



AMRUTVAHINI[®]
Since 1978

Amrutvahini Sheti & Shikshan Vikas Sanstha's
Amrutvahini College of Pharmacy,
Amrutnagar, P.O. Sangamner

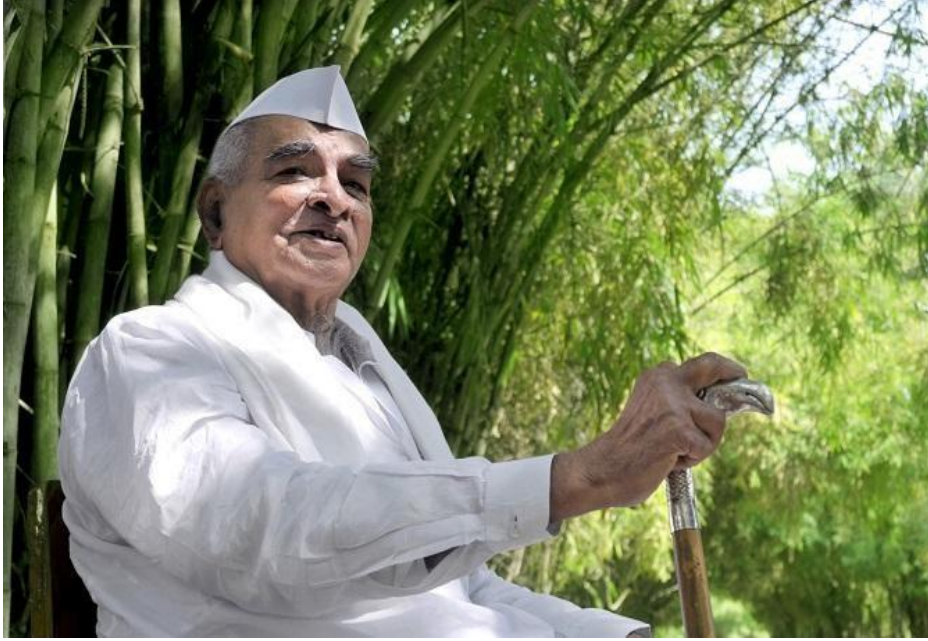
(An Autonomous College Affiliated to Savitribai Phule Pune University, Pune)



STUDENT INFORMATION BOOKLET
(2026-27)

Hon'ble Late Shri. Bhausahab Santuji Thorat

Founder, Amrutvahini Sheti and Shikshan Vikas Sanstha's, Amrutnagar, Sangamner.



Our Source of Strength & Inspiration

The concept of non-aided engineering college was put forth by Padmabhushan. Shri. Vasantdada Patil in 1983. The vision, untiring efforts, multidimensional thinking of a humble farmer, freedom fighter, social worker and doyen of co-operative movement Sahakarmaharshi Shri. Bhausahab Santuji Thorat alias Dada laid the foundation of “Amrutvahini Sheti & Shikshan Vikas Sanstha” in 1983 at Sangamner. An altruistic vision and aspire of Dada was to start & propagate the higher technical education to the students of rural area and put the name of Sangamner on the national map for one of the best educational meadow. A very energetic, poised and quantum multi jumping in this direction which proved to be a paragon of childhood to managerial education was the establishment of an institution. Today it became a “Banyan Tree” for everyone who deserves and seeks for its peaceful bloom.

Dada says, “Since 1983 more than 10000 students have completed successfully their childhood to engineering / managerial education under the shade of Amrutvahini and are settled all over India right from Kanyakumari to Jammu-Kashmir; & in abroad and whenever they meet & tell me their success story, my heart fills with joy along with tears in my eye”

CONTENTS

Sr.No.	Particular	Page No.
1	Academic Calendar B.Pharm & M.Pharm	1-4
CURRICULAR STRUCTURE FOR BACHELOR OF PHARMACY (B. Pharm) (2026) as per NEP 2020		
1	GRADUATE ATTRIBUTES (GA's)	1
2	PROGRAMME EDUCATIONAL OBJECTIVES	2
3	PROGRAMME OUTCOMES (POs)	3-4
4	PHARMACIST'S OATH	5
5	GLOSSARY	6-11
6	CURRICULAR STRUCTURE	12-50
SYLLABUS FOR BACHELOR OF PHARMACY		
07	SYLLABUS FOR BACHELOR OF PHARMACY (B. Pharm) (2026) as per NEP 2020	1-57
EXAMINATION		
08	Exam Rule Book	1-14



Amrutvahini Sheti & Shikshan Vikas Sanstha's

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER

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- Recognised under section 2(f) and 12B UGC Act 1956
- University ID : PU/AN/Pharm/83, 2004; Puncode : CPHA016760
- DTE CODE : 5194
- A.I.S.H.E. Code : C-42026
- NAAC "A" Grade

An Autonomous College

Ref.No. AVCOP/01/2026-27

Date: 01/07/2026

Academic Calendar 2026-27

Name of Course	Term I		Term II	
	Date of Commencement	Date of Conclusion	Date of Commencement	Date of Conclusion
F.Y.B.Pharm	21 th October	12 th February	8 st March	2 nd July
F.Y.M.Pharm	21 th October	12 th February	8 st March	2 nd July


Dr.M.M.Deshpande
Dean Academic
Amrutvahini College of Pharmacy
(Autonomous), Sangamner-422608




Dr.M.J.Chavan
Principal
Amrutvahini College of Pharmacy,
Sangamner - 422608

Copy to: For information and necessary action: Dean Research/ HOD's/ College Examination officer/All Section Heads of the college/ All faculty members/All students

Term-II

MARCH 2027

Mon	Tue	Wed	Thu	Fri	Sat	Sun
			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				

8th MAR Commencement of Even Semester
8th MAR Women's day celebration

WORKING DAYS: 18

APRIL 2027

Mon	Tue	Wed	Thu	Fri	Sat	Sun
			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		

20th APRIL Commencement of first sessional Practical examination
27th APRIL Commencement of first sessional Theory examination

WORKING DAYS: 22

MAY 2027

Mon	Tue	Wed	Thu	Fri	Sat	Sun
					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						

WORKING DAYS: 23

JUNE 2027

Mon	Tue	Wed	Thu	Fri	Sat	Sun
		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			

14th JUNE Commencement of Second sessional Practical examination
21st JUNE Commencement of Second sessional Theory examination

WORKING DAYS: 25

2nd July Conclusion of Even semester

WORKING DAYS: 02

8th JULY ESE Theory
22nd JULY ESE Practical

Note: This is tentative planning of current academic 2026-27 year and schedule dates may change as per Pharmacy Council of India and Govt. of Maharashtra notifications.

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Ref. No. AVCOP/01/2026-27

Date: 28/09/2026

Academic Calendar 2026-27

It is hereby informed that, the dates of commencement and conclusion of the first and second term of course of **First Year M. Pharmacy** for academic year 2026-27 shall be as under.

Term-I

Mon	Tue	Wed	Thu	Fri	Sat	Sun
			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	

OCTOBER 2026

21st OCTOBER

Commencement of Odd semester

WORKING DAYS: 10

Mon	Tue	Wed	Thu	Fri	Sat	Sun
						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						

NOVEMBER 2026

FIRST WEEK OF NOVEMBER

31st NOVEMBER

Diwali Vacation
Commencement of first Sessional
Practical Examination

WORKING DAYS: 19

Mon	Tue	Wed	Thu	Fri	Sat	Sun
	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			

DECEMBER 2026

7th DECEMBER

Commencement of first Sessional
Theory Examination

WORKING DAYS: 26

Mon	Tue	Wed	Thu	Fri	Sat	Sun
				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

JANUARY 2027

18th JANUARY

25th JANUARY

Commencement of Second
Sessional Practical Examination
Commencement of first Sessional
Theory Examination

WORKING DAYS: 24

Mon	Tue	Wed	Thu	Fri	Sat	Sun
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

FEBRUARY 2027

2nd FEBRUARY

11th FEBRUARY

25th FEBRUARY

12th FEBRUARY

Recessional
ESE Theory
ESE Practical
Conclusion of semester

WORKING DAYS: 11

Term-II

MARCH 2027

Mon	Tue	Wed	Thu	Fri	Sat	Sun
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
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Commencement of first sessional Practical examination

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WORKING DAYS: 22

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Mon	Tue	Wed	Thu	Fri	Sat	Sun
					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						

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JUNE 2027

Mon	Tue	Wed	Thu	Fri	Sat	Sun
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
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27	28	29	30			

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WORKING DAYS: 25

2nd July

Conclusion of Even semester

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8th JULY

ESE Theory

22nd JULY

ESE Practical

Note: This is tentative planning of current academic 2026-27 year and schedule dates may change as per Pharmacy Council of India and Govt. of Maharashtra notifications.

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(As per UGC letter Ref.no. No.F. 2-10/2023(AC-Policy) dated 27th May 2025 and SPPU letter no. CA/ 716 dated 09/06/2025)

CURRICULAR STRUCTURE FOR BACHELOR OF PHARMACY
(B. Pharm)
(2026) as per NEP 2020

[Framed under PCI NOTIFICATION, New Delhi, the 9th June, 2026 No. 14-154/2025-PCI.—In exercise of the powers conferred by Regulation 8. of the Bachelor of Pharmacy (B. Pharm) Course Regulations, 2014, the Pharmacy Council of India.]

With Effect from Academic Year
2026-27
[Revision 0.0]



Amrutvahini Sheti & Shikshan Vikas Sanstha's
Amrutvahini College of Pharmacy, Sangamner
Nashik-Pune Highway, Ghulewadi, Amrutnagar,
Tal. Sangamner, Dist.-Ahilyanagar, Pin Code:- 422608

Vision

Our College will be recognized as socially cautious centre of excellence in innovative education through its contribution in training, scholarly research in pharmacy profession and services to society

Mission

For translation of our vision into reality college is striving to:

M1: Provide value based student centric and sustained quality pharmaceutical education

M2: Foster advanced and innovative research that benefits pharmaceutical industry and community.

M3: Encourage and strengthen leadership, competitiveness, ethical reasoning and intellectual curiosity



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Ref. AVCOP/317/2026-27

An Autonomous College

Date: 01/10/2026

Curricular Structure and Syllabus for B.Pharm (2026) as per NEP 2020

-2026-27:B.Pharm

The Bachelor of Pharmacy (B.Pharm) program syllabus of **First Year B.Pharm Semester-I and Semester-II** of academic year 2026-27 being offered at **Amrutvahini College of Pharmacy, Sangamner (An Autonomous College)** has been duly approved by the Academic Council of Amrutvahini Sheti & Shikshan Vikas Sanstha's, Amrutvahini College of Pharmacy, Sangamner (An Autonomous College).

Dr.M.J.Chavan
Chairman Academic Council & Principal
Chairman, Academic Council
Amrutvahini College of Pharmacy
(Autonomous), Sangamner-422608



GRADUATE ATTRIBUTES (GA's)

Graduate Attributes (GAs) represent the key competencies and professional qualities expected from every pharmacy graduate, irrespective of the program such as D.Pharm, B.Pharm, Pharm.D or M.Pharm. While the level of mastery may vary, these attributes remain common and guide the overall outcomes of pharmacy education.

1. Pharmaceutical Knowledge Proficiency

- Strong grounding in core and applied pharmaceutical sciences and practice.

2. Scientific and Analytical Thinking

- Ability to critically analyze data, processes, and clinical information.

3. Ethical and Professional Integrity

- Commitment to ethical conduct, patient safety, and regulatory compliance.

4. Patient-Centered Orientation

- Sensitivity to patient needs, cultural diversity, and healthcare outcomes.

5. Industry and Practice Readiness

- Preparedness for roles in industry, hospitals, community pharmacy, research, and regulation.

6. Digital and Technological Awareness

- Familiarity with AI, data analytics, automation, and modern pharmaceutical technologies.

7. Effective Communication Skills

- Clear, empathetic, and professional interaction across healthcare settings.

8. Teamwork and Leadership Skills

- Ability to collaborate, lead, and contribute constructively in teams.

9. Innovation and Problem-Solving Mindset

- Capability to identify problems and develop practical, evidence-based solutions.

10. Lifelong Learning Orientation

- Motivation for continuous professional development and higher education.

PROGRAMME EDUCATIONAL OBJECTIVES

The Bachelor of Pharmacy (B. Pharm) programme aims to prepare graduates with strong knowledge of pharmaceutical sciences, practical skills, professional ethics, and a commitment to patient care and public health. The graduates of the programme are expected to achieve the following Programme Educational Objectives (PEOs):

PEO 1: Apply fundamental knowledge of pharmaceutical sciences to work effectively in pharmacy practice, pharmaceutical industry, research, and related healthcare fields.

PEO 2: Demonstrate practical skills in drug formulation, manufacturing, pharmaceutical analysis, quality control, and pharmacy practice.

PEO 3: Use scientific reasoning and problem-solving skills to address challenges related to medicines, drug development, and patient care.

PEO 4: Practice pharmacy with ethical responsibility, good communication, teamwork, and concern for patient safety and public health.

PEO 5: Pursue continuous learning and professional development to keep pace with advances in pharmaceutical sciences and healthcare.

PROGRAMME OUTCOMES (POs)

Bachelor of Pharmacy (B. Pharm)

PO1. Pharmacy Knowledge

Apply comprehensive knowledge of pharmaceutical sciences, biomedical sciences, pharmacology, pharmacognosy, pharmaceutical chemistry, pharmacy practice, and manufacturing processes to understand drug actions, disease mechanisms, and therapeutic interventions and solve professional problems across diverse pharmacy domains.

PO2. Problem Analysis, Critical Thinking and Evidence-Based Decision Making

Identify, formulate, analyze, and interpret complex pharmaceutical problems using principles of scientific inquiry, critical thinking, biostatistics, and evidence-based reasoning to arrive at defensible solutions and informed decision-making.

PO3. Pharmaceutical Skills & Practice

Demonstrate proficiency in formulation development, analysis, quality assurance, pharmacovigilance, clinical pharmacotherapy, and pharmacy practice through laboratory work, simulations, internships, and experiential learning.

PO4. Modern Tools, AI & Digital Competence

Select, apply, and evaluate modern pharmaceutical tools, analytical instruments, digital technologies, artificial intelligence, machine learning, and computational techniques with awareness of their limitations and ethical use.

PO5. Research & Innovation

Design and conduct basic research, analyze data, interpret results, and contribute to innovation through research projects, startup initiatives, and problem-based learning relevant to industry, healthcare, and society.

PO6. Professional Ethics & Human Values

Apply ethical principles, professional integrity, regulatory frameworks, intellectual property rights, and universal human values while addressing professional, legal, and societal responsibilities in pharmacy practice.

PO7. Communication & Interpersonal Skills

Communicate effectively with patients, healthcare professionals, industry personnel, and society through clear documentation, reports, presentations, counseling, teamwork, and interdisciplinary collaboration.

PO8. Leadership, Management & Entrepreneurship

Demonstrate leadership, teamwork, planning, and managerial skills in pharmaceutical organizations, healthcare systems, quality systems, and entrepreneurial ventures, including innovation and startup ecosystems.

PO9. Pharmacist & Society

Evaluate public health, patient safety, legal, and societal issues related to pharmacy practice and contribute responsibly to healthcare delivery, rational use of medicines, and improvement of community health outcomes.

PO10. Environment and sustainability:

Recognize and address the environmental impact of pharmaceutical manufacturing, use, and disposal, and promote environmentally responsible practices, green pharmacy principles, and sustainable healthcare aligned with the United Nation's Sustainable Development Goals (SDGs).

PO11. Life-Long Learning & Professional Development

Recognize the need for continuous learning and demonstrate the ability to engage in self-directed, life-long learning to adapt to technological advancements, evolving healthcare needs, and professional growth.

PHARMACIST'S OATH

I swear by the code of ethics of Pharmacy Council of India, in relation to the community and shall act as an integral part of health care team.

I shall uphold the laws and standards governing my profession.

I shall strive to perfect and enlarge my knowledge to contribute to the advancement of pharmacy and public health.

I shall follow the system which I consider best for pharmaceutical care and counselling of patients.

I shall endeavour to discover and manufacture drugs of quality to alleviate sufferings of humanity.

I shall hold in confidence the knowledge gained about the patients in connection with my professional practice and never divulge unless compelled to do so by the law.

I shall associate with organizations having their objectives for betterment of the profession of Pharmacy and make contribution to carry out the work of those organizations.

While I continue to keep this oath unviolated, may it be granted to me to enjoy life and the practice of pharmacy respected by all, at all times!

Should I trespass and violate this oath, may the reverse be my lot!

