical organization.	2
2	<b>Carbohydrates</b> <ul style="list-style-type: none"><li>• Definition, classification with examples, chemical properties</li><li>• Monosaccharides - Structure of glucose, fructose, and galactose</li><li>• Disaccharides - structure of maltose, lactose, and sucrose</li><li>• Polysaccharides - chemical nature of starch and glycogen</li><li>• Qualitative tests and biological role of carbohydrates</li></ul>	5

<b>3</b>	<b>Proteins</b> <ul style="list-style-type: none"> <li>• Definition, classification of proteins based on composition and solubility with examples</li> <li>• Definition, classification of amino acids based on chemical nature and nutritional requirements with examples</li> <li>• Structure of proteins (four levels of organization of protein structure)</li> <li>• Qualitative tests and biological role of proteins and amino acids</li> <li>• Diseases related to malnutrition of proteins.</li> </ul>	<b>5</b>
<b>4</b>	<b>Lipids</b> <ul style="list-style-type: none"> <li>• Definition, classification with examples</li> <li>• Structure and properties of triglycerides (oils and fats)</li> <li>• Fatty acid classification - Based on chemical and nutritional requirements with examples</li> <li>• Structure and functions of cholesterol in the body</li> <li>• Lipoproteins - types, composition and functions in the body</li> <li>• Qualitative tests and functions of lipids</li> </ul>	<b>5</b>
<b>5</b>	<b>Nucleic acids</b> <ul style="list-style-type: none"> <li>• Definition, purine and pyrimidine bases</li> <li>• Components of nucleosides and nucleotides with examples</li> <li>• Structure of DNA (Watson and Crick model), RNA and their functions</li> </ul>	<b>4</b>
<b>6</b>	<b>Enzymes</b> <ul style="list-style-type: none"> <li>• Definition, properties and IUB and MB classification</li> <li>• Factors affecting enzyme activity</li> <li>• Mechanism of action of enzymes, Enzyme inhibitors</li> <li>• Therapeutic and pharmaceutical importance of enzymes</li> </ul>	<b>5</b>
<b>7</b>	<b>Vitamins</b> <ul style="list-style-type: none"> <li>• Definition and classification with examples</li> <li>• Sources, chemical nature, functions, coenzyme form, recommended dietary requirements, deficiency diseases of fat-and water-soluble vitamins</li> </ul>	<b>6</b>
<b>8</b>	<b>Metabolism</b> (Study of cycle/pathways without chemical structures) <ul style="list-style-type: none"> <li>• Metabolism of Carbohydrates: Glycolysis, TCA cycle and glycogen metabolism, regulation of blood glucose</li> </ul>	<b>20</b>

	<p>level. Diseases related to abnormal metabolism of Carbohydrates</p> <ul style="list-style-type: none"> <li>• Metabolism of lipids: Lipolysis, <math>\beta</math>-oxidation of Fatty acid (Palmitic acid) ketogenesis and ketolysis. Diseases related to abnormal metabolism of lipids such as Ketoacidosis, Fatty liver, Hypercholesterolemia</li> <li>• Metabolism of Amino acids (Proteins): General reactions of amino acids and its significance—Transamination, deamination, Urea cycle and decarboxylation. Diseases related to abnormal metabolism of amino acids, Disorders of ammonia metabolism, phenylketonuria, alkaptonuria and Jaundice.</li> <li>• Biological oxidation: Electron transport chain and Oxidative phosphorylation</li> </ul>	
<b>9</b>	<b>Minerals:</b> Types, Functions, Deficiency diseases, recommended dietary requirements	<b>05</b>
<b>10</b>	<p><b>Water and Electrolytes</b></p> <ul style="list-style-type: none"> <li>• Distribution, functions of water in the body</li> <li>• Water turnover and balance</li> <li>• Electrolyte composition of the body fluids, Dietary intake of electrolyte and Electrolyte balance</li> <li>• Dehydration, causes of dehydration and oral rehydration therapy</li> </ul>	<b>05</b>
<b>11</b>	Introduction to Biotechnology	<b>01</b>
<b>12</b>	<p><b>Organ function tests</b></p> <ul style="list-style-type: none"> <li>• Functions of kidney and routinely performed tests to assess the functions of kidney and their clinical significances</li> <li>• Functions of liver and routinely performed tests to assess the functions of liver and their clinical significances</li> <li>• Lipid profile tests and its clinical significances</li> </ul>	<b>06</b>
<b>13</b>	<p><b>Introduction to Pathology of Blood and Urine</b></p> <ul style="list-style-type: none"> <li>• Lymphocytes and Platelets, their role in health and disease</li> <li>• Erythrocytes - Abnormal cells and their significance</li> <li>• Normal and Abnormal constituents of Urine and their significance</li> </ul>	<b>06</b>

## BIOCHEMISTRY & CLINICAL PATHOLOGY – PRACTICAL

**Course Code: ER20-23P**

**50 Hours (2 Hours/week)**

**Scope:** This course is designed to train the students in the qualitative testing of various biomolecules and testing of biological samples for determination of normal and abnormal constituents

**Course Objectives:** This course will train and provide hands-on experiences on the following

1. Qualitative determination of biomolecules / metabolites in simulated biological samples
2. Determination of normal and abnormal constituents of simulated blood and urine samples

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Qualitatively determine the biomolecules / metabolites in the given biological samples
2. Determine the normal and abnormal constituents in blood and urine samples and interpret the results of such testing

### Practicals

1. Qualitative analysis of carbohydrates (4 experiments)
2. Qualitative analysis of Proteins and amino acids (4 experiments)
3. Qualitative analysis of lipids (2 experiments)
4. Qualitative analysis of urine for normal and abnormal constituents (4 experiments)
5. Determination of constituents of urine (glucose, creatinine, chlorides) (2 experiments)
6. Determination of constituents of blood/serum (simulated) (Creatine, glucose, cholesterol, Calcium, Urea, SGOT/SGPT) (5 experiments)
7. Study the hydrolysis of starch from acid and salivary amylase enzyme (1 experiment)

### Assignments

The students shall be asked to submit written assignments on Various Pathology Lab Reports (One assignment per student per sessional period. i.e., a minimum of THREE assignments per student)

## PHARMACOTHERAPEUTICS - THEORY

**Course Code:** ER20-24T

**75 Hours (3 Hours/week)**

**Scope:** This course is designed to impart basic knowledge on etiopathogenesis of common diseases and their management along with quality use of medicines.

**Course Objectives:** This course will discuss about

1. Etiopathogenesis of selected common diseases and evidence-based medicine therapy
2. Importance of individualized therapeutic plans based on diagnosis
3. Basic methods for assessing the clinical outcomes of drug therapy

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Help assessing the subjective and objective parameters of patients in common disease conditions
2. Assist other healthcare providers to analyse drug related problems and provide therapeutic interventions
3. Participate in planning the rational medicine therapy for common diseases
4. Design and deliver discharge counselling for patients

Chapter	Topic	Hours
1	Pharmacotherapeutics – Introduction, scope, and objectives. Rational use of Medicines, Evidence Based Medicine, Essential Medicines List, Standard Treatment Guidelines (STGs)	8
2	<b>Definition, etiopathogenesis, clinical manifestations, non-pharmacological and pharmacological management of the diseases associated with</b>	
	<b>(a) Cardiovascular System</b> <ul style="list-style-type: none"><li>• Hypertension</li><li>• Angina and Myocardial infarction</li><li>• Hyperlipidaemia</li><li>• Congestive Heart Failure</li></ul>	8
	<b>(b) Respiratory System</b> <ul style="list-style-type: none"><li>• Asthma</li><li>• COPD</li></ul>	4
	<b>(c) Endocrine System</b> <ul style="list-style-type: none"><li>• Diabetes</li><li>• Thyroid disorders - Hypo and Hyperthyroidism</li></ul>	5
	<b>(d) Central Nervous System</b> <ul style="list-style-type: none"><li>• Epilepsy</li></ul>	8



	<ul style="list-style-type: none"> <li>• Parkinson's disease</li> <li>• Alzheimer's disease</li> <li>• Stroke</li> <li>• Migraine</li> </ul>	
	<b>(e) Gastro Intestinal Disorders</b> <ul style="list-style-type: none"> <li>• Gastro oesophageal reflux disease</li> <li>• Peptic Ulcer Disease</li> <li>• Alcoholic liver disease</li> <li>• Inflammatory Bowel Diseases (Crohn's Disease and Ulcerative Colitis)</li> </ul>	<b>8</b>
	<b>(f) Haematological disorders</b> <ul style="list-style-type: none"> <li>• Iron deficiency anaemia</li> <li>• Megaloblastic anaemia</li> </ul>	<b>4</b>
	<b>(g) Infectious diseases</b> <ul style="list-style-type: none"> <li>• Tuberculosis</li> <li>• Pneumonia</li> <li>• Urinary tract infections</li> <li>• Hepatitis</li> <li>• Gonorrhoea and Syphilis</li> <li>• Malaria</li> <li>• HIV and Opportunistic infections</li> <li>• Viral Infections (SARS, CoV2)</li> </ul>	<b>12</b>
	<b>(h) Musculoskeletal disorders</b> <ul style="list-style-type: none"> <li>• Rheumatoid arthritis</li> <li>• Osteoarthritis</li> </ul>	<b>3</b>
	<b>(i) Dermatology</b> <ul style="list-style-type: none"> <li>• Psoriasis</li> <li>• Scabies</li> <li>• Eczema</li> </ul>	<b>3</b>
	<b>(j) Psychiatric Disorders</b> <ul style="list-style-type: none"> <li>• Depression</li> <li>• Anxiety</li> <li>• Psychosis</li> </ul>	<b>4</b>
	<b>(k) Ophthalmology</b> <ul style="list-style-type: none"> <li>• Conjunctivitis (bacterial and viral)</li> <li>• Glaucoma</li> </ul>	<b>2</b>
	<b>(l) Anti-microbial Resistance</b>	<b>2</b>
	<b>(m) Women's Health</b> <ul style="list-style-type: none"> <li>• Polycystic Ovary Syndrome</li> <li>• Dysmenorrhea</li> <li>• Premenstrual Syndrome</li> </ul>	<b>4</b>

## PHARMACOTHERAPEUTICS – PRACTICAL

**Course Code: ER20-24P**

**25 Hours (1 Hour/week)**

**Scope:** This course is designed to train the students in the basic skills required to support the pharmaceutical care services for selected common disease conditions.

**Course Objectives:** This course will train the students on

1. How to prepare a SOAP (Subjective, Objective, Assessment and Plan) note for clinical cases of selected common diseases
2. Patient counselling techniques/methods for common disease conditions

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Write SOAP (Subjective, Objective, Assessment and Plan) notes for the given clinical cases of selected common diseases
2. Counsel the patients about the disease conditions, uses of drugs, methods of handling and administration of drugs, life-style modifications, and monitoring parameters.

### Practicals

I. Preparation and discussion of SOAP (Subjective, Objective, Assessment and Plan) notes for at least SIX clinical cases (real / hypothetical) of the following disease conditions.

1. Hypertension
2. Angina Pectoris
3. Myocardial Infarction
4. Hyperlipidaemia
5. Rheumatoid arthritis
6. Asthma
7. COPD
8. Diabetes
9. Epilepsy
10. Stroke
11. Depression
12. Tuberculosis
13. Anaemia (any one type as covered in theory)
14. Viral infection (any one type as covered in theory)
15. Dermatological conditions (any one condition as covered in theory)

- II. Patient counselling exercises using role plays based on the real / hypothetical clinical case scenarios. The students are expected to provide counselling on disease condition, medications, life-style modifications, monitoring parameters, etc. and the same shall be documented. (Minimum 5 cases)
- III. Simulated cases to enable dose calculation of selected drugs in paediatrics, and geriatrics under various pathological conditions. (Minimum 4 cases)

## HOSPITAL AND CLINICAL PHARMACY – THEORY

**Course Code: ER20-25T**

**75 Hours (3 Hours/week)**

**Scope:** This course is designed to impart fundamental knowledge and professional skills required for facilitating various hospital and clinical pharmacy services.

**Course Objectives:** This course will discuss and train the students in the following

1. Hospital and Hospital Pharmacy organization and set-ups
2. Basics of hospital pharmacy services including the procurement, supply chain, storage of medicines and medical supplies
3. Basics of clinical pharmacy including introduction to comprehensive pharmaceutical care services
4. Basic interpretations of common laboratory results used in clinical diagnosis towards optimizing the drug therapy

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Explain about the basic concepts of hospital pharmacy administration
2. Manage the supply chain and distribution of medicines within the hospital settings
3. Assist the other healthcare providers in monitoring drug therapy and address drug related problems
4. Interpret common lab investigation reports for optimizing drug therapy

S. No.	Topic	Hours
1	<b>Hospital Pharmacy</b> <ul style="list-style-type: none"><li>• Definition, scope, national and international scenario</li><li>• Organisational structure</li><li>• Professional responsibilities, Qualification and experience requirements, job specifications, work-load requirements and inter professional relationships</li><li>• Good Pharmacy Practice (GPP) in hospital</li><li>• Hospital Pharmacy Standards (FIP Basel Statements, AHSP)</li><li>• Introduction to NAQS guidelines and NABH Accreditation and Role of Pharmacists</li></ul>	6
2	<b>Different Committees in the Hospital</b> <ul style="list-style-type: none"><li>• Pharmacy and Therapeutics Committee - Objectives, Composition, and functions</li><li>• Hospital Formulary - Definition, procedure for development and use of hospital formulary</li></ul>	4

	<ul style="list-style-type: none"> <li>• Infection Control Committee – Role of Pharmacist in preventing Antimicrobial Resistance</li> </ul>	
<b>4</b>	<b>Supply Chain and Inventory Control</b> <ul style="list-style-type: none"> <li>• Preparation of Drug lists - High Risk drugs, Emergency drugs, Schedule H1 drugs, NDPS drugs, reserved antibiotics</li> <li>• Procedures of Drug Purchases – Drug selection, short term, long term, and tender/e-tender process, quotations, etc.</li> <li>• Inventory control techniques: Economic Order Quantity, Reorder Quantity Level, Inventory Turnover etc.</li> <li>• Inventory Management of Central Drug Store – Storage conditions, Methods of storage, Distribution, Maintaining Cold Chain, Devices used for cold storage (Refrigerator, ILR, Walk-in-Cold rooms)</li> <li>• FEFO, FIFO methods</li> <li>• Expiry drug removal and handling, and disposal. Disposal of Narcotics, cytotoxic drugs</li> <li>• Documentation - purchase and inventory</li> </ul>	<b>14</b>
<b>5</b>	<b>Drug distribution</b> <ul style="list-style-type: none"> <li>• Drug distribution (in- patients and out - patients) – Definition, advantages and disadvantages of individual prescription order method, Floor Stock Method, Unit Dose Drug Distribution Method, Drug Basket Method.</li> <li>• Distribution of drugs to ICCU/ICU/NICU/Emergency wards.</li> <li>• Automated drug dispensing systems and devices</li> <li>• Distribution of Narcotic and Psychotropic substances and their storage</li> </ul>	<b>7</b>
<b>6</b>	Compounding in Hospitals. Bulk compounding, IV admixture services and incompatibilities, Total parenteral nutrition	<b>4</b>
<b>7</b>	<b>Radio Pharmaceuticals</b> - Storage, dispensing and disposal of radiopharmaceuticals	<b>2</b>
<b>8</b>	Application of computers in Hospital Pharmacy Practice, Electronic health records, Softwares used in hospital pharmacy	<b>2</b>
<b>9</b>	<b>Clinical Pharmacy:</b> Definition, scope, and development - in India and other countries  Technical definitions, common terminologies used in clinical settings and their significance such as Paediatrics, Geriatric, Anti-natal Care, Post-natal Care, etc.	<b>12</b>

	<p><b>Daily activities of clinical pharmacists:</b> Definition, goal, and procedure of</p> <ul style="list-style-type: none"> <li>• Ward round participation</li> <li>• Treatment Chart Review</li> <li>• Adverse drug reaction monitoring</li> <li>• Drug information and poisons information</li> <li>• Medication history</li> <li>• Patient counselling</li> <li>• Interprofessional collaboration</li> </ul> <p><b>Pharmaceutical care:</b> Definition, classification of drug related problems. Principles and procedure to provide pharmaceutical care</p> <p><b>Medication Therapy Management, Home Medication Review</b></p>	
10	<p><b>Clinical laboratory tests used in the evaluation of disease states - significance and interpretation of test results</b></p> <ul style="list-style-type: none"> <li>• Haematological, Liver function, Renal function, thyroid function tests</li> <li>• Tests associated with cardiac disorders</li> <li>• Fluid and electrolyte balance</li> <li>• Pulmonary Function Tests</li> </ul>	10
11	<p><b>Poisoning:</b> Types of poisoning: Clinical manifestations and Antidotes</p> <p><b>Drugs and Poison Information Centre and their services –</b> Definition, Requirements, Information resources with examples, and their advantages and disadvantages</p>	6
12	<p><b>Pharmacovigilance</b></p> <ul style="list-style-type: none"> <li>• Definition, aim and scope</li> <li>• Overview of Pharmacovigilance</li> </ul>	2
13	<p><b>Medication errors:</b> Definition, types, consequences, and strategies to minimize medication errors, LASA drugs and Tallman lettering as per ISMP</p> <p><b>Drug Interactions:</b> Definition, types, clinical significance of drug interactions</p>	6

## HOSPITAL AND CLINICAL PHARMACY – PRACTICAL

**Course Code: ER20-25P**

**25 Hours (1 Hour / Week)**

**Scope:** This course is designed to train the students to assist other healthcare providers in the basic services of hospital and clinical pharmacy.

**Course Objectives:** This course will train the students with hands-on experiences, simulated clinical case studies in the following:

1. Methods to systematically approach and respond to drug information queries
2. How to interpret common laboratory reports to understand the need for optimizing dosage regimens
3. How to report suspected adverse drug reactions to the concerned authorities
4. Uses and methods of handling various medical/surgical aids and devices
5. How to interpret drug-drug interactions in the treatment of common diseases.

**Course Outcomes:** Upon completion of the course, the students will be able to

1. Professionally handle and answer the drug information queries
2. Interpret the common laboratory reports
3. Report suspected adverse drug reactions using standard procedures
4. Understand the uses and methods of handling various medical/surgical aids and devices
5. Interpret and report the drug-drug interactions in common diseases for optimizing the drug therapy

**Note:** Few of the experiments of Hospital and Clinical Pharmacy practical course listed here require adequate numbers of desktop computers with internet connectivity, adequate drug information resources including reference books, different types of surgical dressings and other medical devices and accessories. Various charts, models, exhibits pertaining to the experiments shall also be displayed in the laboratory.

### Practicals

1. Systematic approach to drug information queries using primary / secondary / tertiary resources of information (2 cases)
2. Interpretation of laboratory reports to optimize the drug therapy in a given clinical case (2 cases)
3. Filling up IPC's ADR Reporting Form and perform causality assessments using various scales (2 cases)
4. Demonstration / simulated / hands-on experience on the identification, types, use / application /administration of
  - Orthopaedic and Surgical Aids such as knee cap, LS belts, abdominal belt, walker, walking sticks, etc.

- Different types of bandages such as sterile gauze, cotton, crepe bandages, etc.
  - Needles, syringes, catheters, IV set, urine bag, RYLE's tube, urine pots, colostomy bags, oxygen masks, etc.
5. Case studies on drug-drug interactions (any 2 cases)
  6. Wound dressing (simulated cases and role play –minimum 2 cases)
  7. Vaccination and injection techniques (IV, IM, SC) using mannequins (5 activities)
  8. Use of Hospital Pharmacy Software and various digital health tools

## **Assignments**

The students shall be asked to submit written assignments on the following topics (One assignment per student per sessional period. i.e., a minimum of THREE assignments per student)

1. Typical profile of a drug to be included in the hospital formulary
2. Brief layout and various services of the Central Sterile Supplies Department (CSSD)
3. Various types of sterilizers and sterilization techniques used in hospitals
4. Fumigation and pesticide control in hospitals
5. Role of Pharmacists in Transition of Care: Discharge cards, post hospitalization care, medicine reconciliation activities in developed countries
6. Total parenteral nutrition and IV admixtures and their compatibility issues
7. Concept of electronic health records
8. Invasive and Non-invasive diagnostic tests - HRCT, MRI, Sonography, 2D ECHO, X-rays, Mammography, ECG, EMG, EEG
9. Home Diagnostic Kits - Pregnancy Test, COVID testing etc
10. Measures to be taken in hospitals to minimize Antimicrobial Resistance
11. Role and responsibilities of a pharmacist in public hospital in rural parts of the country
12. Safe waste disposal of hospital waste

## **Field Visit**

The students shall be taken in groups to visit a Government / private healthcare facility to understand and witness the various hospital and clinical pharmacy services provided. Individual reports from each student on their learning experience from the field visit shall be submitted.



## PHARMACY LAW AND ETHICS – THEORY

**Course Code: ER20-26T**

**75 Hours (3 Hours/week)**

**Scope:** This course is designed to impart basic knowledge on several important legislations related to the profession of pharmacy in India

**Course Objectives:** This course will discuss the following

1. General perspectives, history, evolution of pharmacy law in India
2. Act and Rules regulating the profession and practice of pharmacy in India
3. Important code of ethical guidelines pertaining to various practice standards
4. Brief introduction to the patent laws and their applications in pharmacy

**Course Outcomes:** Upon successful completion of this course, the students will be able to

1. Describe the history and evolution of pharmacy law in India
2. Interpret the act and rules regulating the profession and practice of pharmacy in India
3. Discuss the various codes of ethics related to practice standards in pharmacy
4. Interpret the fundamentals of patent laws from the perspectives of pharmacy

Chapter	Topics	Hours
1	General Principles of Law, History and various Acts related to Drugs and Pharmacy profession	2
2	<b>Pharmacy Act-1948 and Rules:</b> Objectives, Definitions, Pharmacy Council of India; its constitution and functions, Education Regulations, State and Joint state pharmacy councils, Registration of Pharmacists, Offences and Penalties.  <b>Pharmacy Practice Regulations 2015</b>	5
3	<b>Drugs and Cosmetics Act 1940 and Rules 1945 and New Amendments</b> Objectives, Definitions, Legal definitions of schedules to the Act and Rules <b>Import of drugs</b> – Classes of drugs and cosmetics prohibited from import, Import under license or permit.	23

	<p><b>Manufacture of drugs</b> – Prohibition of manufacture and sale of certain drugs, Conditions for grant of license and conditions of license for manufacture of drugs, Manufacture of drugs for test, examination and analysis, manufacture of new drug, loan license and repacking license.</p> <p>Study of schedule C and C1, G, H, H1, K, P, M, N, and X.</p> <p><b>Sale of Drugs</b> – Wholesale, Retail sale and Restricted license, Records to be kept in a pharmacy Drugs Prohibited for manufacture and sale in India</p> <p><b>Administration of the Act and Rules</b> – Drugs Technical Advisory Board, Central Drugs Laboratory, Drugs Consultative Committee, Government analysts, licensing authorities, controlling authorities, Drug Inspectors.</p>	
4	<p><b>Narcotic Drugs and Psychotropic Substances Act 1985 and Rules</b> Objectives, Definitions, Authorities and Officers, Prohibition, Control and Regulation, Offences and Penalties.</p>	2
5	<p><b>Drugs and Magic Remedies (Objectionable Advertisements) Act 1954</b> Objectives, Definitions, Prohibition of certain advertisements, Classes of Exempted advertisements, Offences and Penalties.</p>	2
6	<p><b>Prevention of Cruelty to Animals Act-1960:</b> Objectives, Definitions, CPCSEA - brief overview, Institutional Animal Ethics Committee, Breeding and Stocking of Animals, Performance of Experiments, Transfer and Acquisition of animals for experiment, Records, Power to suspend or revoke registration, Offences and Penalties.</p>	2
7	<p><b>Poisons Act-1919:</b> Introduction, objective, definition, possession, possession for sales and sale of any poison, import of poisons</p>	2
8	<p><b>FSSAI (Food Safety and Standards Authority of India) Act and Rules:</b> brief overview and aspects related to manufacture, storage, sale, and labelling of Food Supplements</p>	2

<b>9</b>	<b>National Pharmaceutical Pricing Authority:</b> Drugs Price Control Order (DPCO) - 2013. Objectives, Definitions, Sale prices of bulk drugs, Retail price of formulations, Retail price and ceiling price of scheduled formulations, Pharmaceutical Policy 2002, National List of Essential Medicines (NLEM)	<b>5</b>
<b>10</b>	<b>Code of Pharmaceutical Ethics:</b> Definition, ethical principles, ethical problem solving, registration, code of ethics for Pharmacist in relation to his job, trade, medical profession and his profession, Pharmacist's oath.	<b>5</b>
<b>11</b>	Medical Termination of Pregnancy Act and Rules – basic understanding, salient features, and Amendments	<b>2</b>
<b>12</b>	Role of all the government pharma regulator bodies – Central Drugs Standards Control Organization (CDSCO), Indian Pharmacopoeia Commission (IPC)	<b>1</b>
<b>13</b>	Good Regulatory practices (documentation, licenses, renewals, e-governance) in Community Pharmacy, Hospital pharmacy, Pharma Manufacturing, Wholesale business, inspections, import, export of drugs and medical devices	<b>3</b>
<b>14</b>	Introduction to BCS system of classification, Basic concepts of Clinical Trials, ANDA, NDA, New Drug development, New Drugs and Clinical Trials Rules, 2019. Brand v/s Generic, Trade name concept, Introduction to Patent Law and Intellectual Property Rights, Emergency Use Authorization	<b>7</b>
<b>15</b>	Blood bank – basic requirements and functions	<b>2</b>
<b>16</b>	Clinical Establishment Act and Rules – Aspects related to Pharmacy	<b>2</b>
<b>17</b>	Biomedical Waste Management Rules 2016 – Basic aspects, and aspects related to pharma manufacture to disposal of pharma / medical waste at homes, pharmacies, and hospitals	<b>2</b>
<b>18</b>	Bioethics - Basic concepts, history and principles. Brief overview of ICMR's National Ethical Guidelines for Biomedical and Health Research involving human participants	<b>2</b>
<b>19</b>	Introduction to the Consumer Protection Act	<b>1</b>
<b>20</b>	Introduction to the Disaster Management Act	<b>1</b>
<b>21</b>	Medical Devices – Categorization, basic aspects related to manufacture and sale	<b>2</b>

## Assignments

The students shall be asked to submit written assignments on the following topics (One assignment per student per sessional period. i.e., a minimum of THREE assignments per student)

1. Requirements for Ayurvedic, Homeopathic manufacturing, sale, and licensing requirements
2. Layout and contents of official websites of various agencies regulating the profession of pharmacy in India: e.g., CDSCO, SUGAM portal, PCI, etc.
3. Licenses required, application processes (online/offline), drug regulatory office website of the respective state
4. Case studies – actions taken on violation of any act / rule related to pharmacy
5. Schedule H1 drugs and its implementation in India
6. Counterfeit / Spurious medicines
7. Drug Testing Labs in India
8. Overview of Pharma marketing practices
9. Generic Medicines

## 9. Appendices

No	Appendix Document
1.	A typical format for the assessment of an Assignment
2.	A typical format for the assessment of a Field Visit Report
3.	List of instruments and equipment required for the conduct of D.Pharm program as per ER-2020

## Appendix – 1

### A typical format for the assessment of an Assignment

Name of the College:

Name of the Student:	
Academic Year of the Student:	
Name of the Subject:	
Title of the Assignment:	
Date on which the Assignment was given:	
Date on which the Assignment was submitted:	
Name & Designation of the Evaluator:	
Signature of the Evaluator with Date:	

**Directions:** For evaluation, enter rating of the student utilizing the following scale:

5 – Excellent; 4 - Very Good; 3 – Good; 2 – Satisfactory; 1 - Poor

Assessment Criteria	Score	Comments if any
a. Relevance with the content		
b. Use of resource material		
c. Organization & mechanical accuracy		
d. Cohesion & coherence		
e. Language proficiency & Timely submission		
<b>Total Score</b>		

**Signature of the Student with Date:**

**Note:** Subject teacher should try to cover all assignments mentioned in the list for each practical subject by assigning the topics to the students. Students should be encouraged to submit an assignment (in a format decided by the Institute) and encouraged to present assignments (at least any one assignment per subject) in the class.

## Appendix – 2

### A typical format for the assessment of a Field Visit Report

Name of the College:

Name of the Student:	
Academic Year of the Student:	
Name of the Subject:	
Name & full address of the organization visited:	
Date and Duration of Visit:	
Name & Designation of the Evaluator:	
Signature of the Evaluator with Date:	

Objectives set for the field visit: (give 2 – 4 objectives one by one)
Prior preparation of the student for the field visit: (minimum 100 words)
Describe the general experiences during the field visit: (minimum 100 words)
Learning points: Describe what theoretical concept that is correlated during the field visit: (minimum 300 words)

## Appendix – 3

### List of Instruments and Equipment required for the Conduct of D.Pharm program as per ER-2020

#### As per ER 2020 regulation;

At least four laboratories specified below should be provided for:

1. Pharmaceutics Lab.
2. Pharm. Chemistry Lab.
3. Physiology, Pharmacology and Pharmacognosy Lab.
4. Biochemistry, Clinical Pathology, Hospital and Clinical Pharmacy Lab.

The institutions shall provide “Model Pharmacy” as per following details

Model Pharmacy	No.	Area
<b><u>Essential:</u></b>  Running Model Community Pharmacy	01	80 Sq. Mts. (Including 10 Sq. mt. for Drug Information Centre & 10 Sq. mt. for Patient Counselling)
<b><u>Desirable:</u></b>  Drug Model Store		

**NOTE:** Wherever animal experimentations are prescribed in the curriculum, the required knowledge and skill should be imparted by using computer assisted modules. Animal hold area shall be as per the Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA) guidelines.

Practical of Social Pharmacy, Pharmacotherapeutics can be conducted in any one of the laboratories by making necessary provisions.



**Department wise List of Minimum Equipment required for D.Pharm**  
**(For a practical batch of 20 students)**

**1. Physiology, Pharmacology and Pharmacognosy Lab.**

<b>S. No.</b>	<b>Name</b>	<b>Minimum required Nos. for DPharm 60 intake</b>
1	Microscopes	20
2	Haemocytometer with Micropipettes	20
3	Sahli's haemoglobinometers	20
4	Sphygmomanometers	5
5	Stethoscopes	10
6	Human Permanent Slides for various tissues	One pair of each tissue Organs and endocrine glands
7	Models for various organs	One model of each organ system
8	Specimen for various organs and systems	One model for each organ system
9	Human Skeleton and bones	One set of skeleton and one spare bone
10	Different Contraceptive Devices and Models	One set of each device
11	Digital Balance (10 mg Sensitivity)	1
12	Computer with LCD	1
13	Licensed Software packages for Physiological & Pharmacological experiment	1
14	IR Thermometer	2
15	Refrigerator	1
16	First aid equipment	Adequate number
17	Stop watch	20
18	Dummy Inhalers and Nebulizer	1
19	Pharmacotherapeutic charts for various diseases & disorders	Adequate number
20	Surgical devices and Sutures	Adequate number
21	Digital BP Instrument	5
22	Mercury Thermometer	10
23	Digital Thermometer	10
24	Pulse Oximeter	5
25	ESR Apparatus (Westergren and Wintrobe)	10
26	Peak Flow meter	10
27	Stadiometer	2
28	Adult Weighing Scale (150 kg)	5
29	Glucometer	10
30	Projection microscope	1
31	Permanent slide set of plants and charts for Pharmacognosy Lab	Adequate number
32	Drug information resources	Adequate number
33	Various types of PPE Kits,	Adequate number

34	Charts /displays/ AVs on tobacco control, glycemic index of foods, nutrition, reproductive health	Adequate number
35	Menstrual hygiene products	Adequate number
36	Display for various disinfectants, mosquito repellents etc	Adequate number
37	Water Testing Kit	Adequate number
38	Permanent slide of different microbes	Adequate number

**NOTE:** Adequate number of glassware commonly used in the laboratory should be provided in each laboratory and department

## 2. Pharmaceutical Chemistry/ Biochemistry, Clinical Pathology

S. No.	Name	Minimum required Nos. for DPharm 60 intake
1	Hot plates	5
2	Hot Air Oven	1
3	Refrigerator	1
4	Analytical Balances for demonstration	1
5	Digital balance 10mg sensitivity	5
6	Magnetic Stirrers with Thermostat	10
7	Vacuum Pump	1
8	Digital pH meter	1
9	Wall Mounted Water Distillation Unit	2
10	Nessler's Cylinders	40
11	Digital Melting Point Apparatus	2
12	Thieles Tube	20
13	Digital Colorimeter	2
14	Thermostatic Water Bath	1

**NOTE:** Adequate number of glassware commonly used in the laboratory should be provided in each laboratory and department

## 3. Pharmaceutics

S. No.	Name	Minimum required Nos. for DPharm 60 intake
1	Digital balance (10mg)	5
2	Microscopes	10
3	Autoclave	1
4	Vacuum Pump	1
5	Standard sieves, sieve no. 8, 10, 12, 22, 24, 44, 54, 60, 80, 85, 100, 120	10 sets
6	Tablet dissolution test apparatus IP (Digital single/double Unit)	1
7	Magnetic stirrer, 500ml and 1 liter capacity with speed control	5

8	Digital pH meter	1
9	Capsule Counter	2
10	Hot Plate	2
11	Distillation Unit	1
12	Tablet counter – small size	2
13	Hot air oven	1
14	Electric water bath unit	2
15	Stalagmometer	5
16	Desiccator	5
17	Buchner Funnels (Medium)	10
18	Filtration assembly with Vacuum Pump	1
19	Andreasen's Pipette	5
20	Ointment slab	20
21	Ointment spatula	20
22	Pestle and mortar porcelain	20
23	Refrigerator	1
24	Micrometre slide Eyepiece	5
25	Micrometre slide Stage	5
26	Viscometer Ostwald/Brookfield	1
27	Stop watch	1
28	Sintered glass filter with vacuum	4

**NOTE:** Aseptic cabinet or area should be provided as per Appendix A of ER 2020  
Adequate number of glassware commonly used in the laboratory should be provided in each laboratory and department

### Machine Room

S. No.	Name	Minimum required Nos. for D.Pharm 60 intake
1	Capsule filling machine	1
2	Automated Single Station Tablet punching machine	1
3	Tablet disintegration test apparatus IP (Digital Single/Double unit)	1
4	Monsanto's hardness tester	2
5	Pfizer type hardness tester	2
6	Friability test apparatus (Digital Single/Double unit)	1
7	Sieve shaker with sieve set	1
8	Ointment filling machine	1
9	All-purpose equipment with all accessories	1
10	Bottle washing Machine	1
11	Bottle Sealing Machine	1
12	Liquid Filling Machine	1
13	Ampoule washing machine	1
14	Ampoule filling and sealing machine (Jet Burner)	1

15	Clarity test apparatus	1
16	Collapsible tube – Filling and Sealing	1
17	Liquid Mixer	1

**NOTE:** Adequate number of glassware commonly used in the laboratory should be provided in each laboratory and department

#### 4. Hospital and Clinical Pharmacy Lab

S. No.	Name	Minimum required Nos for D.Pharm 60 intake
1	Orthopaedical & Surgical Aids such as knee cap, LS belts, abdominal belt, walker, walking sticks, etc	Adequate Number
2	Different Types of bandages such as sterile gauze, cotton, crepe bandages, roll bandage etc	Adequate Number
3	Mannequins for CPR-1 (with indication Signals)	2
4	Mannequins for injection IV Arm	2
5	Variety of Needles	20
6	Variety of Syringes	20
7	Variety of catheters	5
8	IV set	20
9	Urine Bag	2
10	RYLE's tube	2
11	Urine pots	2
12	Colostomy bags	2
13	Oxygen masks	10
14	Inventory Software for Retail Pharmacy	1

**NOTE:** Adequate number of glassware commonly used in the laboratory should be provided in each laboratory and department

## 5. Model Pharmacy

S. No.	Name	Minimum required Nos. for D.Pharm 60 intake (
1	<ul style="list-style-type: none"> <li>• Empty cartons of variety medicines (across variety dosage forms)</li> <li>• Various name plates indicating different parts of Pharmacy,</li> <li>• Proper arrangement of medicines, shelves, racks, drawers</li> <li>• Box/area for expiry medicines,</li> <li>• Display windows, shelves</li> <li>• Computer</li> <li>• Refrigerator</li> <li>• Designated patient counselling area,</li> <li>• Patient Information Leaflets/Cards</li> <li>• Patient waiting area,</li> <li>• Drug Information books</li> <li>• Health information display,</li> <li>• Various devices for screening services (B.P. monitor, glucometer etc)</li> <li>• Height and body weight chart</li> <li>• Dummy devices (eg. Inhalers)</li> <li>• Display of pharmacist registration, license and other licenses</li> <li>• Display of name of owner</li> <li>• Inspection book,</li> <li>• Lock and key arrangement for Schedule X and NDPS medicines,</li> <li>• Bill book (dummy) , Computer stationary for bill printing</li> </ul>	Adequate
2	Computers: hospital and community pharmacy management software	1

## **APPENDIX 4**

### **Subject wise list of Recommended Books (Latest Edition)**

#### **Pharmaceutics**

1. History of Pharmacy in India by Dr. Harikishan Singh
2. Indian Pharmacopoeia, Govt. of India Publication
3. A Text book of Pharmaceuticals Formulation by B.M. Mithal, Vallabh Prakashan.
4. Bentleys' Text book of Pharmaceutics, Editor E.A. Rawlins, Elsevier Int.,
5. The Theory and Practice of Industrial Pharmacy. Leon Lachman, Herbert Lieberman and Joseph Kanig, Editors, Lea and Febiger, Philadelphia. Varghese Publishing House
6. Responsible Use of Medicines: A Layman's Handbook, [www.ipapharma.org / publications](http://www.ipapharma.org/publications)

#### **Pharmaceutical Chemistry**

1. Medicinal & Pharmaceutical chemistry by Harikishan Singh and VK Kapoor
2. Wilson and Griswold's Text book of Organic Medicinal and pharmaceutical Chemistry
3. Practical Organic Chemistry by Mann and Saunders.
4. Practical Pharmaceutical Chemistry, Volume- I & II by Beckett and J. B. Stenlake
5. Indian Pharmacopoeia
6. Vogel's text book of Practical Organic Chemistry

#### **Pharmacognosy**

1. Text book of Pharmacognosy by C. K. Kokate, S. B. Gokhale, A.P. Purohit, Nirali Prakashan
2. Text book of Pharmacognosy by C.S. Shah and J. S. Qadry, CBS Publishers & Distributors Pvt. Ltd.
3. Text Book of Pharmacognosy by T. E. Wallis. CBS Publishers & Distributors Pvt. Ltd.
4. Study of crude drugs by M. A. Iyengar, Manipal Press Ltd, Manipal
5. Powder crude drugs by M. A. Iyengar, Manipal Press Ltd, Manipal
6. Anatomy of crude drugs by M. A. Iyengar, Manipal Press Ltd, Manipal
7. Augmented Text Book of Homeopathic Pharmacy by Dr. D D Banerjee, B Jain Publishers (P) Ltd

## **Human Anatomy and Physiology**

1. Human Physiology by C. C. Chatterjee
2. Human Anatomy and Physiology by S. Chaudhary and A. Chaudhary
3. Derasari and Gandhi's elements of Human Anatomy, Physiology and Health Education
4. S.R. Kale and R.R. Kale, Textbook of Practical Anatomy and Physiology
5. Ross and Wilson Anatomy and Physiology in Health and illness
6. Human Anatomy and Physiology by Tortora Gerard J
7. Fundamentals of Medical Physiology by K. Sambulingam and P Sambulingam
8. Ranade V.G. Text Book of Practical Physiology
9. Goyal R.K., Natvar M.P. and Shah S.A., Practical Anatomy, Physiology and Biochemistry, Experimental Physiology

## **Social Pharmacy**

1. Social Pharmacy – Innovation and development. Geoff Harding, Sarah Nettleton and Kevin Taylor. The Pharmaceutical Press.
2. Text Book of Community Pharmacy Practice. RPSGB Publication
3. Community Pharmacy Handbook- Jonathan Waterfield
4. S Khurana, P Suresh and R Kalsi. Health Education & Community Pharmacy. S Vikas & Co
5. Social Pharmacy: Tayler, Geoffrey. Pharmaceutical Press. London.
6. Textbook by Dandiya PC, Zafer ZYK, Zafer A. Health education & Community Pharmacy. Vallabh Prakashan.
7. Websites of Ministry of Health and Family Welfare, National Health Portal
8. Pharmacists at the Frontlines: A Novel Approach at Combating TB [www.ipapharma.org](http://www.ipapharma.org) Visit Publications
9. Where There Is No Doctor: A Village Health Care Handbook by David Werner ,2015 updated version
10. Various WHO publications [www.who.int](http://www.who.int)

## **Pharmacology**

1. Pharma Satoskar, R.S. and Bhandarkar, S.D. Pharmacology and Pharmacotherapeutics
2. B. Suresh, A Text Book of Pharmacology
3. Derasari and Gandhi's Elements of Pharmacology
4. S.K. Kulkarni, Practical Pharmacology and Clinical Pharmacy
5. H.K. Sharma. Principles of Pharmacology
6. Mary J. Mycek, Lippincott Williams and Wilkins. Lippincott's illustrated Reviews: Pharmacology
7. Tripathi, K.D. Essentials of Medical Pharmacology.
8. Various Drug Information Books like British National Formulary, MIMS, CIMS, Drug Today etc., WHO, NIH Websites

## **Community Pharmacy and Management**

1. Health Education and Community Pharmacy by N.S. Parmar.
2. WHO consultative group report.
3. Drug store and Business management by Mohammed Ali and Jyoti.
4. Handbook of pharmacy – health care. Edt. Robin J Harman. The Pharmaceutical Press
5. Comprehensive Pharmacy Review – Edt. Leon Shargel. Lippincott Williams and Wilkins.
6. Good Pharmacy Practices Training Manual by IPA/CDSCO/WHO India
7. Training Module for Community Pharmacists in TB Care and Control/ by MoH/IPA
8. Hand Book of PharmaSoS, Drugs in Special population- Pregnancy and Lactation, Tobacco free future- Choice is yours: KSPC Publications.
9. Responsible Use of Medicines: A Layman's Handbook, [www.ipapharma.org/publications](http://www.ipapharma.org/publications)
10. Community Pharmacy Practice around the Globe: Part One: [www.ipapharma.org/publications](http://www.ipapharma.org/publications)

## **Biochemistry and Clinical Pathology**

1. Essentials of Biochemistry by U. Satyanarayana, Books and Allied (P) Ltd.
2. A Textbook of Biochemistry by A.V.S.S. Rama Rao, UBS Publishers' Distributors Pvt. Ltd.
3. Practical Biochemistry by R.C. Gupta and S. Bhargava.
4. Laboratory manual of Biochemistry by Pattabiraman and Sitaram Acharya

## **Pharmacotherapeutics**

1. Clinical Pharmacy and Therapeutics - Roger and Walker, Churchill Livingstone Publication
2. Clinical Pharmacy and Therapeutics - Eric T. Herfindal, Williams and Wilkins Publication
3. Applied Therapeutics: The clinical Use of Drugs. Lloyd Young and Koda-Kimble MA Lippincott, Williams and Wilkins Publication.
4. Pharmacotherapy: A Pathophysiologic approach - Joseph T. Dipiro et al. Appleton and Lange Publication.
5. National Formulary of India, Indian Pharmacopoeia Commission, Ghaziabad.



## **Hospital and Clinical Pharmacy**

1. A Textbook of Clinical Pharmacy Practice - Essential concepts and skills - Parthasarathi G, Karin Nyfort-Hansen and Milap Nahata. Orient Longman Pvt. Ltd. Hyderabad.
2. Text Book of Hospital and Clinical Pharmacy by Dr. Pratibha Nand and Dr. Roop K Khar, Birla publications, New Delhi.
3. Gupta B.K and Gupta R.N., GPP in Hospital Pharmacy, Vallabh Prakashan.
4. Basic skills in interpreting laboratory data - Scott LT, American Society of Health System Pharmacists Inc.
5. Australian drug information- Procedure manual. The Society of Hospital Pharmacists of Australia.

## **Pharmacy Law and Ethics**

1. Text book of Forensic Pharmacy by B.M. Mithal
2. Forensic Pharmacy by B. Suresh
3. Hand book of drug law-by M.L. Mehra
4. A text book of Forensic Pharmacy by N.K. Jain
5. Drugs and Cosmetics Act/Rules by Govt. of India publications.
6. Medicinal and Toilet preparations Act 1955 by Govt. of India publications.
7. Narcotic Drugs and Psychotropic Substances Act by Govt. of India publications
8. Drugs and Magic Remedies Act by Govt. of India publications.
9. CDSCO Website, NPPA Website
10. Books on Drugs and Cosmetic Act by Nilesh Gandhi and Sudhir Deshpande
11. Text Book of Forensic Pharmacy by Dr Guruprasad Mohanta



Est:1962  
A++ Accredited by NAAC  
(2021) with CGPA 3.52

SHIVAJI UNIVERSITY, KOLHAPUR-416 004. MAHARASHTRA  
Affiliation T-1 Section (0231) 2609089 , 2609136 & 2609146

शिवाजी विद्यापीठ, कोल्हापूर - ४१६ ००४, महाराष्ट्र

(संलग्नक टी-१ विभाग क्र २६०९०८९, २६०९१३६ व २६०९१४६)

Website : [www.unishivaji.ac.in](http://www.unishivaji.ac.in) E-mail : [affiliationt1@unishivaji.ac.in](mailto:affiliationt1@unishivaji.ac.in)

शिवाजी विद्यापीठ/संलग्नता टी.१/ प्रशांत/ १२६/ ६६२

दिनांक- ०७ SEP 2021

परिपत्रक

ईशानिक वर्ष २०२१- २०२२ सर्व विद्यार्थ्यांच्या पदवी तसेच पदव्युत्तर वर्षाच्या सत्रारंभ व सत्रसमाप्ती तारखा खालील प्रमाणे राहतील.

विद्यार्थ्यांचा	प्रथम सत्र		द्वितीय सत्र	
	सत्रारंभ	सत्रसमाप्ती	सत्रारंभ	सत्रसमाप्ती
सनातन, बालिक, विज्ञान, मान्यताप्राप्त, (पदवी अभ्यासक्रम)	1/10/2021	24/1/2022	1/3/2022	21/6/2022
पदव्युत्तर अभ्यासक्रम (विद्यार्थी व महाविद्यालयीन) प्रथम वर्ष	1/10/2021	24/1/2022	1/3/2022	21/6/2022
पदव्युत्तर अभ्यासक्रम (विद्यार्थी व महाविद्यालयीन) द्वितीय वर्ष	18/10/2021	7/2/2022	11/3/2022	30/6/2022
सनातन व बालिक (बी.आर.डी. व बी.के.ए. पदवी अभ्यासक्रम)	1/10/2021	24/1/2022	1/3/2022	21/6/2022
बालिका व बालकांकर (बी.बी.ए., बी.सी.ए. पदवी अभ्यासक्रम)	1/10/2021	24/1/2022	1/3/2022	21/6/2022
मान्यताप्राप्त (पदव्युत्तर अभ्यासक्रम एम.बी.ए., एम.सी.ए.) प्रथम वर्ष	18/10/2021	7/2/2022	11/3/2022	30/6/2022
मान्यताप्राप्त (पदव्युत्तर अभ्यासक्रम एम.बी.ए., एम.सी.ए.) द्वितीय वर्ष	1/10/2021	24/1/2022	1/3/2022	21/6/2022
समाजकार्य (पदवी अभ्यासक्रम) प्रथम वर्ष	1/10/2021	24/1/2022	1/3/2022	21/6/2022
समाजकार्य (पदवी अभ्यासक्रम) द्वितीय वर्ष	18/10/2021	7/2/2022	11/3/2022	30/6/2022
शिक्षणशास्त्र (पदवी /पदव्युत्तर प्रथम वर्ष अभ्यासक्रम)	18/10/2021	7/2/2022	11/3/2022	30/6/2022
शिक्षणशास्त्र (पदवी अभ्यासक्रम) द्वितीय, तृतीय व चतुर्थ वर्षासाठी व पदव्युत्तर द्वितीय वर्ष अभ्यासक्रम	1/10/2021	24/1/2022	1/3/2022	21/6/2022
मिमी (पदवी /पदव्युत्तर प्रथम वर्ष अभ्यासक्रम)	18/10/2021	7/2/2022	11/3/2022	30/6/2022
मिमी (पदवी अभ्यासक्रम) द्वितीय, तृतीय व चतुर्थ व मान्यता प्राप्त शाळांनी तसेच (पदव्युत्तर द्वितीय वर्ष अभ्यासक्रम)	1/10/2021	24/1/2022	1/3/2022	21/6/2022
अभिवांषिकी, टेक्नोलाईन, वास्तुशास्त्र, (पदवी /पदव्युत्तर प्रथम वर्ष अभ्यासक्रम)	18/10/2021	7/2/2022	11/3/2022	30/6/2022
अभिवांषिकी, टेक्नोलाईन, वास्तुशास्त्र, (पदवी अभ्यासक्रम) द्वितीय, तृतीय व चतुर्थ वर्षासाठी व (पदव्युत्तर द्वितीय वर्ष अभ्यासक्रम)	1/10/2021	24/1/2022	1/3/2022	21/6/2022
कार्मसी (पदवी प्रथम वर्ष)	18/10/2021	7/2/2022	11/3/2022	30/6/2022
कार्मसी (पदवी अभ्यासक्रम) द्वितीय, तृतीय व चतुर्थ वर्षासाठी (प्रथम वर्ष पदव्युत्तर अभ्यासक्रम)	1/10/2021	24/1/2022	1/3/2022	21/6/2022
कार्मसी (द्वितीय वर्ष पदव्युत्तर अभ्यासक्रम)	8/11/2021	28/2/2022	4/4/2022	31/7/2022
अंतरविद्यासाठी व आणि अभ्यास केंद्रांतर्गत अभ्यासक्रम (प्रथम वर्ष)	1/10/2021	24/1/2022	1/3/2022	21/6/2022
अंतरविद्यासाठी व आणि अभ्यास केंद्रांतर्गत अभ्यासक्रम (द्वितीय वर्ष)	18/10/2021	7/2/2022	11/3/2022	30/6/2022

टीप-१) विद्यार्थी अभ्यास आयोजकाच्या दिनांक १८/०९/२०१८ च्या अधिसूचनेतील कलम १४.१ नुसार सत्रारंभ व सत्रसमाप्तीच्या तारखेमध्ये विद्यार्थी प्रवेश व परीक्षा यांचा प्राथमिक कालावधी अंतर्भूत आहे.

२) सत्रारंभाच्या दिवशी महाविद्यालयाची साप्ताहिक सुट्टी येत असल्यास त्याच्या दुस-या दिवशी सत्रारंभ करावा. सत्रसमाप्तीच्या दिवशी महाविद्यालयाची साप्ताहिक सुट्टी येत असल्यास त्याच्या आधीचा दिवस सत्रसमाप्तीचा दिन राहिल.

  
डॉ. बी. बी. नांदवडेकर  
कुलसचिव

प्रति,

१. प्राचार्य/संचालक, सर्व संलग्न महाविद्यालये/ मान्यताप्राप्त शिक्षण संस्था.

२. विभागप्रमुख, सर्व अधिविभाग, शिवाजी विद्यापीठ, कोल्हापूर.

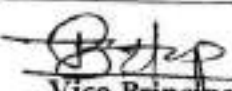
३. विभागप्रमुख, सर्व प्रशासकीय विभाग, शिवाजी विद्यापीठ, कोल्हापूर. सदरचे परिपत्रक विद्यापीठाच्या संकेतस्थळावर [www.unishivaji.ac.in](http://www.unishivaji.ac.in) - Affiliation-Affiliation T-१ Circulars मध्ये उपलब्ध आहे.

**Sant Dnyaneshwar Shikshan Sanstha's  
Annasaheb Dange College of B Pharmacy, Ashta.**

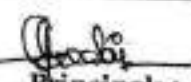
**ACADEMIC CALENDAR**

(A. Y. 2021-22 TERM-I)

SR. NO.	ACTIVITIES	SEMESTER	TENTATIVE DATE(S)
1	Start of Session	SEM III, V & VII	04.10.2021
2	Start of Session	SEM I & Lateral Entry SEM III	15.12.2021
3	Teachers Day Celebration	All Semesters	05.09.2021
4	Pharmacist Day Celebration	All Semesters	25.09.2021
	<b>DIWALI VACATION</b>	<b>All Semesters</b>	<b>01.11.2021 to 07.11.2021</b>
5	First Sessional Practical Examination	SEM III, V & VII	08.11.2021 to 13.11.2021
6	First Sessional Theory Examination	SEM III, V & VII	15.11.2021 to 20.11.2021
7	National Pharmacy Week 2021	All Semesters	29.11.2021 to 04.12.2021
8	First Sessional Practical Examination	SEM I & Lateral Entry SEM III	17.01.2022 to 22.01.2022
9	First Sessional Theory Examination	SEM I & Lateral Entry SEM III	24.01.2022 to 29.01.2022
10	Second Sessional Practical Examination	SEM III, V & VII	27.12.2021 to 01.01.2022
11	Second Sessional Theory Examination	SEM III, V & VII	03.01.2022 to 08.01.2022
12	Remedial Theory & Practical Examination	SEM III, V & VII	10.01.2022 to 12.01.2022
13	Second Sessional Practical Examination	SEM I & Lateral Entry SEM III	28.02.2022 to 05.03.2022
14	Second Sessional Theory Examination	SEM I & Lateral Entry SEM III	07.03.2022 to 12.03.2022
15	Remedial Theory & Practical Examination	SEM I	14.03.2022 to 19.03.2022
16	SUK Practical Examination (Tentative)	SEM III, V & VII	13.01.2022 to 17.01.2022
17	SUK Practical Examination (Tentative)	SEM I	21.03.2022 to 26.03.2022
18	SUK Theory Examination (Tentative)	SEM III, V & VII	18.01.2022 to 24.01.2022
19	SUK Theory Examination (Tentative)	SEM I	28.03.2022 to 02.04.2022

  
Vice-Principal  
(Academics)  
Annasaheb Dange College of B. Pharmacy, Ashta



  
Principal  
Annasaheb Dange College of  
B. Pharmacy, Ashta.





## परिपत्रक

शैक्षणिक वर्ष २०२१-२०२२ सर्व विद्याशाखांच्या पदवी तसेच पदव्युत्तर वर्षाच्या सत्रारंभ व सत्रसमाप्ती तारखा खालील प्रमाणे राहतील.

विद्यशाखा	प्रथम सत्र		द्वितीय सत्र	
	सत्रारंभ	सत्रसमाप्ती	सत्रारंभ	सत्रसमाप्ती
कला, वाणिज्य, विज्ञान, सामाजिकशास्त्रे, (पदवी अभ्यासक्रम)	1/10/2021	24/1/2022	1/3/2022	21/6/2022
पदव्युत्तर अभ्यासक्रम (विद्यापीठ व महाविद्यालयीन) प्रथम वर्ष	1/10/2021	24/1/2022	1/3/2022	21/6/2022
पदव्युत्तर अभ्यासक्रम (विद्यापीठ व महाविद्यालयीन) द्वितीय वर्ष	18/10/2021	7/2/2022	11/3/2022	30/6/2022
कला व उच्चशिक्षण (बी.आर.डी. व बी.एस. पदवी अभ्यासक्रम)	1/10/2021	24/1/2022	1/3/2022	21/6/2022
यशस्वि व व्यवस्थापन (बी.बी.ए., बी.सी.ए., पदवी अभ्यासक्रम)	1/10/2021	24/1/2022	1/3/2022	21/6/2022
व्यवस्थापन (पदव्युत्तर अभ्यासक्रम एम.बी.ए., एम.सी.ए.) प्रथम वर्ष	18/10/2021	7/2/2022	11/3/2022	30/6/2022
व्यवस्थापन (पदव्युत्तर अभ्यासक्रम एम.बी.ए., एम.सी.ए.) द्वितीय वर्ष	1/10/2021	24/1/2022	1/3/2022	21/6/2022
समाजकार्य (पदवी अभ्यासक्रम) प्रथम वर्ष	1/10/2021	24/1/2022	1/3/2022	21/6/2022
समाजकार्य (पदवी अभ्यासक्रम) द्वितीय वर्ष	18/10/2021	7/2/2022	11/3/2022	30/6/2022
शिक्षणशास्त्र (पदवी /पदव्युत्तर प्रथम वर्ष अभ्यासक्रम)	18/10/2021	7/2/2022	11/3/2022	30/6/2022
शिक्षणशास्त्र (पदवी अभ्यासक्रम) द्वितीय, तृतीय व चतुर्थ वर्षासाठी व पदव्युत्तर द्वितीय वर्ष अभ्यासक्रम	1/10/2021	24/1/2022	1/3/2022	21/6/2022
शिबी (पदवी /पदव्युत्तर प्रथम वर्ष अभ्यासक्रम)	18/10/2021	7/2/2022	11/3/2022	30/6/2022
शिबी (पदवी अभ्यासक्रम) द्वितीय, तृतीय व चतुर्थ वर्षासाठी व पदव्युत्तर द्वितीय वर्ष अभ्यासक्रम	1/10/2021	24/1/2022	1/3/2022	21/6/2022
अभिव्यक्ति, टेक्स्टाईल, यशस्विता, (पदवी /पदव्युत्तर प्रथम वर्ष अभ्यासक्रम)	18/10/2021	7/2/2022	11/3/2022	30/6/2022
अभिव्यक्ति, टेक्स्टाईल, यशस्विता, (पदवी अभ्यासक्रम) द्वितीय, तृतीय व चतुर्थ वर्षासाठी व (पदव्युत्तर द्वितीय वर्ष अभ्यासक्रम)	1/10/2021	24/1/2022	1/3/2022	21/6/2022
कार्मसी (पदवी प्रथम वर्ष)	18/10/2021	7/2/2022	11/3/2022	30/6/2022
कार्मसी (पदवी अभ्यासक्रम) द्वितीय, तृतीय व चतुर्थ वर्षासाठी (प्रथम वर्ष पदव्युत्तर अभ्यासक्रम)	1/10/2021	24/1/2022	1/3/2022	21/6/2022
कार्मसी (द्वितीय वर्ष पदव्युत्तर अभ्यासक्रम)	8/11/2021	28/2/2022	4/4/2022	31/7/2022
अंतरविद्याशाखीय आणि अभ्यास केंद्रांतर्गत अभ्यासक्रम (प्रथम वर्ष)	1/10/2021	24/1/2022	1/3/2022	21/6/2022
अंतरविद्याशाखीय आणि अभ्यास केंद्रांतर्गत अभ्यासक्रम (द्वितीय वर्ष)	18/10/2021	7/2/2022	11/3/2022	30/6/2022

टीप-१) विद्यापीठ अनुदान आयोगाच्या दिनांक १८/४/२०१८ च्या अधिसूचनेतील कलम १४.१ नुसार सत्रारंभ व सत्रसमाप्तीच्या तारखेमध्ये विद्यार्थी प्रवेश व परीक्षा यांचा प्राथमिक कालावधी अंतर्भूत आहे.