GLOSSARY

KEYWORD	DEFINITION
Ability Enhancement Courses	Courses of varying durations which are optional, and offered in the curriculum that improves the understanding of the subject and enhance ability of the students.
Academic Calendar	The schedule of the institution for the academic year, giving details of all academic and administrative events.
Assessment	Performance evaluation based on certain established criteria
Attainment of Course Outcomes (COs)	COs are to be attained by all students at the end of a formal course. While the method of computation of attainment of COs is not unique, each institution has to follow a well-defined direct method of computing CO attainment based on the student performance in all assessment instruments, and indirect method of computing COs through course exit survey of students
Bloom's Taxonomy	A hierarchical framework used to classify educational learning Objectives into levels of complexity and specificity, utilized here to design question papers and assessment tools.
Choice Based Credit System (CBCS)	A mode of learning in higher education which facilitates a student to have some freedom in selecting his/her own choices, across various disciplines for completing a UG / PG program. All UG and PG programs, as per UGC, have to implement CBCS
Co-Curricular Activities	Activities, which support the curriculum such as field trips, hospital visits, community medicine shops, display of academic achievements, quiz, debate, discussion, seminars, role-play, etc.
Collaboration	Formal agreement/ understanding between any two or more institutions for training, research, student/ faculty exchange or extension support.
Continuous Assessment	A component of internal assessment that evaluates regular engagement, including attendance and student-teacher interaction.
Counseling	Assisting and mentoring students individually or collectively for academic, career, personal and financial decision-making.

Course	A course is a unit of 1 to 6 credits in a formal program. A 3-credit course will have three classroom sessions of one-hour duration during each week for the entire semester.
Course Outcomes (COs)	COs are statements that describe what students should be able to do at the end of a course.
Credit	A credit system is a systematic way of describing an educational programme by attaching credits to its components as a unit of measure for academic work. One (1) credit is assigned for every one hour of lecture per week or every two hours of practical (laboratory) work per week. For internship and projects, 30 hours equals 1 credit.
Cumulative Grade Point Average (CGPA)	A calculation based on the SGPA of all eight semesters, used to determine the final class and rank.
E-learning Resources	Learning resources available on Internet
Elective Courses	A choice available to students to select from among a large number of Courses
Enrichment Courses	Value added courses offered by institution for student empowerment. They enhance the curriculum by amplifying, supplementing and replacing such parts or features as have become ineffective or obsolete.
Evaluation Process	Assessment of learning, teaching and evaluation process and reforms to increase the efficiency and effectiveness of the system.
Experiential Learning	Is a process of learning through experience and is more specifically defined as “learning through reflection on doing”.
Field Project	Formal projects students need to undertake that involve conducting surveys outside the college/university premises and

GLOSSARY

	collection of data from designated communities or natural places
Graduate Attributes	The disciplinary expertise or technical knowledge that has traditionally formed the core of most university courses. They are qualities that also prepare graduates as agents for social good in an unknown future.
Grievance Redressal	Mechanisms for receiving, processing and addressing dissatisfaction expressed, complaints and other formal requests

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	made by learners, staff and other stakeholders on the institutional provisions promised and perceived.
ICT	Information and Communication Technology Consists of the hardware, software, networks and media for the collection, storage, processing, transmission and presentation of information (voice, data, text, images) as well as related services.
Internal Examination Committee	A body chaired by the Principal that plans the internal assessment calendar, approves question paper patterns, and addresses student grievances regarding internal marks.
Internship	A mandatory period of at least 120 hours of work in a pharmaceutical industry, hospital, or clinical research organization, typically completed after Semester V and VI under an identified mentor.
Learning Outcomes	Specific intentions of a Programme or module, written in clear terms. They describe what a student should know, understand, or be able to do at the end of that Programme or module
Levels of Outcomes	<p>Programme Educational Objectives (PEOs): PEOs are broad statements that describe the professional achievements and career accomplishments that graduates are expected to attain a few years after completing the programme.</p> <p>Programme Outcomes (POs): POs are statements that describe the knowledge, skills, and competencies that students should acquire by the time they graduate from the programme.</p> <p>Course Outcomes (COs): COs are statements that describe what students should be able to know, understand, and perform at the end of a specific course.</p>
Miller's Pyramid	A framework for assessing clinical competence, used to monitor the progress and attainment of pharmacy students.
Multi-disciplinary Courses	Courses of varying durations which are optional, and offered outside the curriculum in the multidisciplinary areas that

	encourage understanding of recent trends in allied areas and helping the students in getting placed.
OBE: Outcome Based Education	OBE is an educational theory that bases each part of an educational system around goals (outcomes). Each student should have achieved the goal by the end of the educational experience
Outcome	An outcome of an educational Programme is what the student should be able to do at the end of a Programme/ course/ instructional unit.
Participative Learning	Participatory Learning and Action is a family of approaches, methods, attitudes, behaviours and relationships, which enable and empower people to share, analyze and enhance their knowledge of their life and conditions, and to plan, act, monitor, evaluate and reflect.
Problem Based Learning (PBL)	Is a student-centred pedagogy in which students learn about a subject through the experience of solving an open-ended problem found in trigger material. The PBL process does not focus on problem solving with a defined solution, but it allows for the development of other desirable skills and attributes. This includes knowledge acquisition, enhanced group collaboration and communication.
Programme	A structured set of courses and learning experiences offered over a specified period, leading to the award of a certificate, diploma, or degree recognized by the appropriate regulatory authority (e.g., UGC/PCI).
Program Committee	A committee led by a senior teacher that reviews class progress, discusses curriculum issues, and monitors the attainment of program outcomes.
Remedial Courses	Courses offered to academically disadvantaged students in order to help them cope with academic requirements.
Research Project	A supervised project carried out in groups of no more than three students during the final year, relating to an elective subject.

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Semester	A period of study consisting of not less than 90 working days. Odd semesters run from June/July to November/December, and even semesters run from December/January to May/June
Semester Grade Point Average (SGPA)	A number representing the weighted average of the grade points obtained in all courses during a single semester.
Sessional	Tests conducted for each course during the semester, the average of which contributes to the internal assessment marks.
Skill Enhancement Courses	Courses of varying durations which are optional, and offered in the curriculum that develop the required skills and helping the students in getting placed.
Progression	Vertical movement of students from one level of education to the next higher level successfully or towards gainful employment.
Value Added Courses	Courses of varying durations which are optional, and offered outside the curriculum that add value and helping the students in getting placed.

REGULATION

1. Short title and commencement

This regulation shall be called as “The Regulation for the B. Pharm. Degree Programme Choice Based Credit System (CBCS) as per National Education Policy 2020 of the Pharmacy Council of India, New Delhi”. It shall come into effect immediately upon notification by the Pharmacy Council of India. The regulations framed are subject to modification from time to time by Pharmacy Council of India.

2. Minimum qualification for admission

2.1 First year B. Pharm:

- i. A candidate shall have passed the 10+2 examination conducted by the respective State or Central Government authorities, or any equivalent examination recognized by bodies such as the Association of Indian Universities (AIU) or the Council of Boards of School Education in India (COBSE), including wings such as IGNOU and NIOS, with English as one of the subjects and with Physics and Chemistry as compulsory subjects, along with either Mathematics or Biology.
- ii. 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):

Candidate shall have passed 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 Programme

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 Programme shall be prescribed from time to time by Pharmacy Council of India.

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 90 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. A break of not less than 7 days shall be provided between the semesters.

6. Attendance and progress

A candidate must maintain a minimum of 75% attendance in each individual course. Attendance for theory and practical components shall be considered separately. Only candidates who satisfactorily complete the prescribed course requirements shall be eligible to appear for the respective examinations.

7. Programme/Course credit structure

As per the Choice Based Credit System (CBCS), certain quantum of academic work viz. theory classes, 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 Practical courses

Courses are broadly classified as Theory, Practical, Project and Internship. Theory (T) courses consist of lecture (L) hours, while Practical (P) courses consist of hours spent in the laboratory. The Credits (C) assigned to a course dependent on the number of instructional hours per week and are calculated using a multiplier of one (1) for lecture hours, and a multiplier of one-half (1/2) for practical (laboratory) hours. For example, a theory course having three lectures per week throughout the semester carries 3credits. Similarly, a practical course with four laboratory hours per week throughout semester carries 2 credits. If the calculated credit value results in a fraction of 0.5 or below, the lower integer value will be assigned as the credit. Every 30 hours spent on internship (I) and projects shall be considered equivalent to 1 credit.

7.1.2 Minimum credit requirements

The minimum credit points required for award of a B. Pharm. degree is 193 and 9 “add on credits” should be completed during the tenure of B.Pharm degree to get final degree certificate. These credits are distributed across Theory courses, Practical courses, Internship and Project over the duration of eight semesters. The semester-wise distribution of credits is presented in Table IX. Courses generally progress in sequences, building competencies and their positioning indicate certain levels of 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 take additional courses, namely Healthcare Psychology and Communication Skills (Theory and Practical) and Basics of Python Programming for Pharmaceutical Sciences (Theory) during Semester III, and Applied Biostatistics and Data Analytics for Pharmaceutical Sciences (Theory) during Semester IV of the programme. The lateral entry student shall be awarded 47 credit points, equivalent to the cumulative credits earned as per the scheme of their Diploma in Pharmacy (D. Pharm.) programme, upon successful completion of the above-mentioned courses. Out of the total 47 credits, 41 credits shall be accounted for the Diploma programme, and the remaining 6 credits shall be awarded for the above-mentioned additional courses. The 41 credits accounted for the lateral entry students shall be recorded in the Semester III marks sheet.

8. Academic work

A regular record of attendance in Theory, Practical, Internship and Research Projects 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 Tables – I to VIII. The number of hours allotted to each theory and practical course in any semester shall not be less than that shown in Tables – I to VIII.

Table-I: Course of study for semester I

Course Code	Name of the course	No. of hours per week (L/P)	Credit points
BP101T	Basics of Python Programming for Pharmaceutical Sciences (Theory)	2	2
BP102T	General Pharmacy (Theory)	3	3
BP103T	Healthcare Psychology and Communication Skills (Theory)	1	1
BP104T	Human Anatomy, Physiology and Pathophysiology I (Theory)	4	4
BP105T	Introduction to Pharmacognosy (Theory)	3	3
BP106T	Pharmaceutical Inorganic and Analytical Chemistry (Theory)	3	3
BP107P	General Pharmacy (Practical)	3	1
BP108P	Healthcare Psychology and Communication Skills (Practical)	2	1
BP109P	Human Anatomy, Physiology and Pathophysiology I (Practical)	3	1
BP110P	Introduction to Pharmacognosy (Practical)	3	1
BP111P	Pharmaceutical Inorganic and Analytical Chemistry (Practical)	3	1
Total		30	21

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Table-II: Course of study for semester II

Course Code	Name of the course		No. of hours per week (L/P)	Credit points
BP201T	Applied Biostatistics and Data Analytics for Pharmaceutical Sciences (Theory)		2	2
BP202T	Biochemistry (Theory)		3	3
BP203T	Human Anatomy, Physiology and Pathophysiology II (Theory)		4	4
BP204T	Pharmaceutical Organic Chemistry (Theory)		4	4
BP205T	Pharmacognosy and Phytochemistry (Theory)		4	4
BP206T	Physical Pharmaceutics (Theory)		3	3
BP207P	Biochemistry (Practical)		3	1
BP208P	Human Anatomy, Physiology and Pathophysiology II (Practical)		3	1
BP209P	Pharmaceutical Organic Chemistry (Practical)		3	1
BP210P	Pharmacognosy and Phytochemistry (Practical)		3	1
BP211P	Physical Pharmaceutics (Practical)		3	1
BP212P SEC*	BP212P SEC1	Communication Skills	2	1
	BP212P SEC2	Mental Well-Being, Stress & Conflict Management		
	BP212P SEC3	Fundamentals of Computer Operations		
Total			37	26

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Table-III: Course of study for semester III

Course Code	Name of the course		No. of hours per week (L/P)	Credit points
BP301T	Introduction to Machine Learning in Pharmaceutical Sciences (Theory)		2	2
BP302T	Environmental Sciences (Theory)		1	1
BP303T	Ethics and Universal Human Values (Theory)		1	1
BP304T	General Pharmacology (Theory)		3	3
BP305T	Heterocyclic Compounds and Stereochemistry (Theory)		3	3
BP306T	Pharmaceutical Dosage Forms I (Theory)		3	3
BP307T	Pharmaceutical Engineering (Theory)		3	3
BP308T	Pharmaceutical Microbiology (Theory)		3	3
BP309P	General Pharmacology (Practical)		4	2
BP310P	Heterocyclic Compounds and Stereochemistry (Practical)		4	2
BP311P	Pharmaceutical Dosage Forms I (Practical)		3	1
BP312P AEC*	BP312P AEC1	Nutraceuticals and Functional Foods	2	1
	BP312P AEC2	Food Analysis		
	BP312P AEC3	Yoga and Life Sciences		
Total			32	25

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Table-IV: Course of study for semester IV

Course Code	Name of the course	No. of hours per week (L/P)	Credit points
BP401T	Herbal Drug Technology (Theory)	3	3
BP402T	Medicinal Chemistry (Theory)	3	3
BP403T	Pharmaceutical Biotechnology (Theory)	3	3
BP404T	Social Pharmacy and Public Health (Theory)	2	2
BP405T	Systemic Pharmacology I (Theory)	3	3
BP406P	Herbal Drug Technology (Practical)	3	1
BP407P	Medicinal Chemistry (Practical)	3	1
BP408P	Pharmaceutical Biotechnology (Practical)	3	1
BP409P	Social Pharmacy and Public Health (Practical)	2	1
BP410P	Systemic Pharmacology I (Practical)	3	1
BP411I	Internship (Mandatory)	8	4
Total		28	23

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Table-V: Course of study for semester V

Course Code	Name of the course	No. of hours per week (L/P)	Credit points
BP501T	Biomedical Chemistry (Theory)	3	3
BP502T	Industrial Pharmacognosy (Theory)	3	3
BP503T	Innovation and Startup Ecosystem (Theory)	2	2
BP504T	Pharmaceutical Dosage Form II (Theory)	2	2
BP505T	Pharmaceutical Quality Assurance (Theory)	3	3
BP506T	Systemic Pharmacology II (Theory)	3	3
BP507P	Biomedical Chemistry (Practical)	4	2
BP508P	Industrial Pharmacognosy (Practical)	3	1
BP509P	Pharmaceutical Dosage Form II (Practical)	3	1
BP510P	Systemic Pharmacology II(Practical)	4	2
Total		30	22

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Table-VI: Course of study for semester VI

Course Code	Name of the course		No. of hours per week (L/P)	Credit points
BP601T	Advanced Pharmacognosy (Theory)		3	3
BP602T	Biopharmaceutics and Pharmacokinetics (Theory)		3	3
BP603T	Intellectual Property Rights (Theory)		2	2
BP604T	AI applications in Pharmaceutical Sciences (Theory)		2	2
BP605T	Pharmaceutical Analysis (Theory)		3	3
BP606T	Pharmaceutical Jurisprudence (Theory)		3	3
BP607T AEC*	BP607T AEC1	Green Chemistry	1	1
	BP607T AEC2	Materiovigilance and Hemovigilance		
	BP607T AEC3	Scientific Writing		
	BP607T AEC4	Drug Store and Business Management		
	BP607T AEC5	Career Building in Cultivation of Medicinal Plants		
	BP607T AEC6	Active Pharmaceutical Ingredients and Excipient Sciences		
BP608P	Biopharmaceutics and Pharmacokinetics (Practical)		3	1
BP609P	Pharmaceutical Analysis (Practical)		4	2
BP610P SEC*	BP610P SEC1	Computer-Aided Drug Design	2	1
	BP610P SEC2	Analytical Method Development and Validation		
	BP610P SEC3	Principles of Preclinical Studies		

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

BP611P VAC*	BP611P VAC1	Professional Skills	2	1
	BP611P VAC2	Process Analytical Technology (PAT) and QbD in Formulation Science		
BP612I	Internship (Mandatory)		8	4
Total			28	26

Table-VII: Course of study for semester VII

Course Code	Name of the course		No. of hours per week (L/P)	Credit points
BP701T	Biostatistics Research methodology (Theory)		3	3
BP702T	Cosmetics and Cosmeceuticals (Theory)		2	2
BP703T	AI in Clinical applications (Theory)		2	2
BP704T	Modern Analytical Techniques (Theory)		3	3
BP705T	Pharmacovigilance (Theory)		3	3
BP706T	Pharmacy Practice (Theory)		3	3
BP707T	Regulatory Affairs (Theory)		2	2
BP708T AEC	BP708T AEC1	Current Good Manufacturing Practices (cGMP)	1	1
	BP708T AEC2	Pharmaceutical Automation		
	BP708T AEC3	Modern Techniques in Cellular Biology		
	BP708T AEC4	Medical Devices		
	BP708T AEC5	Transformation of Food Waste into Medicinal Products		
	BP708T AEC6	Biosimilars, Vaccines & Macromolecules		
BP709P	Modern Analytical Techniques (Practical)		3	1
BP710RP	Research Project		-	6
Total			22	26

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Table-VIII: Course of study for semester VIII

Course Code	Name of the course		No. of hours per week (L/P)	Credit points
BP801T	Ethical Considerations and Translational Applications of AI in Pharmacy (Theory)		2	2
BP802T	Clinical Pharmacotherapeutics (Theory)		2	2
BP803T	Industrial Pharmacy and Facility Design (Theory)		3	3
BP804T	Pharmaceutical Management (Theory)		2	2
BP805T	Sterile Dosage Forms and Novel Drug Delivery System (Theory)		3	3
BP806T AEC*	BP806T AEC1	Pharmaceutical Packaging	2	2
	BP806T AEC2	Supply Chain Management		
	BP806T AEC3	Industrial Safety and Waste Management		
	BP806T AEC4	Traditional Healing Practices of India		
	BP806T AEC5	Futuristic Pharma through AR/VR: Pharma 4.0		
	BP806T AEC6	Herbal Cosmetics for Industry Perspective		
BP807P	Pharmaceutical Marketing Skills (Practical)		2	1
BP808P	Sterile Dosage Forms and Novel Drug Delivery System (Practical)		4	2
BP809P VAC*	BP809P VAC1	Cleaning Validation	2	1
	BP809P VAC2	Basic Training in Aseptic Handling Techniques		
	BP809P VAC3	Impurity Profiling		
BP810RP	Research Project		-	6
Total			22	24

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Table-IX: Total Credits per Semester

Semester	Total Credits
I	21
II	26
III	25
IV	23
V	22
VI	26
VII	26
VIII	24
Grand Total	193

Note: Earning total credits [193] as mentioned above are mandatory for award of the degree.

Table X: Add on courses

Class	Semester	Course Code	Name of Course	No. of Hrs.	Credits
First Year B.Pharm	III	BAD207T	Democracy, Elections and Governance	2	2
Second Year B.Pharm	IV	BP412AEC	Design Thinking	2	2
Third Year B.Pharm	V	BP511AEC	Entrepreneurship	2	2
Final Y.B.Pharm	VIII	BP811AEC	Management Principals of Chatrapati Shivaji Maharaj	2	2
MOOCs course of Minimum 3 credits which complies with National credit framework (Ncrf) credit level of 4.5-6 should be completed from 1 st to 3 rd Year of B.Pharm course	From I to VI Semester	-	-	-	3
				Total Credits= 9*	

*The add on credits will be converted in to grade which will not include in to the CGPA calculation

MOOCs Course: If anyone fails to complete the course from I to VI Semester, He/She should complete before the completion of VIII Semester to award B.Pharm. degree.

10. Programme Committee and Internal Examination Committee

10.1 Programme Committee

1. The B. Pharm. Programme shall have a Programme Committee constituted by the Head of the Institution/Principal in consultation with all the Heads of the Departments and reconstituted annually.
2. The composition of the Programme Committee shall be as follows:
 - The Principal/HoI shall serve as the Chairperson
 - One senior teacher from any department shall act as the B. Pharm Coordinator
 - One teacher from each department offering B. Pharm courses and
 - Four student representatives of the programme (one from each academic year), nominated by the Head of the Institution.
3. The Programme Committee shall meet at least twice in every semester to perform the following duties.
4. Duties of the Programme Committee (not limited to):
 - i. Periodically reviewing the progress of classes and attendance.
 - ii. Discussing problems concerning the curriculum, syllabus, and conduct of classes.
 - iii. Communicating its recommendations on academic matters to the Head of the Institution, with such communications being duly recorded.
 - iv. Periodically reviewing and monitoring the attainment of Programme Outcomes and Course Outcomes along with Bloom's Taxonomy Levels and/or Miller's Pyramid.
 - v. Encouraging the use of ICT tools and providing e-learning resources for higher- order learning.
 - vi. Ensuring effective implementation of participative, problem-based, experiential learning, and innovative pedagogical approaches for effective outcomes.

10.2 Internal Examination Committee

1. The B. Pharm. Programme shall have an Internal Examination Committee constituted by the Principal / HoI in consultation with all the Heads of the Departments and may be reconstituted as and when necessary.
2. The composition of the Internal Examination Committee shall be as follows:
 - Principal / HoI – Chairperson
 - B. Pharm Programme Coordinator – Member Secretary
 - One senior faculty member from each department involved in B. Pharm teaching Members
 - Examination Cell In-charge – Member
3. The Committee shall meet periodically, before each Sessional Examination (Internal Assessment) and before the end-semester examination.
4. Duties of the Internal Examination Committee (not limited to):
 - i. Plan and approve the internal assessment calendar for all semesters.
 - ii. Ensure uniformity, transparency, and fairness in continuous assessment, sessional, and practical examinations.
 - iii. Moderation of sessional question papers and assessment tools in alignment with programme and course outcomes, incorporating Bloom's Taxonomy Levels and/or Miller's Pyramid.
 - iv. Monitor the conduct and evaluation of theory, practical, internship, and project assessments.
 - v. Ensure compliance with PCI regulations, university ordinances, and NEP-2020 assessment reforms.
 - vi. Promote outcome-based, skill-oriented, and innovative assessment methods.
 - vii. Review, moderate, and finalize internal assessment marks prior to submission to the university.
 - viii. Address student grievances related to internal assessments in a timely and structured manner.
 - ix. Maintain proper records, reports, and minutes related to internal examinations and assessments.
 - x. Recommend remedial measures and academic support as and when required.

10.3 Scheme for credit based marks distribution for assessment

The general scheme for credit wise marks distribution is as given below. The detailed scheme for internal assessment and end semester examinations is given in Table – XI (a-h).

Credits	Maximum Marks	Internal Assessment	External Assessment
4	100	40	60
3	75	30	45
2 or 1	50	20	30

11. End semester examinations

The End Semester Examinations for each theory and practical course through semesters I to VIII shall be conducted by the university. (Table-XI).

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Table-Xa: Semester I

Course Code	Name of the Course	Credit	Continuous Mode (Marks)	Sessional Exam (Marks)	Sessional Duration	Internal Total	End Semester Marks	End Sem Exam Duration	Total Marks
BP101T	Basics of Python Programming for Pharmaceutical Sciences (Theory)	2	10	10	1 Hr	20	30	1.5 Hr	50
BP102T	General Pharmacy (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP103T	Healthcare Psychology and Communication Skills (Theory)	1	10	10	1 Hr	20	30	1.5 Hr	50
BP104T	Human Anatomy, Physiology and Pathophysiology I (Theory)	4	20	20	1 Hr	40	60	3 Hr	100
BP105T	Introduction to Pharmacognosy (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP106T	Pharmaceutical Inorganic and Analytical Chemistry (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP107P	General Pharmacy (Practical)	1	10	10	3 Hr	20	30	3 Hr	50

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

BP108P	Healthcare Psychology and Communication Skills (Practical)	1	10	10	3 Hr	20	30	3Hr	50
BP109P	Human Anatomy, Physiology and Pathophysiology I (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP110P	Introduction to Pharmacognosy (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP111P	Pharmaceutical Inorganic and Analytical Chemistry (Practical)	1	10	10	3 Hr	20	30	3 Hr	50

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Table-Xb: Semester II

Course Code	Name of the Course	Credit	Continuous Mode (Marks)	Sessional Exam (Marks)	Sessional Duration	Internal Total	End Semester Marks	Exam Duration	Total Marks
BP201T	Applied Biostatistics and Data Analytics for Pharmaceutical Sciences (Theory)	2	10	10	1 Hr	20	30	1.5 Hr	50
BP202T	Biochemistry (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP203T	Human Anatomy, Physiology and Pathophysiology II (Theory)	4	20	20	1 Hr	40	60	3 Hr	100
BP204T	Pharmaceutical Organic Chemistry (Theory)	4	20	20	1 Hr	40	60	3 Hr	100
BP205T	Pharmacognosy and Phytochemistry (Theory)	4	20	20	1 Hr	40	60	3 Hr	100
BP206T	Physical Pharmaceutics (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP207P	Biochemistry (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP208P	Human Anatomy, Physiology and Pathophysiology II (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP209P	Pharmaceutical Organic Chemistry (Practical)	1	10	10	3 Hr	20	30	3 Hr	50

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

BP210P	Pharmacognosy and Phytochemistry (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP211P	Physical Pharmaceutics (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP212P	SEC – Elective 1 (Practical)	1	10	10	3 Hr	20	30	3 Hr	50

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Table-Xc: Semester III

Course Code	Name of the Course	Credit	Continuous Mode (Marks)	Sessional Exam (Marks)	Sessional Duration	Internal Total	End Semester Marks	Exam Duration	Total Marks
BP301T	Introduction to Machine Learning in Pharmaceutical Sciences (Theory)	2	10	10	1 Hr	20	30	1.5 Hr	50
BP302T	Environmental Science (Theory)	1	10	10	1 Hr	20	30	1.5 Hr	50
BP303T	Ethics and Universal Human Values (Theory)	1	10	10	1 Hr	20	30	1.5 Hr	50
BP304T	General Pharmacology (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP305T	Heterocyclic Compounds and Stereochemistry (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP306T	Pharmaceutical Dosage Forms I (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP307T	Pharmaceutical Engineering (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP308T	Pharmaceutical Microbiology (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP309P	General Pharmacology (Practical)	2	10	10	4 Hr	20	30	4 Hr	50

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

BP310P	Heterocyclic Compounds and Stereochemistry (Practical)	2	10	10	4 Hr	20	30	4 Hr	50
BP311P	Pharmaceutical Dosage Forms I (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP312P	AEC – Elective 2 (Practical)	1	10	10	3 Hr	20	30	3 Hr	50

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Table-Xd: Semester IV

Course Code	Name of the Course	Credit	Continuous Mode (Marks)	Sessional Exam (Marks)	Sessional Duration	Internal Total	End Semester Marks	Exam Duration	Total Marks
BP401T	Herbal Drug Technology (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP402T	Medicinal Chemistry (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP403T	Pharmaceutical Biotechnology (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP404T	Social Pharmacy and Public Health (Theory)	2	10	10	1 Hr	20	30	1.5 Hr	50
BP405T	Systemic Pharmacology I (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP406P	Herbal Drug Technology (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP407P	Medicinal Chemistry (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP408P	Pharmaceutical Biotechnology (Practical)	1	10	10	3 Hr	20	30	3 Hr	50

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

BP409P	Social Pharmacy and Public Health (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP410P	Systemic Pharmacology I (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP411I	Internship (Mandatory)	4	Refer Section 22	–	–	–	100	4 Hr	100

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Table-Xe: Semester V

Course Code	Name of the Course	Credit	Continuous Mode (Marks)	Sessional Exam (Marks)	Sessional Duration	Internal Total	End Semester Marks	Exam Duration	Total Marks
BP501T	Biomedical Chemistry (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP502T	Industrial Pharmacognosy (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP503T	Innovation and Startup Ecosystem (Theory)	2	10	10	1 Hr	20	30	1.5 Hr	50
BP504T	Pharmaceutical Dosage Forms II (Theory)	2	10	10	1 Hr	20	30	1.5 Hr	50
BP505T	Pharmaceutical Quality Assurance (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP506T	Systemic Pharmacology II (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP507P	Biomedical Chemistry (Practical)	2	10	10	4 Hr	20	30	4 Hr	50
BP508P	Industrial Pharmacognosy (Practical)	1	10	10	3 Hr	20	30	3 Hr	50

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

BP509P	Pharmaceutical Dosage Forms II (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP510P	Systemic Pharmacology II (Practical)	2	10	10	4 Hr	20	30	4 Hr	50

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Table-Xf: Semester VI

Course Code	Name of the Course	Credit	Continuous Mode (Marks)	Sessional Exam (Marks)	Sessional Duration	Internal Total	End Semester Marks	Exam Duration	Total Marks
BP601T	Advanced Pharmacognosy (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP602T	Biopharmaceutics and Pharmacokinetics (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP603T	Intellectual Property Rights (Theory)	2	10	10	1 Hr	20	30	1.5 Hr	50
BP604T	AI Applications in Pharmaceutical Sciences (Theory)	2	10	10	1 Hr	20	30	1.5 Hr	50
BP605T	Pharmaceutical Analysis (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP606T	Pharmaceutical Jurisprudence (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP607T	AEC – Elective 3 (Theory)	1	10	10	1 Hr	20	30	1.5 Hr	50
BP608P	Biopharmaceutics and Pharmacokinetics (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP609P	Pharmaceutical Analysis (Practical)	2	10	10	4 Hr	20	30	4 Hr	50

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

BP610P	SEC – Elective 4 (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP611P	VAC – Elective 5 (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP612I	Internship (Mandatory)	4	Refer Section 22	–	–	–	100	4 Hr	100

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Table-Xg: Semester VII

Course Code	Name of the Course	Credit	Continuous Mode (Marks)	Sessional Exam (Marks)	Sessional Duration	Internal Total	End Semester Marks	Exam Duration	Total Marks
BP701T	Biostatistics and Research Methodology (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP702T	Cosmetics and Cosmeceuticals (Theory)	2	10	10	1 Hr	20	30	1.5 Hr	50
BP703T	AI in Clinical Applications (Theory)	2	10	10	1 Hr	20	30	1.5 Hr	50
BP704T	Modern Analytical Techniques (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP705T	Pharmacovigilance (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP706T	Pharmacy Practice (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP707T	Regulatory Affairs (Theory)	2	10	10	1 Hr	20	30	1.5 Hr	50
BP708T	AEC – Elective 6 (Theory)	1	10	10	1 Hr	20	30	1.5 Hr	50
BP709P	Modern Analytical Techniques (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP710RP	Research Project	6	Refer Section 21	–	–	–	150	4 Hr	150

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(AN AUTONOMOUS COLLEGE)

Table-Xh: Semester VIII

Course Code	Name of the Course	Credit	Continuous Mode (Marks)	Sessional Exam (Marks)	Sessional Duration	Internal Total	End Semester Marks	Exam Duration	Total Marks
BP801T	Ethical Considerations and Translational Applications of AI in Pharmacy (Theory)	2	10	10	1 Hr	20	30	1.5 Hr	50
BP802T	Clinical Pharmacotherapeutics (Theory)	2	10	10	1 Hr	20	30	1.5 Hr	50
BP803T	Industrial Pharmacy and Facility Design (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP804T	Pharmaceutical Management (Theory)	2	10	10	1 Hr	20	30	1.5 Hr	50
BP805T	Sterile Dosage Forms and Novel Drug Delivery System (Theory)	3	15	15	1 Hr	30	45	2 Hr	75
BP806T	AEC – Elective 7 (Theory)	2	10	10	1 Hr	20	30	1.5 Hr	50
BP807P	Pharmaceutical Marketing Skills (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP808P	Sterile Dosage Forms and Novel Drug Delivery System (Practical)	2	10	10	4 Hr	20	30	4 Hr	50
BP809P	VAC – Elective 8 (Practical)	1	10	10	3 Hr	20	30	3 Hr	50
BP810RP	Research Project	6	Refer Section 21	–	–	–	150	4 Hr	150

11.2. Internal assessment: Continuous internal assessment and sessional examination

The marks allocated for Continuous mode of Internal assessment and Sessional examination shall be awarded as per the scheme given below.

Table–XII: Scheme for awarding internal assessment: Continuous mode and Sessional

a. Theory

Theory– Internal assessment pattern of marks distribution

Theory		Internal assessment pattern of marks distribution			
Credit Type	Max. Marks	Total	Attendance (Refer Table–XII) and Student–Teacher Interaction	Academic Activities (Average of any three: quiz, assignment, open book test, field work, group discussion, seminar, etc.)	Sessional (Average of two tests) Duration 1 Hour
4	100	40	10	10	20
3	75	30	7.5	7.5	15
2 or 1	50	20	05	05	10

b. Practical

Practical – Internal assessment pattern of marks distribution

Theory		Internal assessment pattern of marks distribution			
Credit Type	Max. Marks	Total	Attendance (Refer Table–XII) and Student–Teacher Interaction	Based on Practical Records, Regular viva voce, etc.	Sessional (Average of two tests) Duration – As per allotted hours#)
2 or 1	50	20	05	05	10

For practical courses (core as well as elective), those having four hours per week shall have a four-hour duration for the sessional and end-semester examinations. Practical courses with less than four hours per week shall have three-hour duration for the sessional and end-semester examinations.

Table–XIII: Guidelines for the allotment of marks for attendance

Percentage of Attendance	Theory			Practical
	4 Credit	3 Credit	2 or 1 Credit	
90 – 100	4	3.5	2	2
85 – 89	3	2.5	1.5	1.5
75 – 84	2	1.5	1	1
Less than 75	0	0	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)/University. The scheme of question paper for theory and practical Sessional examinations is given in Table XIII– XIV below.