- २) सत्रारंभाच्या दिवशी महाविद्यालयाची साप्ताहिक सुट्टी घेत असल्यास त्याच्या दुसऱ्या दिवशी सत्रारंभ करावा. सत्रसमाप्तीच्या दिवशी महाविद्यालयाची साप्ताहिक सुट्टी घेत असल्यास त्याच्या आधीचा दिवस सत्रसमाप्तीचा दिवस राहील.

  
डॉ. व्ही. डी. नंदवडेकर  
कुलसचिव

प्रति,

१. प्राचार्य/संचालक, सर्व संलग्न महाविद्यालये/ मान्यताप्राप्त शिक्षण संस्था.
२. विभागप्रमुख, सर्व अभिविभाग, शिवाजी विद्यापीठ, कोल्हापूर.
३. विभागप्रमुख, सर्व प्रशासकीय विभाग, शिवाजी विद्यापीठ, कोल्हापूर. सदरचे परिपत्रक विद्यापीठाच्या संकेतस्थळावर [www.unishivaji.ac.in](http://www.unishivaji.ac.in) - Affiliation-Affiliation T-1 Circulars मध्ये उपलब्ध आहे.

**Sant Dnyaneshwar Shikshan Sanstha's  
Annasaheb Dange College of B Pharmacy, Ashta.**

**ACADEMIC CALENDAR**

(A. Y. 2021-22 TERM-II)

SR. NO.	ACTIVITIES	SEMESTER(S)	TENTATIVE DATE(S)
<b>EXAM DEPARTMENT</b>			
1	First Sessional Practical Examination	SEM IV & VI	11.04.2022 to 16.04.2022
2	First Sessional Theory Examination	SEM IV, VI & VIII	18.04.2022 to 23.04.2022
3	First Sessional Practical Examination	Sem II	16.05.2022 to 21.05.2022
4	First Sessional Theory Examination	Sem II	23.05.2022 to 28.05.2022
5	Second Sessional Practical Examination	SEM IV & VI	06.06.2022 to 11.06.2022
6	Second Sessional Theory Examination	SEM IV, VI & VIII	13.06.2022 to 18.06.2022
7	Second Sessional Practical Examination	Sem II	27.06.2022 to 02.07.2022
8	Second Sessional Theory Examination	Sem II	04.07.2022 to 09.07.2022
9	SUK Practical Examination (Tentative)	SEM IV & VI	01.07.2022 to 09.07.2022
10	SUK Theory Examination (Tentative)	SEM IV, VI & VIII	11.07.2022 to 16.07.2022
11	SUK Practical Examination (Tentative)	Sem II	18.07.2022 to 23.07.2022
12	SUK Theory Examination (Tentative)	Sem II	25.07.2022 to 30.07.2022
<b>ALUMNI ASSOCIATION</b>			
1	Alumni meet	Alumni	3 <sup>rd</sup> week of March
2	Alumni guest lecture (Clinical data management)	SEM VIII	09.04.2022
3	Alumni Panel Discussion	All	Last week of April 2022
4	Alumni guest lecture (Competitive exams)	SEM VI & VIII	14.05.2022
5	Alumni guest lecture (Pharmacovigilance)	SEM VI & VIII	First week of June 2022



TRAINING AND PLACEMENT CELL			
1	Workshop of Rubicon skill development pvt. Ltd., Pune. on "Training, Personality Development and Employability Skills" for Final Year B. Pharmacy students	SEM VIII	07.03.2022 to 10.03.2022
2	Certificate Course Admission (IKYA & Learntoupgrade)	For registered students	2 <sup>nd</sup> Week of March 2022
3	Career Survey for Final Year B. Pharmacy students	SEM VIII	3 <sup>rd</sup> Week of March 2022
4	Industrial tour for T. Y. B. Pharm students	SEM VI	3 <sup>rd</sup> & 4 <sup>th</sup> Week of March 2022
5	Meeting of Training & Placement Cell	----	4 <sup>th</sup> Week of March 2022
6	Arrangement of Guest Lecture-I (IIIC)	SEM VI	4 <sup>th</sup> Week of March 2022
7	Two days Workshop on Personality Development by Ms. Nayal Sanjeeta Mam, ADCET, Ashta	SEM VIII	1 <sup>st</sup> Week of April 2022
8	Arrangement of tour to Seema Biotech for S. Y. B. Pharm students	SEM IV	1 <sup>st</sup> Week of April 2022
9	Internship Report Submission	SEM VIII	4 <sup>th</sup> Week of April 2022
10	Arrangement of Guest Lecture-II (IIIC)	SEM VI	4 <sup>th</sup> Week of April 2022
11	Arrangement of TCS Off Campus Interview for Final Year B. Pharmacy students	SEM VIII	4 <sup>th</sup> Week of April 2022
12	Arrangement of Guest Lecture-III (IIIC)	SEM VI, SEM VIII	1 <sup>st</sup> Week of May 2022
13	Meeting of Training & Placement Cell	----	2 <sup>nd</sup> Week of May 2022
14	Invitation to different companies for arrangement of campus interview	SEM VIII	2 <sup>nd</sup> Week of May 2022

15	Arrangement of Guest Lecture-IV (IIIC)	SEM VI, VIII	3 <sup>rd</sup> Week May
16	Campus Interview Arrangement	SEM VIII	4 <sup>th</sup> Week of May 2022 & 1 <sup>st</sup> week of June 2022
17	Collect data of placement from students	SEM VIII	4 <sup>th</sup> week of June 2022
18	Permission letter to different companies for students internship	----	4 <sup>th</sup> week of June 2022
19	Guest Lecture on Validation (Mr. Sandip Honmane Sir)	----	4 <sup>th</sup> Wee of July 2022
20	Provision of Industrial/Hospital internship for students (SEM-VI)	SEM VI	1 <sup>st</sup> Week of August 2022
<b>RESEARCH &amp; DEVELOPMENT CELL</b>			
1	First Meet of R & D Cell	----	03.03.2022
2	Hands on training Sophisticated instruments for students	For registered students	28.02.2022 to 05.03.2022
3	Organization and conduction of National Level Webinar/Seminar/Workshop/Con ference/FDP/STTP on from Pharmaceutics, Pharmaceutical Chemistry Department, Pharmacology, Pharmacognosy Dept(Month Wise)	----	02.04.2022 to 10.02.2022
4	Hands on training Sophisticated instruments for Laboratory Assistant	Lab Technician	05.03.2022
5	National Level Quiz Competition on chemistry Subject for UG Level in collaboration with SGM Karad	Open to all	19.03.2022
6	Organization and conduction National Symposium on Advanced chemistry Approach in collaboration with SGM	Open to all	20.03.2022
7	Organization and conduction of National Level Webinar/Seminar/Workshop/Con ference/FDP/STTP on from all department	----	First and Second Week of April 2022
8	Second meet of R& D Cell	----	20.04.2022

9	Organization and conduction of National Level Webinar/Seminar/Workshop/Conference/FDP/STTP on from all Dept(Month Wise)	----	Third and Fourth Week of May 2022
<b>CO-CURRICULAR ACTIVITY CELL</b>			
1	Scientific Video Making Competition	Open to all	28.02.2022
2	Medicinal Plants in My Neighborhood	Open to all	28.02.2022
3	Poster Presentation	Open to all	Second Week of March
4	Guest lecture	SEM VI, VIII	10.03.2022
5	Guest lecture	SEM VI, VIII	17.03.2022
6	Quiz competition	Open to all	Third Week of March
7	Guest lecture	SEM VI, VIII	24.03.2022
8	Awareness Camp	Open to all	25.04.2022
9	Pharma Recipe Competition	Open to all	Last week of April
<b>SPORT ACTIVITIES</b>			
1	Selection of players for lead college tournament	Open to all	1 <sup>st</sup> & 2 <sup>nd</sup> Week of March 22
2	Lead college tournaments	For Selected Students	2 <sup>nd</sup> & 3 <sup>rd</sup> Week of March 22
3	Sports week 2021-22	ALL SEM	4 <sup>th</sup> to 9 <sup>th</sup> April 2022
4	Seminars related to sports	Open to all	1 <sup>st</sup> Week of August 22
<b>CULTURAL ACTIVITIES</b>			
1	Cultural week ( Cultural Days )	Open to All	25.04.2022 to 29.04.2022
2	Annual Gathering ( Aspire 2022)	Open to All	30.04.2022
<b>SOCIAL &amp; EXTENSION ACTIVITIES: NSS</b>			
1	No Smoking Day	ALL SEM	09.03.2022
2	Social & Extension NSS Camp	ALL SEM	14.03.2022 to 20.02.2022
3	World TB Day	ALL SEM	24.02.2022
4	World Health Day	ALL SEM	07.02.2022



5	World Malaria Day	ALL SEM	25.02.2022
6	World Asthma Day	ALL SEM	03.02.2022
7	National Dengue Day	ALL SEM	16.05.2022
8	World Blood Donor Day	ALL SEM	14.06.2022
9	International Yoga Day	ALL SEM	21.06.2022
<b>COMPETITIVE EXAMINATIONS CELL</b>			
1	MOC Test for GPAT 2022	SEM VIII	10.03.2022
2	Guest lecture on: Tips and tricks for GPAT by Alumni	Open to All	16.03.2022
3	Guest lecture on Carrier guidance, competitive exam, civil services	Open to All	18.03.2022
4	Guest lecture on: Tips and tricks for NIPER	SEM VI	25.04.2022
5	Guest lecture on Carrier guidance, competitive exam, civil services	SEM VI	09.05.2022
6	Guest lecture for GPAT and NIPER for SY & TY	SEM IV, SEM VI	Second Week of May
<b>INNOVATION STARTUP AND IPR</b>			
1	Guest Lecture/Success story of entrepreneur	Open to All	28 <sup>th</sup> to 31 <sup>st</sup> March
2	Lecture on funding or scholarship for various innovations/IPR	Open to All	1 <sup>st</sup> week of April
3	Guest lecture on filing of patent by Mr. Sachin lokapure	Open to All	1 <sup>st</sup> week of April
4	State level Model presentation competition	Open to All	25 <sup>th</sup> April to 30 <sup>th</sup> April
5	Entrepreneurship Conclave	Open to All	2 <sup>nd</sup> Week of May
<b>INTERNAL COMPLAINTS CELL</b>			
1	Guest lecture/Seminar on sexual harassment and gender equality and Essay competitions on gender sensitization	All Girls	08.03.2022
2	Guest Lecture on various acts and laws of Sexual Harassment	Open to All	First week of April
3	Awareness Program in School/Villages	Open to All	Last week of April
4	Elocution Competition	Open to All	Last week of May

4	Second Project Review	SEM VIII	Last week of May 22
<b>CELL FOR GUARDIAN TEACHER &amp; INTERACTION WITH PARENTS</b>			
1	First Meeting of Parent Interaction and Guardian Teacher Cell	---	02.03.2022
2	One to One parent Meet for F.Y. B.Pharm	SEM II	07.03.2022 to 12.03.2022
3	One to One parent Meet for S.Y. B.Pharm	SEM IV	14.03.2022 to 19.03.2022
4	One to One parent Meet for T.Y. B.Pharm	SEM VI	21.03.2022 to 26.03.2022
5	One to One parent Meet for Final Year. B.Pharm	SEM VIII	28.03.2022 to 06.04.2022
6	Second meeting Parent interaction and guardian teacher cell	---	08.04.2022
<b>OVERSEAS HIGHER EDUCATION</b>			
1	Special Talk on Different Courses for oversea education offered by Country, Colleges	SEM VIII	30.04.2022
2	Guest Lecture on Eligibility Pattern courses/ Sponsored courses for oversea education	SEM VIII	18.05.2022
3	Mock Interviews	SEM VIII	20.06.2022
<b>LIBRARY ASSISTANCE CELL</b>			
1	Library Orientation Programmes	Open to All	20.03.2022
2	World Book and Copyright Day	Open to All	23.04.2022
3	Guest Lecture on Importance of Reading Habits	Open to All	20.06.2022
4	Guest Lecture on information of library Services	Open to All	25.06.2022

  
**Vice-Principal (Academic)**  
 Annasaheb Dange College of B. Pharmacy, Ashta



  
**Principal**  
**PRINCIPAL**  
 Annasaheb Dange College of  
 B. Pharmacy, Ashta.



*Sant Dnyaneshwar Shikshan Santha's*  
**Annasaheb Dange College of B. Pharmacy, Ashta**  
**[D. Pharm Course]**

Tal.-Walwa, Dist.-Sangli, Maharashtra, India 416 301

ADCBP

**ACADEMIC CALENDAR 2021-2022**

**September**

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

5<sup>th</sup> September 2021- Teachers Day,

15<sup>th</sup> September 2021 Commencement of SY D pharm

25<sup>th</sup> September 2021- World Pharmacists Day

**Academic days- 14**

**October**

S	M	T	W	T	F	S
31					1	
3	4	5	6	7	8	9
10	11	12	13	14		16
17	18		20	21	22	23
24	25	26	27	28	29	30
31						

2<sup>nd</sup> Oct. 2021 - Gandhi Jayanti

15<sup>th</sup> Oct 2021- Vijayadashmi Dasara

18<sup>th</sup> Oct 2021- Commencement of F.Y. D.Pharmacy

19<sup>th</sup> Oct 2021-Eid -e- Milad

**Academic days- 23**

**November**

S	M	T	W	T	F	S
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

1<sup>st</sup> Nov to 7<sup>th</sup> Nov 2021- Diwali Vacation

22<sup>nd</sup> Nov to 27<sup>th</sup> Nov 2021 First Sessional Exam S.Y. D. Pharmacy

**Academic days- 20**

**December**

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	
26	27	28	29	30	31	

13<sup>th</sup> Dec to 18<sup>th</sup> Dec 2021 First Sessional Exam FY D Pharmacy.

25<sup>th</sup> December 2021- Christmas

**Academic days- 26**



January						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
	17	18	19	20	21	22
	24	25		27	28	29
	31					

19<sup>th</sup> January 2022- Sanstha SnehMelava

26<sup>th</sup> January 2022- Republic Day

**Academic days- 25**

February						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	
20	21	22	23	24	25	26
27	28					

19<sup>th</sup> February 2022- Chhatrapati Shivaji Maharaj Jayanti

**Academic days- 23**

March						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

01<sup>st</sup> March- Mahashivratri

07<sup>th</sup> March to 12<sup>th</sup> March 2022 Second Sessional Exam FY D Pharmacy.

07<sup>th</sup> March to 12<sup>th</sup> March 2022 Second Sessional Exam SY D Pharmacy.

**Academic days- 27**

April						
S	M	T	W	T	F	S
					1	
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

02<sup>nd</sup> April 2022 Gudhi Padwa

**Academic days- 25**

May						
S	M	T	W	T	F	S
1	2		4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

June						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

03 <sup>rd</sup> May 2022 Akshay Trutiya, Ramjan Eid
14 <sup>th</sup> May 2022 – Ramjan Eid
23 <sup>rd</sup> May to 28 <sup>th</sup> May 2022 Third Sessional Exam FY D Pharmacy.
23 <sup>rd</sup> May to 28 <sup>th</sup> May 2022 Third Sessional Exam SY D Pharmacy.
31 <sup>st</sup> May 2022 - Academic Term End
<b>Academic days- 25</b>


**Total Weeks available- 35 Weeks**

**Total Days Available- 208**

**Date of Commencement of Academics: 15/09/2021**

**Date of Completion of Academics: 31/05/2022**

**First Sessional Examination- 22<sup>nd</sup> Nov 2021 to 27<sup>th</sup> Dec 2021/ 13<sup>th</sup> Dec 2021 to 18<sup>th</sup> Dec 2021**

**Second Sessional Examination- 07<sup>th</sup> March to 12<sup>th</sup> March 2022 Second Sessional Exam FY D Pharmacy.**

**Third Sessional Examination- 23<sup>rd</sup> May to 28<sup>th</sup> May 2022 Third Sessional Exam FY D Pharmacy.**



  
**PRINCIPAL**  
**PRINCIPAL**  
 Annasaheb Dange College of  
 B. Pharmacy, Ashta.



# MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION

(Autonomous)

(ISO 9001:2015)

(ISO/IEC 27001:2013)

4<sup>th</sup> Floor, Govt. Polytechnic, Bldg. 49, Kharwadi, Bandra (E), Mumbai-400 051

Tel.No. : 022-62542110/158

Email:secretary@msbte.com

web:www.msbte.org.in

No. MSBTE/D-40/Academic Calendar/2021/ 135

Date 1-1 SEP 2021

## **Odd semester Academic schedule for academic year 2021-22 (Except Newly admitted 1<sup>st</sup> semester / year and Direct 2<sup>nd</sup> year students)**

Odd Semester Academic Schedule 2021-22				
S. N.	Activities	Odd semester (3,5,7 semester)	Yearly Pattern (2, 3 year)	
1	First Term	September 15 – December 31, 2021	September 15 – December 31, 2021	
2	First Class Test	October 27-29, 2021	October 27-29, 2021	
3	Second Class Test	December 23-24, 2021	--	
WINTER 2021 Exam form filling Schedule (Except Newly admitted 1 <sup>st</sup> and 3 <sup>rd</sup> semester students )				
Regular Exam form will be made available only for 3,5,7 semester students and Backlog exam forms will be made available for 1,2,3,4,5,6,7,8 Semester & 1,2,3 Year students				
S. N.	Activities	Filling Examination forms (Normal Fees)	Filling Examination forms (With Exam form fees + Late fees of Rs. 200/-)	Filling Examination forms (With Exam form fees + Penalty Rs. 1500/-)
1	Candidate fill	October 04 -17, 2021	October 19 - 21, 2021	October 23 - 25, 2021
2	Institute fill & Confirmation	October 04 -18, 2021	October 19 - 22, 2021	October 23 - 26, 2021
3	RBTE confirmation	October 27- 29, 2021		
Last date for RBTE confirmation of filled exam form is 29 <sup>th</sup> October 2021 upto 5:00 PM				

### **Note:**

1. The Classes may be started in Online/Offline (Class Room) or Blended mode (Online as well as Offline) following the prescribed protocols / guidelines / directives from Government or local authorities if any.
2. The academic schedule displayed is tentative it may change by considering prevailing COVID – 19 situation and guidelines / directives from Government if any.
3. Institutes have to take measures to conduct additional instructional days for academic activities if needed.
4. All type of fees & penalties shall be necessarily deposited to regional office of the Board as per the schedule declared by respective RBTE or MSBTE.
5. All Practical & term work shall be completed with continuous assessment as per curriculum till the end of term.
6. In unavoidable circumstances, the necessary amendment in the schedule of any activity will be notified through separate circular on MSBTE web portal.

(Dr. Mahendra R. Chitlange)  
Secretary,

Copy to:

M. S. Board of Technical Education, Mumbai

1. Hon. Director, MSBTE, Mumbai – for information.
2. Dy. Secretary, CDC, MSBTE, Mumbai – for information.
3. Dy. Secretary, MSBTE Regional Offices, Mumbai, Pune, Nagpur, Aurangabad for necessary action.
4. Desk Officer D-40, D-42 & D-43 MSBTE, Mumbai – for necessary action.



# महाराष्ट्र राज्य तंत्र शिक्षण मंडळ

(स्वायत्त) (ISO:१००१:२०१५) (IEC: २७००१:२०१३)

शासकीय तंत्र निकेतन इमारत, चौथा मजला, ४९, खेरवाडी, बांद्रा (पूर्व), मुंबई - ४०० ०५९

दूरध्वनी क्र. ०२२-६२५४२१००/१८८/११०

ईमेल: [secretary@msbte.com](mailto:secretary@msbte.com)

संकेतस्थळ : [www.msbte.org.in](http://www.msbte.org.in)

जा. क्र. मरातशिम/कल-४०(परीक्षा विभाग)/F१/२०२२/ ०५३

दिनांक - 4 APR 2022

## महत्वाचे परीपत्रक

प्रति,

प्राचार्य,

अखिल भारतीय तंत्रशिक्षण परिषद मान्यताप्राप्त अभियांत्रिकी पदविका अभ्यासक्रम

तसेच औषधनिर्माणशास्त्र पदविका अभ्यासक्रम राबविणा-या मंडळाशी संलग्नित सर्व संस्था

**विषय: उन्हाळी परीक्षा - २०२२ च्या आयोजनाबाबत...**

महाराष्ट्र राज्य तंत्रशिक्षण मंडळाशी संलग्नित सर्व अभ्यासक्रमाकरीता उन्हाळी परीक्षा - २०२२ ची रुपरेषा व कार्यपद्धती याबाबत मंडळाच्या विद्वत समितोच्या दि. २९/०३/२०२२ रोजीच्या बैठकीत सविस्तर चर्चा करण्यात येऊन विद्वत समितीच्या शिफारशीने व मान्यतेने उन्हाळी - २०२२ परीक्षेबाबतच्या ठळक बाबी अखिल भारतीय तंत्रशिक्षण परिषद मान्यताप्राप्त अभियांत्रिकी पदविका अभ्यासक्रम तसेच औषधनिर्माणशास्त्र पदविका अभ्यासक्रम राबविणा-या मंडळाशी संलग्नित सर्व संस्था, विद्यार्थी व त्यांच्या पालकांना माहिती व कार्यवाहीसाठी खालीलप्रमाणे कळविण्यात येत आहे-

- अखिल भारतीय तंत्रशिक्षण परिषद मान्यताप्राप्त तसेच औषधनिर्माण शास्त्र अभ्यासक्रमातील सर्व सत्र/वर्षातील विद्यार्थ्यांची उन्हाळी - २०२२ पासून **प्रात्यक्षिक परीक्षा व लेखी परीक्षा** मंडळाच्या प्रचलित पद्धतीने लागू असलेल्या Teaching Examination Scheme, मंडळाच्या परीक्षाविषयक नियमावलीतील तरतुद व Manual for conduct of Examination, Assessment Process & Post Result Activities मधील मार्गदर्शक तत्त्वानुसार घेण्यात येणार आहेत.
- विद्यार्थी हितास्तव केवळ उन्हाळी - २०२२ परीक्षेकरीता Teaching Examination Scheme नुसार निर्धारित केलेल्या फक्त लेखी परीक्षेच्या कालावधीत प्रत्येक तासाच्या कालावधीकरीता अतिरिक्त १० मिनिटे वेळ देण्यात येईल. उदा. Teaching Examination Scheme नुसार लेखी परीक्षेसाठी ३ तासांचा कालावधो निर्धारित केला असेल अशा लेखी परीक्षेस ३० मिनिटे अतिरिक्त वेळ देण्यात येईल.
- मंडळाने अखिल भारतीय तंत्रशिक्षण परिषद मान्यताप्राप्त अभियांत्रिकी तसेच औषधनिर्माण शास्त्र पदविका अभ्यासक्रमाकरीता शैक्षणिक वर्ष २०२१-२२ मधील समसन्नाकरीता शैक्षणिक वेळापत्रक दि. २९/०१/२०२२ रोजी जाहीर केले होते. त्यानुसार वित्तीय घटक चाचणी परीक्षा दिनांक २७.०५.२०२२ रोजी संपणार आहे. त्या अनुषंगाने उन्हाळी परीक्षा - २०२२ प्रात्यक्षिक व लेखी परीक्षेचे वेळापत्रक खालीलप्रमाणे घोषित करण्यात येत आहे.

अनु. क्र.	परीक्षा	कालावधी
१	प्रात्यक्षिक परीक्षा	२८ मे ते ६ जून, २०२२
२	लेखी परीक्षा	८ जून ते २८ जून, २०२२



४) कोव्हिड-१९ च्या प्रादुर्भावामुळे उद्भवलेली अणवादात्मक परिस्थितीत प्रात्यक्षिक व Multiple Choice Question (MCQ) नुसार ऑनलाईन पद्धतीने घेण्यात आलेल्या लेखी परीक्षेच्या आयोजनाकरीता मंडळाने निर्गमित केलेले परीपत्रक अथवा आदेश हे उन्हाळी परीक्षा - २०२२ पासून लागू राहणार नाहीत. सदर परीक्षेकरिता तसेच पुढील परीक्षेकरिता Examination Regulations (२०१८-२०१९) मधील सर्व तरतुदी तसेच Manual for conduct of Examination, Assessment Process & Post Result Activities नुसार देण्यात आलेली मार्गदर्शक तत्त्वे लागू राहतील.

संस्थेच्या प्राचार्यांनी सर्व स्त्र/ वर्षातील विद्यार्थ्यांना उन्हाळी परीक्षा - २०२२ करिता वरील सर्व जागी विद्यार्थी व त्यांचे पालक यांना अवगत करून द्याव्यात. तसेच विद्यार्थ्यांना परीक्षेबाबत मार्गदर्शन करावे. परीक्षा सुरळीतपणे पार पाडण्याची जबाबदारी सर्वस्वी संस्थेच्या प्राचार्यांची राहिल, याची नोंद घ्यावी.



(डॉ. महेंद्र रा. चितलांगे)

सचिव

महाराष्ट्र राज्य तंत्र शिक्षण मंडळ, मुंबई

प्रत माहितीस्तव -

मा.संचालक, महाराष्ट्र राज्य तंत्र शिक्षण मंडळ, मुंबई-५१

प्रत माहिती व आवश्यक कार्यवाहीकरीता -

- १) प्राचार्य, पदविका अभ्यासक्रम राबविणा-या सर्व स्वायत्त संस्था
- २) उपसचिव, मंडळाचे विभागीय कार्यालय - मुंबई, पुणे, नागपूर, औरंगाबाद





# MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION

(Autonomous)

(ISO 9001:2015)

(ISO/IEC 27001:2013)

4<sup>th</sup> Floor, Govt. Polytechnic, Bldg, 49, Kherwadi, Bandra (E), Mumbai-400 051

Tel.No.: 022-62542100/110/188

Email:secretary@msbte.com

web:www.msbte.org.in

No. MSBTE/D 40/Even sem /Academic Calendar/2021/ 007

Date 21 JAN 2022

## Academic Year 2021-22 Even Term Academic Schedule

<b>A.Y. 2021-22 Even Term academic Schedule for AICTE approved Diploma Engineering and Pharmacy courses</b>					
S.N.	Course Pattern	Even Term academic schedule	First Class Test	Second Class Test	Third Class Test
1	Semester pattern AICTE approved Diploma Engineering courses (2,4,6,8)	February 14 - June 03, 2022	April 04 - 06, 2022	May 25 - 27, 2022	Not Applicable
2	Yearly pattern Mining courses (1,2,3)	January 24, 2022 - June 03, 2022	1 <sup>st</sup> class Test is already conducted in Odd Term of A.Y. 2021-22	May 25 - 27, 2022	Not Applicable
3	Pharmacy 1 <sup>st</sup> and 2 <sup>nd</sup> Year	January 24, 2022 - June 03, 2022	1 <sup>st</sup> class Test is already conducted in Odd Term of A.Y. 2021-22	March 07 - 12, 2022	May 23 - 28, 2022

**Important Note:** For State Government approved short term (Non-AICTE) courses the Even term Academic schedule will be published through separate circular.

<b>Summer 2022 Exam form filling Schedule for AICTE approved Diploma Engineering and Pharmacy courses</b>				
S.N.	Activities	Filling Examination forms (Normal Fees)	Filling Examination forms (With Exam form fees + Late fees of Rs. 200/-)	Filling Examination forms (With Exam form fees + Penalty Rs. 1500/-)
1	Candidate fill	March 29 - April 15, 2022	April 17 - 20, 2022	April 22 - 24, 2022
2	Institute fill & Confirmation	March 29 - April 16, 2022	April 17 - 21, 2022	April 22 - 25, 2022
3	RBTE Confirmation	April 26 - 28, 2022		

**Last date for RBTE confirmation of filled exam form is 28<sup>th</sup> April, 2022 upto 5:00 PM**

**Note:**

- For State Government approved short term (Non-AICTE) Yearly and Semester pattern courses the Summer 2022 Exam form schedule will be published through separate circular.
- For Summer 2022 exam Regular Exam form will be made available only for Even semester & Yearly pattern students and Backlog exam forms will be made available for Odd, Even Semester & Yearly pattern students.



# MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION

(Autonomous)

(ISO 9001:2015)

(ISO/IEC 27001:2013)

4<sup>th</sup> Floor, Govt. Polytechnic, Bldg. 49, Kherwadi, Bandra (E), Mumbai-400 051

Tel.No.: 022-62542100/110/188

Email:secretary@msbte.com

web:[www.msbte.org.in](http://www.msbte.org.in)

## Note:

1. The Classes may be started in Online/Offline (Class Room) or Blended mode (Online as well as Offline) following the prescribed protocols / guidelines / directives from Government or local authorities if any.
2. The academic schedule displayed is tentative it may change by considering prevailing COVID – 19 situation and guidelines / directives from Government if any.
3. Institutes have to take measures to conduct additional instructional days for academic activities if needed.
4. All type of fees & penalties shall be necessarily deposited to regional office of the Board as per the schedule declared by respective RBTE or MSBTE.
5. All Practical & term work shall be completed with continuous assessment as per curriculum till the end of term.
6. In unavoidable circumstances, the necessary amendment in the schedule of any activity will be notified through separate circular on MSBTE web portal.