Table–XIV: Internal Assessment Question Paper Pattern (Theory)

Type of questions	4 Credit Course	3 Credit Course	2 or 1 Credit Course
I. Multiple Choice Questions (MCQs) Or Objective Type Questions	4×1 Mark each or 2×2 Marks each (Compulsory)	2×1 Mark each (Compulsory)	2×1 Mark each (Compulsory)
II. Short Answers	2×3 Marks each (2 out of 3)	2×3 Marks each (2 out of 3)	1×3 Marks each (1 out of 2)
III. Long Answers	1×10 Marks each (1 out of 2)	1×7 Marks each (1 out of 2)	1×5 Marks each (1 out of 2)
Max. Marks	20	15	10
Duration	1 Hour	1 Hour	1 Hour

Table–XV: Internal Assessment Question Paper Pattern (Practical)

Type of questions	2 or 1 Credit Course
Synopsis	2
Major Experiment	4
Minor Experiment	2
Viva voce	2
Max. Marks	10
Duration	As per the allotted hours in scheme

The average marks of two Sessional exams shall be computed for internal assessment as per the requirements given in Table – XI.

11.3. End semester Examination

The End semester Theory and practical examination shall be conducted as per the scheme given in Table XV– XVI as per the credits allotted.

Table–XVI: End Semester Question Paper Pattern (Theory)

Type of questions	4 Credit Course	3 Credit Course	2 or 1 Credit Course
I. Multiple Choice Questions (MCQs) Or Objective Type Questions	20×1 Mark each or 10×2 Marks each (Compulsory)	10×1 Mark each (Compulsory)	10×1 Mark each (Compulsory)
II. Short Answers	5×4 Marks each (5 out of 7)	5×4 Marks each (5 out of 7)	5×2 Marks each (5 out of 7)

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

III. Long Answers	2×10 Marks each (2 out of 3)	2×7.5 Marks each (2 out of 3)	2×5 Marks each (2 out of 3)
Max. Marks	60	45	30
Duration	3 Hours	2 Hours	1.5 Hours

Table–XVII: End Semester Question Paper Pattern (Practical)

Type of questions	2 or 1 Credit Course
Synopsis	7.5
Major Experiment	10
Minor Experiment	5
Viva voce	7.5
Max. Marks	30
Duration	As per the allotted hours in scheme #

For practical courses (core as well as elective), those having four hours per week shall have a four-hour duration for the sessional and end-semester examinations. Practical courses with less than four hours per week shall have a three-hour duration for the sessional and end-semester examinations.

12. Promotion and award of grades

12.1. Promotion: A student shall be declared PASS and eligible to receive a grade in a course of the B.Pharm. programme if he/she secures at least 50% marks in that particular course, including internal assessment. For example, to be declared PASS and to receive a grade, the student must secure a minimum of 50 marks out of a total of 100, inclusive of internal assessment marks (continuous internal assessment and sessional examination marks) and the end-semester theory examination marks as applicable

12.2. Grace Marks and Moderation: Grace marks shall be awarded to the students as per the norms of the University, with due emphasis on promoting learner progression. (Ordinance 1)

12.3. Condonation Marks: Condonation Marks shall be awarded to the students as per the norms of the University, with due emphasis on promoting learner progression. (Ordinance 4)

13. Carry forward of internal assessment 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. Re-sessional Examination:

Students who fail to secure a minimum of 50% marks in the Internal Assessment shall be required to appear for a re-sessional examination. The re-sessional assessment shall be conducted within the respective semester only.

14.1 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 within that particular semester only. The re-conduct of sessional examinations for failed candidates shall be conducted only once for the purpose of improving their sessional marks, without changing their continuous internal assessment.

15. End semester Re-examinations

Students who fail any theory or laboratory course during the academic year are eligible to register for that course in the Re- examination. The Re-exam will be conducted at the end of the each semester for all the courses. Students registering for the Re- examination within seven days of declaration of result.

16. Supplementary Examination

In case a student fails in both the End-Semester Examination (ESE) and the End Semester re-examination in a particular semester, he/she shall be given an opportunity to clear the failed subject(s) through the Supplementary Examination conducted in the Next semester.

Table–XVIII: Tentative schedule of end semester examinations

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

17. Academic progression

Students are permitted to progress to the next semester even if they fail a course. However, to appear for the Semester VIII end semester examination, a student must have successfully completed all courses up to Semester VII. The final CGPA shall be awarded only after successful completion of all courses from Semester I to Semester VIII within the maximum duration prescribed by PCI. Lateral entry students shall successfully complete all courses from Semester III to Semester VII before appearing for the Semester VIII end semester examination

18. Grading of performance

18.1. 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 – XVII.

Table–XIX: Letter grades and grade points equivalent to percentage of marks and performance

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 student 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. Such rules are also applicable for those students who fail to register for examination(s) of any course in any semester.

19. 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.

$$SGPA = \frac{C1G1 + C2G2 + C3G3 + C4G4 + C5G5}{C1 + C2 + C3 + C4 + C5}$$

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 ABS grade awarded in that semester.

20. 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.

$$SGPA = \frac{C1S1 + C2S2 + C3S3 + C4S4 + C5S5 + C6S6 + C7S7 + C8S8}{C1 + C2 + C3 + C4 + C5 + C6 + C7 + C8}$$

CGPA to Percentage Conversion

It is mandatory for Examining Authority to mention both, marks and SGPA and/or CGPA scores, in the marksheets. The conversion factor for calculation of CGPA into percentage should be 10.0 uniformly.

Credit Record and Transfer Mechanism

The Examining Authority shall be responsible for creation and verification of Academic Bank of Credits ID, uploading and maintenance of semester wise credits/grades and award in the ABC and National Academic Depository (NAD) to facilitate the credit transfer and redemption as per guidelines of statutory bodies.

21. Declaration of class

The classification of the degree shall be determined based on the Cumulative Grade Point Average (CGPA) obtained by the candidate, as indicated below:

- 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**

22. Project work

All students shall undertake a project under the supervision of a teacher and submit a report, preferably with the involvement of an external mentor from Industry, Hospital, NABL or CDSCO-approved labs, or an Allied/Interdisciplinary field. The project shall be carried out in groups not exceeding three members. The project report must be submitted in triplicate as a typed and bound copy of no less than 25 pages. Internal and external examiners appointed by the University shall evaluate the project during the practical examinations of the respective semester(s), and students shall be evaluated in groups. Additionally, students are permitted the option to pursue a continuous research theme initiated in the seventh semester and extending through the eighth semester. Under this provision, the specific project milestones achieved by the conclusion of the seventh semester shall undergo formal evaluation by the appointed examiners during that semester's final examination.

The projects shall be evaluated as per the criteria given in **Table XX** and **Table XXI** below.

Table - XX: Evaluation of Dissertation Book

Sl. No.	Evaluation Criteria	Maximum Marks
1	Objectives of the work undertaken	10
2	Methodology adopted	20
3	Results and discussion	20
4	Conclusion and outcome	10
	Total	60

Table XXI. Evaluation of Dissertation Presentation

Sl. No.	Evaluation Criteria	Maximum Marks
1	Presentation of work	40
2	Communication skills	20
3	Question and answer skills	30
	Total	90

Explanation: The 60 marks assigned to the dissertation book shall be same for all the students in a group. However, the 90 marks assigned for presentation shall be awarded based on the performance of individual students in the given criteria.

23. Internship

Every candidate shall be required to complete a minimum of 240 hours of practical training, spread over a period of two semesters (SEM IV & VI), in a Pharmaceutical/ Cosmetics/ Medical Devices/ Food Industry, or in a Hospital/Community Pharmacy, or any other relevant field as per the prescribed course content. He/she has to submit two internship reports which will be evaluated separately.

Certificate and Report submission: 75 Marks

Presentation and Discussion: 25 Marks

Total: 100 Marks

24. Industry/Field Visits and other Co-curricular Activities.

It shall be compulsory for pharmacy Institutions to organize industrial/field visit and other co-curricular activities to promote holistic learning through participative, problem-based, experiential and innovative pedagogical methods. Students shall submit individual reports, which shall be assessed in continuous evaluation mode as part of any core course each year, as decided by the Programme Committee.

a. Industry/Field Visits

It shall be compulsory for students to undertake at least one industrial/field visit during each year to facilities involved in the manufacturing of active pharmaceutical ingredients, excipients, pharmaceutical formulations, medical devices, food, cosmetics, government/ NABL approved drug and medical device testing laboratories or NABH accredited hospital. It shall be assured by the institutions that the facilities chosen for a particular year shall not be repeated.

b. Memorandum of Understanding (MoU)

A formal and legally valid Memorandum of Understanding (MoU) must be executed (minimum 10) between the pharmacy Institution and pharmaceutical Industry/ government/NABL approved drug and medical device testing laboratories/ NABH accredited hospital. Out of those MoUs, 5 must be with the pharmaceutical industries.

c. Co-curricular Activities

It shall be compulsory for the pharmacy institution to adopt a village or a ward in the panchayath/municipal corporation and engage in community service activities. The community services shall include (but not limited to) prescription survey, awareness of rational drug use, patient counselling services or activities as per the prescribed course content.

25. 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 Programme shall not be eligible for award of ranks. Moreover, the candidates should have completed the B. Pharm Programme in minimum prescribed number of years (i.e. four years) for the award of Ranks.

26. Award of Degree

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

27. Duration for Completion of the Programme

The maximum period permitted for completion of the Programme shall be twice the prescribed duration of the Programme. Any student who fails to complete the Programme within this stipulated period shall be required to discontinue the course.

28. Re-admission after Break of Study

A candidate seeking re-admission to the programme after a break in studies must obtain approval from the university by paying the prescribed condonation fee. Condonation will not be granted if the break in study exceeds two years or if the student fails to complete the programme within the maximum permitted duration $[N(\text{no. of years}) \times 2]$.

CURRICULAR STRUCTURE

T: Theory **P:** Practical **AEC:** Ability Enhancement Course **SEC:** Skill Enhancement Course **VAC:** Value Addition Course

The numeral against the T / P cell indicates the credit assigned for the course. e.g.:

T	3
---	---

 indicates Theory course with 3 credits.

Note:-Refer the detailed syllabus for exact course codes

Semester																
Course Type	I		II		III		IV		V		VI		VII		VIII	
Core-1	T	3	T	3	T	3	T	3	T	3	T	3	T	3	T	3
	General Pharmacy		Biochemistry		General Pharmacology		Herbal Drug Technology		Biomedical Chemistry		Biopharmaceutics and Pharmacokinetics		Modern Analytical Techniques		Sterile Dosage Form and Novel Drug Delivery Systems	
Core-2	P	1	P	1	P	1	P	1	P	1	P	1	P	1	P	2
	General Pharmacy		Biochemistry		General Pharmacology		Herbal Drug Technology		Biomedical Chemistry		Biopharmaceutics and Pharmacokinetics		Modern Analytical Techniques		Sterile Dosage Form and Novel Drug Delivery Systems	
Course Type	I		II		III		IV		V		VI		VII		VIII	

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Core-3	T	1	T	4	T	3	T	3	T	3	T	3	T	3	T	3
	Healthcare Psychology and Communication Skills		Human Anatomy, Physiology and Pathophysiology II		Heterocyclic Compounds and Stereochemistry		Medicinal Chemistry		Industrial Pharmacognosy		Pharmaceutical Analysis		Biostatistics Research methodology		Industrial Pharmacy and Facility Design	
Core-4	P	1	P	1	P	1	P	1	P	1	P	2	T	3	T	2
	Healthcare Psychology and Communication Skills		Human Anatomy, Physiology and Pathophysiology II		Heterocyclic Compounds and Stereochemistry		Medicinal Chemistry		Industrial Pharmacognosy		Pharmaceutical Analysis		Pharmacovigilance		Clinical Pharmacotherapeutics	
Core-5	T	4	T	4	T	3	T	3	T	2	T	3	T	3	T	2
	Human Anatomy, Physiology and Pathophysiology I		Pharmaceutical Organic Chemistry		Pharmaceutical Dosage Forms I		Pharmaceutical Biotechnology		Pharmaceutical Dosage Forms II		Advanced Pharmacognosy		Pharmacy Practice		Pharmaceutical Management	
Core-6	P	1	P	1	P	1	P	1	P	1	T	3	T	2	T	2
	Human Anatomy, Physiology and Pathophysiology I		Pharmaceutical Organic Chemistry		Pharmaceutical Dosage Forms I		Pharmaceutical Biotechnology		Pharmaceutical Dosage Forms II		Pharmaceutical Jurisprudence		Cosmetics and Cosmeceuticals		Ethical Considerations and Translational Applications of AI in Pharmacy	
Core-7	T	3	T	4	T	3	T	2	T	3	T	2	T	2	P	1
	Introduction To Pharmacognosy		Pharmacognosy and Phytochemistry		Pharmaceutical Engineering		Social Pharmacy and Public Health		Systemic Pharmacology and Chemotherapy		Intellectual Property Rights		AI in Clinical applications		Pharmaceutical Marketing Skills	
Course Type	I		II		III		IV		V		VI		VII		VIII	

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Core-8	P	1	P	1	T	3	P	1	P	1	P	2	T	2	—	
	Introduction To Pharmacognosy		Pharmacognosy and Phytochemistry		Pharmaceutical Microbiology		Social Pharmacy and Public Health		Systemic Pharmacology and Chemotherapy		AI applications in Pharmaceutical Sciences		Regulatory Affairs		—	
Core-9	T	3	T	3	T	2	T	2	T	3	—		—		—	
	Pharmaceutical Inorganic and Analytical Chemistry		Physical Pharmaceutics		Introduction to Machine Learning in Pharmaceutical Sciences		Systemic Pharmacology I		Pharmaceutical Quality Assurance		—		—		—	
Core-10	P	1	P	1	T	1	P	1	T	2	—		—		—	
	Pharmaceutical Inorganic and Analytical Chemistry		Physical Pharmaceutics		Environmental Science		Systemic Pharmacology I		Innovation and Startup Ecosystem		—		—		—	
Core-11	T	2	T	3	T	1	—		—		—		—		—	
	Basics of Python Programming for Pharmaceutical Sciences (Theory)		Applied Biostatistics and Data Analytics for Pharmaceutical Sciences		Ethics and Universal Human Values		—		—		—		—		—	
Internship	—		—		—		—	4	—		—	4	—		—	
	—		—		—		Internship (Mandatory)		—		Internship (Mandatory)		—		—	
Research	—		—		—		—		—		—		—	6	—	6
	—		—		—		—		—		—		Research Project		Research Project	
Course Type	I		II		III		IV		V		VI		VII		VIII	

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AEC	—	—	P	1	—	—	T	1	T	1	T	2
	—	—	Elective 2		—	—	Elective 3		Elective 6		Elective 7	
SEC	—	P	1	—	—	—	P	1	—	—	—	—
	—	Elective 1		—	—	—	Elective 4		—	—	—	—
VAC	—	—	—	—	—	—	P	1	—	—	P	1
	—	—	—	—	—	—	Elective 5		—	—	Elective 8	
Credits per semester	21	23	23	25	25	26	26	24				
Total Credits	193											

Add on Courses

Add-on Courses												
AEC	—	—	T	2	T	2	T	2			T	2
	—	—	Democracy, Elections and Governance		Design Thinking		Entrepreneurship		-	-	Management Principals of Chatrapati Shivaji Maharaj	
AEC	MOOCs course of Minimum 3 credits which complies with National credit framework (Ncrf)credit level of 4.5-6 should be completed from 1 st to 3 rd Year of B.Pharm course									-	-	
	03											
Total Credits	09											

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(As per UGC letter Ref.no. No.F. 2-10/2023(AC-Policy) dated 27th May 2025 and SPPU letter no. CA/ 716 dated 09/06/2025)

SYLLABUS FOR BACHELOR OF PHARMACY (B. Pharm)
(2026) as per NEP 2020

[Framed under PCI NOTIFICATION, New Delhi, the 9th June, 2026 No. 14-154/2025-PCI.—In exercise of the powers conferred by Regulation 8. of the Bachelor of Pharmacy (B. Pharm) Course Regulations, 2014, the Pharmacy Council of India.]

With Effect from Academic Year
2026-27
[Revision 0.0]



Amrutvahini Sheti & Shikshan Vikas Sanstha's
Amrutvahini College of Pharmacy, Sangamner
Nashik-Pune Highway, Ghulewadi, Amrutnagar,
Tal. Sangamner, Dist.-Ahilyanagar, Pin Code:- 422608

Vision

Our College will be recognized as socially cautious centre of excellence in innovative education through its contribution in training, scholarly research in pharmacy profession and services to society

Mission

For translation of our vision into reality college is striving to:

M1: Provide value based student centric and sustained quality pharmaceutical education

M2: Foster advanced and innovative research that benefits pharmaceutical industry and community.

M3: Encourage and strengthen leadership, competitiveness, ethical reasoning and intellectual curiosity



Amrutvahini Sheti & Shikshan Vikas Sanstha's

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER

AMRUTVAHINI[®]
Since 1978

- Approved by Pharmacy Council of India (PCI), New Delhi
- Permanently Affiliated to Savitribai Phule Pune University
- University ID : PU/AN/Pharm/83, 2004; Puncode : CPHA016760
- DTE CODE : 5194
- A.I.S.H.E. Code : C-42026
- NAAC "A" Grade
- Approved by D.T.E., Mumbai & Govt. of Maharashtra
- Recognised under section 2(f) and 12B UGC Act 1956

Ref. AVCOP/317/2026-27

An Autonomous College

Date: 01/10/2026

Curricular Structure and Syllabus for B.Pharm (2026) as per NEP 2020

-2026-27:B.Pharm

The Bachelor of Pharmacy (B.Pharm) program syllabus of **First Year B.Pharm Semester-I and Semester-II** of academic year 2026-27 being offered at **Amrutvahini College of Pharmacy, Sangamner (An Autonomous College)** has been duly approved by the Academic Council of Amrutvahini Sheti & Shikshan Vikas Sanstha's, Amrutvahini College of Pharmacy, Sangamner (An Autonomous College).

Dr.M.J.Chavan

Chairman Academic Council & Principal
Chairman, Academic Council
Amrutvahini College of Pharmacy
(Autonomous), Sangamner-422608



SYLLABUS

SEMESTER I

Course Code	Name of the course	No. of hours per week (L/P)	Credit points
BP101T	Basics of Python Programming for Pharmaceutical Sciences (Theory)	2	2
BP102T	General Pharmacy (Theory)	3	3
BP103T	Healthcare Psychology and Communication Skills (Theory)	1	1
BP104T	Human Anatomy, Physiology and Pathophysiology I (Theory)	4	4
BP105T	Introduction to Pharmacognosy (Theory)	3	3
BP106T	Pharmaceutical Inorganic and Analytical Chemistry (Theory)	3	3
BP107P	General Pharmacy (Practical)	3	1
BP108P	Healthcare Psychology and Communication Skills (Practical)	2	1
BP109P	Human Anatomy, Physiology and Pathophysiology I (Practical)	3	1
BP110P	Introduction to Pharmacognosy (Practical)	3	1
BP111P	Pharmaceutical Inorganic and Analytical Chemistry (Practical)	3	1
Total		30	21

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Program : B. Pharmacy	Class: First Year			Semester : 1
Course Code	Course Title			Course Type
BP101T	Basics of Python Programming for Pharmaceutical Sciences (Theory)			Core
Credit	Hours Per Week (L-T-P)			Max. Hours
	L	T	P	
2	2	--	--	30
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

The objectives of this course are to:

1. Introduce the fundamentals of Python programming for pharmaceutical sciences.
2. Develop basic programming skills using control structures, functions, and data structures.
3. Provide knowledge of data handling techniques for structured dataset management.
4. Familiarize students with data analysis tools such as NumPy and Pandas for healthcare datasets.
5. Enable students to visualize and interpret pharmaceutical data.

COURSE OUTCOMES (CO):

CO No.	Upon successful completion of this course, the students will be able to:
1	Explain the fundamentals of Python programming, including variables, data types, operators, and libraries.
2	Analyze program logic using control structures and functions.
3	Organize, manipulate, and retrieve data using data structures and file handling techniques.
4	Analyze pharmaceutical datasets using Python libraries.
5	Visualize and interpret pharmaceutical data using graphical tools.

COURSE CONTENT:

Unit	Topic	Hours
I	Introduction to Python programming <ul style="list-style-type: none"> • Installing Python and an Integrated Development Environment (IDE) [Jupyter Notebook, PyCharm, VS Code etc.], Advantages of IDEs over text editors. • Python variables and data types (integers, floats, strings, booleans), Type casting and basic operators (arithmetic, comparison, logical), Input and output operations. 	6
II	<ul style="list-style-type: none"> • Basic string operations and manipulation techniques. Introduction to standard libraries and third-party libraries, installing and uninstalling libraries. Control Structures & Functions <ul style="list-style-type: none"> • Conditional statements (if, if-else, if-elif-else), nested conditions • Loops (for loop, while loop). • Break and continue statements. • Defining and calling functions, passing arguments and returning values. • Writing modular programs for simple pharmaceutical applications- dosage 	6

	calculation and BMI calculation.	
III	Data Structures & File Handling <ul style="list-style-type: none"> • Lists, tuples, and dictionaries. • Indexing and slicing lists, basic operations on lists and dictionaries, string manipulation techniques. • Introduction to NumPy arrays, basic operations using NumPy (array creation, arithmetic operations). • Reading and writing CSV files. • Understanding structured healthcare datasets. • Importing small pharmaceutical datasets and performing basic data access and manipulation tasks. 	6
IV	Data Handling with Pandas <ul style="list-style-type: none"> • Introduction to Pandas library. • Pandas Series and DataFrame structures. • Reading CSV and Excel files-PK study datasets and ADR reports • Inspecting datasets using functions such as head (), tail (), info (), and describe (). • Data cleaning techniques and handling missing values. • Filtering and selecting data based on conditions. • Grouping data and performing aggregation functions. 	6
V	Data Visualization with Matplotlib <ul style="list-style-type: none"> • Introduction to Matplotlib. • Creating line plots, histograms, scatter plots, and box plots. • Labeling axes, titles, and legends. • Create plots and visualize pharmaceutical datasets - concentration-time curves for oral and IV administration, ADR reporting rates across drugs, dissolution profiles. • Scientific interpretation of plots. 	6

Recommended References (Preferably latest editions):

1. McKinney, W. 2022, Python for Data Analysis: Data Wrangling with Pandas, NumPy, and Jupyter, 3rd Edition, O'Reilly Media, Sebastopol.
2. Lutz, M. 2013, Learning Python, 5th Edition, O'Reilly Media, Sebastopol.
3. Matthes, E. 2023, Python Crash Course: A Hands-On, Project-Based Introduction to Programming, 3rd Edition, No Starch Press, San Francisco.
4. VanderPlas, J. 2016, Python Data Science Handbook: Essential Tools for Working with Data, O'Reilly Media, Sebastopol.
5. Wes McKinney. 2018, Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython, 2nd Edition, O'Reilly Media, Sebastopol.

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Program : B. Pharmacy	Class : First Year			Semester : 1
Course Code	Course Title			Course Type
BP102T	General Pharmacy (Theory)			Core
Credit	Hours Per Week (L-T-P)			Max. Hours
	L	T	P	
3	3	-	-	45
Maximum Marks	ISE			ESE
75	30			45

Course Objectives:

1. Provide knowledge about evolution and development of Pharmacy profession in India and the growth of the Pharmaceutical Industries over the years.
2. Provide understanding of different types of pharmacopoeias and other official books in maintaining the standards of medicines.
3. Provide knowledge about the basic pharmaceutical calculations used in dispensing and compounding.
4. Understand the role of active pharmaceutical ingredients and pharmaceutical excipients in drug formulations
5. Impart basic knowledge about formulation and preparation of various solid, liquid and semisolid dosage forms.

COURSE OUTCOME (CO):

CO No.	Upon completion of this course, the students will able to:
1	Describe the history and evolution of the pharmacy profession, including Pharmacopeia practices, prescription handling and pharmaceutical incompatibilities.
2	Perform accurate pharmaceutical calculations required in the formulation and preparation of various types of dosage forms.
3	Explain the properties and functions of pharmaceutical excipients and demonstrate the methods of preparation of solid dosage forms.
4	Illustrate the formulation principles of monophasic and biphasic liquid dosage forms by analyzing the role of excipients and methods of preparation.
5	Compare and evaluate the formulation of semisolid dosage forms based on the types of bases, excipients, and preparation methods.

COURSE CONTENT

Unit	Topic	Hours
I	Introduction to the Profession of Pharmacy <ul style="list-style-type: none"> History of the Profession of Pharmacy in India: In relation to pharmacy education, pharmaceutical industries and organizations – evolution, development and milestones. Scope of the Pharmacy Profession: Role and responsibilities of pharmacists in retail/community pharmacy, hospital and clinical pharmacy, and industrial pharmacy including research and development. Pharmacopoeias: Introduction to IP, BP, USP, BPC, International Pharmacopoeia, other pharmacopoeias and the National Formulary of India; structure and content of the Indian Pharmacopoeia; study of one model IP monograph. Introduction to Prescription: Structure and format/parts of prescription, handling of prescriptions, Latin terminology related to prescriptions. Introduction of incompatibility and their types 	9
II	Introduction to Pharmaceutical Calculations and Dosage Forms <ul style="list-style-type: none"> Metric system of weights and measures; calculations based on allegation, proof spirit, isotonic solutions, dilute solutions (percentage and ratio) and geometric dilution; scientific notation of units and measures. Posology: Definition and dose calculation based on age, body weight and body surface area. Introduction to Dosage Forms: Routes of administration and classification of dosage forms. Introduction to Active Pharmaceutical Ingredients and Excipients: Definition, ideal characteristics and importance. 	9
III	Solid Dosage Forms <ul style="list-style-type: none"> Powders: Classification, advantages and disadvantages; dusting powders, effervescent powders, efflorescent powders, hygroscopic powders and eutectic mixtures; introduction to excipients and methods of preparation. Tablets: Definition, types of tablets including molded tablets and pills with examples; advantages and disadvantages; introduction to excipients and methods of preparation. Capsules: Definition, types of capsules, advantages and disadvantages, capsule sizes; introduction to excipients and methods of preparation. 	9
IV	Monophasic and Biphasic Liquids <ul style="list-style-type: none"> For internal use – Solutions, aromatic waters, syrups, elixirs and linctus (definition and preparation). For external use and body cavities – liniments, lotions, throat paints, applications, gargles, mouthwashes, enemas, eye drops, ear drops, nasal drops and tinctures with examples. 	9

	<ul style="list-style-type: none"> • Study of official preparations- Introduction to excipients and methods of preparation. • Suspensions- Definition and types (flocculated and deflocculated), advantages and disadvantages, formulation excipients and general methods of preparation. • Emulsions- Definition and types, emulsifying agents, tests for identification of types of emulsions, formulation excipients and general methods of preparation. 	
V	<p>Semisolid Dosage Forms</p> <ul style="list-style-type: none"> • Definitions, classification, advantages and disadvantages, ointment bases and other excipients used in semisolid dosage forms; general methods of preparation of ointments, pastes, creams and gels. • Suppositories/Pessaries: Definition, types of suppositories, advantages and disadvantages, formulation excipients used in suppositories, properties of ideal suppository bases, types of suppository bases, displacement value and general method of preparation. 	9

References (Preferably Latest Editions):

1. Ansel HC, Popovich NG. Pharmaceutical dosage forms and drug delivery systems. Lippincott Williams & Wilkins, New Delhi.
2. Gunn C, Carter SJ. Dispensing for Pharmaceutical students. CBS Publisher, New Delhi.
3. Indian Pharmacopoeia Commission, Indian Pharmacopoeia. Ghaziabad.
4. Indian Pharmacopoeia Commission, National Formulary of India. Ghaziabad, India.
5. British Pharmacopoeia Commission, British Pharmacopoeia. London.
6. United States Pharmacopeial Convention, United States Pharmacopeia (USP–NF). Rockville, Maryland, USA.
7. Lachman L, Lieberman HA, Kanig JL. The theory and practice of industrial pharmacy. Philadelphia: Lea & Febiger, University of Michigan.
8. Remington JP. Remington: the science and practice of pharmacy. Lippincott Williams & Wilkins, New Delhi
9. Jain SK. Bentley's Textbook of Pharmaceutics. Elsevier health sciences, USA.
10. Nieloud F, Marti-Mestres G, Pharmaceutical emulsions and suspensions. Marcel Dekker, Inc., New York.

**AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)**

Program : B. Pharmacy	Class: First Year			Semester : 1
Course Code	Course Title			Course Type
BP103T	Healthcare Psychology and Communication Skills (Theory)			Core 3
Credits	Hours Per Week (L-T-P)			Max Hours
	L	T	P	
1	1	--	--	15
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

1. Introduce the fundamental concepts and branches of psychology relevant to healthcare.
2. Help students understand human behavior, development, and psychological responses to illness.
3. Develop awareness of common psychological disorders and coping mechanisms in healthcare contexts.
4. Equip students with effective health communication skills for clinical and community settings
5. Promote professional interaction with patients, caregivers, and healthcare teams through ethical and empathetic communication.

COURSE OUTCOME (CO):

CO No.	Upon completion of the course student shall be able to
1	Explain the fundamental concepts of psychology and their relevance in healthcare settings
2	Describe the stages of human development, personality traits, and behavioral responses associated with illness and recovery.
3	Apply effective communication models and techniques in clinical and interdisciplinary healthcare scenarios
4	Demonstrate professional communication skills including active listening, empathetic interaction and accurate clinical documentation.
5	Analyze psychological and behavioral interventions that promote mental health, treatment adherence, and stigma reduction.

COURSE CONTENT:

Unit	Topic	Hours
I	Introduction to Psychology in Healthcare Definition, scope, and relevance of psychology in health sciences. Branches of psychology with healthcare relevance: clinical, health, behavioural, and developmental psychology. Sensation, perception, and attention in clinical assessment. Learning and memory: reinforcement in health behavior change. Emotion and motivation: theories and implications in health contexts.	3
II	Developmental and Behavioural Psychology Human developmental stages and healthcare needs. Personality theories and patient interaction styles. Psychological factors affecting illness perception and recovery. Common psychological disorders in healthcare: anxiety, depression, and somatization. Coping strategies, resilience, and stress management techniques.	3
III	Foundations of Health Communication Elements and models of communication in healthcare. Types of communication: interpersonal, group, mass, and telehealth communication. Barriers to effective communication in clinical settings. Active listening, questioning techniques, and empathy. Culturally appropriate and inclusive communication.	3

IV	Professional Communication in Healthcare Settings Communication with patients, caregivers, and interdisciplinary teams. Delivering difficult news and handling emotionally charged situations. Legal and ethical issues in health communication (confidentiality, consent). Writing patient records, reports, and discharge summaries. Use of technology and digital communication tools in healthcare services	3
V	Health Psychology and Behavioural Interventions Health belief models and illness behaviour. Psychosomatic illnesses and the mind–body connection. Behaviour change theories (e.g., CBT, TTM) in treatment adherence. Psychological first aid and crisis communication. Mental health promotion and stigma reduction through communication.	3

Reference Books

1. Feldman, R.S., Understanding Psychology. McGraw-Hill Education, New York.
2. Taylor, S.E., Health Psychology. McGraw-Hill Education, New York.
3. Hargie, O., The Handbook of Communication Skills. Routledge, London.
4. Nevid, J.S., Rathus, S.A. and Greene, B., Psychology and the Challenges of Life: Adjustment and Growth. Wiley, New York.
5. Atkinson, R.L., Atkinson, R.C., Smith, E.E., Bem, D.J. and Nolen-Hoeksema, S., Introduction to Psychology. Wadsworth Publishing, Belmont.
6. Kumar, A., Communication Skills for Health Professionals. Jaypee Brothers Medical Publishers, New Delhi.
7. Park, K., Park's Textbook of Preventive and Social Medicine. Banarsidas Bhanot Publishers, Jabalpu

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Program : B. Pharmacy			Class: First Year		Semester : 1
Course Code	Course Title			Course Type	
BP104T	Human Anatomy, Physiology and Pathophysiology I (Theory)			Core 5	
Credits	Hours Per Week (L-T-P)			Max Hours	
	L	T	P		
4	4	--	--	60	
Maximum Marks	ISE			ESE	
100	40			60	

COURSE OBJECTIVES:

1. Understand the structural organization of the human body from cells to systems.
2. Comprehend physiological functions of various body systems and the principles of homeostasis.
3. Learn the cellular basis of disease including injury, adaptation, and inflammation.
4. Recognize common pathological conditions related to skin, bones, joints, blood cardiovascular system, and special senses.
5. Establish the groundwork for clinical interpretation of symptoms and disease mechanisms relevant to pharmacy and therapeutics.

COURSE OUTCOME (CO):

CO No.	Upon successful completion of this course, the students will be able to:
1	Explain the fundamental concepts of Human Anatomy, Physiology and Pathophysiology.
2	Explain the gross morphology, structure and functions of various organs of the human body
3	Understand the etiology and pathogenesis of diseases/disorders associated with integumentary system, peripheral nervous system and cardiovascular system.
4	Understand the basic mechanism behind inflammation
5	Identify and differentiate the various tissues and organs of different systems of human body.