(Dr. Mahendra R. Chidange)

Secretary,

M. S. Board of Technical Education, Mumbai

## Copy to:

1. Hon. Director, MSBTE, Mumbai – for information.
2. Deputy Secretary, CDC, MSBTE, Mumbai – for information.
3. Deputy Secretary, MSBTE Regional Offices, Mumbai, Pune, Nagpur, Aurangabad for necessary action.
4. Desk Officer D-40, D-42 & D-43 MSBTE, Mumbai - for necessary action.
5. Portal Manager, MSBTE, Mumbai to display on the website



# MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION

(Autonomous)

(ISO 9001:2015)

(ISO/IEC 27001:2013)

4<sup>th</sup> Floor, Govt. Polytechnic, Bldg. 49, Kherradi, Dandara (E), Mumbai-400 051

Tel.No.: 022-62542110/188

Email:secretary@msbte.com

web:[www.msbte.org.in](http://www.msbte.org.in)

No. MSBTE/D-40/Even sem /Academic Calendar/ Non-AICTE / 2022/44

Date 30 MAR 2022

## Academic schedule - Even Term A.Y. 2021-22 (Non-AICTE Courses)

Even Term Academic Schedule for State Government approved short term (Non-AICTE) courses				
S.N.	Course Pattern	Even Term academic schedule	First Class Test	Second Class Test
1	Semester pattern courses	April 18 - July 09, 2022	01 - 03 June, 2022	04 - 06 July, 2022
2	Yearly pattern courses	April 01 - July 09, 2022	1st class Test is already conducted in Odd Term of A.Y. 2021-22	04 - 06 July, 2022
Summer 2022 Exam form filling Schedule for State Government approved short term (Non-AICTE) courses				
S.N.	Activities	Filling Examination forms (Normal Fees)	Filling Examination forms (With Exam form fees + Late fees of Rs. 200/-)	Filling Examination forms (With Exam form fees +Penalty Rs. 1500/-)
1	Candidate fill	May 20 - 30, 2022	June 01 - 03, 2022	June 05 - 06, 2022
2	Institute fill & Confirmation	May 20 - 31, 2022	June 01 - 04, 2022	June 05 - 07, 2022
3	RBTE Confirmation	June 08 - 10, 2022		
Last date for RBTE confirmation of filled exam form is 10 <sup>th</sup> June, 2022 upto 5:00 PM				
Note: For Summer 2022 exam Regular Exam form will be made available only for Even semester & Yearly pattern students and Backlog exam forms will be made available for Odd, Even Semester & Yearly pattern students				

### Note:

1. Institutes have to take measures to conduct additional instructional days for academic activities if needed.
2. All type of fees & penalties shall be necessarily deposited to regional office of the Board as per the schedule declared by respective RBTE or MSBTE.
3. All Practical & term work shall be completed with continuous assessment as per curriculum till the end of term.
4. In unavoidable circumstances, the necessary amendment in the schedule of any activity will be notified through separate circular on MSBTE web portal.

(Dr. Mahendra R. Chitlange)  
Secretary,

Copy to:

M. S. Board of Technical Education, Mumbai

1. Hon. Director, MSBTE, Mumbai - for information.
2. Deputy Secretary, CDC, MSBTE, Mumbai - for information.
3. Deputy Secretary, MSBTE Regional Offices, Mumbai, Pune, Nagpur, Aurangabad for necessary action.
4. Desk Officer D-40, D-42 & D-43 MSBTE, Mumbai - for necessary action





# MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION

(Autonomous)

(ISO 9001:2015)

(ISO/IEC 27001:2013)

4<sup>th</sup> Floor, Govt. Polytechnic, Bldg. 49, Kherwadi, Bandra (E), Mumbai-400 051

Tel.No.: 022-62542110/188

Email:secretary@msbte.com

web:www.msbte.org.in

No. MSBTE/D-40/Academic schedule Newly admitted/2021/ 154

Date 24 SEP 2021

## Academic Schedule for Newly admitted Students 2021-22

### Odd term Academic Schedule for Newly admitted Students

S.N.	Activities	Newly admitted 1 <sup>st</sup> and 3 <sup>rd</sup> semester	Newly admitted 1 <sup>st</sup> Year
1	First Term	*October 01, 2021 – January 08, 2022	*October 01, 2021 – January 08, 2022
2	First Class Test	November 24 - 26, 2021	November 24 - 26, 2021
3	Second Class Test	January 03 – 05, 2022	--

\*Commencement of term as per the date specified by the Admission Authority.

Enrollment schedule for Newly admitted 1<sup>st</sup> Semester / Year and Direct 2<sup>nd</sup> year students and Exam form schedule for Newly admitted 1<sup>st</sup> and 3<sup>rd</sup> semester students.

S.N.	Activities	Filling Examination forms (Normal Fees)	Filling Examination forms (With Regular fees + Late fees of Rs. 200/-)	Filling Examination forms (With regular fees + Penalty Rs. 1500/-)
1	Candidate fill	**November 16 – 28, 2021	**November 30 – 02 December, 2021	**December 04 - 05, 2021
2	Institute fill & Confirmation	November 16 – 29, 2021	November 30 – 03 December, 2021	December 04 - 06, 2021
3	RBTE Confirmation	December 07 – 09, 2021		

Last date for RBTE confirmation of filled exam form is 09<sup>th</sup> December, 2021 upto 5:00 PM

\*\* Tentative schedule for Enrollment and Exam form

#### Note:

1. The Classes may be started in Online/Offline (Class Room) or Blended mode (Online as well as Offline) following the prescribed protocols / guidelines / directives from Government or local authorities if any.
2. The academic schedule displayed is tentative it may change by considering prevailing COVID – 19 situation and guidelines / directives from Government if any.
3. Institutes have to take measures to conduct additional instructional days for academic activities if needed.
4. All type of fees & penalties shall be necessarily deposited to regional office of the Board as per the schedule declared by respective RBTE or MSBTE.
5. All Practical & term work shall be completed with continuous assessment as per curriculum till the end of term.
6. In unavoidable circumstances, the necessary amendment in the schedule of any activity will be notified through separate circular on MSBTE web portal.
7. The enrollment of the newly admitted students shall remain provisional till the approval of merit list from respective Regional Joint Director of Technical Education.

(Dr. Mahendra R. Chitlange)  
Secretary

#### Copy to:

M. S. Board of Technical Education, Mumbai

1. Hon. Director, MSBTE, Mumbai – for information.
2. Deputy Secretary, CDC, MSBTE, Mumbai – for information.
3. Deputy Secretary, MSBTE Regional Offices, Mumbai, Pune, Nagpur, Aurangabad for necessary action.
4. Desk Officer D-40, D-42 & D-43 MSBTE, Mumbai - for necessary action.



*Sant Dnyaneshwar Shikshan Sanstha's*  
**Annasaheb Dange College of B. Pharmacy, Ashta**  
**[D. Pharm Course]**  
 Tal.-Walwa, Dist.-Sangli, Maharashtra, India 416 301

**ADCBP**

## **ACADEMIC CALENDAR 2021-2022**

September						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

5<sup>th</sup> September 2021- Teachers Day,  
 15<sup>th</sup> September 2021 Commencement of SY D pharm  
 25<sup>th</sup> September 2021- World Pharmacists Day  
**Academic days- 14**

October						
S	M	T	W	T	F	S
31					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

2<sup>nd</sup> Oct. 2021 - Gandhi Jayanti  
 15<sup>th</sup> Oct 2021- Vijayadashmi Dasara  
 18<sup>th</sup> Oct 2021- Commencement of F.Y. D.Pharmacy  
 19<sup>th</sup> Oct 2021-Eid -e- Milad  
**Academic days- 23**

November						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

1<sup>st</sup> Nov to 7<sup>th</sup> Nov 2021- Diwali Vacation  
 22<sup>nd</sup> Nov to 27<sup>th</sup> Nov 2021 First Sessional Exam S.Y. D. Pharmacy  
**Academic days- 20**

December						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

13<sup>th</sup> Dec to 18<sup>th</sup> Dec 2021 First Sessional Exam FY D Pharmacy.  
 25<sup>th</sup> December 2021- Christmas  
**Academic days- 26**



January						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

19<sup>th</sup> January 2022- Sanstha SnehMelava

26<sup>th</sup> January 2022- Republic Day

Academic days- 25

February						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

19<sup>th</sup> February 2022- Chhatrapati Shivaji Maharaj Jayanti

Academic days- 23

March						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

01<sup>st</sup> March- Mahashivratri

07<sup>th</sup> March to 12<sup>th</sup> March 2022 Second Sessional Exam FY D Pharmacy.

07<sup>th</sup> March to 12<sup>th</sup> March 2022 Second Sessional Exam SY D Pharmacy.

Academic days- 27

April						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

02<sup>nd</sup> April 2022 Gudhi Padwa

Academic days- 25

May						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

03 <sup>rd</sup> May 2022 Akshay Trutiya, Ramjan Eid
14 <sup>th</sup> May 2022 - Ramjan Eid
23 <sup>rd</sup> May to 28 <sup>th</sup> May 2022 Third Sessional Exam FY D Pharmacy.
23 <sup>rd</sup> May to 28 <sup>th</sup> May 2022 Third Sessional Exam SY D Pharmacy.
31 <sup>st</sup> May 2022 - Academic Term End
<b>Academic days- 25</b>

June						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		


**Total Weeks available- 35 Weeks**

**Total Days Available- 208**

**Date of Commencement of Academics: 15/09/2021**

**Date of Completion of Academics: 31/05/2022**

**First Sessional Examination- 22<sup>nd</sup> Nov 2021 to 27<sup>th</sup> Dec 2021/ 13<sup>th</sup> Dec 2021 to 18<sup>th</sup> Dec 2021**

**Second Sessional Examination- 07<sup>th</sup> March to 12<sup>th</sup> March 2022 Second Sessional Exam FY D Pharmacy.**

**Third Sessional Examination- 23<sup>rd</sup> May to 28<sup>th</sup> May 2022 Third Sessional Exam FY D Pharmacy.**



*Gadga*  
**PRINCIPAL**  
**PRINCIPAL**  
 Annasaheb Dange College of  
 B. Pharmacy, Ashta.

**Sant Dnyaneshwar Shikshan Sanstha's  
Annasaheb Dange College of B Pharmacy, Ashta.**

**First Year B. Pharmacy: Semester I (2021-22) (Division I- Roll No 01 to 60)**

**Time Table**  
(w. e. f. 08/02/2022)

Time →	9.15 am	10.15 am	11.15 am	1.00 pm to 5.00 pm
Day ↓	Theory / Tutorial			Practical
<b>Monday</b>	PA-I (YHM)	PIC (SPD)	Comm. Skills (MDP)	P'ceutics (RDP) Batch A PA-I (YHM) Batch B PIC (AKM) Batch C
<b>Tuesday</b>	PIC (SPD)	P'ceutics (SPP)	Comm. Skills (MPD)	HAP-I (MGS/STT) Batch A P'ceutics (RDP) Batch B PA-I (PSG) Batch C
<b>Wednesday</b>	HAP-I (GVS/SJS)	PA-I (YHM)	HAP-I (GVS/SJS)	PIC (NMJ) Batch A HAP-I (GVS/STT) Batch B Comm. Skills (MDP) Batch C (1.00 To 3.00 pm)
<b>Thursday</b>	PIC (SPD)	PA-I (YHM)	PIC (SPD) (Tutorials)	Comm. Skills (MDP) Batch A (1.00 To 3.00 pm) Comm. Skills (MDP) Batch B (3.00 To 5.00 pm) HAP-I (GVS/AMB) Batch C
<b>Friday</b>	P'ceutics (SPP)	P'ceutics (SPP) (Tutorials)	HAP-I (GVS/SJS)	PA-I (YHM) Batch A PIC (SPD) Batch B P'ceutics (AMB) Batch C
<b>Saturday</b>	P'ceutics (SPP)	PA-I (YHM) (Tutorials)	HAP-I (GVS/SJS) (Tutorials)	1.00 to 3.00 pm Remedial Biology - Theory (AMB) Remedial Mathematics (YSS) - 1.00 to 3.00 pm 3.00 to 5.00 pm Remedial Biology - (AMB) Practical -3.00 to 5.00 pm

**MGS-** Dr. M. G. Saralaya    **SJS-** Mr. S. J. Sajane    **SRJ-** Dr. S. R. Jagtap    **YHM-** Ms. Y. H. Momin    **GVS-** Mr. G. V. Sutar    **PSG-** Mrs. P. S. Gaikwad  
**ARM-** Mr. A. R. Mali    **SPD-** Ms. S. P. Desai    **RDP-** Mr. R. D. Patil    **STT-** Ms. S. T. Taralekar    **NMJ-** Ms. N. M. Jagtap    **AMB-** Ms. A. M. Bhajji  
**MDP-** Mr. M. D. Patil    **YSS-** Mr. Y. S. Shaikh

**HAP-I** - Human Anatomy and Physiology I  
**PIC** - Pharmaceutical Inorganic Chemistry  
**Batch A:** Roll No-01 to 23;

**P'ceutics-I** - Pharmaceutics I

**PA-I** - Pharmaceutical Analysis I

**Comm. Skills** - Communication Skills  
**Batch B:** Roll No: 24 to 46 &

**Batch C:** Roll No: 47 to 69



**Vice-Chancellor (Academic)**  
**Annasaheb Dange College of B Pharmacy, Ashta**

**Principal**  
**Annasaheb Dange College of B Pharmacy, Ashta**



**Sant Dnyaneshwar Shikshan Sansha's  
Annasaheb Dange College of B Pharmacy, Ashta.**

**First Year B. Pharmacy: Semester I (2021-22) (Division II- Roll No 61 to 113)**

**Time Table**

(w. e. f. 08/02/2022)

Time → Day ↓	9.15 am	10.15 am	11.15 am	1.00 pm to 5.00 pm
	<b>Theory / Tutorial</b>			<b>Practical</b>
<b>Monday</b>	PA-I (PSG)	Commua. Skills (SO)	P'ceutics (SPP)	
<b>Tuesday</b>	PA-I (PSG)	HAP-I (SJS)	PIC (SPD)	HAP-I (SJS) Batch D PA-I (PSG) Batch E
<b>Wednesday</b>	P'ceutics (SPP)	Commua. Skills (SO)	PIC (SPD)	PIC (AKM) Batch D P'ceutics (AMB)-Batch E
<b>Thursday</b>	P'ceutics (SPP)	PA-I (PSG)	HAP-I (SJS) (Tutorials)	Commua. Skills (SO) Batch D (1.00 to 3.00 pm) Commua. Skills (SO) Batch E (3.00 to 5.00 pm)
<b>Friday</b>	HAP-I (SJS)	PA-I (PSG) (Tutorials)	PIC (SPD) (Tutorials)	PA-I (PSG) Batch D PIC (SPD) Batch E
<b>Saturday</b>	HAP-I (SJS)	PIC (SPD)	P'ceutics (SPP) (Tutorials)	P'ceutics (NMI)- Batch D HAP-I (STT) Batch E
				1.00 to 3.00 pm Remedial Biology - Theory (AMB) Remedial Mathematics (YSS) - 1.00 to 3.00 pm
				Remedial Biology- (AMB) Practical -3.00 to 5.00 pm

SJS- Mr. S. J. Sajane    SRJ- Dr. S. R. Jagtap    AKM- Mr. A. K. Mullani    GVS- Mr. G. V. Sutar    PSG- Mrs. P. S. Gaikwad    SPD- Ms. S. P. Desai  
NDP- Mr. N. D. Patil    STT- Ms. S. T. Taralekar NMJ- Ms. N. M. Jagtap    AMB- Ms. A. M. Bhajji    SO- Ms. S. Oblisamy YSS- Mr. Y. S. Shaikh

**HAP-I** - Human Anatomy and Physiology I  
**PIC**-Pharmaceutical Inorganic Chemistry

**Batch D:** Roll No-70 to 91;

**P'ceutics-I**-Pharmaceutics I

**PA-I**- Pharmaceutical Analysis I  
**Commua. Skills**- Commua. Skills

**Batch E:** Roll No: 92 to 113

*(Signature)*  
**Vice-Principal (Academics)**  
Annasaheb Dange College of B. Pharmacy, Ashta



*(Signature)*  
**Annasaheb Dange College of B. Pharmacy, Ashta**

**Sant Dnyaneshwar Shikshan Sanstha's  
Annasahab Dange College of B. Pharmacy, Ashta.**

**Second Year B. Pharmacy: Semester III (2021-22) (Division I- Roll No 01 to 60)**

**Time Table**

**(w. e. f. 18/10/2021)**

Time →	9.15 am to 01.15 pm	1.15 - 02.00 pm	2.00 - 3.00 pm	3.00- 4.00 pm	4.00- 5.00 pm
Day ↓	Practical	Lunch Break	Theory/Tutorial		
<b>Monday</b>	PP-I (SMH) Batch B Pharm. Micro. (PVC) Batch C		PP-I (SMH)	POC- II (GDM)	Pharm. Micro. (RSJ)
<b>Tuesday</b>	Pharm. Micro. (RSJ) Batch A PP-I (SSK) Batch C		PP-I (SMH)	POC- II (GDM)	Pharm. Micro. (RSJ) (Tutorial)
<b>Wednesday</b>	PP-I (SMH) Batch A Pharm. Micro. (RSJ) Batch B P.E. (SSP) Batch C		PP-I (SMH)	POC- II (GDM)	P.E. (SNP)
<b>Thursday</b>	P.E. (SNP) Batch B POC- II (GDM) Batch C		Pharm. Micro. (RSJ)	P.E. (SNP)	PP-I (SMH) (Tutorial)
<b>Friday</b>	P.E. (SNP) Batch A POC- II (GDM) Batch B		P.E. (SNP)	Pharm. Micro. (RSJ)	P.E. (SNP) (Tutorial)
<b>Saturday</b>	POC- II (GDM) Batch A		POC- II (GDM) (Tutorial)	---	---

**RSJ- Dr. R. S. Jagtap SMH- Mr. S. M. Honmane SNP- Mr. S.N. Pattekar GDM- Mr. G. D. Mote**

**SSK- Ms. S. S. Kharat PVC- Mr. P. V. Chavan**

**POC- II - Pharmaceutical Organic Chemistry II PP-I - Physical Pharmacy - I Pharm. Micro.-Pharmaceutical Microbiology**  
**P. E. - Pharmaceutical Engineering**

**Batch A: Roll No-01 to 28;**

**Batch B: Roll No: 29 to 45**

**& Batch C: Roll No: 57 to 83**

**Principal (Academics)**

**Principal**

Annasahab Dange College of B. Pharmacy, Ashta

Annasahab Dange College of B. Pharmacy, Ashta





**Sant Dnyaneshwar Shikshan Sanstha's  
Annasaheb Dange College of B. Pharmacy, Ashta.**

**Second Year B. Pharmacy: Semester III (2021-22) (Division II- Roll No 61 onwards)**

**Time Table** (w. e. f. 15/12/2021)

Time →	9.15 am to 01.15 pm	Lunch Break 1.15 - 02.00 pm			2.00 - 3.00 pm	3.00- 4.00 pm	4.00- 5.00 pm
Day ↓	Practical	Theory/Tutorial					
<b>Monday</b>	POC- II(NMJ) Batch D P.E. (RDM) Batch E	Pharm. Micro. (PVC)	P.E. (SSP)	P.E. (SSP) Tutorial	P.E. (SSP) Tutorial		
<b>Tuesday</b>	P.E. (SSP) Batch D POC- II(NMJ) Batch E	Pharm. Micro. (PVC)	P.E. (SSP)	POC. II (NMJ)			
<b>Wednesday</b>	Comm. Skill (SN) Batch E (Lateral entry) (09.15 to 11.15 am)	P.E. (SSP)	Pharm. Micro. (PVC)	PP-I (SMH)			
<b>Thursday</b>	-----	POC- II (NMJ)	PP-I (SMH)	Pharm. Micro. (PVC) Tutorial			
<b>Friday</b>	PP -I (SSK) Batch D Pharm. Micro. (PVC) Batch E	POC. II (NMJ)	PP-I (SMH)	POC- II (NMJ) Tutorial			
<b>Saturday</b>	Pharm. Micro. (PVC) Batch D PP -I (RDP) Batch E	PP-I (SMH) Tutorial	Comm. Skills (AGS) (Lateral entry)	Comm. Skills (AGS) (Lateral entry)			

**SMH-** Mr. S. M. Honmane  
**RDP-** Mr. R. D. Patil

**NMJ-** Mr. N. M. Jangade  
**SSK-** Ms. S. S. Kharat

**RDM-** Mr. R. D. Mali  
**PVC-** Mr. P. V. Chavan

**SSP-** Mr. S. S. Patil  
**SN-** Mrs. S. Nayal

**AGS-** Mr. A. G. Shinde

**POC- II** – Pharmaceutical Organic Chemistry II, **PP -I** - Physical Pharmacy – I, **Pharm. Micro-** Pharmaceutical Microbiology, **P. E.** – Pharmaceutical Engineering  
**Batch D:** Roll No: 84 to 110 & **Batch C:** Roll No: 111 onwards

*Patil*  
**Vice-Principal (Academics)**  
**Vice-Principal (Academic)**  
Annasaheb Dange College of B. Pharmacy, Ashta



*Shinde*  
**PRINCIPAL**  
Annasaheb Dange College of B. Pharmacy, Ashta

**Sant Dnyaneshwar Shikshan Sanstha's  
Annasaheb Dange College of B. Pharmacy, Ashta.**

**Third Year B. Pharmacy: Semester V (2021-22) (Division I- Roll No 01 to 60)**

**Time Table**  
(w. e. f. 24/11/2021)

Time →	9.15 am	10.15 am	11.15 am	12.15 - 01.00 pm Lunch Break		1.00 pm to 5.00 pm
Day ↓	Theory		Tutorial			Practical
<b>Monday</b>	IP-I (ARM)	Pcol-II (GSP)	PJ (NDP)			IP-I (ARM) A Pcog-II (RDM) B
<b>Tuesday</b>	PJ (NDP)	IP-I (ARM)	Medichem-II (AKM)			Pcog-II (ETT) A IP-I (ARM) B
<b>Wednesday</b>	Medichem-II (AKM)	PJ (NDP)	Pcog-II (ETT)			Pcol-II (GSP) A IP-I (KMT) C
<b>Thursday</b>	Pcol-II (GSP)	IP-I (ARM)	Pcog-II (ETT) Tutorial			Pcol-II (GSP) B Pcog-II (NDP) C
<b>Friday</b>	Pcog-II (ETT)	Medichem-II (AKM)	Pcol-II (GSP) Tutorial			Pcol-II (STT) C
<b>Saturday</b>	Pcog-II (ETT)	Pcol-II (GSP)	IP-I (ARM) Tutorial	Medichem-II (AKM) Tutorial 1.00 pm to 2.00 pm	PJ (NDP) Tutorial 2.00 pm to 3.00 pm	

**ETT- Dr. E.T. Tamboli AKM-Mr. A. K. Mullani KMT - Mr. K.M. Thorawade ARM-Mr. A. R. Mali GSP- Mr. G. S. Patil,  
NDP- Mr. N. D. Patil**

**IP-I- Industrial Pharmacy-I Pcog-II- Pharmacognosy & Phytochemistry-II Medichem-II- Medicinal chemistry-II  
Pcol-II- Pharmacology-II PJ- Pharmaceutical jurisprudence**

**Batch A: Roll No-01 to 24;**

**Batch B: Roll No-25 to 48**

**& Batch C: Roll No: 49 to 72**

**Vice-principal (Academics)**

**Vice-Principal (Academic)**

**Annasaheb Dange College of B. Pharmacy, Ashta**



**Principal**

**Annasaheb Dange College of  
B. Pharmacy, Ashta.**



**Sant Dnyaneshwar Shikshan Sanstha's  
Annasaheb Dange College of B Pharmacy, Ashta.**

**Third Year B. Pharmacy: Semester V (2021-22) (Division II- Roll No 61 to 121)**

**Time Table**  
(w. e. f. 24/11/2021)

Time →	9.15 am	10.15 am	11.15 am	1.00 pm to 5.00 pm
Day ↓	Theory/Tutorial			Practical/ Tutorial
Monday	Pcog-II (ETT)	IP-I (ARM)	Pcog-II (ETT)	Pcog-II (STT) D
Tuesday	Pcog-II (ETT)	Medichem-II (RDM)	Pcog-II (STT)	Pcog-II (AMB) E
Wednesday	PJ (NDP)	Pcog-II (STT)	IP-I (ARM) Tutorial	Pcog-II (HPK) E
Thursday	Medichem-II (RDM)	PJ (NDP)	PJ (NDP) Tutorial	IP-I (KMT) D
Friday	IP-I (ARM)	Medichem-II (RDM)	Pcog-II (STT) Tutorial	Pcog-II (NDP) D IP-I (SSP) E
Saturday	IP-I (ARM)	PJ (NDP)	Pcog-II (STT)	Medichem-II (RDM) Tutorial 1.00 pm to 2.00 pm Pcog-II (ETT) Tutorial 2.00 pm to 3.00 pm

ETT- Dr. E. T. Tamboli KMT - Mr. K. M. Thorawade ARM- Mr. A. R. Mali STT- Ms. S. T. Taralekar

RDM- Mr. R. D. Mali NDP- Mr. N. D. Patil AMB- Ms. A. M. Bhajji

IP-I- Industrial Pharmacy-I Pcog-II- Pharmacognosy & Phytochemistry-II Medichem-II- Medicinal chemistry-II

Pcog-II- Pharmacology-II PJ- Pharmaceutical jurisprudence

Batch C: Roll No: 49 to 72 Batch D: Roll No-73 to 96 Batch E: Roll No: 97-121

**Vice-Principal (Academics)  
Vice-Principal (Academic)**  
Annasaheb Dange College of B Pharmacy, Ashta



**Principal**  
Annasaheb Dange College of  
B. Pharmacy, Ashta.

**Sant Dnyaneshwar Shikshan Sanstha's  
Anna Bahadur Dange College of B Pharmacy, Ashta.**

**Final Year B. Pharmacy: Semester VII (2021-22) (Division I- Roll No 01 to 60)**

**(w. e. f. 18/10/2021)**

**Time Table**

Time →	9.15 am to 1.15 pm	Lunch Break 01.15 - 02.00 pm			2.00-3.00 pm	3.00 - 4.00 pm	4.00- 5.00 pm
Day ↓	Practical	Theory					
Monday	IMA(NMJ) Batch A Practice school Batch B Practice school Batch C	PP (SSK)	IMA (NMJ)	IP-II (KMT)	IP-II (KMT)		
Tuesday	Practice school Batch A IMA (NMJ) Batch B Practice school Batch C	IMA (NMJ)	IMA (NMJ) Tutorial	PP (SSK)	IP-II (KMT) Tutorial		
Wednesday	Practice school Batch A Practice school Batch B IMA(RDM) Batch C	IMA (NMJ)	NDSD (RDP) Tutorial	IP-II (KMT)	NDSD (RDP)		
Thursday	Practice school Batch A Practice school Batch B Practice school Batch C	PP (SSK)	IP-II (KMT) Tutorial	PP (SSK)	IP-II (KMT) Tutorial		
Friday							
Saturday							

**KMT- Mr. K.M. Thorawade RDP: Mr. R. D. Patil SSK: Miss S. S. Kharat RDM: Mr. R. D. Mali NMJ: Ms. N.M. Jagtap**  
**NDSD: Novel Drug Delivery System IMA: Instrumental Methods of Analysis PP: Pharmacy Practice IP-II- Industrial Pharmacy-II**

**Batch A: Roll No-01 to 24;**

**Batch B: Roll No: 25 to 48**

**Batch C: Roll No: 49 to 72**

**B. B. P.**

**Vice-Principal (Academics)**  
**Vice-Principal (Academic)**  
 Anna Bahadur Dange College of B. Pharmacy, Ashta



**Principal**  
 Anna Bahadur Dange College of  
 B. Pharmacy, Ashta.

**Dr. Ant Dnyaneshwar Shikshan Sanstha's**  
**Annasaheb Dange College of B Pharmacy, Ashta.**

**Final Year B. Pharmacy: Semester VII (2021-22) (Division II- Roll No 61 to 116)**

**Time Table**  
**(w. e. f. 18/10/2021)**

Time →	9.15 am to 1.15 pm	01.15 - 02.00 pm Lunch Break			2.00-3.00 pm	3.00 - 4.00 pm	4.00- 5.00 pm
Day ↓	Practical				Theory		
Monday	-----				IP-II (KMT)	IMA (HPK)	PP (SSK) Tutorial
Tuesday	-----				NDDS (RDP)	PP (SSK)	IP-II (KMT)
Wednesday	Practice school Batch D Practice school Batch E				NDDS (RDP)	NDDS (RDP)	----
Thursday	Practice school Batch D Practice school Batch E				PP (SSK)	IMA (HPK)	IMA (HPK) Tutorial
Friday	IMA(HPK) Batch D Practice school Batch E				IP-II (KMT)	PP (SSK)	----
Saturday	Practice school Batch D IMA (HPK) Batch E				IP-II (KMT) Tutorial	IMA (HPK)	NDDS (RDP) Tutorial ----
<b>KMT- Mr. K.M. Thorawade</b>		<b>HPK- Mr. H. P Khade</b>		<b>RDP- Mr. R. D. Patil</b>		<b>SSK: Miss S. S. Kharat</b>	

**NDDS: Novel Drug Delivery System**

**Batch C: Roll No: 49 to 72**

**IMA: Instrumental Methods of Analysis**

**Batch D: Roll No: 73 to 94**

**PP: Pharmacy Practice**

**Batch E: Roll No: 95 to 116**

**IP-II- Industrial Pharmacy-II**

*(Signature)*  
**Vice-Principal (Academics)**  
**Vice-Principal (Academic)**  
 Annasaheb Dange College of B. Pharmacy, Ashta



*(Signature)*  
**Principal**  
 Annasaheb Dange College of  
 B. Pharmacy, Ashta.