COURSE CONTENT:

Unit	Topics	Hours
I	<p>Introduction to human body Cellular and tissue level of organization. Definition and scope of anatomy, physiology and pathophysiology. Levels of structural organization and body systems, basic life processes, homeostasis, basic anatomical terminologies. Structure and functions of cell, transport across cell membrane, cell division, cell junctions. General principles of cell communication, forms of intracellular signalling a) Contact-dependent, b) Paracrine, c) Synaptic, d) Endocrine Classification of tissues, structure, location and functions of epithelial, muscular and nervous and connective tissues.</p> <p>Basic principles of cell injury and adaptation Components and types of feedback systems, causes of cellular injury, pathogenesis (cell membrane damage, mitochondrial damage, ribosome damage and nuclear damage), morphology of cell injury – adaptive changes (atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia), cell swelling, intra cellular accumulation and cell death. Definitions of commonly used relevant medical terminologies.</p>	12

II	<p>Integumentary system and wound healing Structure and functions of skin. Skin disorders: Psoriasis and dermatitis and pathophysiology of Leprosy. Basic principles of wound healing.</p> <p>Skeletal system and joints Divisions of skeletal system, types of bones, salient features and functions of bones of axial and appendicular skeletal system. Organization of skeletal muscle, physiology of muscle contraction, neuromuscular junction. Structural and functional classification of joints.</p> <p>Diseases of bones and joints Pathophysiology of rheumatoid arthritis, osteoporosis and gout.</p>	12
III	<p>Body fluids, blood and lymphatic system Body fluids, composition and functions of blood, hemopoiesis, formation of haemoglobin, mechanisms of coagulation, blood grouping, Rh factors and transfusion. Lymphatic organs and tissues, lymphatic vessels, lymph formation, circulation and functions of lymphatic system.</p> <p>Basic mechanism of inflammation and repair Introduction, classification and pathophysiology of inflammation, mediators of inflammation.</p> <p>Haematological diseases Pathophysiology of iron deficiency, megaloblastic anaemia (Vit B12 and folic acid), sickle cell anaemia, Thalassemia, hereditary acquired anaemia and haemophilia</p>	12
IV	<p>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.</p> <p>Special senses Structure and functions of eye, ear, nose and tongue. Pathophysiology of special sense disorders- glaucoma, cataract, myopia, otitis externa, otitis media, vertigo and anosmia</p>	12
V	<p>Cardiovascular system Anatomy of heart, blood circulation, blood vessels, structure and functions of artery, vein and capillaries, elements of conduction system of heart and heartbeat, its regulation by autonomic nervous system, cardiac output, cardiac cycle. Regulation of blood pressure, pulse, electrocardiogram. Pathophysiology of hypertension, cardiac arrhythmias, congestive heart failure, ischemic heart disease (angina, myocardial infarction, atherosclerosis and coronary artery disease).</p>	12

Reference Books

1. Wilson, K.J.W., Ross and Wilson Anatomy and Physiology in Health and Illness. Churchill Livingstone, New York.
2. Tortora, G.J. and Grabowski, S.R., Principles of Anatomy and Physiology. Palmetto, GA, U.S.A.
3. Guyton, A.C. and Hall, J.E., Textbook of Medical Physiology. Elsevier.
4. Chatterjee, C.C., Human Physiology (Vol. I & II). Academic Publishers, Kolkata.
5. Mohan, H., Textbook of Pathology. Jaypee Publishers.
6. Porth, C.M., Pathophysiology: Concepts of Altered Health States. Lippincott Williams & Wilkins.
7. Kumar, V., Abbas, A.K., Aster, J.C. and Deyrup, A.T., Robbins and Kumar Basic Pathology. Elsevier
8. Sembulingam, K. and Sembulingam, P., Essentials of Medical Physiology. Jaypee Brothers Medical Publishers, New Delhi.
9. Kumar, V., Cotran, R.S. and Robbins, S.L., Basic Pathology. W.B. Saunders Company, Philadelphia.

Program: B. Pharmacy	Class: First Year			Semester: I
Course Code	Course Title			Core
BP105T	Introduction to Pharmacognosy (Theory)			7
Credit	Hours Per Week (L-T-P)			Max. Hours
	L	T	P	
3	3	-	-	45
Maximum Marks	ISE			ESE
75	30			45

COURSE OBJECTIVES:

1. Explain the origin, history, and classification of natural drugs.
2. Understand cultivation and conservation methods for medicinal plants.
3. Study quality control and evaluation of crude drugs.
4. Study primary and secondary metabolites with their therapeutic relevance
5. Introduce traditional systems of medicine and Phyto-therapeutic agents.

COURSE OUTCOME (CO):

CO No.	Upon successful completion of this course, the students will be able to:
1	Describe the historical development, classification, and scope of Pharmacognosy.
2	Explain cultivation, processing, and conservation techniques for medicinal plants.
3	Apply quality evaluation methods to crude drugs using organoleptic, microscopic, and chemical parameters.
4	Identify primary and secondary metabolites with their therapeutic relevance.
5	Recognize traditional systems of medicine and commonly used Phyto-therapeutic agents.

COURSE CONTENTS:

Unit	Topics	Hours
I	Fundamentals of Pharmacognosy (a) Definitions, history, present status, scope and development of pharmacognosy. (b) Sources of drugs: Plants, animals, microbial, marine, mineral and plant tissue culture. (c) Historical milestones in drug discovery: Morphine, quinine, aspirin, warfarin, penicillin, cephalosporin, taxol and artemisinin. (d) Introduction to different herbal / traditional pharmacopoeias: Indian Pharmacopoeia, British Herbal Pharmacopoeia, United States Pharmacopoeia –Herbal Medicines and Dietary Supplements, Ayurvedic Pharmacopoeia of India, Unani Pharmacopoeia of India and American Herbal Pharmacopoeia. e) Official and non-official; codified and non-codified drugs. Classification of crude drugs: alphabetical, morphological, taxonomical, chemical, pharmacological and chemotaxonomic classification along with their merits and limitations.	10

II	<p>Cultivation, Collection, Processing and Storage of Drugs of Natural Origin Methods of plant cultivation and Good Agricultural and Collection Practices (WHO/ GAP / GCP guidelines) for medicinal plants. Factors influencing cultivation, collection and storage of medicinal plants.</p> <p>Plant hormones and their applications in cultivation of medicinal plants. Application of polyploidy, mutation and hybridization concepts with reference to secondary metabolites. Ex-situ and in-situ conservation and strategies for value addition of medicinal plants. Role of eco-pharmacognosy in sustainable conservation of endangered medicinal plants such as kutki and chirata.</p>	8
III	<p>Quality Control of Drugs of Natural Origin (WHO Guidelines) Adulteration of drugs of natural origin. Evaluation of drugs using organoleptic, microscopic (qualitative and quantitative), physical, chemical and biological methods. Physicochemical parameters: extractive values, moisture content, foreign organic matter, ash values, bitterness value, foaming index, haemolytic potential, swelling index, viscosity, optical rotation, refractive index, acid value and saponification value. DNA barcoding.</p>	8
IV	<p>Introduction to Metabolites of Plant Origin: Definition and general properties of plant metabolites. Primary and secondary metabolites such as carbohydrates, proteins, lipids, alkaloids, glycosides, flavonoids, tannins, terpenoids, volatile oils and resins.</p> <p>Traditional Systems of Medicine Basic principles of treatment of diseases in different systems of medicine including AYUSH and TCM. Types of dosage forms in AYUSH medicines. Role of pharmacognosy in allopathy and traditional systems of medicine such as AYUSH and TCM.</p>	12
V	<p>Phyto-therapeutic Agents: Biological source, major constituents and uses of the following classes of drugs:</p> <ul style="list-style-type: none"> • Adaptogens and Immunomodulators: Ashwagandha, Tulsi, Amla • Hepatoprotectives: Milk thistle, Kutki • Cardiovascular drugs: Garlic, Arjuna • Antidiabetics: Gymnema, Fenugreek • Anti-inflammatory and analgesics: Turmeric, Boswellia • CNS drugs: Brahmi • Antimicrobial and antivirals: Giloy, Neem, Andrographis • Gastrointestinal drugs: Psyllium • Dermatological agents: Aloe • Drugs used in women's health: Chasteberry, Shatavari • Respiratory drugs: Vasaka 	7
<p>Recommended References (<i>Preferably latest editions</i>):</p> <ol style="list-style-type: none"> 1. Evans, W. C., Trease and Evans Pharmacognosy. 16th ed. London: W.B. Saunders & Co., 2009. 2. Tyler, V.E., Brady, L.R. and Robbers, J.E., Pharmacognosy. 9th ed. Philadelphia: Lea & Febiger, 1988. 3. Wallis, T.E., Textbook of Pharmacognosy. London: J.&A. Churchill Ltd. 4. World Health Organization (2002) WHO traditional medicines strategy 2002-2005. Geneva: World Health Organization 5. World Health Organization (1998) Quality control methods for medicinal plant materials. Geneva: World Health Organization. 6. World Health Organization (2003) WHO guidelines on good agricultural and collection practices (GACP) for medicinal plants. Geneva: World Health Organization. 		

Program : B. Pharmacy	Class: First Year			Semester : 1
Course Code	Course Title			Course Type
BP106T	Pharmaceutical Inorganic and Analytical Chemistry (Theory)			Core
Credit	Hours Per Week (L-T-P)			Max. Hours
	L	T	P	
3	3	--	--	45
Maximum Marks	ISE			ESE
75	30			45

COURSE OBJECTIVES:

The Understand the importance of errors, impurities in pharmaceuticals.

1. Comprehend the principles of buffer systems.
2. Develop skills in performing and interpreting limit tests and titrimetric analysis.
3. Emphasize the importance of inorganic compounds and radiopharmaceuticals in Pharmacy
4. Explain synthesis and analysis of inorganic compounds/products of pharmaceutical importance

COURSE OUTCOMES (CO):

CO No.	Upon successful completion of this course, the students will be able to:
1	Identify sources and types of errors in pharmaceutical analysis, and impurities products
2	Apply concepts of acid-base chemistry, buffer systems with importance of electrolytes
3	Describe and differentiate various analytical techniques used in pharmaceutical analysis, including titrimetric methods, and their specific applications in quality assessment.
4	Analyze the properties, mechanisms, and therapeutic uses of gastrointestinal agents, antimicrobials and radiopharmaceuticals illustrating their roles in therapy and safety considerations.
5	Describe the drugs used as expectorants, emetics, Haematinics, poisons and antidotes, astringents, topical agents and dental products

COURSE CONTENT:

Unit	Topic	Hours
I	Introduction to pharmaceutical analysis Different techniques of analysis, Methods of expressing strength of solutions, Primary and secondary standards with examples.	7
	Errors Sources of errors, types of errors, methods of minimizing errors, accuracy, precision and significant figures.	
	Impurities Definition, types, contents and regulatory importance. Sources and types of impurities in Pharmaceuticals, limit tests for chloride, sulphate, iron, arsenic, lead, heavy metals, and modified limit test for chloride and sulphate.	
	General methods of preparation and assay for compounds superscripted with an asterisk (*), Properties and Medicinal uses of Inorganic Compounds belonging to the following classes	

II	<p>Acid-Base Chemistry and Buffer Systems in Pharmacy</p> <p>Definition of acids, bases, principles of acid-base titrations, buffers, pH Scale, measurement of pH and its significance, Buffer equation (Henderson-Hasselbalch equation), buffer solution. Isotonicity and its application in IV Fluids and Ophthalmic Solutions.</p> <p>Major extra and intracellular electrolytes</p> <p>Functions of major physiological ions, Electrolytes used in the replacement therapy: Sodium chloride*, Potassium chloride, Calcium chloride and Oral Rehydration Salt (ORS), Physiological acid base balance.</p>	8
III	<p>Acid base titrations</p> <p>Theories of acid base indicators, classification of acid base titrations. Preparation and standardization of titrants viz. hydrochloric acid and sodium hydroxide. Theory involved in titrations of strong, weak, and very weak acids and bases, neutralization curves. Assay of Ammonium hydroxide.</p> <p>Non-aqueous titrations</p> <p>Types of solvents used, acidimetric and alkalimetric titration using non-aqueous solvents. Preparation and standardization of acidic and basic titrants. Estimation of weakly acidic and basic substances using non-aqueous titrants, estimation of Sodium benzoate.</p> <p>Precipitation titrations and gravimetry</p> <p>Principle and steps involved in gravimetric analysis, Mohr's method, Volhard's, Modified Volhard's, Fajans method. Estimation of barium sulphate by gravimetry.</p> <p>Complexometric titrations</p> <p>Classification, metal ion indicators, masking and demasking reagents, preparation and standardization of disodium EDTA. Estimation of Magnesium sulphate and Calcium gluconate*.</p> <p>Redox titrations</p> <p>Concepts of oxidation and reduction, Types of redox titrations viz. Permanganometry, Cerimetry, Iodimetry, Iodometry and titrations with potassium iodate.</p>	14
IV	<p>Gastrointestinal agents</p> <p>Acidifiers: Sodium acid phosphate and Dilute Hydrochloric acid.</p> <p>Antacids: Ideal properties of antacids, combinations of antacids, Sodium bicarbonate*, Aluminium hydroxide gel*.</p> <p>Agents promote bowel movements: Magnesium hydroxide, Sodium orthophosphate, Sodium Potassium tartrate and magnesium trisilicate. Antimicrobials: Mechanism, classification, Potassium permanganate, Boric acid, Hydrogen peroxide*, Chlorinated lime*, Iodine and its preparations.</p> <p>Radiopharmaceuticals</p> <p>Basics of radioactivity, applications of radioisotopes of Sodium Iodide I-131, Technetium-99 m, Cobalt-60, Phosphorus-32 including safe handling, storage, and disposal of radiopharmaceuticals adhering to regulatory guidelines for safety.</p>	10

V	<p>Miscellaneous Compounds</p> <p>Expectorants: Potassium iodide, Ammonium chloride*.</p> <p>Emetics: Copper sulphate*, Sodium potassium tartrate.</p> <p>Haematinics: Ferrous sulphate*, Ferrous gluconate.</p> <p>Poisons and Antidotes: Definition, classification of antidotes, Sodium Thiosulphate</p> <p>Astringents: Alum (Potash Alum), Zinc Sulfate (ZnSO₄)</p> <p>Topical agents: Zinc Oxide (ZnO), Titanium Dioxide (TiO₂)</p> <p>Dental Products: Dentifrices, role of fluoride in the treatment of dental caries, Desensitizing agents, Calcium carbonate, Sodium fluoride, Zinc eugenol cement</p>	06
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Recommended References (Preferably latest editions):

1. Block, J.H., Roche, E.B., Soine, T.O and Wilson, C.O. 1974, Inorganic Medicinal and Pharmaceutical Chemistry, Philadelphia
2. Bentley, R. and Driver, J., Bentley and Driver's Textbook of Pharmaceutical Chemistry. Oxford: Oxford University Press.
3. Vogel, A.I., Vogel's Textbook of Quantitative Chemical Analysis. Essex: Pearson Education Limited.
4. Beckett, A.H. and Stenlake, J.B., Practical Pharmaceutical Chemistry. Part I & II. London: The Athlone Press, University of London.
5. Schroff, M.L., Inorganic Pharmaceutical Chemistry. New Delhi: Oxford Book Company
6. Indian Pharmacopoeia Commission, Indian Pharmacopoeia. Ghaziabad, India.

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

Program : B. Pharmacy	Class : First Year			Semester : 1
Course Code	Course Title			Course Type
BP107P	General Pharmacy (Practical)			Core
Credit	Hours Per Week (L-T-P)			Max. Hours
	L	T	P	
1	-	-	3	45
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

1. Familiarize students with essential pharmaceutical calculations including dilution, concentration, and allegation methods required for accurate formulation of dosage forms.
2. Impart practical skills in the preparation of official and non-official dosage forms such as solutions, syrups, powders, granules, suppositories, semisolids, gargles, and mouthwashes in accordance with pharmacopeial standards.
3. Develop understanding of formulation principles related to selection of ingredients, dosage form design, stability, and patient acceptability.
4. Train students in the application of pharmacopoeial specifications (IP, BPC, WHO) during compounding, labeling, and evaluation of pharmaceutical preparations.
5. Enhance hands-on competency and professional confidence required for dispensing practice and pharmaceutical compounding in hospital and community pharmacy settings.

COURSE OUTCOME (CO):

CO No.	Upon completion of this course, the students will able to:
1	Perform accurate pharmaceutical calculations using dilution and allegation principles for the preparation of various dosage forms.
2	Formulate solid dosage forms including powders, divided powders, dusting powders, and effervescent granules as per standard pharmacopeial guidelines, with appropriate labeling and patient-centric considerations.
3	Prepare and dispense liquid dosage forms such as solutions, syrups, gargles, and mouthwashes following official pharmacopeial procedures, with appropriate labeling and patient-centric considerations.
4	Prepare semisolid and specialized dosage forms such as ointments, liniments, and suppositories using appropriate bases and techniques, following pharmacopeial requirements and incorporating appropriate labeling and patient-centric considerations.

COURSE CONTENT:

List of practicals
<ol style="list-style-type: none"> 1. Pharmaceutical Calculations Solutions based on allegation and dilution methods 2. Powders & Granules <ol style="list-style-type: none"> a) ORS powder – WHO b) Effervescent granules – IP c) Dusting powder – IP d) Divided powders – IP 3. Solutions <ol style="list-style-type: none"> a) Strong solution of ammonium acetate – IP b) Cresol with soap solution – IP c) Lugol's solution – BPC 4. Gargles & Mouthwashes <ol style="list-style-type: none"> a) Iodine gargle – BPC

- b) Chlorhexidine mouthwash – IP
- 5. Syrups**
- a) Simple Syrup – IP
- 6. Suppositories**
- a) Glycerogelatin suppository – BPC
- b) Cocoa butter suppository – IP
- c) Zinc Oxide suppository – IP
- 7. Semisolids**
- a) Sulphur ointment – IP
- b) Non-staining iodine ointment with methyl salicylate – BPC

Note:

- a) *Preparation of compendia of dosage forms (marketed products), is recommended.*
- b) *Any other practical relevant to the syllabus can be introduced.*
- c) *Minimum 12 experiments must be performed covering all dosage forms.*

References (Preferably Latest Editions):

1. Gunn C, Carter SJ. Dispensing for Pharmaceutical students. CBS Publishers, New Delhi.
2. Indian Pharmacopoeia Commission, Indian Pharmacopoeia, Ghaziabad.
3. United States Pharmacopeial Convention, United States Pharmacopeia–National Formulary (USP–NF). Rockville, MD, USA.
4. British Pharmacopoeia Commission, British Pharmacopoeia Codex. London: The Stationery Office.
5. World Health Organization, Oral Rehydration Salts (ORS) Formulation Guidelines. Geneva: WHO

Program : B. Pharmacy	Class: First Year			Semester : 1
Course Code	Course Title			Course Type
BP108P	Healthcare Psychology and Communication Skills (Practical)			Core 4
Credit	Hours Per Week (L-T-P)			Max. Hours
	L	T	P	
1	--	--	2	30
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

1. To develop effective communication skills essential for diverse clinical and community health scenarios.
2. To enhance empathetic interaction through role plays, simulations, and reflective practices.
3. To promote collaborative learning and peer feedback in Communication-based tasks.
To encourage application of psychological principles in real-life healthcare contexts.
4. To build confidence in delivering health education and awareness activities in community settings.

COURSE OUTCOME (CO):

CO No.	Upon completion of course student will able to
1	Demonstrate patient-centered communication through role plays and clinical simulations.
2	Analyze healthcare communication challenges using case study discussions.
3	Practice reflective listening, paraphrasing, and team-based communication strategies.
4	Design and deliver effective health education messages for the community.
5	Reflect on personal emotional growth and improvement in communication competencies.

List of Practicals	
1	Role Plays and Simulations Counselling a patient with chronic illness Breaking bad news in a clinical setting Empathetic listening in crisis response
2	Case Study Discussions Mental health cases in primary care Impact of miscommunication in healthcare errors
3	Peer-to-Peer Practice Sessions Reflective listening and paraphrasing Effective team communication and decision-making
4	Community Engagement Tasks Designing IEC materials for public health awareness Conducting mock health education sessions
5	Journaling & Self-Reflection Logs Weekly reflection on emotional responses during care simulations Growth in communication skill development over the semester

Recommended References (*Preferably Latest Editions*):

1. Morgan, C.T. and King, R.A., *Introduction to Psychology*. New York: McGraw-Hill.
2. Taylor, S.E., *Health Psychology*. New York: McGraw-Hill Education.
3. Hargie, O., *Skilled Interpersonal Communication: Research, Theory and Practice*.
London: Routledge.
4. Balzer-Riley, J., *Communication in Nursing and Healthcare*. Boston: Pearson.
5. Weinman, J., Petrie, K.J. and Moss-Morris, R., *The Psychology of Health and Illness*.
London: Routledge.

Program : B. Pharmacy	Class: First Year			Semester : 1
Course Code	Course Title			Course Type
BP109P	Human Anatomy, Physiology & Pathophysiology- I (Practical)			Core 6
Credits	Hours Per Week (L-T-P)			Max Hours
	L	T	P	
1	--	--	3	45
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

1. Provide fundamental knowledge of the structure and functions of various organ systems of the human body
2. Understand the mechanisms of homeostasis and their role in maintaining normal physiological functions.
3. Introduce the basic concepts of pathophysiology and the causes of diseases affecting different organ systems.
4. Explain the body's physiological responses to disease-producing agents.
5. Lay the foundation for understanding clinical conditions through the study of functional alterations in organs and systems.

COURSE OUTCOME (CO):

CO No.	Upon successful completion of this course, the students will be able to
1	Explain the principles, applications, and experimental use of microscopy techniques, and perform basic laboratory experiments related to the nervous system and special senses.
2	Describe the gross morphology, microscopic structure, and coordinated functioning of major human organs and organ systems, emphasizing their roles in maintaining normal physiology.
3	Estimate and interpret key hematological parameters, and explain the mechanisms of homeostasis along with related physiological and pathological disorders
4	Discuss the etiology and pathogenesis of selected disease states, linking structural and functional changes to clinical manifestations.
5	Identify and explain common diseases with respect to their signs and symptoms, risk factors, diagnostic methods, preventive measures, treatment strategies, and possible complications.

COURSE CONTENT:

Sr No.	List of Practical
<i>(Minimum of 12 experiments must be performed)</i>	
Practical HAPP allows the verification of physiological processes discussed in theory classes through experiments on living tissues, simulated videos, models, and charts.	
1.	Study of compound microscopes.
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.	Demonstration of total blood count by cell analyser.
8.	Enumeration and interpretation of white blood cell (WBC) count, differential count.
9.	Enumeration and interpretation of total red blood corpuscles (RBC) count.
10.	Determination of bleeding time and clotting time
11	Estimation and interpretation of hemoglobin content.
12	Determination of blood group

**AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)**

13	Determination and interpretation of erythrocyte sedimentation rate (ESR).
14	Determination of pulse rate, heart rate and blood pressure.
15	Recording and interpretation of ECG.
16	To study the cardiovascular system and integumentary system
17	Case studies/files of patients with anaemia, thalassemia, haemophilia, leprosy, gout, hypertension and ischemic heart disease.

Recommended References (*Preferably latest editions*):

1. Wilson, K. J. W., and Waugh, A. *Anatomy and Physiology in Health and Illness*. Churchill Livingstone, New York.
2. Best, C. H., and Taylor, N. B. *The Physiological Basis of Medical Practice*. Williams & Wilkins, Baltimore.
3. Guyton, A. C., and Hall, J. E. *Textbook of Medical Physiology*. Elsevier / W.B. Saunders, Philadelphia.
4. Tortora, G. J., and Grabowski, S. R. *Principles of Anatomy and Physiology*. John Wiley & Sons.
5. Brunton, L., Chabner, B., and Knollmann, B. *Goodman & Gilman's The Pharmacological Basis of Therapeutics*. McGraw-Hill, New York.
6. Colledge, N. R., Walker, B. R., and Ralston, S. H. *Davidson's Principles and Practice of Medicine*. Churchill Livingstone, London.

Program: B. Pharm.	Class: First Year			Semester: I
Course Code	Course Title			Core
BP110P	Introduction to Pharmacognosy (Practical)			8
Credit	Hours Per Week (L-T-P)			Max. Hours
1	L	T	P	45
	-	-	3	
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

1. Identify medicinal plants and crude drugs using morphological and microscopical characters.
2. Analyze powdered drugs and perform quantitative microscopy.
3. Evaluate crude drugs using physicochemical parameters.
4. Introduce standardization and quality control of herbal materials.
5. Collect medicinal plants and prepare voucher specimens.

COURSE OUTCOME (CO):

CO No.	Upon successful completion of this course, the students will be able to:
1	Identify medicinal plants and crude drugs using morphological and microscopical characters.
2	Analyze powdered drugs microscopically to identify diagnostic cell contents.
3	Perform quantitative microscopy for stomatal and vein parameters.
4	Evaluate quality and purity of crude drugs using physicochemical parameters.
5	Collect medicinal plants and prepare voucher specimens during field visits.

COURSE CONTENTS:

List of Practicals	
<i>(Minimum 12 experiments must be performed)</i>	
1.	Morphological study of medicinal plants (as mentioned in Unit V Theory) and Experiential learning-based experiments involving collection, identification of medicinal plant material, preparation of voucher specimens and excursion visits to medicinal plant garden.
2.	Organoleptic evaluation and powder microscopical characters of the following drugs: Tulsi and Ashwagandha.
3.	Organoleptic evaluation and powder microscopical characters of the following drugs: Amla and Arjuna.
4.	Organoleptic evaluation and powder microscopical characters of the following drugs: Turmeric and Psyllium husk.
5.	Organoleptic evaluation and powder microscopical characters of the following drugs: Brahmi and Fenugreek.
6.	Determination of moisture content and foreign organic matter of crude drugs.
7.	Determination of swelling index and foaming index of crude drugs.
8.	Determination of stomatal number and stomatal index of leaf.
9.	Determination of vein islet and vein termination number of leaf.
10.	Determination of ash value and extractive values of crude drugs.
11.	Determination of dimensions of calcium oxalate crystals and phloem fibers by eyepiece micrometry.

12. Determination of percentage purity of powder drug using lycopodium spore method.

Recommended References (*Preferably Latest Editions*):

1. Evans, W.C., 2009. Trease and Evans Pharmacognosy. 16th ed. London: W.B. Saunders & Co.
2. Tyler, V. E., Brady, L. R. and Robbers, J. E., 1988. Pharmacognosy .9th ed. Philadelphia: Lea & Febiger.
3. Wallis, T. E., Textbook of Pharmacognosy. London:J. & A.Churchill Ltd.

Program : B. Pharmacy	Class: First Year			Semester : 1
Course Code	Course Title			Course Type
BP111P	Pharmaceutical Inorganic and Analytical Chemistry (Practical)			Core
Credit	Hours Per Week (L-T-P)			Max. Hours L
	L	T	P	
1	--	--	1	--
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

1. Gain practical knowledge on various volumetric titration techniques.
2. Learn the principles of volumetric analysis.
3. Study the preparation and assessment of inorganic compounds.
4. Determine the assay of various inorganic compounds in pharmaceutical use.
5. Develop analytical skill for the qualitative and quantitative analysis of various inorganic compounds.

COURSE OUTCOMES (CO):

CO No.	Upon successful completion of this course, the students will be able to:
1	Perform limit tests to detect and identify impurities in pharmaceutical substances.
2	Prepare various pharmaceutical inorganic compounds following standard procedures.
3	Analyze the significance of quality control in pharmaceutical products and raw materials and Compete in applying analytical skills to qualitative and quantitative data
4	Demonstrate proficiency in titrimetric analysis using different volumetric techniques.
5	Perform calibration of pH meter and measure pH
6	Compete in applying analytical skills to qualitative and quantitative data.

COURSE CONTENT:

List of Practicals
<p>1. Limit tests (Any 4 Experiments)</p> <p>a. Limit test and modified limit test for Chloride as per Indian Pharmacopoeia</p> <p>b. Limit test and modified limit test for sulphate as per Indian Pharmacopoeia</p> <p>c. Limit test for Iron</p> <p>d. Limit test for Lead</p> <p>e. Limit test for arsenic</p> <p>f. Limit tests for heavy metals</p> <p>2. Preparation of inorganic pharmaceuticals (Any 3 Experiments)</p> <p>a. Preparation of Aluminium hydroxide</p> <p>b. Preparation of potash alum</p> <p>c. Preparation of ferrous sulphate</p> <p>d. Preparation of Magnesium sulphate from magnesium hydroxide or magnesium carbonate</p> <p>3. Test for Purity (Any 2 Experiments)</p> <p>a. Assessment of swelling power of bentonite as per Indian Pharmacopoeia</p>

- b. Evaluation of acid neutralizing capacity of aluminium hydroxide gel
- c. Determination of potassium iodate and iodine in potassium Iodide
- 4. Assay of the following inorganic compounds including standardization of titrant (Any 5 Experiments)**
- a. Assay of ammonium chloride by acid base titration
- b. Assay of Ferrous sulphate by Cerimetry
- c. Assay of Copper sulphate by Iodometry
- d. Assay of Calcium gluconate by Complexometry
- e. Assay of Hydrogen peroxide by Permanganometry
- f. Assay of Sodium benzoate by non-aqueous titration
- g. Assay of Sodium Chloride by precipitation titration (Modified Volhard's method)
- 5. Calibration of pH meter and pH measurement techniques.**

Recommended References (Preferably latest editions):

1. Bentley, R. and Driver, J., Bentley and Driver's Textbook of Pharmaceutical Chemistry. Oxford: Oxford University Press
2. Vogel, A.I., Vogel's Textbook of Quantitative Chemical Analysis. Essex: Pearson Education Limited.
3. Beckett, A.H. and Stenlake, J.B., Practical Pharmaceutical Chemistry. Part I & II. London: The Athlone Press, University of London.
4. Kennedy, J.H., Analytical Chemistry: Principles. New York: Saunders College Publishing. Schroff, M.L., Inorganic Pharmaceutical Chemistry. New Delhi: Oxford Book Company.
5. Indian Pharmacopoeia Commission, Indian Pharmacopoeia. Ghaziabad, India.

SYLLABUS

SEMESTER II

Course Code	Name of the course		No. of hours per week (L/P)	Credit points
BP201T	Applied Biostatistics and Data Analytics for Pharmaceutical Sciences (Theory)		2	2
BP202T	Biochemistry (Theory)		3	3
BP203T	Human Anatomy, Physiology and Pathophysiology II (Theory)		4	4
BP204T	Pharmaceutical Organic Chemistry (Theory)		4	4
BP205T	Pharmacognosy and Phytochemistry (Theory)		4	4
BP206T	Physical Pharmaceutics (Theory)		3	3
BP207P	Biochemistry (Practical)		3	1
BP208P	Human Anatomy, Physiology and Pathophysiology II (Practical)		3	1
BP209P	Pharmaceutical Organic Chemistry (Practical)		3	1
BP210P	Pharmacognosy and Phytochemistry (Practical)		3	1
BP211P	Physical Pharmaceutics (Practical)		3	1
BP212P SEC*	BP212P SEC1	Communication Skills	2	1
	BP212P SEC2	Mental Well-Being, Stress & Conflict Management		
	BP212P SEC3	Fundamentals of Computer Operations		
Total			37	26

* Only one elective course shall be selected

The syllabi for elective subjects are given in the *appendix*

Program : B. Pharmacy	Class: First Year			Semester : 2
Course Code	Course Title			Course Type
BP201T	Applied Biostatistics and Data Analytics for Pharmaceutical Sciences (Theory)			Core 11
Credits	Hours Per Week (L-T-P)			Max Hours L
	L	T	P	
2	2	--	2	2
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

1. Explain fundamental statistical concepts relevant to pharmaceutical sciences.
2. Develop the ability to interpret clinical and experimental data scientifically.
3. Apply statistical methods for analyzing pharmaceutical and biomedical data.
4. Demonstrate the use of Python-based tools for statistical analysis and data handling.
5. Recognize the role of statistical analysis in evidence-based decision making and machine learning applications in healthcare.

COURSE OUTCOMES:

CO NO.	Upon completion of course student will able to
1	Classify pharmaceutical data using appropriate descriptive statistics.
2	Apply probability concepts and statistical distributions in clinical and pharmaceutical contexts
3	Perform sampling and hypothesis testing for decision-making in research.
4	Analyze correlation and regression relationships in pharmaceutical datasets.
5	Demonstrate statistical analysis using Python and interpret outputs appropriately.

Unit	Topic	Hours
I	Descriptive Statistics <ul style="list-style-type: none"> • Types of data in pharmaceutical sciences (nominal, ordinal, interval, ratio) • Sources of data in pharmacy: clinical trials, pharmacovigilance, quality control, PK studies • Measures of central tendency: mean, median, mode, their calculation and interpretation • Measures of dispersion (range, variance, standard deviation) and their interpretation using pharmaceutical data • Skewness and understanding distribution shape in biological measurements • Perform descriptive statistical analysis using Python libraries such as NumPy and Pandas, with focus on Interpretation of results 	6
II	Probability & Statistical Distributions in Healthcare <ul style="list-style-type: none"> • Basic probability concepts and laws (addition and multiplication rules), conditional probability and its interpretation • Bayes' theorem and its application in clinical decision-making • Concept of random variables (discrete and continuous) • Normal distribution and its importance in biological and pharmaceutical measurements, • Binomial distribution demonstrating applications in clinical trial 	6

	<p>outcomes</p> <ul style="list-style-type: none"> • Poisson distribution for modeling rare events such as adverse drug reactions • Graphical visualization of these probability distributions using Python 	
III	<p>Sampling & Statistical Inference</p> <ul style="list-style-type: none"> • Population versus sample, sampling techniques used in clinical research, Sampling error and bias • Conceptual understanding of the Central Limit Theorem • Confidence intervals and their interpretation • Hypothesis testing framework (null and alternative hypotheses) • Type I and Type II errors, p-value and statistical significance • Demonstration, calculation and interpretation of these parameters using python with pharmaceutical data 	6
IV	<p>Basics of Correlation & Regression</p> <p>Conceptual understanding of the following concepts with emphasis on their interpretation-</p> <ul style="list-style-type: none"> • correlation and Pearson correlation coefficients • Interpretation of positive and negative correlations • Scatter plots and trend visualization using pharmaceutical data such as dose-response relationships • Simple linear regression concept, interpretation of regression coefficients • Introduction to odds ratio and its application in clinical risk analysis 	6
V	<p>Statistical Analysis Using Python – Case based learning</p> <ul style="list-style-type: none"> • Demonstration of descriptive statistics, correlation analysis and linear regression using Python libraries- SciPy/Statsmodels/Scikit-learn on pharmaceutical datasets • Interpretation of the output summaries and p-values • Preparation of statistical reports 	6

Recommended References (*Preferably Latest Editions*):

1. Lane, D.M., Introduction to Statistics. Houston: Rice University. Available at: <https://onlinestatbook.com/2/index.html>
2. Walters, S.J., Campbell, M.J. and Machin, D., Medical Statistics: A Textbook for the Health Sciences. Hoboken, NJ: Wiley-Blackwell.
3. Rowe, P., Essential Statistics for the Pharmaceutical Sciences. London: Pharmaceutical Press.
4. Bolton, S. and Bon, C., Pharmaceutical Statistics: Practical and Clinical Applications. New York: Informa Healthcare.
5. De Muth, J.E., Basic Statistics and Pharmaceutical Statistical Applications. Boca Raton, FL: CRC Press.