SANT DNYANESHWAR SHIKSHAN SANSTHA'S  
**ANNASHEB DANGE COLLEGE OF B PHARMACY, ASHTA**

Ashta, Tal: Walwa, Dist: Sangli, Maharashtra, India - 416301

**Number of Classes Prescribed & Conducted**  
**ACADEMIC YEAR 2021-22 (TERM-I)**

Sr. No.	Class	Semester	Name of Subject	Theory		Practical		Tutorials	
				Prescribed no. of hours	No. of hours conducted	Prescribed no. of hours	No. of hours conducted	Prescribed no. of hours	No. of hours conducted
01	First Year B Pharm	I	Human Anatomy & Physiology I	45	45	60	40	15	15
		I	Pharmaceutical Analysis I	45	45	60	52	15	15
		I	Pharmaceutics I	45	45	60	60	15	15
		I	Pharmaceutical Inorganic Chemistry	45	45	60	60	15	15
		I	Communication Skills	30	30	30	30	00	---
		I	Remedial Biology	30	30	30	30	00	---
		I	Remedial Mathematics	30	30	00	---	00	---
02	Second Year B Pharm	III	Physical Pharmaceutics - I	45	45	60	64	15	15
		III	Pharmaceutical Engineering	45	45	60	68	15	15
		III	Pharmaceutical Microbiology	45	45	60	60	15	15
		III	POC-II	45	45	60	60	15	15
03	Third Year B Pharm	V	P'cal Jurisprudence	45	45	00	00	15	15
		V	Industrial Pharmacy I	45	28	60	60	15	15
		V	Pharmacology - II	45	45	60	60	15	15
		V	Medicinal Chemistry-II	45	47	00	00	15	15
		V	Prognosis & Phytochem-II	45	45	60	60	15	15
		V							
04	Final Year B Pharmacy	VII	Novel drug delivery system	45	45	00	00	15	15
		VII	Pharmacy Practice	45	45	00	00	15	15
		VII	Instrumental Methods of Analysis	45	45	60	64	15	15
		VII	Industrial Pharmacy-II	45	45	00	00	15	15
		VII							



*[Signature]*  
Principal  
Annasaheb Dange College of  
B Pharmacy, Ashta.



**Sri Dnyaneshwar Shikshan Sanstha's**  
**Annasaheb Dange College of B Pharmacy, Ashta.**

**S.Y. B. Pharm: Semester IV (2021-22) (Division I- Roll No 01 to 60)**

**Time Table**

(w. e. f. 03/03/2022)

Time →	9.15 am to 1.15 pm	2.00-3.00 pm	3.00- 4.00 pm	4.00- 5.00 pm
Day ↓	Practical	Theory/ Tutorial		
<b>Monday</b>	PP-II (SMH)- Batch-A Pcog-I (ETT)- Batch-B P'Cology-I (PVC) -Batch -C	MC-I (ASP)	Pcog-I (ETT) Tutorial	MC-I (ASP)
<b>Tuesday</b>	P'Cology-I (SSK) -Batch -A PP-II (SMH)- Batch-B MC-I (NMI) - Batch-C	P'Cology-I (STT)	MC-I (ASP)	P'Cology-I (STT) Tutorial
<b>Wednesday</b>	MC-I (ASP) - Batch-B PP-II (SHM)- Batch-C	P'Cology-I (STT)	MC-I (ASP) Tutorial	P'Cology-I (STT)
<b>Thursday</b>	Pcog-I (ARM)- Batch-A P'Cology-I (STT) - Batch -B	PP-II (SMH)	POC-III (GDM)	PP-II (SMH)
<b>Friday</b>	MC-I (ASP) - Batch-A Pcog-I (ETT)- Batch-C	POC-III (GDM)	Pcog-I (ETT)	POC-III (GDM) Tutorial
<b>Saturday</b>	POC-III (GDM) 9.15 to 10.15 pm PP-II(SMH) Tutorial 10.15 to 11.15 pm	Pcog-I (ETT)	PP-II (SMH)	Pcog-I (ETT)

ETT- Dr. E. T. Tamboli

HPK- Mr. H. P. Khade,

POC-III - Pharmaceutical Organic Chemistry III,  
P'Cology -I,- Pharmacology I

Batch A: Roll No-01 to 28;

SNP- Mr. S. N. Pattekar,

STT- Ms. S. T. Taralekar,

MC- I- Medicinal Chemistry I,

Pcog I-Pharmacognosy and Phytochemistry I

Batch B: Roll No: 29 to 56

SMH- Mr. S. M. Honmane

SSK- Ms. S. S. Kharat,

MC- I- Medicinal Chemistry I,

Pcog I-Pharmacognosy and Phytochemistry I

Batch B: Roll No: 29 to 56

GDM- Mr. G. D. Mole,

ASP- Ms. A.S. Patil

PP -II - Physical Pharmaceutics - II

Batch C: Roll No: 57 to 83



**PRINCIPAL**  
**Annasaheb Dange College of**  
**B. Pharmacy, Ashta.**

**Vice-Principal (Academic)**  
**Annasaheb Dange College of B. Pharmacy, Ashta**

**Sant Dnyaneshwar Shikshan Sansna's**  
**Annasaheb Dange College of B Pharmacy, Ashta.**

**S.Y. B. Pharm: Semester IV (2021-22) (Division II- Roll No 61 to 128)**

**Time Table**

(w. e. f. 03/03/2022)

Time →	9.15 am to 01.15 pm	12.30 - 01.15 pm Lunch Break				2.00-3.00 pm	3.00-4.00 pm	4.00-5.00 pm
Day ↓	Practical	Theory/ Tutorial						
Monday	MC-I (HPK) – Batch-D	CAP (ABC)	P'Cology-I (SJP)	POC-III (NMD)	P'Cology-I (SJP) Tutorial			
Tuesday	Pcog-I (RSJ) – Batch-E	CAP (ABC)	POC-III (NMD)	Pcog-I (ETT)	POC-III (NMD) Tutorial			
Wednesday	Pcog-I (RSJ) – Batch-D P'Cology-I (STT) – Batch-E	Environ. Sci. (SVD)	POC-III (NMD)	PP-II (SNP)	Pcog-I (ETT)			
Thursday	PP-II (SNP) – Batch D MC-I (HPK) – Batch-E	Environ. Sci. (SVD)	Pcog-I (ETT)	MC-I (ASP)	Pcog-I (ETT) Tutorial			
Friday	P'Cology-I (SJP) – Batch-D PP-II (SNP) – Batch-E	---	PP-II (SNP)	MC-I (ASP)	PP-II (SNP) Tutorial			
Saturday	P'Cology-I (SJP) MC-I (ASP) Tutorial CAP (ABC) Practical 11.15 to 1.15 pm (L.E. Students)	---	PP-II (SNP)	MC-I (ASP)	P'Cology-I (SJP)			

**RSJ-Dr. R. S. Jagtap**  
**SJP- Mr. S. J. Patil**

**ETT- Dr. E. T. Tamboli**  
**NMJ- Ms. N. M. Jagtap**

**SNP- Mr. S. N. Pattekar,**  
**HPK- Mr. H. P. Khade**

**GDM- Mr. G. D. Mote,**  
**SSK- Ms. S. S. Kharat**

**ARM- Mr. A.R. Mali,**  
**ASP- Ms. A.S. Patil**

**POC-III – Pharmaceutical Organic Chemistry III,**  
**P'Cology-I- Pharmacology I**

**MC-I- Medicinal Chemistry I,**

**PP-II – Physical Pharmaceutics – II**

**CAP: Computer Applications in Pharmacy**

**Batch C: Roll No: 57 to 83**

**Batch D: Roll No-84 to 110**

**Batch E: Roll No: 111 to 128**



**Principal**  
**Annasaheb Dange College of B. Pharmacy, Ashta.**

**Vice-Principal (Academics)**  
**Annasaheb Dange College of B. Pharmacy, Ashta**



Time →	9.15 am	10.15 am	11.15 am	12.15 pm	2.00 pm to 6.00 pm
Day ↓	Theory/ Tutorial				Practical
Monday	P Biotech (RDP)	Biopharm (SSK)	P Biotech (RDP)	Biopharm (SSK) Tutorial	HDT (KMT) - Batch C
Tuesday	QA (ARM)	P Biotech (RDP)	MC-III (AKM)	QA (ARM) Tutorial	HDT (KMT) - Batch A MC-III(RMD)-Batch C
Wednesday	Biopharm (SSK)	QA (ARM)	Biopharm (SSK)	P Biotech (RDP) Tutorial	HDT (KMT) - Batch B PCol-III (AMB) Batch C
Thursday	MC-III (AKM)	PCol-III (AMB)	HDT (NDP)	MC-III (AKM) Tutorial	PCol-III (SJP) -Batch A MC-III(AKM)-Batch B
Friday	PCol-III (AMB)	MC-III (AKM)	HDT (NDP)	PCol-III ((AMB) Tutorial	MC-III (AKM)-Batch A PCol-III (PRS) Batch B
Saturday	HDT (NDP)	QA (ARM)	PCol-III (AMB)	HDT (NDP) Tutorial	GPAT

Lunch Break 1.15 - 02.00 pm

AKM- Mr. A. K. Mullani, ARM: Mr. A. R. Mali, KMT: Mr. K. M. Thorawade, RDP: Mr. R. D. Patil, NDP: Mr. N. D. Patil  
 PRS- Ms. P. R. Shelake, RDM: Mr. R. D. Mali, SSK- Ms. S. S. Kharat, AMB: Ms. A. M. Bhairi  
 P Biotech- Pharmaceutical Biotechnology, Biopharm- Biopharmaceutics and Pharmacokinetics, QA- Quality Assurance,  
 Pcol-III- Pharmacology-III, MC-III- Medicinal Chemistry-III, HDT- Herbal Drug Technology

Batch A: Roll No-1 to 24;

Batch B: Roll No-25 to 48

Batch C: Roll No: 49 to 72

PRINCIPAL

Vice-Principal (Academic)

Vice-Principal (Arademics)

**Sant Dnyaneshwar Shikshan Sansuda's**  
**Annasaheb Dange College of B Pharmacy, Ashta.**

**T.Y.B. Pharm: Semester- VI (2021-22) (Division II- Roll No 61 to 122)**

**Time Table**

(w. e. f. 01/03/2022)

Time → Day ↓	9.15 am	10.15 am	11.15 am	12.15 pm	1.15 - 02.00 pm Lunch Break	2.00 pm to 6.00 pm
	Theory					Practical / Tutorial
<b>Monday</b>	QA (ARM)	PCol-III (AMB)	HDT (NDP)	QA (ARM) Tutorial		PCol-III (AMB) Batch D MC-III(RDM)-Batch E
<b>Tuesday</b>	PCol-III (AMB)	MC-III (RDM)	HDT (NDP)	PCol-III (AMB) Tutorial		PCol-III (PRS) Batch E
<b>Wednesday</b>	HDT (NDP)	MC-III (RDM)	PCol-III (AMB)	HDT (NDP) Tutorial		MC-III(RDM)-Batch D
<b>Thursday</b>	P Biotech (RDP)	Biopharm (SSK)	P Biotech (RDP)	Biopharm (SSK) Tutorial		HDT (NDP) - Batch D
<b>Friday</b>	MC-III (RDM)	QA (ARM)	P Biotech (RDP)	MC-III (RDM) Tutorial		HDT (NDP) - Batch E
<b>Saturday</b>	P Biotech (RDP) Tutorial	Biopharm (SSK)	QA (ARM)	Biopharm (SSK)		<b>GPAT</b>

AKM- Mr. A. K. Mullani, ARM: MR. A. R. Mali KMT: Mr. K. M. Thorawade, RDP: Mr. R. D. Patil, NDP: Mr. N. D. Patil  
 PRS- Ms. P. R. Shelake RDM: Mr. R. D. Mali, SSK- Ms. S. S. Kharat AMB- Ms. A. M. Bhajji  
 P Biotech- Pharmaceutical Biotechnology, Biopharm- Biopharmaceutics and Pharmacokinetics, QA- Quality Assurance,  
 Pcol-III- Pharmacology-III, MC-III- Medicinal Chemistry-III, HBT- Herbal Drug Technology  
 Batch C: Roll No: 49 to 72 Batch D: Roll No: 73 to 96 Batch E: Roll No: 97 to 122  
 Principal, Annasaheb Dange College of B Pharmacy, Ashta  
 Vice-Principal (Academics)



Time Table

(w. e. f. 01/03/2022)

Time →	9.15 am to 1.15 pm	1.15 - 02.00 pm	2.00-3.00 pm	3.00-4.00 pm	4.00- 5.00 pm
Day ↓	Project/ GPAT	Lunch Break	Theory/ Tutorial		
Monday	Project work		PMM (PVC)	SPP (PRS)	BRM (RSJ)
Tuesday	Project work		AIT (HPK) Tutorial	BRM (RSJ)	---
Wednesday	Project work		PMM (PVC)	AIT (HPK)	---
Thursday	GPAT		PMM (PVC)	BRM (RSJ) Tutorial	SPP (PRS)
Friday	GPAT		AIT (HPK)	PMM (PVC) Tutorial	AIT (HPK)
Saturday	GPAT		SPP (PRS) Tutorial	BRM (RSJ)	SPP (PRS)

RSJ- Dr. R.S. Jagtap

HPK- Mr. H.P. Khade

PRS- Ms. P. R. Shelake

PVC- Mr. P. V. Chavan

BRM: Biostatistics and Research Methodology

AIT- Advanced Instrumentation Techniques (ELECTIVE)

SPP: Social and Preventive Pharmacy

PMM: Pharma Marketing Management (Elective)

Batch A: Roll No-01 to 24;

Batch B: Roll No: 25 to 48 &

Batch C: Roll No: 49 to 71

*B.P.P.*  
Vice-Principal (Academics)

Vice-Principal (Academic)

Annasaheb Dange College of B. Pharmacy, Ashta



*Principal*  
Principal

Annasaheb Dange College of  
B. Pharmacy, Ashta.

**Sant Dnyaneshwar Shikshan Sangha's  
Annasaheb Dange College of B. Pharm. Scy, Ashta.**

**Final Year B. Pharm: Semester VIII (2021-22) (Division II- Roll No 61 to 115)**

**Time Table**  
(w. e. f. 01/03/2022)

Time →	9.15 am to 1.15 pm	1.15 - 02.00 pm	2.00-3.00 pm	3.00- 4.00 pm	4.00- 5.00 pm
Day ↓	Project/ GPAT	Lunch Break	Theory/ Tutorial		
Monday	Project work		AIT (HPK)	PMM (PVC)	SPP (PRS)
Tuesday	Project work		PMM (PVC)	PMM (PVC) Tutorial	AIT (HPK)
Wednesday	Project work		SPP (PRS)	PMM (PVC)	SPP (PRS) Tutorial
Thursday	GPAT		SPP (PRS)	BRM (KMT)	AIT (HPK) Tutorial
Friday	GPAT		BRM (KMT)	BRM (KMT) Tutorial	---
Saturday	GPAT		AIT (HPK)	BRM (KMT)	---

**KMT-** Mr. K.M. Thorawade      **HPK-** Mr. H.P. Khade      **PRS-** Ms. P. R. Shelake      **PVC-** Mr. P. V. Chavan

**BRM:** Biostatistics and Research Methodology  
**AIT-** Advanced Instrumentation Techniques (ELECTIVE)

**SPP:** Social and Preventive Pharmacy

**PMM:** Pharma Marketing Management (Elective)

**Batch C:** Roll No: 49 to 71

**Batch D:** Roll No: 72 to 93

**Batch D:** Roll No: 94 to 115

  
**Vice-Chancellor (Academics)**  
Annasaheb Dange College of B. Pharmacy, Ashta



  
**Principal**  
Annasaheb Dange College of B. Pharmacy, Ashta

**Sant Dnyaneshwar Shikshan Sanstha's**  
**Annasaheb Dange College of B. Pharmacy, Ashta. (D. Pharm Course)**  
**D. Pharmacy First Year: (2021-22)**

**Time Table**

Time →	9.15 am	10.15 am	11.15 am	12.15 - 01.00 pm		1.00 pm to 4.00 pm	4.00 to 5.00 pm
Day ↓	Theory			Lunch Break		Practical	Tutorial
Monday	PGY (SDK)	PH (SSK)	PC (SST)			PC (A batch) (SST) PH (B batch) (SSU) PGY. (C batch) (SDK)	PGY (SDK)
Tuesday	PC (SST)	PGY (SDK)	PH (SSK)			PGY. (A batch) (SDK) PC (B batch) (SST) PH (C batch) (SSU)	H.A.P. (YSC)
Wednesday	PC (SST)	PH (SSK)	PGY (SDK)			PH (A batch) (SSU) S.P. (B batch) (SST) H.A.P. (C batch) (YSC)	PC (SST)
Thursday	S.P. (NRI)	H.A.P. (YSC)	S.P. (NRI)			PGY. (B batch) (SDK) S.P. (C batch) (SST)	PH (SSK)
Friday	H.A.P. (YSC)	S.P. (NRI)	H.A.P. (YSC)			S.P. (A batch) (SSK) H.A.P. (B batch) (YSC)	S.P. (SSK)
Saturday	Class Test / L.H					H.A.P. (A batch) (YSC) PC (C batch) (SST)	

SSU- Mr. S.S. Upadhye NRI- Mr. N.R. Inamdar. SST- Ms.S.S. Thorat YSC- Mr. Y.S. Chandanshive SDK- Mr.S.D. Kadam SSK; Ms. S.S. Khairmode  
 PH - Pharmaceutics PC- Pharmaceutical Chemistry  
 PGY - Pharmacognosy H.A.P - Human Anatomy and Physiology  
 S.P.- Social Pharmacy

Batch A: Roll No-01 to 23; Batch B; Roll No: 24 to 46 & Batch C; Roll No: 47 to 68

**Academic Incharge**

**Academic Incharge**

Annasaheb Dange College of B. Pharmacy, Ashta  
 (D. Pharm Course)

**Principal**

**Principal**

Annasaheb Dange College of  
 B. Pharmacy, Ashta.





**Sant Dnyaneshwar Shikshan Sanstha's**  
**Annasaheb Dange College of B. Pharmacy, Ashta. (D. Pharm Course)**  
**D. Pharmacy Second Year: (2021-22)**

**Time Table**

Time →	9.15 am to 12.15 pm	12.15 - 01.00 pm			01pm	02pm	03pm	4.0 to 4.45 pm
Day ↓	Practical	Lunch Break			Theory			Tutorial
Monday	PNT. (A batch) (YSC)* PC- II. (B batch) (NRI)				PC-II (NRI)	PNT (YSC)	PH-II (SSK)	PC-II (NRI)
Tuesday	PNT. (B batch) (YSC)* PC-II. (C batch) (NRI)				PC-II (NRI)	PH-II (SSK)	PNT (YSC)	HCP (SDK)
Wednesday	PNT. (C batch) (YSC)* PC- II. (A batch) (NRI)				HCP (SDK)	PH-II (SSK)	PC-II (NRI)	PNT (YSC)
Thursday	PH-II. (A batch) (SSK)** HCP. (B batch) (SSU)*				DSBM (SSU)	PNT (YSC)	DSBM (SSU)	PJ (SST)
Friday	PH-II. (B batch) (SSK)** HCP. (C batch) (SSU)*				PJ (SST)	DSBM (SSU)	PJ (SST)	PH-II (SSK)
Saturday	PH-II. (C batch) (SSK)** HCP. (A batch) (SSU)*				HCP (SDK)	PC-II (NRI)	HCP (SDK)	DSBM (SSU)

\*Indicates Two hours Practical \*\*Indicate Four Hour Practical

SSU- Mr. S.S. Upadhye NRI- Mr. N.R. Inamdar, SST- Ms.S.S. Thorat YSC- Mr. Y.S. Chandanshive SDK- Mr.S.D. Kadam SSK: Ms. S.S. Khairmode  
 PH-II – Pharmaceutics-II PC-II- Pharmaceutical Chemistry II PNT- Pharmacology and Toxicology  
 PJ- Pharmaceutical Jurisprudence HCP- Hospital and Clinical Pharmacy DSBM- Drug store and Business Management.

Batch A: Roll No-01 to 23, Batch B: Roll No: 24 to 45 & Batch C: Roll No: 47 to 68

**Academic Incharge**  
 Annasaheb Dange College of B. Pharmacy, Ashta  
 (D. Pharm Course)



**Principal**  
 Annasaheb Dange College of  
 B. Pharmacy, Ashta.



**Sant Dnyaneshwar Shikshan Santha's**  
**Annasaheb Dange College of B Pharmacy, Ashta**  
**Teaching Workload (Academic Year 2021-22, Odd Term)**

**Department of Pharmacology**

Sr. No	Staff Name	Subject	Semester	Workload		Tutorial	Total Workload
				Theory	Practical		
01	Dr. M.G. Sarayala	HAP -I	I	-	04	-	04
02	Mr. S. J. Sajane	HAP -I	I	03	08	01	12
03	Mr. G. V. Sutar	HAP -I	I	03	08	01	12
04	Mr. G. S. Patil	Pharmacology-II	V	03	12	01	12
05	Ms. S T Taralekar	Pharmacology-II	V	03	08	01	12
68	Ms. A. M. Bhaiji	Remedial Biology	I	02	02	--	16
		Pharmacology-II	V	--	04	--	
		Pharmaceutics - I	I	--	08	--	

**Department of Pharmaceutics**

Sr. No	Staff Name	Subject	Semester	Workload		Tutorial	Total Workload
				Theory	Practical		
01	Dr. R. S. Jagtap	P'cal Microbiology	III	03	08	01	12
02	Mrs. S. R. Jagtap	Pharmaceutics - I	I	06	08	02	16
03	Mr. S. N. Pattekar	P'cal Engineering	III	03	08	01	12
04	Mr. S. M. Honmane	Physical Pharmaceutics - I	III	06	08	02	16
05	Mr. A. R. Mali	Industrial Pharmacy I	V	06	08	02	16
69	Mr. R. D. Patil	Novel drug delivery system	VII	06	--	02	16
		Physical Pharmaceutics - I	III	--	04	--	
		Pharmaceutics - I	I	--	04	--	
07	Mr. K.M. Thorawade	Industrial Pharmacy-II	VII	06	--	02	16
		Industrial Pharmacy-I	V	--	08	--	
08	Mr. S. S. Patil	P'cal Engineering	III	03	08	01	16
		Industrial Pharmacy-I	V	--	04	--	
09	Ms. S. S. Kharat	Pharmacy Practice	VII	06	--	02	16
		Physical Pharmaceutics - I	III	--	08	--	
10	Mr. P. V. Chavan	P'cal Microbiology	III	03	12	01	16
11	Mr. N. D. Patil	P'cal Jurisprudence	V	06	--	02	16
		Pharmacognosy and phytochemistry II	V	--	08	--	

### Department of Pharmaceutical Chemistry

Sr. No	Staff Name	Subject	Semester	Workload		Tutorial	Total Workload
				Theory	Practical		
01	Ms. Y. H. Momin	P'ceutical Analysis - I	I	03	08	01	12
02	Mr. A.K. Mullani	Medicinal Chemistry-II	V	03	--	01	12
		P'ceutical Inorganic Chemistry	I	--	08	--	
03	Mr. G. D. Mote	POC - II	III	03	12	01	16
04	Mr. N. M. Jangade	POC - II	III	03	08	01	16
		P'ceutical Inorganic Chemistry	III	--	04	--	
05	Ms. P.S. Gaikwad	P'ceutical Analysis - I	I	03	12	01	16
06	Mr. H. P. Khade	Instrumental Methods of Analysis	VII	03	08	01	16
		Pharmacognosy and phytochemistry II	V	--	04	--	
07	Miss S. P. Desai	P'ceutical Inorganic Chemistry	I	06	08	02	16
08	Mr. R. D. Mali	Medicinal Chemistry-II	V	03	--	01	16
		Instrumental Methods of Analysis	VII	--	04	--	
		P'cal Engineering	III	--	04	--	
		Pharmacognosy and phytochemistry II	V	--	04	--	
09	Ms. N. M. Jagtap	Instrumental Methods of Analysis	VII	03	08	01	16
		Pharmaceutics - I	I	--	04	--	

### Department of Pharmacognosy

Sr. No	Staff Name	Subject	Semester	Workload		Tutorial	Total Workload
				Theory	Practical		
01	Dr. E.T. Tamboli	Pharmacognosy and phytochemistry II	V	06	04	02	12

### CHB Staff from ADCET

Sr. No	Staff Name	Subject	Semester	Workload		Tutorial	Total Workload
				Theory	Practical		
01	Mr. S. B. Barge/ Mr. M. D. Patil	Communication skills	I	04	10	---	18
	Mr. A. G. Shinde/ Mrs. S. Nayal	Communication skills	III (L.E.)	02	02	--	
02	Mr. S. D. Patil	Remedial Mathematics	I	02	--	--	02

  
**Vice-Principal (Academics)**  
**Vice-Principal (Academics)**  
 Annapasheb Dange College of B. Pharmacy, Ashta



  
**Principal**  
**Principal**  
 Annapasheb Dange College of  
 B. Pharmacy, Ashta.



**Sant Dnyaneshwar Shikshan Sanstha's**  
**Annasaheb Dange College of B Pharmacy, Ashta**  
**Teaching Workload (Academic Year 2021-22, TERM-II)**

**Department of Pharmaceutics**

Sr. No	Staff Name	Subject	Semester	Workload		Tutorial	Total Workload
				Theory	Practical		
01	Dr. R. S. Jagtap	Biostatistics and Research Methodology	VIII	03	-	01	12
		Pharmacognosy and Phytochemistry I	IV	--	08	--	
02	Mr. S. N. Pattekari	Physical Pharmaceutics-II	IV	03	08	01	12
03	Mr. S. M. Honmane	Physical Pharmaceutics-II	IV	03	12	01	16
04	Ms. S. S. Kharat	Biopharmaceutics and Pharmacokinetics	VI	06	--	02	12
		Pharmacology I	IV	--	04	--	
05	Mr. A. R. Mali	Quality Assurance	VI	06	--	02	12
		Pharmacognosy and Phytochemistry I	IV	--	04	--	
06	Mr. K. M. Thorawade	Biostatistics and Research Methodology	VIII	03	-	01	16
		Herbal Drug Technology	VI	--	12	--	
07	Mr. R.D. Patil	Pharmaceutical Biotechnology	VI	06	--	02	16
		HAP-II	II	--	08	--	
08	Mr. P. V. Chavan	Pharma Marketing Management (Elective)	VIII	06	--	02	12
		Pharmacology I	IV	--	04	--	
09	Ms. P. R. Shelake	Social and Preventive Pharmacy	VIII	06	--	02	16
		Pharmacology III	VI	--	08	--	

**Department of Pharmacology**

Sr. No	Staff Name	Subject	Semester	Workload		Tutorial	Total Workload
				Theory	Practical		
01	Dr. M. G. Saralaya	HAP-II	II	--	04	--	04
02	Mr. S. J. Sajane	Pathophysiology	II	06	--	02	12
		HAP-II	II	--	04	--	
03	Mr. G. V. Sutar	HAP-II	II	06	04	02	12
04	Ms. A. M. Bhajji	Pharmacology III	VI	06	08	02	16
05	Ms. S. T. Taralekar	Pharmacology I	IV	03	08	01	12
06	Mr. S. J. Patil	Pharmacology I	IV	03	04	01	12
		Pharmacology III	VI	--	04	--	

### Department of Pharmaceutical Chemistry

Sr. No	Staff Name	Subject	Semester	Workload		Tutorial	Total Workload
				Theory	Practical		
01	Ms. Y. H. Momin	P'ceutical Organic Chemistry - I	II	03	08	01	12
02	Mr. A.K. Mullani	Medicinal Chemistry-III	VI	03	08	01	12
03	Mr. G. D. Mote	POC- III	IV	03	--	01	12
		Biochemistry	II	--	08	--	
04	Mrs. Gaikwad P.S.	Biochemistry	II	06	08	02	16
05	Mr. H. P. Khade	Advanced Instrumentation Technique	VIII	06	--	02	16
		Medicinal Chemistry I	II	--	08	--	
06	Miss S. P. Desai	P'ceutical Organic Chemistry - I	II	03	12	01	16
07	Mr. R. D. Mali	Medicinal Chemistry-III	VI	03	12	01	16
08	Ms. N. M. Jagtap	POC- III	IV	03	--	01	12
		Medicinal Chemistry-I	IV	--	04	--	
		Biochemistry	II	--	04	--	
09	Ms. A. S. Patil	Medicinal Chemistry-I	IV	06	08	02	16

### Department of Pharmacognosy

Sr. No	Staff Name	Subject	Semester	Workload		Tutorial	Total Workload
				Theory	Practical		
01	Dr. E.T. Tamboli	Pharmacognosy & Phytochem-I	IV	06	08	02	16
02	Mr. N. D. Patil	Herbal Drug Technology	VI	06	08	02	16

### Visiting Faculty from ADCET

Sr. No	Staff Name	Subject	Semester	Workload		Tutorial	Total Workload
				Theory	Practical		
01	Mr. Nadaf A B	Computer Application in Pharmacy	II	04	10	--	18
		Computer Application in Pharmacy	IV (L. E.)	02	02	--	
02	Mr. Dighole S. D.	Environmental sciences	II	04	--	--	06
		Environmental sciences	IV (L. E.)	02	--	--	

  
**Principal**  
 Annasaheb Dange College of  
 B. Pharmacy, Ashta.



  
**Vice-Principal (Academic)**  
 Annasaheb Dange College of B. Pharmacy, Ashta.





Sant Dnyaneshwar Shikshan Sanstha's  
**Annasaheb Dange College of B.Pharmacy, Ashta**  
 Tal.-Walwa, Dist.-Sangli, Maharashtra, India 416 301



**D. Pharm Course**  
**WORK LOAD DISTRIBUTION**  
**Academic Year- 2021-22**

Sr.No	Name of Staff	Subject	1st Yr			2nd Yr		Total
			TH	TU	PR	TH	PR	
1	Mr. S.S. Upadhye	Pharmaceutics-II	-	-	-	3	8	14
		Drug Store & Business Management	-	-	-	3	-	
2	Mr. N. R. Inamdar	Social Pharmacy	3	1	-	-	-	17
		Pharmaceutical Chemistry- II	-	-	-	4	9	
3	Miss. S. S. Thorat	Pharmaceutical Chemistry	3	1	9	-	-	21
		Social Pharmacy	-	-	6	-	-	
		Pharmaceutical Jurisprudence	-	-	-	2	-	
4	Mr.Y.S. Chandanshive	Human Anatomy & Physiology	3	1	9			22
		Pharmacology & Toxicology	-	-	-	3	6	
5	Mr.S.D. Kadam	Pharmacognosy & Phytochemistry	3	1	9	-	-	22
		Hospital & Clinical Pharmacy	-	-	-	3	6	
6	Ms. S. S. Khairmode	Pharmaceutics	3	1	9	-	-	20
		Social Pharmacy	-	-	3	-	-	
		Pharmaceutics-II	-	-	-	-	4	

*[Signature]*

**ACADEMIC INCHARGE**  
**Academic Incharge**  
 Annasaheb Dange College of B. Pharmacy Ashta  
 (D. Pharm Course)



*[Signature]*

**PRINCIPAL**  
**PRINCIPAL**  
 Annasaheb Dange College of  
 B. Pharmacy, Ashta.

## Formats for Internal Continuous Assessment of Students

### 1. Record of Continuous Assessment (Theory)

Attendance (04)	Academic Activities (03)			Monitoring (Interaction with Student & Feedback by Faculty) (03)	Total Marks (10)
	Assignments (1)	Active Learning (1)	Self- learning (1)		

### 2. Record of Continuous Assessment (Practical)

Attendance (02)	Record Book (01)	Skill Acquisition (Based on skill level attended) (01)	Monitoring (Interaction with Student) Viva- voce, (01)	Total Marks (05)

## Process for internal Continuous Assessment of Students

### Theory and Practical

1. A regular record of attendance both in Theory and Practical shall be maintained by the teaching staff of respective courses.

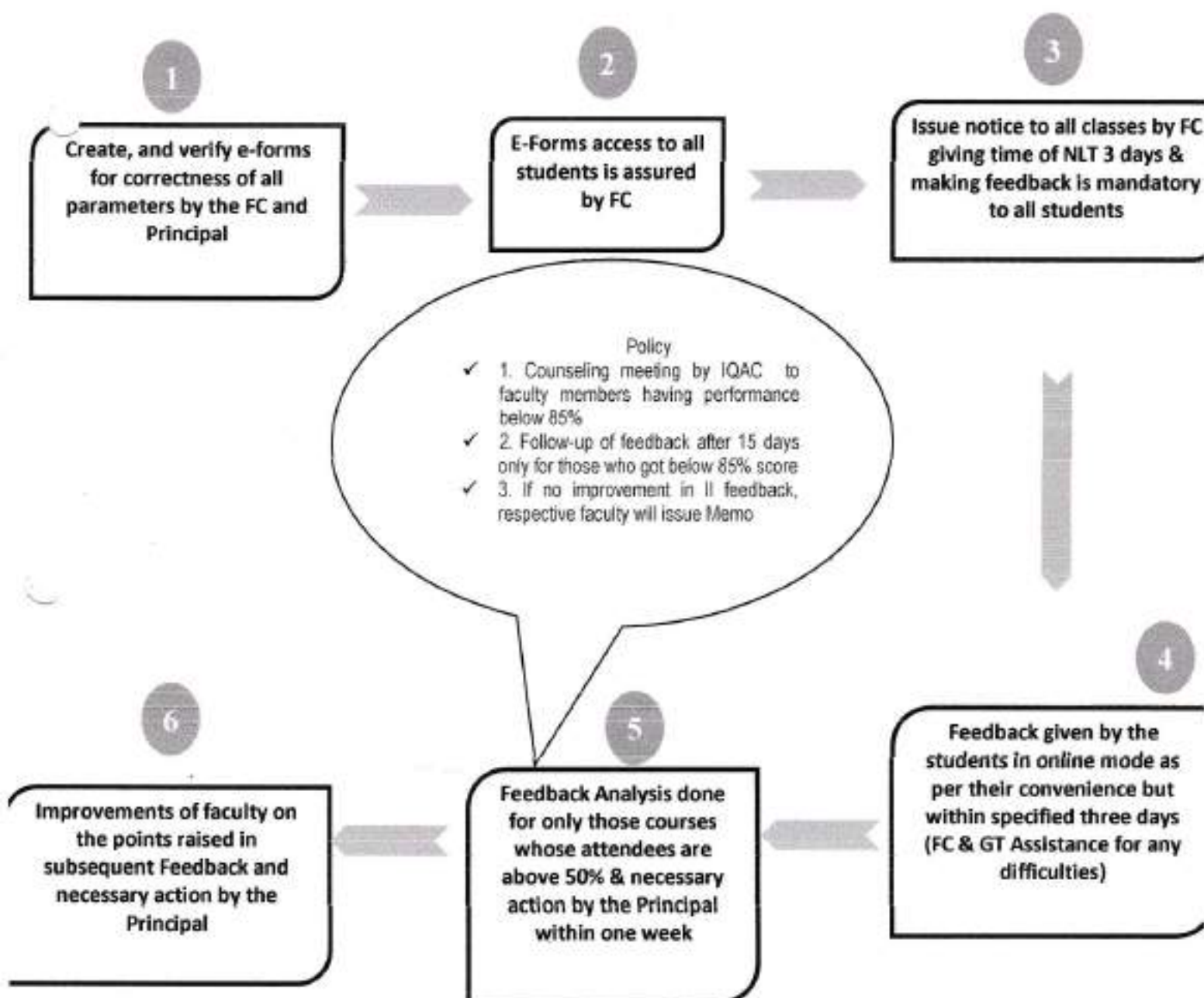
Percentage of Attendance	Theory	Practical
95 – 100	4	2
90 – 94	3	1.5
85 – 89	2	1
80 – 84	1	0.5
Less than 80	0	0

2. The marks allocated for Continuous mode of Internal Assessment shall be awarded as per the scheme given.
3. Total Marks will be entered in Internal Assessment Sheet and then undersigned by the respective students.
4. These marks will be entered in Mother register as well as on SUK portal and printout will be taken for that same.
5. Then these Marksheet will be confirmed through respective teachers, HOD as well as from principal login and then confirmed Marksheet will be sent to Shivaji University.

# Feedback System at ADCBP, Ashta

## Students Feedback on Faculty Performance

Conducted not before & not after the end of fourth week of Semester commencement (on 28<sup>th</sup> day of commencement)



FC: Feedback Coordinator

GT: Guardian Teachers

NLT: Not less than



### **Feedback analysis and reward/ corrective measures:**

➤ Faculties of ADCBP are assessed twice in semester for their effective teaching methodologies based on the feedback received from the students. This process is an online and conducted at college level and is full proof. A faculty from ADCBP is assigned a job of institute level coordination to monitor the feedback process. The faculty is assessed against well designed 10 questionnaire in Theory and Practical respectively, as given below;

1. Whether the lectures are well prepared, organized and well structured?
2. Whether any Audio-Visual Aid used during the lectures?
3. Whether the lectures were delivered with emphasis on fundamental concepts and illustrative examples?
4. Whether the difficult topics were taught with adequate attention and ease?
5. Does the teacher provide you additional knowledge related to the subject?
6. Whether the teacher delivered lectures with good communication skill?
7. Whether the teacher encouraged students to ask questions in order to make lectures interactive and lively?
8. Does the teacher provided any informative and appreciate study material?
9. Does the teacher give feedback to students after completion of assigned tasks?
10. Whether the tests/ assignments were challenging enough to stimulate problem solving approach?

### **Questionnaires for Practical course;**

1. Whether the teacher comes well organized and prepared for practicals?
2. Whether the difficult topics were taught with adequate attention and ease?
3. Whether the Handouts, laboratory manuals were understandable, informative, clear and helped you in practical work?
4. Whether the teacher used to give Handouts, laboratory manuals and/ or instructions in advance.
5. Whether the teacher discussed application part of each practical?
6. Whether the writing is least because the emphasis is on doing practical tasks that allows students to effectively link theory to practice.

7. Whether all practical tasks are performed individually or in pairs at most so students always get to understand how things by themselves.
8. Whether students receive prompt feedback on their submissions.
9. Whether feedback on submissions verbally and/ or in writing is useful and helps students to improve further learning.
10. Whether the teacher speaks and explains concepts with good communication skill.

Each head is measured in the category of Excellent (E), Good (G), Average (A) and Below average (B). The overall score is on the scale of 0 to 100. Soon after the feedback collection the coordinator circulates the overall ratings of all faculties for necessarily action. The list of faculties having overall score more than 85% are made available for reward and corrective measures respectively.

#### System of Reward:

As detailed in graphical representation of faulty feedback process, ADCBP has designed a process of feedback in which the faculties are honoured by giving a letter of appreciation for achieving excellence (Above 95% score) in the teaching. The letter of appreciation issued by the head of institution reads as "On behalf of the management and our own behalf, we appreciate you for obtaining the excellent student feedback in the subject.....taught by you for..... Year for the year..... Please accept our sincere appreciation for the excellent job you had done. We are sure that in future also you will be able to contribute to the growth and development of the institute. Wish you all the best for your future endeavours"

#### Corrective Measures:

Faculty members whose score below 85% in feedback are called for meeting with IQAC. The IQAC do the counselling of particular faculty member on the points like core knowledge, preparation of lectures, class control, doubt clearance and areas to be focused, etc. After 15 days similar feedback is collected from students for respective faculty. The comparison of two feedbacks is done for assessment of improvement in teaching.



  
**PRINCIPAL**  
Annasaheb Dange College of  
B. Pharmacy, Ashta.



Sant Dnyaneshwar Shikshan Santha's



# ANNASAHEB DANGE COLLEGE OF B PHARMACY, ASHTA

(Approved by AICTE, New Delhi, Govt. of Maharashtra and Affiliated to Shivaji University, Kolhapur)

Date: 1-10-21

To,  
The Head,  
Pharmaceutics,  
Annasaheb Dange College of Pharmacy,  
Ashta, Dist- Sangli,  
Maharashtra, 416301

Subject: Letter of Appreciation for student's feedback regarding...

Dear Sir/ Madam,

On behalf of the management and my own behalf, we want to appreciate the following faculty from department of PHARMACEUTICS for obtaining the excellent student feedback in their respective subjects taught by them for Even Semester (II, IV, VI and VIII<sup>th</sup>) of Academic year 2020-21. This is sincere appreciation for the excellent performance they have done. We highly anticipate and appreciate consistent performance in oneself and institute.

Sr. No.	Subject Name	Faculty Name
1	Physical Pharmaceutics- II(Sem IV, Div. A)	Mr. S. M. Honmane
2	Biopharmaceutics (Sem VI, Div. A)	Miss. S. S. Kharat
3	Pharmaceutical Quality Assurance (Sem VI, Div. B)	Mr. A. R. Mali
4	Biostatistics and Research Methodology(Sem VIII, Div A)	Dr. R. S. Jagtap
5	Quality Control and Standardization of Herbals(Sem VIII, Div. A & B) and Biostatistics and Research Methodology (Sem VIII, Div B)	Mr. K. M. Thorwade

Feedback Coordinator

Vice-Principal  
(Academics)

IQAC Head

Vice-Principal  
(Admin)

Vice-Principal (Admin.)

Annasaheb Dange College of B. Pharmacy, Ashta

Principal  
Annasaheb Dange College of  
B. Pharmacy, Ashta.

Received  
1/10/21







Sant Dnyaneshwar Shikshan Santha's



# ANNASAHEB DANGE COLLEGE OF B PHARMACY, ASHTA

(Approved by AICTE, New Delhi, Govt. of Maharashtra and Affiliated to Shivaji University, Kolhapur)

Date 1.10.21

## FACULTY COMMUNICATION

To,  
Mr. R. D. Patil  
Dept. of Pharmaceutics,  
Annasaheb Dange College of B. Pharmacy,  
Ashta

Dear Sir,

Student's satisfaction is one of the most important aspects of organizational performance that is most critical for the current and future success of the organization.

It is evident from the student feedback conducted on 23<sup>rd</sup> March 2021 that your student satisfaction score is below 85% for Pharmaceutical Biotechnology subject (T.Y. B. Pharm. SemVI Div A and B). This may leads to failure of some students in summative exam conducted by the university. Such failure has undesirable consequences which affect unique identity of the institute.

You are therefore directed to go through student's comments and weakness and rectify it.


Thanking you

  
Feedback Coordinator

  
Vice-Principal  
(Academics)

  
IQAC Head

  
Vice-Principal  
(Admin)

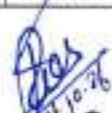
  
Principal  
Annasaheb Dange College of B. Pharmacy, Ashta




## Academic feedback 2020-21 (Even Term)

Sr. No	Faculty Name	Class	Feedback (Achievement)
<b>F.Y Div I (Sem II)</b>			
1.	Mr. V. D. Chaougule	CAP	87
2.	Mr. S. V. Digole	Env. Sci.	85
3.	Mr. G. V. Sutar	HAP-II	97
4.	Mr. S. J. Sajane	Patho	93
5.	Miss P. S. Gaikwad	Biochem	90
6.	Miss S. P. Desai	POC-I	92
<b>F.Y Div II (Sem II)</b>			
7.	Mr. G. V. Sutar	HAP-II	96
8.	Mr. V. D. Chougule	CAP	88
9.	Mr. P. B. Bhagwati	Env. Sci.	91
10.	Miss Y. H. Momin	POC-I	91
11.	Mr. S. J. Sajane	Patho	95
12.	Miss P. S. Gaikwad	Biochem	93
<b>S.Y. Div I (Sem IV)</b>			
13.	Mr A. R. Tamboli	Pcog-I	95
14.	Mr. S. N. Pattekari	PE	94
15.	Mr S. N. Honmane	PP-II	96
16.	Mr. H. P. Khade	MC-I	97
17.	Miss S. T. Tarlekar	Pcology-I	91
18.	Mr G.D. Mote	POC-III	96
<b>S.Y. Div II (Sem IV)</b>			
19.	Mr A. R. Tamboli	Pcog-I	
20.	Mr S. N. Pattekari	PP-II	90
21.	Mr. N. M. Jangde	POC-III	94
22.	Mr. V. D. Chaougule	CAP	88
23.	Miss S. T. Tarlekar	Pcology-I	95
24.	Mr. S. V. Digole	Env. Sci	85
25.	Miss V. R. Mangrule	MC-I	94
<b>T.Y. Div I (Sem VI)</b>			
26.	Dr.E.T.Tamboli	HBT	98
27.	Mr.A.K.Mullani	MC-III	93
28.	Mr.G.S.Patil	Pcol-III	92
29.	Miss S. R. Jagtap	QA	93
30.	Miss S. S. Kharat	Biopharm	95
31.	Mr.R. D.Patil	P'Biotech	83
<b>T.Y. Div II (Sem VI)</b>			
32.	Mr. R. D. Patil	P'Biotech	82
33.	Ms. G. S. Patil	Pcol-III	92
34.	Mr. R. D. Mali	MC-III	94
35.	Dr. E. T. Tamboli	HBT	98

36.	Mr. A.R. Mali	QA	96
37.	Miss S. S. Kharat	Biopharm	94
38.	<b>Final Year Y. Div I (Sem VIII)</b>		
39.	Dr. R. S. Jagtap	BRM	96
40.	Miss. S. A Naik	SPP	88
41.	Mr. H. P. Khade	AIT(Elet)	92
42.	Mr. K. M. Thorwade	QCSH	97
	<b>Final Year Div II (Sem VIII)</b>		
43.	Miss. S. A Naik	SPP	86
44.	Mr. H. P. Khade	AIT(Elet)	88
45.	Mr. K. M. Thorwade	QCSH	95
46.	Mr. K. M. Thorwade	BRM	95

  
Feedback Co-ordinator

  
Academic Co-ordinator



## Sant Dnyaneshwar Shikshan Sanstha, Annasaheb Dange College of B.Pharmacy, Ashta, Sangli

### Feedback Analysis

Title : Feedback II (Even Semester 2020-21)

Academic Year : 2020-21

Class : Second Semester (Div-A) [ B. Pharmacy ]

Details : Miss Priyanka Harman Jadhav

Total number of response(s) : 46

Question	Is teacher easily accessible online or via phone?			
Answer	Value	No. of response(s)	Response value	Response %
Yes	1	43	43	93.48
No	0	3	0	6.52
Performance				93.48



Question	Is teacher able to verify your queries?			
Answer	Value	No. of response(s)	Response value	Response %
Excellent	3	29	89	97.89
Good	2	14	28	30.43
Poor	1	1	1	2.17
Performance				86.41



Question	How would you rate the quality of videos used by faculty?			
Answer	Value	No. of response(s)	Response value	Response %
Excellent	3	30	90	85.22
Good	2	15	30	32.61
Poor	1	1	1	2.17
Performance				87.88



Question	How you rate quality of teaching in online mode?			
Answer	Value	No. of response(s)	Response value	Response %
Excellent	3	28	84	80.87
Good	2	17	34	36.96
Poor	1	1	1	2.17
Performance				80.23



Question	How would you rate the faculty for online teaching?			
Answer	Value	No. of response(s)	Response value	Response %
Excellent	3	28	84	80.87
Good	2	17	34	36.96
Poor	1	1	1	2.17
Performance				80.23



Question	Is faculty providing study material?			
Answer	Value	No. of response(s)	Response value	Response %
Yes	1	43	43	93.48
No	0	3	0	6.52
Performance				93.48



Question	Is faculty interactive in online classes?			
Answer	Value	No. of response(s)	Response value	Response %
Yes	1	45	45	97.83
No	0	1	0	2.17
Performance				97.83





All India Council for Technical Education  
(A Statutory body under Ministry of HRD, Govt. of India)

7th Floor, Chandralok Building, Janpath, New Delhi- 110 001  
PHONE: 23724151/52/53/54/55/56/57 FAX: 011-23724183 [www.aicte-India.org](http://www.aicte-India.org)

F.No. Western/2016/1-2858009941

Date: 30-Apr-2016

To,  
The Secretary,  
Tech. & Higher Education Deptt.  
Govt. of Maharashtra, Mantralaya,  
Annexe Building, Mumbai-400032

**Sub: Letter of Approval for New Institute 2016-17**

Sir/Madam,

In terms of the provisions under the All India Council for Technical Education (Grant of Approvals for Technical Institutions) Regulations 2012 notified by the Council vide notification number F.No.37-3/Legal/2012 dated 27/09/2012 and other notifications, as applicable and published from time to time, I am directed to convey the approval to

Regional Office	Western	Application Id	1-2858009941
Name of the Institute	ANNASHEB DANGE COLLEGE OF B PHARMACY	Institute Address	A/P - ASHTA, TAL - WALWA, DIST - SANGLI, ASHTA, SANGLI, Maharashtra, 416301
Name of the Society/Trust	SANT DNYANESHWAR SHIKSHAN SANSTHA	Society/Trust Address	"MADHAV" NIWAS, KACHARE GALLI, ISLAMPUR, ISLAMPUR, SANGLI, Maharashtra, 415409
Institute Type	Unaided - Private		

to conduct following courses with the intake indicated below for the academic year 2016-2017

Application Id : 1-2858009941				Course	Full/Part Time	Affiliating Body	Intake approved for 2016-17	PIO/F N/Gulf Quota	NRI
S. No.	Programme	Shift	Level						
1	PHARMACY	1st Shift	UNDER GRADUATE	PHARMACY	FULL TIME	Shivaji University, Kolhapur	50	No	No

**Note: The approval is valid for two years from the date of issue of this letter for getting affiliation with respective University/ Board of Technical Education (BTE)/ Board of Technical Education & Training (BTET) (as applicable) and fulfilling State Govt. requirements for admission. If institution is unable to start in the academic session 2016-17 due to reason mentioned above, the institution will have to apply On-line on AICTE web portal in next academic session for continuation of approval.**

The Society/Trust/Institution shall obtain necessary affiliation / permission from the concerned affiliating University/ Board of Technical Education (BTE)/ Board of Technical Education & Training (BTET)(as applicable) as per the prescribed schedule of the University/ Board of Technical Education (BTE)/ Board of Technical Education & Training (BTET)(as applicable) Admission authority etc. The Applicant Society/Trust/Institution shall send information about commencement of the above courses to AICTE. In case the Institution is not in a position to commence the above mentioned courses for whatever reason during the two years period from the date of issue of this letter, the approval becomes invalid and the applicant Society/Trust/Institution shall make fresh application to AICTE for grant of approval as per the norms prevailing at that time.

All Institutions shall fulfill the following general conditions:





1. The management shall provide adequate funds for development of land and for providing related infrastructural, instructional and other facilities as per norms and standards laid down by the Council from time to time and for meeting recurring expenditure.
2. The admission shall be made only after adequate infrastructure and all other facilities, including the availability / recruitment of the required faculty are provided as per norms and guidelines of the AICTE.
3. The admissions shall be made in accordance with the regulations notified by the Council from time to time.
4. The curriculum of the course, the procedure for evaluation / assessment of students shall be in accordance with the norms prescribed by the AICTE and concerned affiliating university/ Board of Technical Education (BTE)/ Board of Technical Education & Training (BTET) (as applicable) wherever applicable.
5. The management of the Institution shall not close the Institution or the institution shall not discontinue any course(s) or start any new course(s) or alter intake capacity of seats without the prior approval of the Council.
6. No excess admission shall be made by the Institution over and above the approved intake under any circumstances. In case any excess admission is reported to the Council, appropriate action as per the notified regulations shall be initiated against the Institution.
7. The institutions shall not have any collaborative arrangements with any Indian and / or Foreign Universities for conduct of technical courses other than those approved by AICTE without obtaining prior approval from AICTE. In case any violation is reported to the Council, appropriate action as per the notified regulations shall be initiated against the Institution.
8. The Institution shall not conduct any course(s) in the field of technical education in the same premises / campus and / or in the name of the Institution without prior permission / approval of AICTE. If found so, appropriate action as per the notified regulations shall be initiated against the Institution.
9. The institution shall not conduct any non-technical course (s) in the same premises under any circumstances. In case any violation is reported to the Council, appropriate action as per the notified regulations shall be initiated against the Institution.
10. The institution shall operate only from the approved location, and that the institution shall not open any off campus study centers / extension centers directly or in collaboration with any other institution / university / organization for the purpose of imparting technical education without obtaining prior approval from the AICTE. If found so, appropriate action as per the notified regulations shall be initiated against the Institution.
11. The tuition and other fees shall be charged as prescribed by the Competent Authority within the overall criteria prescribed by the Council from time to time. No capitation fee shall be charged from the students / guardians of students in any form. If found so, appropriate action as per the notified regulations shall be initiated against the Institution.
12. The accounts of the Institution shall be audited annually by a certified Chartered Accountant and shall be open for inspection by the Council or anybody or persons authorized by it.
13. The Director / Principal and the teaching and other staff shall be appointed in given time frame and selection shall be done according to procedures, qualifications and experience prescribed by the Council from time to time and pay scales are as per the norms prescribed by the Council from time to time.



*All India Council for Technical Education*  
(A Statutory body under Ministry of HRD, Govt. of India)

7th Floor, Chandralok Building, Janpath, New Delhi- 110 001  
PHONE: 23724151/52/53/54/55/56/57 FAX: 011-23724183 [www.aicte-India.org](http://www.aicte-India.org)

14. The technical institution shall publish an information booklet before commencement of the academic year giving details regarding the institution and courses / programs being conducted and details of infrastructural facilities including faculty etc. in the form of mandatory disclosure. The information booklet may be made available to the stakeholders of the technical education. The mandatory disclosure information, as per directions in the AICTE website / Approval Process Handbook, shall be put on the Institution Website. The information shall be revised every year with updated information about all aspects of the institution.
15. It shall be mandatory for the technical institution to maintain a Website providing the prescribed information. The Website information must be continuously updated as and when changes take place.
16. If a technical Institution fails to disclose the information or suppress and / or misrepresent the information, appropriate action as per the notified regulations shall be initiated against the Institution.
17. AICTE may carry out random inspections round the year for verifying the status of the Institutions to ensure maintenance of norms and standards.
18. AICTE may also conduct inspections with or without notifying the dates to verify specific complaints, to verify adherence to AICTE norms & standards, and to verify any mis-representation, violation of norms & standards, mal-practices etc.
19. The Institution by virtue of the approval given by Council shall not automatically become claimant to any grant-in-aid from the Central or State Government.
20. In the event of a student / candidate withdrawing before the starting of the course, the wait listed candidates should be given admission against the vacant seat. The entire fee collected from the student, after a deduction of the processing fee of not more than Rs. 1000/- (Rupees one thousand only) shall be refunded and returned by the Institution / University/ Board of Technical Education (BTE)/ Board of Technical Education & Training (BTET)(as applicable) to the student / candidate withdrawing from the program. It would not be permissible for Institutions and Universities to retain the School / Institution Leaving Certificates in original to force retention of admitted students.
21. The Institute shall take appropriate measures for prevention of ragging in any form, in the light of AICTE regulation "Prevention and Prohibition of Ragging in Technical Institutions, Universities including Deemed to Universities imparting technical education" Regulation 2009 (F.No. 37-3/Legal/AICTE/2009 dated 01/07/2009). In case of failure to prevent the instances of ragging by the Institutions, the Council shall take appropriate action as per the notified regulations.

The Management of the Institute shall strictly follow further conditions as may be specified by the Council from time to time. The Council may withdraw the approval, in case it observe any violation of the above conditions and / or non-adherence to the norms and standards prescribed by the Council, mis-representation of facts and submitting factually in correct information to it.

**Prof. Alok Prakash Mittal**  
**Member Secretary, AICTE**

Copy to:

1. **The Regional Officer,**  
All India Council for Technical Education  
Industrial Assurance Building  
2nd Floor, Nariman Road  
Mumbai - 400 020, Maharashtra



*All India Council for Technical Education*  
(A Statutory body under Ministry of HRD, Govt. of India)

7th Floor, Chandralok Building, Janpath, New Delhi- 110 001  
PHONE: 23724151/52/53/54/55/56/57 FAX: 011-23724183 [www.aicte-India.org](http://www.aicte-India.org)

2. **The Director Of Technical Education,**  
Maharashtra
3. **The Registrar,**  
Shivaji University, Kolhapur
4. **The Principal / Director,**  
ANNASHEB DANGE COLLEGE OF B PHARMACY  
A/P - ASHTA, TAL - WALWA, DIST - SANGLI,  
ASHTA,SANGLI,  
Maharashtra,416301
5. **The Secretary / Chairman,**  
SANT DNYANESHWAR SHIKSHAN SANSTHA  
"MADHAV" NIWAS, KACHARE GALLI, ISLAMPUR,  
ISLAMPUR,SANGLI,  
Maharashtra,415409
6. **Guard File(AICTE)**



# All India Council for Technical Education

(A Statutory body under Ministry of HRD, Govt. of India)

Nelson Mandela Marg Vasant Kunj, New Delhi-110067

PHONE: 23724151/52/53/54/55/56/57 FAX: 011-23724183 [www.aicte-india.org](http://www.aicte-india.org)

F.No. Western/1-3323645384/2017/EOA

Date: 10-Apr-2017

To,

The Secretary,  
Tech. & Higher Education Deptt.  
Govt. of Maharashtra, Mantralaya,  
Annexe Building, Mumbai-400032

## Sub: Extension of approval for the academic year 2017-18

Ref: Application of the Institution for Extension of approval for the academic year 2017-18

Sir/Madam,

In terms of the provisions under the All India Council for Technical Education (Grant of Approvals for Technical Institutions) Regulations 2016 notified by the Council vide notification number F.No.AB/AICTE/REG/2016 dated 30/11/2016 and norms standards, procedures and conditions prescribed by the Council from time to time, I am directed to convey the approval to

Permanent Id	1-2858009941	Application Id	1-3323645384
Name of the Institute	ANNASHEB DANGE COLLEGE OF B PHARMACY	Institute Address	A/P - ASHTA, TAL - WALWA, DIST - SANGLI, ASHTA, SANGLI, Maharashtra, 416301
Name of the Society/Trust	SANT DNYANESHWAR SHIKSHAN SANSTHA	Society/Trust Address	"MADHAV" NIWAS, KACHARE GALLI, ISLAMPUR, ISLAMPUR, SANGLI, Maharashtra, 415409
Institute Type	Unaided - Private	Region	Western

Opted for change from Women to Co-ed and Vice versa	No	Opted for change of name	No	Opted for change of site	No
Change from Women to Co-ed approved and Vice versa	Not Applicable	Change of name Approved	Not Applicable	Change of site Approved	Not Applicable
Opted for Conversion from degree to diploma	No	Opted for Conversion from diploma to degree	No	Conversion (degree to diploma or vice-versa) Approved	Not Applicable

To conduct following courses with the intake indicated below for the academic year 2017-18

Application Id: 1-3323645384			Course	Full/Part Time	Affiliating Body	Intake Approved for 2016-17	Intake Approved for 2017-18	NRI Approval status	PIO / FN / Gulf quota / OCI / Approval status	Foreign Collaboration/Twinning Program Approval status*
Program	Shift	Level								
PHARMACY	1st Shift	UNDERGRADUATE	PHARMACY	FULL TIME	Shivaji University, Kolhapur	50	100	NA	NA	NA



# All India Council for Technical Education

(A Statutory body under Ministry of HRD, Govt. of India)

Nelson Mandela Marg Vasant Kunj, New Delhi-110067

PHONE: 23724151/52/53/54/55/56/57 FAX: 011-23724183 [www.aicte-india.org](http://www.aicte-india.org)

The above mentioned approval is subject to the condition that

ANNASAHEB DANGE COLLEGE OF B PHARMACY

shall follow and adhere to the Regulations, guidelines and directions issued by AICTE from time to time and the undertaking / affidavit given by the institution along with the application submitted by the institution on portal.

In case of any differences in content in this Computer generated Extension of Approval Letter, the content/information as approved by the Executive Council / General Council as available on the record of AICTE shall be final and binding.

Strict compliance of Anti-Ragging Regulation:- Approval is subject to strict compliance of provisions made in AICTE Regulation notified vide F. No. 37-3/Legal/AICTE/2009 dated July 1, 2009 for Prevention and Prohibition of Ragging in Technical Institutions. In case Institution fails to take adequate steps to Prevent Ragging or fails to act in accordance with AICTE Regulation or fails to punish perpetrators or incidents of Ragging, it will be liable to take any action as defined under clause 9(4) of the said Regulation.

**Note: Validity of the course details may be verified at [www.aicte-india.org](http://www.aicte-india.org)**

**Prof. A.P Mittal**  
**Member Secretary, AICTE**

Copy to:

1. **The Regional Officer,**  
All India Council for Technical Education  
Industrial Assurance Building  
2nd Floor, Nariman Road  
Mumbai - 400 020, Maharashtra
2. **The Director Of Technical Education\*\*,**  
Maharashtra
3. **The Registrar\*\*,**  
Shivaji University, Kolhapur
4. **The Principal / Director,**  
ANNASAHEB DANGE COLLEGE OF B PHARMACY  
A/P - ASHTA, TAL - WALWA, DIST - SANGLI,  
ASHTA, SANGLI,  
Maharashtra, 416301
5. **The Secretary / Chairman,**  
SANT DNYANESHWAR SHIKSHAN SANSTHA  
"MADHAV" NIWAS, KACHARE GALLI, ISLAMPUR,  
ISLAMPUR, SANGLI,  
Maharashtra, 415409
6. **Guard File(AICTE)**

**Note: \*\* - Approval letter copy will not be communicated through post/email. However, provision is made in the portal for downloading Approval letter through Authorized login credentials allotted to concerned DTE/Registrar.**



# ***All India Council for Technical Education***

(A Statutory body under Ministry of HRD, Govt. of India)

Nelson Mandela Marg Vasant Kunj, New Delhi-110067

PHONE: 23724151/52/53/54/55/56/57 FAX: 011-23724183 [www.aicte-india.org](http://www.aicte-india.org)

# All India Council for Technical Education

(A Statutory body under Ministry of HRD, Govt. of India)

Nelson Mandela Marg, Vasant Kunj, New Delhi-110070 Website: [www.aicte-india.org](http://www.aicte-india.org)



## APPROVAL PROCESS 2018-19

### Extension of Approval (EoA)

F.No. Western/1-3508346490/2018/EOA

Date: 10-Apr-2018

To,

The Secretary,  
Tech. & Higher Education Deptt.  
Govt. of Maharashtra, Mantralaya,  
Annexe Building, Mumbai-400032

#### Sub: Extension of Approval for the Academic Year 2018-19

Ref: Application of the Institution for Extension of approval for the Academic Year 2018-19

Sir/Madam,

In terms of the provisions under the All India Council for Technical Education (Grant of Approvals for Technical Institutions) Regulations 2016 notified by the Council vide notification number F.No.AB/AICTE/REG/2016 dated 30/11/2016 and amended on December 5, 2017 and norms standards, procedures and conditions prescribed by the Council from time to time, I am directed to convey the approval to

<b>Permanent Id</b>	1-2858009941	<b>Application Id</b>	1-3508346490
<b>Name of the Institute</b>	ANNASAHEB DANGE COLLEGE OF B PHARMACY	<b>Name of the Society/Trust</b>	SANT DNYANESHWAR SHIKSHAN SANSTHA
<b>Institute Address</b>	A/P - ASHTA, TAL - WALWA, DIST - SANGLI, ASHTA, SANGLI, Maharashtra, 416301	<b>Society/Trust Address</b>	"MADHAV" NIWAS, KACHARE GALLI, ISLAMPUR, ISLAMPUR, SANGLI, Maharashtra, 415409
<b>Institute Type</b>	Unaided - Private	<b>Region</b>	Western

<b>Opted for Change from Women to Co-Ed and vice versa</b>	No	<b>Change from Women to Co-Ed and vice versa Approved or Not</b>	NA
<b>Opted for Change of Name</b>	No	<b>Change of Name Approved or Not</b>	NA
<b>Opted for Change of Site</b>	No	<b>Change of Site Approved or Not</b>	NA
<b>Opted for Conversion from Degree to Diploma or vice versa</b>	No	<b>Conversion for Degree to Diploma or vice versa Approved or Not</b>	NA
<b>Opted for Organization Name Change</b>	No	<b>Change of Organization Name Approved or Not</b>	NA

#### To conduct following Courses with the Intake indicated below for the Academic Year 2018-19

Program	Shift	Level	Course	FT/PT+	Affiliating Body (Univ/Body)	Intake Approved for 2018-19	NRI Approval Status	PIO / FN / Gulf quota/ OCI/ Approval Status	Foreign Collaboration / Twinning Program Approval Status*
PHARMACY	1st	UNDER GRADUATE	PHARMACY	FT	Shivaji University, Kolhapur	100	NA	NA	NA
PHARMACY	1st	DIPLOMA	PHARMACY	FT	Maharashtra State Board of Technical Education, Mumbai	60	NA	NA	NA

+FT –Full Time, PT-Part Time

In case of any differences in content in this Computer generated Extension of Approval Letter, the content/information as approved by the Executive Council / General Council as available on the record of AICTE shall be final and binding.

Strict compliance of Anti-Ragging Regulation: - Approval is subject to strict compliance of provisions made in AICTE Regulation notified vide F. No. 37-3/Legal/AICTE/2009 dated July 1, 2009 for Prevention and Prohibition of Ragging in Technical Institutions. In case Institution fails to take adequate steps to Prevent Ragging or fails to act in accordance with AICTE Regulation or fails to punish perpetrators or incidents of Ragging, it will be liable to take any action as defined under clause 9(4) of the said Regulation.

**Prof. A.P Mittal**  
**Member Secretary, AICTE**

Copy to:

1. The Regional Officer,  
All India Council for Technical Education  
Industrial Assurance Building  
2nd Floor, Nariman Road  
Mumbai - 400 020, Maharashtra
2. The Director Of Technical Education\*\*,  
Maharashtra
3. The Registrar\*\*,  
Shivaji University, Kolhapur
4. The Principal / Director,  
ANNASHEB DANGE COLLEGE OF B PHARMACY  
A/P - ASHTA, TAL - WALWA, DIST - SANGLI,  
ASHTA,SANGLI,  
Maharashtra,416301
5. The Secretary / Chairman,  
SANT DNYANESHWAR SHIKSHAN SANSTHA  
"MADHAV" NIWAS, KACHARE GALLI, ISLAMPUR,  
ISLAMPUR,SANGLI,  
Maharashtra,415409
6. Guard File(AICTE)

Note: Validity of the Course details may be verified at <http://www.aicte-india.org/>

---

\*\* Individual Approval letter copy will not be communicated through Post/Email. However, consolidated list of Approved Institutions(bulk) will be shared through official Email Address to the concerned Authorities mentioned above.



# All India Council for Technical Education

(A Statutory body under Ministry of HRD, Govt. of India)

Nelson Mandela Marg, Vasant Kunj, New Delhi-110070 Website: [www.aicte-india.org](http://www.aicte-india.org)



## APPROVAL PROCESS 2019-20

### Extension of Approval (EOA)

F.No. Western/1-4259297061/2019/EOA

Date: 10-Apr-2019

To,

The Secretary,  
Tech. & Higher Education Deptt.  
Govt. of Maharashtra, Mantralaya,  
Annexe Building, Mumbai-400032

#### Sub: Extension of Approval for the Academic Year 2019-20

Ref: Application of the Institution for Extension of approval for the Academic Year 2019-20

Sir/Madam,

In terms of the provisions under the All India Council for Technical Education (Grant of Approvals for Technical Institutions) Regulations 2018 notified by the Council vide notification number F.No.AB/AICTE/REG/2018 dated 31/12/2018 and norms standards, procedures and conditions prescribed by the Council from time to time, I am directed to convey the approval to

<b>Permanent Id</b>	1-2858009941	<b>Application Id</b>	1-4259297061
<b>Name of the Institute</b>	ANNASAHEB DANGE COLLEGE OF B PHARMACY	<b>Name of the Society/Trust</b>	SANT DNYANESHWAR SHIKSHAN SANSTHA
<b>Institute Address</b>	A/P - ASHTA, TAL - WALWA, DIST - SANGLI, ASHTA, SANGLI, Maharashtra, 416301	<b>Society/Trust Address</b>	"MADHAV" NIWAS, KACHARE GALLI, ISLAMPUR, ISLAMPUR, SANGLI, Maharashtra, 415409
<b>Institute Type</b>	Unaided - Private	<b>Region</b>	Western

<b>Opted for Change from Women to Co-Ed and vice versa</b>	No	<b>Change from Women to Co-Ed and vice versa Approved or Not</b>	NA
<b>Opted for Change of Name</b>	No	<b>Change of Name Approved or Not</b>	NA
<b>Opted for Change of Site/Location</b>	No	<b>Change of Site/Location Approved or Not</b>	NA
<b>Opted for Conversion from Degree to Diploma or vice versa</b>	No	<b>Conversion for Degree to Diploma or vice versa Approved or Not</b>	NA
<b>Opted for Organization Name Change</b>	No	<b>Change of Organization Name Approved or Not</b>	NA
<b>Opted for Merger of Institution</b>	No	<b>Merger of Institution Approved or Not</b>	NA
<b>Opted for Introduction of New Program/Level</b>	No	<b>Introduction of Program/Level Approved or Not</b>	NA

#### To conduct following Courses with the Intake indicated below for the Academic Year 2019-20

Program	Shift	Level	Course	FT/PT+	Affiliating Body (Univ/Body)	Intake Approved for 2019-20	NRI Approval Status	PIO / FN / Gulf quota/ OCI/ Approval Status
Pharmacy	1st	Under Graduate	Pharmacy	FT	Shivaji University, Kolhapur	100	NA	NA
Pharmacy	1st	Diploma	Pharmacy	FT	Maharashtra State Board of Technical Education, Mumbai	60	NA	NA

+FT –Full Time, PT-Part Time

In case of any differences in content in this Computer generated Extension of Approval Letter, the content/information as approved by the Executive Council / General Council as available on the record of AICTE shall be final and binding.

Strict compliance of Anti-Ragging Regulation: - Approval is subject to strict compliance of provisions made in AICTE Regulation notified vide F. No. 37-3/Legal/AICTE/2009 dated July 1, 2009 for Prevention and Prohibition of Ragging in Technical Institutions. In case Institution fails to take adequate steps to Prevent Ragging or fails to act in accordance with AICTE Regulation or fails to punish perpetrators or incidents of Ragging, it will be liable to take any action as defined under clause 9(4) of the said Regulation.

**It is mandatory to comply all the essential requirements as given in APH 2019-20(appendix 6)**

**NOTE: If the State Government / UT / DTE / DME has a reservation policy for admission in Technical Education Institutes and the same is applicable to Private & Self-financing Technical Institutions, then the State Government / UT/ DTE / DME shall ensure that 10 % of Reservation for EWS would be operational from the Academic year 2019-20 without affecting the percentage reservations of SC/ST/OBC/General . However, this would not be applicable in the case of Minority Institutions referred to the clause (1) of Article 30 of Constitution of India.**

**Prof. A.P Mittal**  
**Member Secretary, AICTE**

Copy to:

1. **The Director Of Technical Education\*\*, Maharashtra**
2. **The Registrar\*\*,  
Shivaji University, Kolhapur**
3. **The Principal / Director,  
Annasaheb Dange College Of B Pharmacy  
A/P - Ashta, Tal - Walwa, Dist - Sangli,  
Ashta, Sangli,  
Maharashtra, 416301**
4. **The Secretary / Chairman,  
Sant Dnyaneshwar Shikshan Sanstha  
"Madhav" Niwas, Kachare Galli, Islampur.  
Islampur, Sangli,  
Maharashtra, 415409**
5. **The Regional Officer,  
All India Council for Technical Education  
Industrial Assurance Building  
2nd Floor, Nariman Road  
Mumbai - 400 020, Maharashtra**
6. **Guard File(AICTE)**

Note: Validity of the Course details may be verified at <http://www.aicte-india.org/>

\*\* Individual Approval letter copy will not be communicated through Post/Email. However, consolidated list of Approved Institutions(bulk) will be shared through official Email Address to the concerned Authorities mentioned above.



**APPROVAL PROCESS 2020-21**

**Extension of Approval (EoA)**

F.No. Western/1-7014624033/2020/EOA

Date: 30-Apr-2020

To,

The Secretary,  
Tech. & Higher Education Deptt.  
Govt. of Maharashtra, Mantralaya,  
Annexe Building, Mumbai-400032

**Sub: Extension of Approval for the Academic Year 2020-21**

Ref: Application of the Institution for Extension of Approval for the Academic Year 2020-21

Sir/Madam,

In terms of the provisions under the All India Council for Technical Education (Grant of Approvals for Technical Institutions) Regulations 2020 notified by the Council vide notification number F.No. AB/AICTE/REG/2020 dated 4<sup>th</sup> February 2020 and norms standards, procedures and conditions prescribed by the Council from time to time, I am directed to convey the approval to

<b>Permanent Id</b>	1-2858009941	<b>Application Id</b>	1-7014624033
<b>Name of the Institute</b>	ANNASAHEB DANGE COLLEGE OF B PHARMACY	<b>Name of the Society/Trust</b>	SANT DNYANESHWAR SHIKSHAN SANSTHA
<b>Institute Address</b>	A/P - ASHTA, TAL - WALWA, DIST - SANGLI, ASHTA, SANGLI, Maharashtra, 416301	<b>Society/Trust Address</b>	"MADHAV" NIWAS, KACHARE GALLI, ISLAMPUR, ISLAMPUR, SANGLI,, 415409
<b>Institute Type</b>	Private-Self Financing	<b>Region</b>	Western

**To conduct following Courses with the Intake indicated below for the Academic Year 2020-21**

Program	Level	Course	Affiliating Body (University /Body)	Intake Approved for 2019-20	Intake Approved for 2020-21	NRI Approval Status	PIO / FN / Gulf quota/ OCI/ Approval Status
PHARMACY	UNDER GRADUATE	PHARMACY	Shivaji University, Kolhapur	100	100	NA	No
PHARMACY	DIPLOMA	PHARMACY	Maharashtra State Board of Technical Education, Mumbai	60	60	NA	No

It is mandatory to comply with all the essential requirements as given in APH 2020-21 (Appendix 6)

### **Important Instructions**

1. The State Government/ UT/ Directorate of Technical Education/ Directorate of Medical Education shall ensure that 10% of reservation for Economically Weaker Section (EWS) as per the reservation policy for admission, operational from the Academic year 2020-21 is implemented without affecting the reservation percentages of SC/ ST/ OBC/ General. However, this would not be applicable in the case of Minority Institutions referred to the Clause (1) of Article 30 of Constitution of India. Such Institution shall be permitted to increase in annual permitted strength over a maximum period of two years beginning with the Academic Year 2020-21
2. The Institution offering courses earlier in the Regular Shift, First Shift, Second Shift/Part Time now amalgamated as total intake shall have to fulfil all facilities such as Infrastructure, Faculty and other requirements as per the norms specified in the Approval Process Handbook 2020-21 for the Total Approved Intake. Further, the Institutions Deemed to be Universities/ Institutions having Accreditation/ Autonomy status shall have to maintain the Faculty: Student ratio as specified in the Approval Process Handbook. All such Institutions/ Universities shall have to create the necessary Faculty, Infrastructure and other facilities WITHIN 2 YEARS to fulfil the norms based on the Affidavit submitted to AICTE.
3. In case of any differences in content in this Computer generated Extension of Approval Letter, the content/information as approved by the Executive Council / General Council as available on the record of AICTE shall be final and binding.
4. Strict compliance of Anti-Ragging Regulation: - Approval is subject to strict compliance of provisions made in AICTE Regulation notified vide F. No. 373/Legal/AICTE/2009 dated July 1, 2009 for Prevention and Prohibition of Ragging in Technical Institutions. In case Institution fails to take adequate steps to Prevent Ragging or fails to act in accordance with AICTE Regulation or fails to punish perpetrators or incidents of Ragging, it will be liable to take any action as defined under clause 9(4) of the said Regulation.

**Prof.Rajive Kumar**  
**Member Secretary, AICTE**

Copy to:

1. **The Director Of Technical Education\*\***, Maharashtra
2. **The Registrar\*\***,  
Shivaji University, Kolhapur
3. **The Principal / Director**,  
ANNASAHAB DANGE COLLEGE OF B PHARMACY  
A/P - Ashta, Tal - Walwa, Dist - Sangli,  
Ashta, Sangli,  
Maharashtra, 416301
4. **The Secretary / Chairman**,  
"MADHAV" NIWAS, KACHARE GALLI, ISLAMPUR  
ISLAMPUR, SANGLI  
, 415409
5. **The Regional Officer**,  
All India Council for Technical Education  
Industrial Assurance Building  
2nd Floor, Nariman Road  
Mumbai - 400 020, Maharashtra
6. **Guard File(AICTE)**

Note: Validity of the Course details may be verified at <http://www.aicte-india.org/>

\*\* Individual Approval letter copy will not be communicated through Post/Email. However, consolidated list of Approved Institutions(bulk) will be shared through official Email Address to the concerned Authorities mentioned above.



# All India Council for Technical Education

(A Statutory body under Ministry of Education, Govt. of India)

Nelson Mandela Marg, Vasant Kunj, New Delhi-110070 Website: [www.aicte-india.org](http://www.aicte-india.org)



## APPROVAL PROCESS 2021-22

### Extension of Approval (EoA)

F.No. Western/1-9317647918/2021/EOA

Date: 25-Jun-2021

To,

The Secretary,  
Tech. & Higher Education Deptt.  
Govt. of Maharashtra, Mantralaya,  
Annexe Building, Mumbai-400032

#### Sub: Extension of Approval for the Academic Year 2021-22

Ref: Application of the Institution for Extension of Approval for the Academic Year 2021-22

Sir/Madam,

In terms of the provisions under the All India Council for Technical Education (Grant of Approvals for Technical Institutions) Regulations, 2021 Notified on 4th February, 2020 and amended on 24th February 2021 and norms standards, procedures and conditions prescribed by the Council from time to time, I am directed to convey the approval to:

<b>Permanent Id</b>	1-2858009941	<b>Application Id</b>	1-9317647918
<b>Name of the Institution /University</b>	ANNASAHEB DANGE COLLEGE OF B PHARMACY	<b>Name of the Society/Trust</b>	SANT DNYANESHWAR SHIKSHAN SANSTHA
<b>Institution /University Address</b>	A/P - ASHTA, TAL - WALWA, DIST - SANGLI, ASHTA, SANGLI, Maharashtra, 416301	<b>Society/Trust Address</b>	,ISLAMPUR,SANGLI,Maharashtra,415409
<b>Institution /University Type</b>	Private-Self Financing	<b>Region</b>	Western

#### To conduct following Programs / Courses with the Intake indicated below for the Academic Year 2021-22

Program	Level	Course	Affiliating Body (University /Body)	Intake Approved for 2020-21	Intake Approved for 2021-22	NRI Approval Status	FN / Gulf quota/ OCI/ Approval Status
PHARMACY	UNDER GRADUATE	PHARMACY	Shivaji University, Kolhapur	100	100	NA	NA
PHARMACY	DIPLOMA	PHARMACY	Maharashtra State Board of Technical Education, Mumbai	60	60	NA	NA

**It is mandatory to comply with all the essential requirements as given in APH 2021-22 (Appendix 6)**

### **Important Instructions**

1. The State Government/ UT/ Directorate of Technical Education/ Directorate of Medical Education shall ensure that 10% of reservation for Economically Weaker Section (EWS) as per the reservation policy for admission, operational from the Academic year 2019-20 is implemented without affecting the reservation percentages of SC/ ST/ OBC/ General. However, this would not be applicable in the case of Minority Institutions referred to the Clause (1) of Article 30 of Constitution of India. Such Institution shall be permitted to increase in annual permitted strength over a maximum period of two years.
2. The Institution offering courses earlier in the Regular Shift, First Shift, Second Shift/Part Time now amalgamated as total intake shall have to fulfil all facilities such as Infrastructure, Faculty and other requirements as per the norms specified in the Approval Process Handbook 2021-22 for the Total Approved Intake. Further, the Institutions Deemed to be Universities/ Institutions having Accreditation/ Autonomy status shall have to maintain the Faculty: Student ratio as specified in the Approval Process Handbook. All such Institutions/ Universities shall have to create the necessary Faculty, Infrastructure and other facilities WITHIN 2 YEARS to fulfil the norms based on the Affidavit submitted to AICTE within the Academic Year 2021-22
3. Strict compliance of Anti-Ragging Regulation, Establishment of Committee for SC/ ST, Establishment of Internal Complaint Committee (ICC), Establishment of Online Grievance Redressal Mechanism, Barrier Free Built Environment for disabled and elderly persons, Fire and Safety Certificate should be maintained as per the provisions made in Approval Process Handbook and AICTE Regulation notified from time to time.
4. In case of any differences in content in this Computer generated Extension of Approval Letter, the content/information as approved by the Executive Council / General Council as available on the record of AICTE shall be final and binding.

**Prof.Rajive Kumar**  
**Member Secretary, AICTE**

Copy \*\* to:

1. **The Director of Technical Education\*\*, Maharashtra**
2. **The Registrar\*\*,  
Shivaji University, Kolhapur**
3. **The Principal / Director,  
ANNASAHEB DANGE COLLEGE OF B PHARMACY  
A/P - Ashta, Tal - Walwa, Dist - Sangli,  
Ashta, Sangli,  
Maharashtra, 416301**
4. **The Secretary / Chairman,  
  
ISLAMPUR, SANGLI  
Maharashtra, 415409**
5. **The Regional Officer,  
All India Council for Technical Education  
Industrial Assurance Building  
2nd Floor, Nariman Road  
Mumbai - 400 020, Maharashtra**
6. **Guard File(AICTE)**

Note: Validity of the Course details may be verified at <http://www.aicte-india.org/> .

\*\* Individual Approval letter copy will not be communicated through Post/Email. However, consolidated list of Approved Institutions(bulk) will be shared through official Email Address to the concerned Authorities mentioned above.

*This is a computer generated Statement. No signature Required*



**BHASKAR B. PATIL & Co.**

Chartered Accountants

E-mail : ilpbpatil@gmail.com

**Office :** Flat No. 101 & 102, Ground Floor,  
 'C' Wing, Shamrao Mandlik Park,  
 13th Lane, Rajarampuri (East),  
 Kolhapur - 416 008

**Phone :** 0231-2525985, Mob.: 9422047185

**Audit Report**

We have audited the accounts of "Annasahb Dange College of B. Pharmacy, Ashta" (excluding its D Pharmacy wing), Taluka - Walwa, District - Sangli- 416301 which is a unit/branch of parent body - **Sant Dnyaneshwar Shikshan Sanstha Islampur**, Taluka - Walwa, District - Sangli, Registered Trust No. F - 1546 for the period **01-04-2020 to 31-03-2021** and annexed herewith the audited Receipt & Payment A/c, Income & Expenditure A/c for the year ended on **31-03-2021** and Balance Sheet of the said unit/branch as on **31-03-2021**.

We have conducted our audit in accordance with the auditing standards generally accepted in India. Those standards required that we plan & perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement. An audit includes examining on a test check basis, evidence supporting the amount and disclosures in the financial statements. And audit also includes assessing the accounting principles used and significant estimates made by the management as well as evaluating the overall financial statements presented. We believe that our audit provides a reasonable basis for our opinion.

**Auditor's responsibility -**

Our responsibility is to express an opinion on these financial statements based on our audit. An audit involves performing procedures to obtain audit evidence about the amounts and the disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal financial control relevant to the institution's preparation and presentation of the financial statements that give a true and fair view in order to design audit procedures that are appropriate in the circumstances but not for the purpose of expressing an opinion on whether the institution has in place an adequate internal financial controls system over financial reporting and the operating effectiveness of such controls. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of the accounting estimates made by the management as well as evaluating the overall presentation of the financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion on the financial statements.



**Report on required matters as per Fee Regulation Authority-****1. Reporting of Method of Accounting -**

During the Financial Year **01-04-2020** to **31-03-2021** the educational institute has followed the mercantile system of accounting as recommended by the FRA in its guidelines,

**2. Reporting of Segment Accounting -****a) About Geographical Segmentation -**

The area of operation of the educational institute is restricted to only one place situated at "Ashta", Taluka Walwa, District Sangli, Maharashtra State and hence there is no requirement of geographical segmentation for the courses conducted by the institute.

**b) About Business Segmentation -**

The educational institute runs two course of B. Pharmacy as well as D. Pharmacy wing at Same premises. The business segmentation require to show its two separate courses i.e. 1) B. Pharmacy & 2) D. Pharmacy wing and accordingly the two set of books of accounts have been maintained separately for each course. For the purpose of determination of students fees of both courses the financial statements of each course are prepared separately.

Accordingly only for the purpose of determination of fee i.e. B Pharmacy course the Receipt and Payment Account, Income and Expenditure Account and Balance Sheet as on **31-03-2021** of B. Pharmacy Course (excluding its D Pharmacy wing) are prepared & reported upon along with the necessary schedules.

3. The educational institute has kept proper books of accounts required for the purpose of conducting audit for the relevant course i.e. B. Pharmacy (excluding its D Pharmacy wing).
4. While conducting the audit, we have observed that the internal control system is deficient in respect of expenses incurred as some expenses have been incurred in cash instead of paying them by way of cheques and considering the size & volume of the transactions of the institute it is necessary to improve it adequately to safeguard the interest of the educational institute.

## BHASKAR B. PATIL & Co.

Chartered Accountants

**Office :** Flat No. 101 & 102, Ground Floor,  
'C' Wing, Shamrao Mandlik Park,  
13th Lane, Rajarampuri (East),  
Kolhapur - 416 008

E-mail : [tlpbbpatil@gmail.com](mailto:tlpbbpatil@gmail.com)

**Phone :** 0231-2525985, Mob.: 9422047185

5. Subject to above; in our opinion and according to the information and explanation given to us the accounts give true and fair view -

- i) In the case of the Balance Sheet the state of affairs of the educational institute as at 31st March, 2021.
- ii) In the case of Income and Expenditure of the **Surplus** of the educational institute for the year ended on that date.

Place - Kolhapur

Date - 20-12-2021



For M/s. Bhaskar B. Patil & Co.

Chartered Accountants

FRN - 101275W

CA. Bhaskar B. Patil

Proprietor

M. No. 036961

UDIN - 22036561 AAAA I 1208

**BHASKAR B. PATIL & Co.**

Chartered Accountants

E-mail : ilpbpatil@gmail.com

**Office :** Flat No. 101 & 102, Ground Floor,  
'C' Wing, Shamrao Mandlik Park,  
13th Lane, Rajarampuri (East),  
Kolhapur - 416 008

**Phone :** 0231-2525985, Mob.: 9422047185

Sant Dnyaneshwar Shikshan Sanstha's  
**Annasaheb Dange College of R. Pharmacy, Ashta (Excluding D Pharmacy Wing.)**  
Taluka - Walwa, District - Sangli - 416 301  
**Receipts & Payments A/c**  
( Form 01/04/2020 to 31/03/2021 )

Receipts	Rs.	Rs.	Payment	Rs.	Rs.
<b>To Opening Balance</b>		<b>4823737.00</b>	<b>By Salary</b>		<b>13501037.00</b>
Cash in Hand	99062.00		Teaching Staff Salary	11405784.00	
Cash at Bank -			Non-Teaching Staff Salary	1796391.00	
S B I A/c No. 35993853299	319125.00		Mgt. Cont. to PF	298862.00	
I D B I A/c No. 3391	1524271.00				
I D B I A/c No. 122313	580050.00				
Short Term Bank Deposit	2300000.00				
Nutan Sah. Bank A/c No.5584	1229.00				
		<b>24611446.50</b>	<b>By Audit Fee</b>		<b>90000.00</b>
<b>To Student Fees (Net)</b>			Audit Fee	90000.00	
Tuition Fee	21323069.50				
Development Fee	3288377.00		<b>By Student Expenditure</b>		<b>537581.00</b>
		<b>750000.00</b>	File & workshop Stationery	53850.00	
<b>To Grant</b>			Student Pharma kit	169200.00	
SERB-DST Project Grant	750000.00		Training & Placement	16548.00	
			Uniform	2500.00	
			Prize Distribution	210000.00	
			Student Training	60000.00	
			Student Activity	5483.00	
<b>To Bank Interest</b>		<b>168179.18</b>			
Bank Interest	168179.18				
<b>To Net Other Revenue Receipts</b>		<b>2472811.70</b>	<b>By Other Revenue Exp.</b>		<b>2972491.00</b>
Library Fine	1393.00		Office Stationery & Printing	100012.00	
Laboratory Fine	18689.00		Travelling & Conveyance	6990.00	
Te & Le Fee	10950.00		Xerox Charges	365.00	
Ramanubandh fee a/c	22100.00		Hospitality	18650.00	
Other Service Charges	2280510.70		Advertisement	15096.00	
State Cer Cell-	16720.00		R/C Laboratory	15085.00	
Notice Pay	72449.00		M & R General	352675.00	
			Building M & R	700000.00	
			Equip. M & R	47507.00	
			Security Charges	574080.00	





**BHASKAR B. PATIL & Co.**

Chartered Accountants

**Office :** Flat No. 101 & 102, Ground Floor,  
'C' Wing, Shamrao Mandlik Park,  
13th Lane, Rajarampuri (East),  
Kolhapur - 416 008

E-mail : ilpbpatil@gmail.com

**Phone :** 0231-2525985, Mob.: 9422047185

			Telephone Bill	3302.00	
			Electrical Bill	82140.00	
			Magazines & Journals	42670.00	
			News Paper	606.00	
			Bank Commission	1422.00	
			Postage	905.00	
			Revenue Stamp	1000.00	
			Sanitary charges Covid-19	577762.00	
			Website	6500.00	
			Affiliation & Registration	165500.00	
			Honorarium	556.00	
			SERB-DST Project	159168.00	
			Remu. Visiting	100000.00	
			SI Exam Exps.	500.00	
			<b>By Capital Expenditure</b>		2655113.00
			Equipment & Tools		
			Lab Equipment	247800.00	
			Dead Stock (Material)	135000.00	
			<b>Total</b>	<b>382800.00</b>	
			Library Books	28125.00	
			Software	382871.00	
			Equip. & Tools -Computer	1861317.00	
<b>To Scholarship</b>		<b>7522882.00</b>	<b>By Scholarship</b>		<b>7522882.00</b>
All Category - Other	3952790.75		All Category - Other	3952790.75	
Freeship	1612423.25		Freeship	1612423.25	
EBC	1957668.00		EBC	1957668.00	
<b>To Salary Deduction</b>		<b>1618733.00</b>	<b>By Salary Deduction</b>		<b>1618733.00</b>
Income Tax	443500.00		Income Tax	443500.00	
Profession Tax	85875.00		Profession Tax	85875.00	
Provident Fund	551658.00		Provident Fund	551658.00	
SDSS Pat Sanstha	537700.00				
<b>To Advances/other source</b>		<b>11284655.00</b>	<b>By Advances/other source</b>		<b>11284655.00</b>
Advance	11073692.00		Advance	9877145.00	
Admission Deposit	117494.00		Admission Deposit	117494.00	
TDS	93469.00		TDS	93469.00	



**BHASKAR B. PATIL & Co.**

Chartered Accountants

**Office :** Flat No. 101 & 102, Ground Floor,  
 'C' Wing, Shamrao Mandlik Park,  
 13th Lane, Rajarampuri (East),  
 Kolhapur - 416 008

E-mail : ilpbpatil@gmail.com

Phone : 0231-2525985, Mob : 9422047185

<b>To Amt. recd. from Society</b>		<b>3098432.00</b>	<b>By Amount Paid to Society</b>		<b>10862691.38</b>
ADCET	1111619.00		SDSS	606.38	
D. Pharmacy College (B)	1986811.00		Capital Exp. Building	7350249.00	
			ADCET	1111615.00	
			ADIS	563963.00	
			Guest House	1161508.00	
			Building (ADIS)	110000.00	
			Building (ITI)	564750.00	
<b>To Amt Recd For Remittance</b>		<b>1106930.00</b>	<b>By Amount Remitted</b>		<b>989215.00</b>
S. U. Exam fee	629530.00		S. U. Exam fee	629530.00	
S. U. Remuneration	227000.00		S. U. Remuneration	88408.00	
S. U. Fees (YF, AM, PRO)	190230.00		S. U. Fees (YF, AM, PRO)	199875.00	
Environmental Fee	200.00		Unpaid Salary	72449.00	
Insurance	7100.00		Bank Int. Receivable	38953.00	
Unpaid Salary	6451.00				
Bank Int. Receivable	46419.00		<b>By Closing Balance</b>		<b>7107655.00</b>
			Cash in Hand	63355.00	
			Cash at Bank -		
			S B I A/c No. 35993853299	545293.00	
			I D B I A/c No. 3391	569452.00	
			I D B I A/c No. 122313	1204285.00	
			Short Term Bank Deposit	4724041.00	
			Nutan Sah. Bank A/c No.5584	1229.00	
<b>Total</b>		<b>57407806.38</b>	<b>Total</b>		<b>57407806.38</b>

Principal



Place - Kolhapur  
 Date - 20/12/2021

As per our report of even date  
 For M/s. Bhaskar B. Patil & Co.  
 Chartered Accountants  
 FRN - 101276W

CA. Bhaskar B. Patil  
 Proprietor  
 M. No. 036961

## **BHASKAR B. PATIL & Co.**

Chartered Accountants

**Office :** Flat No. 101 & 102, Ground Floor,  
'C' Wing, Shamrao Mandlik Park,  
13th Lane, Rajarampuri (East),  
Kolhapur - 416 008

E-mail : ilpbbpatil@gmail.com

**Phone :** 0231-2525985, Mob.: 9422047185

### **Audit Report**

We have audited the accounts of "**D. Pharmacy wing of Annasaheb Dange College of B Pharmacy Ashta**", Taluka - Walwa, District - Sangli- 416301 which is a unit/branch of parent body - **Sant Dnyaneshwar Shikshan Sanstha Islampur**, Taluka - Walwa, District - Sangli, Registered Trust No. F - 1546 for the **period 01-04-2020 to 31-03-2021** and annexed herewith the audited Receipt & Payment A/c, Income & Expenditure A/c for the year ended on **31-03-2021** and Balance Sheet of the said unit/branch as on **31-03-2021**.

We have conducted our audit in accordance with the auditing standards generally accepted in India. Those standards required that we plan & perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement. An audit includes examining on a test check basis, evidence supporting the amount and disclosures in the financial statements. And audit also includes assessing the accounting principles used and significant estimates made by the management as well as evaluating the overall financial statements presented. We believe that our audit provides a reasonable basis for our opinion.

### **Auditor's responsibility -**

Our responsibility is to express an opinion on these financial statements based on our audit. An audit involves performing procedures to obtain audit evidence about the amounts and the disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal financial control relevant to the institution's preparation and presentation of the financial statements that give a true and fair view in order to design audit procedures that are appropriate in the circumstances but not for the purpose of expressing an opinion on whether the institution has in place an adequate internal financial controls system over financial reporting and the operating effectiveness of such controls. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of the accounting estimates made by the management as well as evaluating the overall presentation of the financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion on the financial statements.



**Report on required matters as per Fee Regulation Authority-**

**1. Reporting of Method of Accounting -**

During the Financial Year 01-04-2020 to 31-03-2021 the educational institute has followed the mercantile system of accounting as recommended by the FRA in its guidelines.

**2. Reporting of Segment Accounting -**

**a) About Geographical Segmentation -**

The area of operation of the educational institute is restricted to only one place situated at "Ashta", Taluka Walwa, District Sangli, Maharashtra State and hence there is no requirement of geographical segmentation for the courses conducted by the institute.

**b) About Business Segmentation -**

The educational institute runs two course of B. Pharmacy as well as D. Pharmacy wing at Same premises. The business segmentation require to show its two separate courses i.e. 1) B. Pharmacy & 2) D. Pharmacy wing and accordingly the two set of books of accounts have been maintained separately for each course. For the purpose of determination of students fees of both courses, the financial statements of each course are prepared separately.

Accordingly only for the purpose of determination of fee i.e. D Pharmacy course (i.e. D Pharmacy wing) the Receipt and Payment Account, Income and Expenditure Account and Balance Sheet as on 31-03-2021 of D Pharmacy wing of Annasaheb Dange College of B Pharmacy Ashta are prepared & reported upon along with the necessary schedules.

**3. The educational institute has kept proper books of accounts required for the purpose of conducting audit for the relevant course i.e. D. Pharmacy (D Pharmacy wing) of Annasaheb Dange College of B Pharmacy Ashta.**

**4. While conducting the audit, we have observed that the internal control system is deficient in respect of expenses incurred as some expenses have been incurred in cash instead of paying them by way of cheques and considering the size & volume of the transactions of the institute it is necessary to improve it adequately to safeguard the interest of the educational institute.**



**BHASKAR B. PATIL & Co.**

Chartered Accountants

**Office :** Flat No. 101 & 102, Ground Floor,  
'C' Wing, Shamrao Mandlik Park,  
13th Lane, Rajarampuri (East),  
Kolhapur - 416 008

E-mail : ilpbbpatil@gmail.com

**Phone :** 0231-2525985, Mob.: 9422047185

5. Subject to above; in our opinion and according to the information and explanation given to us the accounts give true and fair view –

- i) In the case of the Balance Sheet the state of affairs of the educational institute as at 31st March, 2021.
- ii) In the case of Income and Expenditure of the **Surplus** of the educational institute for the year ended on that date.

Place – Kolhapur

Date – 20-12-2021



For M/s. Bhaskar B. Patil & Co.

Chartered Accountants

FRN – 101275W

CA. Bhaskar B. Patil

Proprietor

M. No. 036961

UDIN- 22036961 AAAAAH 5319

**BHASKAR B. PATIL & Co.**

Chartered Accountants

**Office :** Flat No. 101 & 102, Ground Floor,  
'C' Wing, Shamrao Mandlik Park,  
13th Lane, Rajarampuri (East),  
Kolhapur - 416 008

E-mail : ilpbbpatil@gmail.com

**Phone :** 0231-2525985, Mob.: 9422047185

Smt. Dayaneshwar Shikshan Sanstha's  
**Annasaheb Dange College of B. Pharmacy (D Wing), Ashta**  
Taluka - Walwa, District - Sangli - 416 301  
**Receipts & Payments A/c**  
( Form 01/04/2020 to 31/03/2021 )

Receipts	Rs.	Rs.	Payment	Rs.	Rs.
<b>To Opening Balance</b>		<b>808047.00</b>	<b>By Salary</b>		<b>2310955.00</b>
Cash in Hand	5871.00		Teaching Staff Salary	1760456.00	
Cash at Bank -			Non-Teaching Staff Salary	550499.00	
FD B1 A/c No, 3674	202176.00				
Fixed Bank Deposits	600000.00				
<b>To Student Fees (Net)</b>		<b>5878063.00</b>	<b>By Student Expenditure</b>		<b>215532.00</b>
Tuition Fee	4751773.00		File & workshop Stationery	48550.00	
Development Fee	1126290.00		Prize Distribution	150000.00	
			Training & Placement	8000.00	
			Uniform	2500.00	
			Student Activity	6482.00	
<b>To Bank Interest</b>		<b>63390.20</b>	<b>By Audit Fee</b>		<b>45000.00</b>
Bank Intrest	63390.20		Audit Fee	45000.00	
<b>To Net Other Revenue Receipts</b>		<b>791455.00</b>	<b>By Other Revenue Exp.</b>		<b>652725.00</b>
Laboratory Fine	14685.00		Office Stationery & Printing	23394.00	
Library Fine	4307.00		Travelling & Conveyance	1010.00	
Mis Fee& card	1302.00		Hospitality	7708.00	
Tc & Lc Fee	6000.00		Advertisement	13440.00	
Ramanubandh fee a/c	12000.00		Bank Commission	590.00	
Admission Form Fee	1500.00		Sanitary charges Covid-19	123900.00	
MSBTE Fee	13080.00		Service. Charges	600.00	
Other Service Charges	736000.00		Postage & Telegram	41.00	
Notice Pay	2581.00		M & R General	156575.00	
			Electrical Bill	40966.00	
			Telephone Bill	1106.00	
			Laboratory R/c -Pharma Chem.	3848.00	
			Chemicals	108547.00	
			Remu. Visiting	106000.00	
			Affiliation & Registration	65000.00	
			<b>By Capital Expenditure</b>		<b>289198.00</b>
			<b>Equipment &amp; Tools</b>		
			Software	57150.00	



**BHASKAR B. PATIL & Co.**

Chartered Accountants

**Office :** Flat No. 101 & 102, Ground Floor,  
'C' Wing, Shamrao Mandlik Park,  
13th Lane, Rajarampuri (East),  
Kolhapur - 416 008

E-mail : ilpbbpatil@gmail.com

**Phone :** 0231-2525985, Mob.: 9422047185

			Computer Centre Equip.	190814.00	
			Library Books	41234.00	
<b>To Scholarship</b>		<b>1476813.00</b>	<b>By Scholarship</b>		<b>1451813.00</b>
All Category - Other	1018133.00		All Category - Other	993133.00	
Freeship	113500.00		Freeship	113500.00	
EBC	345180.00		EBC	345180.00	
<b>To Salary Deduction</b>		<b>15300.00</b>	<b>To Salary Deduction</b>		<b>15300.00</b>
Profession Tax	15300.00		Profession Tax	15300.00	
<b>To Advances/other source</b>		<b>545738.00</b>	<b>By Advances/other source</b>		<b>551575.00</b>
Advance	535000.00		Advance	534000.00	
TDS	10738.00		TDS	10738.00	
			Bank Intrest Receivable	6837.00	
<b>To Amt. recd. from Society</b>		<b>10738.00</b>	<b>By Amount Paid to Society</b>		<b>2456946.00</b>
ADCET	10738.00		Building (Ladies Hostel)	309395.00	
			B. Pharmacy College	1986813.00	
			ADCET	10738.00	
			D. Pharmacy College (old)	150000.00	
			<b>By Closing Balance</b>		<b>1600500.20</b>
			Cash in Hand	57174.00	
			Cash at Bank -		
			1 D B 1 A/c No. 3674	743326.20	
			Fixed Bank Deposits	800000.00	
<b>Total</b>		<b>9589544.20</b>	<b>Total</b>		<b>9589544.20</b>

Principal



Place - Kolhapur  
Date - 20/12/2021

As per our report of even date  
For M/s. Bhaskar B. Patil & Co.  
Chartered Accountants  
FRN - 101275W

CA. Bhaskar B. Patil  
Proprietor  
M. No. 036961

**BHASKAR B. PATIL & Co.**

Chartered Accountants

**Office :** Flat No. 101 & 102, Ground Floor,  
'C' Wing, Shamrao Mandlik Park,  
13th Lane, Rajarampuri (East),  
Kolhapur - 416 008

E-mail : ilpbpatil@gmail.com

**Phone :** 0231-2525985, Mob.: 9422047185

Sant Dnyaneshwar Shikashan Sanstha's  
**Annasaheb Dange College of B. Pharmacy (D Wing ), Ashta**  
Taluka - Walwa, District - Sangli - 416 301

**Income & Expenditure A/c**  
( From 01-04-2020 to 31-03-2021 )

Expenditure	Rs.	Rs.	Income	Rs.	Rs.
<b><u>To Establishment Exps.</u></b>		<b>195611.00</b>	<b><u>By Income</u></b>		<b>7527910.00</b>
Audit Fee	45000.00		a) Allotted Student Fee for the		
Depreciation for the year	150611.00		Year -		
			- Tuition Fee	6299910.00	
<b><u>To Expenditure on Object</u></b>			- Development Fee	1228000.00	
<b><u>of Educational Trust</u></b>		<b>3179212.00</b>			
Salary Teaching Staff	1760456.00		b) Bank Interest		63390.20
Salary Non-Teaching Staff	550499.00		c) Other Revenue Income		791455.00
Student Expenditure	215532.00				
Other Revenue Exp.	652725.00				
<b><u>To Surplus</u></b>		<b>5007932.20</b>			
<b>Total</b>		<b>8382755.20</b>	<b>Total</b>		<b>8382755.20</b>

Principal



**As per our report of even date**  
For M/s. Bhaskar B. Patil & Co.  
Chartered Accountants  
FRN - 101275W

*B. B. Patil*  
CA. Bhaskar B. Patil  
Proprietor  
M. No. 036961

Place - Kolhapur  
Date - 20/12/2021

Page 1 of 1

UDIN- 22036561 AAAAAS319



**BHASKAR B. PATIL**

B. Com(Hons) F. C. A.  
Chartered Accountants

Office : Flat No. 101 & 102, Ground Floor,  
'C' Wing, Shamrao Mandlik Park,  
13th Lane, Rajarampuri (East),  
Kolhapur- 416 008

Phone : 0231-2525985, 0231-2532530

Date :

**Audit Report**

We have audited the accounts of "Annasaheb Dange College of B. Pharmacy, Ashta"(excluding its D Pharmacy wing), Taluka - Walwa, District - Sangli - 416301 which is a unit/branch of parent body - Sant Dnyaneshwar Shikshan Sanstha Islampur, Taluka - Walwa, District - Sangli, Registered Trust No. F - 1546 for the period **01-04-2018 to 31-03-2019** and annexed herewith the audited Receipt & Payment A/c, Income & Expenditure A/c for the year ended on **31-03-2019** and Balance Sheet of the said unit/branch as on **31-03-2019**.

We have conducted our audit in accordance with the auditing standards generally accepted in India. Those standards required that we plan & perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement. An audit includes examining on a test check basis, evidence supporting the amount and disclosures in the financial statements. And audit also includes assessing the accounting principles used and significant estimates made by the management as well as evaluating the overall financial statements presented. We believe that our audit provides a reasonable basis for our opinion.

**Auditor's responsibility -**

Our responsibility is to express an opinion on these financial statements based on our audit. An audit involves performing procedures to obtain audit evidence about the amounts and the disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal financial control relevant to the institution's preparation and presentation of the financial statements that give a true and fair view in order to design audit procedures that are appropriate in the circumstances but not for the purpose of expressing an opinion on whether the institution has in place an adequate internal financial controls system over financial reporting and the operating effectiveness of such controls. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of the accounting estimates made by the management as well as evaluating the overall presentation of the financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion on the financial statements.



## **BHASKAR B. PATIL**

B. Com(Hons) F. C. A.  
Chartered Accountants

Office : Flat No. 101 & 102, Ground Floor,  
'C' Wing, Shamrao Mandlik Park,  
13th Lane, Rajarampuri (East),  
Kolhapur- 416 008

Phone : 0231-2525985, 0231-2532530

Date :

### **Report on required matters as per Fee Regulation Authority -**

#### **1. Reporting of Method of Accounting -**

During the Financial Year 01-04-2018 to 31-03-2019 the educational institute has followed the mercantile system of accounting as recommended by the FRA in its guidelines.

#### **2. Reporting of Segment Accounting -**

##### **a) About Geographical Segmentation -**

The area of operation of the educational institute is restricted to only one place situated at "Ashta", Taluka Walwa, District Sangli, Maharashtra State and hence there is no requirement of geographical segmentation for the courses conducted by the institute.

##### **b) About Business Segmentation -**

The educational institute runs two course of B. Pharmacy as well as D. Pharmacy wing at Same premises. The business segmentation require to show its two separate courses i.e. 1) B. Pharmacy & 2) D. Pharmacy wing and accordingly the two set of books of accounts have been maintained separately for each course. For the purpose of determination of students fees of both courses the financial statements of each course are prepared separately.

Accordingly only for the purpose of determination of fee i.e. B Pharmacy course the Receipt and Payment Account, Income and Expenditure Account and Balance Sheet as on 31-03-2019 of B. Pharmacy Course (excluding its D Pharmacy wing) are prepared & reported upon along with the necessary schedules.

3. The educational institute has kept proper books of accounts required for the purpose of conducting audit for the relevant course i.e. B. Pharmacy (excluding its D Pharmacy wing).

4. While conducting the audit, we have observed that the internal control system is deficient in respect of expenses incurred and considering the size & volume of the transactions of the institute it is necessary to improve it adequately to safeguard the interest of the educational institute.





## **BHASKAR B. PATIL**

B. Com(Hons) F. C. A.  
Chartered Accountants

**Office :** Flat No. 101 & 102, Ground Floor,  
'C' Wing, Shamrao Mandlik Park,  
13th Lane, Rajarampuri (East),  
Kolhapur- 416 008

**Phone :** 0231-2525985, 0231-2532530

Date :


5. Subject to above; in our opinion and according to the information and explanation given to us the accounts give true and fair view –
- i) In the case of the Balance Sheet the state of affairs of the educational institute as at 31st March, 2019,
  - ii) In the case of Income and Expenditure of the **Surplus** of the educational institute for the year ended on that date.

Place – Kolhapur

Date – 20-10-2019



For M/s. Bhaskar B. Patil & Co.  
Chartered Accountants  
FRN – 101275W

  
CA. Bhaskar B. Patil  
Proprietor  
M. No. 036961

**BHASKAR B. PATIL & Co.**

Chartered Accountants

**Office :** Flat No. 101 & 102, Ground Floor,  
'C' Wing, Shamrao Mandlik Park,  
13th Lane, Rajarampuri (East),  
Kolhapur - 416 008

E-mail : ilpbbpatil@gmail.com

**Phone :** 0231-2525985, Mob.: 9422047185**Audit Report**

We have audited the accounts of "Annasaheb Dange College of B. Pharmacy, Ashta"(excluding its D Pharmacy wing), Taluka - Walwa, District - Sangli - 416301 which is a unit/branch of parent body - Sant Dnyaneshwar Shikshan Sanstha Islampur, Taluka - Walwa, District - Sangli, Registered Trust No. F - 1546 for the period **01-04-2019 to 31-03-2020** and annexed herewith the audited Receipt & Payment A/c, Income & Expenditure A/c for the year ended on **31-03-2020** and Balance Sheet of the said unit/branch as on **31-03-2020**.

We have conducted our audit in accordance with the auditing standards generally accepted in India. Those standards required that we plan & perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement. An audit includes examining on a test check basis, evidence supporting the amount and disclosures in the financial statements. And audit also includes assessing the accounting principles used and significant estimates made by the management as well as evaluating the overall financial statements presented. We believe that our audit provides a reasonable basis for our opinion.

**Auditor's responsibility -**

Our responsibility is to express an opinion on these financial statements based on our audit. An audit involves performing procedures to obtain audit evidence about the amounts and the disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal financial control relevant to the institution's preparation and presentation of the financial statements that give a true and fair view in order to design audit procedures that are appropriate in the circumstances but not for the purpose of expressing an opinion on whether the institution has in place an adequate internal financial controls system over financial reporting and the operating effectiveness of such controls. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of the accounting estimates made by the management as well as evaluating the overall presentation of the financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion on the financial statements.





**Report on required matters as per Fee Regulation Authority -**

**1. Reporting of Method of Accounting -**

During the Financial Year **01-04-2019** to **31-03-2020** the educational institute has followed the mercantile system of accounting as recommended by the FRA in its guidelines.

**2. Reporting of Segment Accounting -**

**a) About Geographical Segmentation -**

The area of operation of the educational institute is restricted to only one place situated at "Ashta", Taluka Walwa, District Sangli, Maharashtra State and hence there is no requirement of geographical segmentation for the courses conducted by the institute.

**b) About Business Segmentation -**

The educational institute runs two course of B. Pharmacy as well as D. Pharmacy wing at Same premises. The business segmentation require to show its two separate courses i.e. 1) B. Pharmacy & 2) D. Pharmacy wing and accordingly the two set of books of accounts have been maintained separately for each course. For the purpose of determination of students fees of both courses the financial statements of each course are prepared separately.

Accordingly only for the purpose of determination of fee i.e. B Pharmacy course the Receipt and Payment Account, Income and Expenditure Account and Balance Sheet as on **31-03-2020** of B. Pharmacy Course (excluding its D Pharmacy wing) are prepared & reported upon along with the necessary schedules.

**3. The educational institute has kept proper books of accounts required for the purpose of conducting audit for the relevant course i.e. B. Pharmacy (excluding its D Pharmacy wing).**

**4. While conducting the audit, we have observed that the internal control system is deficient in respect of expenses incurred and considering the size & volume of the transactions of the institute it is necessary to improve it adequately to safeguard the interest of the educational institute.**

# **BHASKAR B. PATIL & Co.**

Chartered Accountants

**Office :** Flat No. 101 & 102, Ground Floor,  
'C' Wing, Shamrao Mandlik Park,  
13th Lane, Rajarampuri (East),  
Kolhapur - 416 008

E-mail : ilpbpatil@gmail.com

**Phone :** 0231-2525985, Mob.: 9422047185

5. Subject to above; in our opinion and according to the information and explanation given to us the accounts give true and fair view -

- i) In the case of the Balance Sheet the state of affairs of the educational institute as at 31st March, 2020.
- ii) In the case of Income and Expenditure of the **Surplus** of the educational institute for the year ended on that date.

Place - Kolhapur

Date - 27-10-2020



For M/s. Bhaskar B. Patil & Co.

Chartered Accountants

FRN - 101275W

A handwritten signature in blue ink, appearing to be "B. Patil".

CA. Bhaskar B. Patil

Proprietor

M. No. 036961

**Audit Report**

We have audited the accounts of "D. Pharmacy wing of Annasaheb Dange College of B Pharmacy Ashta", Taluka - Walwa, District - Sangli - 416301 which is a unit/branch of parent body - Sant Dnyaneshwar Shikshan Sanstha Islampur, Taluka - Walwa, District - Sangli, Registered Trust No. F - 1546 for the period **01-04-2019 to 31-03-2020** and annexed herewith the audited Receipt & Payment A/c, Income & Expenditure A/c for the year ended on **31-03-2020** and Balance Sheet of the said unit/branch as on **31-03-2020**.

We have conducted our audit in accordance with the auditing standards generally accepted in India. Those standards required that we plan & perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement. An audit includes examining on a test check basis, evidence supporting the amount and disclosures in the financial statements. And audit also includes assessing the accounting principles used and significant estimates made by the management as well as evaluating the overall financial statements presented. We believe that our audit provides a reasonable basis for our opinion.

**Auditor's responsibility -**

Our responsibility is to express an opinion on these financial statements based on our audit. An audit involves performing procedures to obtain audit evidence about the amounts and the disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal financial control relevant to the institution's preparation and presentation of the financial statements that give a true and fair view in order to design audit procedures that are appropriate in the circumstances but not for the purpose of expressing an opinion on whether the institution has in place an adequate internal financial controls system over financial reporting and the operating effectiveness of such controls. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of the accounting estimates made by the management as well as evaluating the overall presentation of the financial statements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion on the financial statements.





**Report on required matters as per Fee Regulation Authority -**

**1. Reporting of Method of Accounting -**

During the Financial Year 01-04-2019 to 31-03-2020 the educational institute has followed the mercantile system of accounting as recommended by the FRA in its guidelines.

**2. Reporting of Segment Accounting -**

**a) About Geographical Segmentation -**

The area of operation of the educational institute is restricted to only one place situated at "Ashta", Taluka Walwa, District Sangli, Maharashtra State and hence there is no requirement of geographical segmentation for the courses conducted by the institute.

**b) About Business Segmentation -**

The educational institute runs two course of B. Pharmacy as well as D. Pharmacy wing at Same premises. The business segmentation require to show its two separate courses i.e. 1) B. Pharmacy & 2) D. Pharmacy wing and accordingly the two set of books of accounts have been maintained separately for each course. For the purpose of determination of students fees of both courses the financial statements of each course are prepared separately.

Accordingly only for the purpose of determination of fee i.e. D Pharmacy course (i.e. D Pharmacy wing) the Receipt and Payment Account, Income and Expenditure Account and Balance Sheet as on 31-03-2020 of D Pharmacy wing of Annasaheb Dange College of B Pharmacy Ashta are prepared & reported upon along with the necessary schedules.

**3. The educational institute has kept proper books of accounts required for the purpose of conducting audit for the relevant course i.e. D. Pharmacy (D Pharmacy wing) of Annasaheb Dange College of B Pharmacy Ashta.**

**4. While conducting the audit, we have observed that the internal control system is deficient in respect of expenses incurred and considering the size & volume of the transactions of the institute it is necessary to improve it adequately to safeguard the interest of the educational institute.**



## BHASKAR B. PATIL & Co.

Chartered Accountants

E-mail : ilpbbpatil@gmail.com

Office : Flat No. 101 & 102, Ground Floor,  
'C' Wing, Shamrao Mandlik Park,  
13th Lane, Rajarampuri (East),  
Kolhapur - 416 008

Phone : 0231-2525985, Mob.: 9422047185

5. Subject to above, in our opinion and according to the information and explanation given to us the accounts give true and fair view –
- In the case of the Balance Sheet the state of affairs of the educational institute as at 31st March, 2020.
  - In the case of Income and Expenditure of the **Surplus** of the educational institute for the year ended on that date.

\*Place – Kolhapur

Date – 27-10-2020



For M/s. Bhaskar B. Patil & Co.

Chartered Accountants

FRN – 101275W

A handwritten signature in blue ink, appearing to be "B. Patil".

CA. Bhaskar B. Patil

Proprietor

M. No. 036961