Program : B. Pharmacy	Class: First Year			Semester : 2
Course Code	Course Title			Course Type
BP202T	Biochemistry (Theory)			Core
Credit	Hours Per Week (L-T-P)			Max. Hours L
	L	T	P	
3	3	--	3	3
Maximum Marks	ISE			ESE
75	30			45

COURSE OBJECTIVES:

1. Know about enzymology and various tests in clinical chemistry
2. Understand the biochemical pathways and clinical relevance of carbohydrate, lipid and protein metabolism.
3. Describe energetics and biological oxidation.
4. Explain amino acid and protein metabolism
5. Understand Nucleic acid metabolism and genetic information.

COURSE OUTCOMES (CO):

CO NO.	Upon completion of course student will able to
1	Explain the classification, properties, kinetics, regulation and therapeutic and diagnostic applications of enzymes, coenzymes, vitamins and minerals, and the commonly performed liver and renal function tests.
2	Explain the structure and biological functions of major biomolecules, bioenergetics, carbohydrate metabolism and biological oxidation, with their relevance to diabetes mellitus and oxidative stress.
3	Explain major classes of lipids and lipoproteins, and their role in lipid and cholesterol metabolism.
4	Understand amino acid and protein metabolism, urea cycle, neurotransmitter and hormone biosynthesis, and heme degradation, along with their associated metabolic disorders.
5	Understand nucleotide metabolism and the processes involved in DNA replication, transcription, translation and DNA repair, along with their clinical significance.

COURSE CONTENT:

Unit	Topic	Hours
I	Enzymology a. Introduction, properties, nomenclature, and IUB classification of enzymes and coenzymes. Enzyme kinetics (Michaelis plot, Lineweaver-Burk plot). Enzyme inhibitors with examples. Regulation of enzymes: enzyme induction and repression, allosteric enzyme regulation. Therapeutic and diagnostic application of enzymes and isoenzymes. Factors affecting enzyme activity. Digestion, absorption function of dietary Macro and Micronutrients, including Vitamins and Minerals, Biochemical functions of vitamins and associated diseases. b. Clinical Chemistry: Liver function tests (routinely performed tests based on liver function). Renal function tests (routinely performed tests based on kidney function,	10

	ELISA test)	
II	<p>a. Introduction about to biomolecules: Introduction of carbohydrate, lipids, nucleic acids, amino acids and proteins.</p> <p>b. Bioenergetics: Concept of free energy; relationship between free energy, enthalpy, and entropy; redox potential; energy-rich compounds (ATP, GTP, etc.) and their biological significance.</p> <p>c. Carbohydrate Metabolism and their role in diabetes mellitus: Overview and significance of major pathways: Glycolysis, Citric Acid Cycle (TCA), Gluconeogenesis, Hexose Monophosphate (HMP) shunt, and Glycogen metabolism; regulation of blood glucose levels; metabolic adaptations during fed state, fasting, and prolonged starvation; metabolic derangements in diabetes mellitus and related disorders.</p> <p>d. Biological Oxidation: Electron Transport Chain (ETC), oxidative phosphorylation, and mechanisms of ATP synthesis; regulation and clinical implications of mitochondrial dysfunction and oxidative stress.</p>	10
III	<p>Lipid metabolism</p> <p>a. Classification, functions, and properties of lipids and lipoproteins (HDL, LDL, VLDL, chylomicrons)</p> <p>b. β-oxidation and de-novo synthesis of fatty acids: Ketone bodies: synthesis, utilization, and clinical significance</p> <p>c. Biological significance of cholesterol, lipid profile, and its clinical significance</p> <p>d. Disorders associated with lipid metabolism: Hyperlipidemias and hypercholesterolemia, lipid storage diseases, atherosclerosis, fatty liver disease, and obesity</p>	7
IV	<p>Amino acids and protein metabolism</p> <p>a. Classification and Biological Functions: Classification and physiological roles of amino acids. Structure and functions of proteins and plasma proteins</p> <p>b. General Metabolism of Amino Acids: Transamination, oxidative and non-oxidative deamination, decarboxylation. Urea cycle – nitrogen disposal and detoxification. Fate of carbon skeletons of amino acids (glucogenic vs ketogenic).</p> <p>c. Catabolism of Specific Amino Acids and Related Disorders: Catabolism of phenylalanine and tyrosine and their metabolic disorders (Phenylketonuria, Albinism, Alkaptonuria, Tyrosinemia) and Inborn errors of branched chain and aromatic amino acids</p> <p>d. Biochemical significance of neurotransmitters and hormones derived from amino acids: 5-HT (serotonin), melatonin, dopamine, noradrenaline, adrenaline</p> <p>e. Catabolism of heme and related disorders (jaundice).</p>	10
V	<p>Nucleic acid metabolism and genetic information transfer</p> <p>a. Nucleotide Metabolism and their related disorders: Biosynthesis of purine and pyrimidine nucleotides. Catabolism of purine nucleotides (uric acid formation). Clinical significance of Hyperuricemia and Gout.</p>	8

	<p>b. Genome Structure and Central Dogma: Organization of the mammalian genome. Introduction to DNA replication, Transcription, and Translation.</p> <p>c. Genetic Code and Regulation of Protein Synthesis: Properties of the genetic code: Inhibitors of transcription and translation (antibiotics, toxins)</p> <p>d. DNA Repair and Related Disorders: DNA damage types, Repair mechanisms. Overview of clinical disorders associated with faulty DNA repair.</p>	
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Recommended References (Preferably latest editions):

1. Nelson, D.L., Cox, M.M. and Hoskins, A., Lehninger Principles of Biochemistry. New York: W.H. Freeman.
2. Kennelly, P.J., Rodwell, V.W., Bender, D.A., Botham, K.M. and Weil, P.A., Harper's Illustrated Biochemistry. New York: McGraw-Hill Education.
3. Murray, R.K., Bender, D.A., Botham, K.M., Kennelly, P.J., Rodwell, V.W. and Weil, P.A., Harper's Biochemistry. New York: McGraw-Hill.
4. Voet, D. and Voet, J.G., Biochemistry. New York: John Wiley & Sons.
5. Devlin, T.M., Textbook of Biochemistry with Clinical Correlations. New York: Wiley-Liss.
6. Satyanarayana, U. and Chakrapani, U., Biochemistry. Kolkata: Books and Allied (P) Ltd.
7. Stryer, L., Biochemistry. New York: W.H. Freeman.
8. Deb, A. C. Viva & Practical Biochemistry, 3/Ed., New Central Book Agency (P) Ltd.

Program : B. Pharmacy			Class: First Year		Semester : 2
Course Code	Course Title			Course Type	
BP203T	Human Anatomy, Physiology & Pathophysiology- II (Theory)			Core 3	
Credits	Hours Per Week (L-T-P)			Max Hours	
	L	T	P		
4	4	--	--	60	
Maximum Marks	ISE			ESE	
100	40			60	

COURSE OBJECTIVES:

1. Understand the anatomy and physiology of major body systems..
2. Learn mechanisms of neurological, gastrointestinal, respiratory, renal, endocrine, and reproductive functions.
3. Identify common pathophysiological conditions affecting each organ system.
4. Correlate structural and functional abnormalities with disease symptoms.
5. Equip students with foundational knowledge for interpreting disease processes and planning rational pharmacotherapy

COURSE OUTCOME (CO):

CO NO.	Upon completion of course student will able to
1	Describe the structural organization of the nervous, gastrointestinal, respiratory,
2	Explain the physiological mechanisms that regulate the functions of nervous, endocrine and reproductive systems.
3	Illustrate the etiology and development of common diseases affecting different organ systems including cancer
4	Analyze the pathophysiological alterations associated with disorders of the nervous, gastrointestinal, respiratory, renal and endocrine systems
5	Interpret clinical manifestations and case findings related to organ system dysfunctions.

COURSE CONTENT

Unit	Topics	Hours
I	Nervous System a) Organization of nervous system, neuron, neuroglia, classification and properties of nerve fibre, electrophysiology, action potential, nerve impulse, receptors, synapse and neurotransmitters. Central nervous system: Meninges, ventricles of brain and cerebrospinal fluid. Structure and functions of brain (cerebrum, brain stem and cerebellum), spinal cord (gross structure, functions of afferent and efferent nerve tracts, reflex activity). b) Pathophysiology of epilepsy, Parkinson's disease, stroke, migraine, depression, schizophrenia, Alzheimer's disease and meningitis.	14
II	Gastrointestinal System a) Anatomy of GI tract with special reference to anatomy and functions of stomach (acid production in the stomach and its regulation through parasympathetic nervous system; role of pepsin in protein digestion). Anatomy and functions of small intestine and large intestine. Anatomy and functions of salivary glands, pancreas and liver. Movements of GIT, digestion and absorption of nutrients. b) Pathophysiology of inflammatory bowel diseases, peptic ulcer, jaundice, hepatitis, typhoid and alcoholic and non alcoholic fatty liver disease	12

III	<p>a) Respiratory System Anatomy of respiratory system with special reference to anatomy of lungs. Mechanism of respiration and regulation of respiration. Lung volumes and capacities, transport of respiratory gases, artificial respiration and resuscitation methods.</p> <p>b) Pathophysiology of asthma, chronic obstructive pulmonary diseases and tuberculosis.</p> <p>c) 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 Renin Angiotensin Aldosterone System in kidney.</p> <p>d) Pathophysiology of acute and chronic renal failure and urinary tract infections.</p>	12
IV	<p>Endocrine System</p> <p>a) Classification of hormones and mechanism of hormone action. Structure and functions of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas, pineal gland and thymus.</p> <p>b) Pathophysiology of diabetes, hypothyroidism, hyperthyroidism, goitre and polycystic ovary syndrome.</p>	10
V	<p>Reproductive System and Cancer</p> <p>a) 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.</p> <p>b) Pathophysiology of sexually transmitted diseases: AIDS, syphilis and gonorrhea.</p> <p>c) Etiology and pathogenesis of cancer.</p>	12

Recommended References (Preferably latest editions):

1. Wilson, K.J.W., *Ross and Wilson Anatomy and Physiology in Health and Illness*. Churchill Livingstone, New York.
2. Tortora, G.J. and Grabowski, S.R., *Principles of Anatomy and Physiology*. Palmetto, GA, U.S.A.
3. Guyton, A.C. and Hall, J.E., *Textbook of Medical Physiology*. Elsevier.
4. Chatterjee, C.C., *Human Physiology (Vol. I & II)*. Academic Publishers, Kolkata.
5. Mohan, H., *Textbook of Pathology*. Jaypee Publishers.
6. Porth, C.M., *Pathophysiology: Concepts of Altered Health States*. Lippincott Williams & Wilkins.
7. Kumar, V., Abbas, A.K., Aster, J.C. and Deyrup, A.T., *Robbins and Kumar Basic Pathology*. Elsevier.

Program : B. Pharmacy	Class: First Year			Semester : 2
Course Code	Course Title			Course Type
BP204T	Pharmaceutical Organic Chemistry (Theory)			Core
Credit	Hours Per Week (L-T-P)			Max. Hours L
	L	T	P	
4	4	--	4	4
Maximum Marks	ISE			ESE
100	40			60

COURSE OBJECTIVES:

1. Develop a clear understanding of the chemistry of saturated hydrocarbons.
2. Study the chemistry and reactions of unsaturated hydrocarbons.
3. Understand the chemistry and reaction mechanisms of alkyl halides.
4. Explain the chemistry of aromatic hydrocarbons and their derivatives.
5. Provide an understanding of carbonyl compounds and fundamental organic reaction mechanisms relevant to pharmaceuticals.

COURSE OUTCOMES (CO):

CO NO.	Upon completion of course student will able to
1	Describe the chemical reactions and mechanisms of aliphatic saturated hydrocarbons.
2	Explain the reactions and mechanisms of aliphatic unsaturated hydrocarbons.
3	Understand nucleophilic substitution and elimination reactions of alkyl halides.
4	Explain electrophilic aromatic substitution reactions and the effect of substituents.
5	Apply knowledge of carbonyl compounds and reaction mechanisms in pharmaceutical chemistry

COURSE CONTENT:

Unit	Topic	Hours
I	Basics of Organic chemistry: Hybridization, Types of Bonds, Bond Fission, Concepts of Homolytic and Heterolytic bond fission/cleavage in reaction mechanisms. Factors affecting reaction Mechanism Aliphatic Saturated Hydrocarbons Alkanes <ul style="list-style-type: none"> • Methods of preparation: Wurtz reaction, Kolbe's reaction, Clemmensen reduction, Wolff- Kishner reduction • Chemical reactions of alkanes • Mechanism of free radical substitution (halogenation) • Pharmaceutical applications of alkanes: Liquid paraffin, soft paraffin, hard paraffin Cycloalkanes <ul style="list-style-type: none"> • Baeyer's strain theory and its limitations • Coulson- Moffitt modification • Sachse- Mohr theory 	12
	Aliphatic Unsaturated Hydrocarbons Alkenes Methods of preparation: <ul style="list-style-type: none"> • Dehydration of alcohols • Dehydrohalogenation of alkyl halides • Dehalogenation of vicinal dihalides • Wittig reaction 	12

II	<p>Chemical reactions of alkenes</p> <ul style="list-style-type: none"> • Mechanism of electrophilic addition reactions • Markovnikov's and anti-Markovnikov's rule • Ozonolysis <p>Conjugated Dienes</p> <ul style="list-style-type: none"> • Stability of conjugated dienes • Mechanism of Diels–Alder reaction Electrophilic and free radical addition reactions • 1, 2- and 1, 4-addition reactions <p>Alkynes</p> <p>Characterization reactions, addition reaction mechanisms</p>	
III	<p>Alkyl Halides</p> <p>Nucleophilic substitution reactions: SN1 and SN2</p> <ul style="list-style-type: none"> • Mechanism, kinetics, substrate structure, solvent effect, stereochemistry <p>Elimination reactions: E1 and E2</p> <ul style="list-style-type: none"> • Mechanism, kinetics, substrate structure, solvent effect, stereochemistry • Zaitsev's (Saytzeff's) rule with examples • Comparison of substitution vs elimination reactions 	12
IV	<p>Benzene and Its Derivatives</p> <ul style="list-style-type: none"> • IUPAC nomenclature of mono- and di-substituted benzene derivatives • Structure of benzene • Molecular orbital picture and resonance • Aromaticity and Hückel's rule • Electrophilic aromatic substitution reactions: <ul style="list-style-type: none"> • Nitration • Halogenation • Friedel- Crafts alkylation and its limitations • Friedel- Crafts acylation • Sulphonation and desulphonation • Effect of substituents on reactivity and orientation 	12
V	<p>Carbonyl compounds Aldehydes and Ketones</p> <ul style="list-style-type: none"> • Preparation and properties of carbonyl compounds • Nucleophilic addition reactions • Aldol condensation and crossed aldol condensation • Cannizzaro and crossed Cannizzaro reactions • Benzoin and Perkin condensation • Oxidation and reduction reactions • Pharmaceutical applications of carbonyl compounds: Chloral, Paraldehyde, Ketoprofen 	12

Recommended References (Preferably latest editions):

1. Morrison, R.T., Boyd, R.N. and Bhattacharjee, S.K., Organic Chemistry. Pearson Education India.
2. Finar, I.L., Organic Chemistry, Vol. I. Pearson Books.
3. Bahl, B.S. and Bahl, A., Textbook of Organic Chemistry. S. Chand & Company.
4. Furniss, B.S., Vogel's Textbook of Practical Organic Chemistry.

Program: B. Pharm.	Class: First Year			Semester: II
Course Code	Course Title			Core
BP205T	Pharmacognosy and Photochemistry (Theory)			7
Credit	Hours Per Week (L-T-P)			Max. Hours
	L	T	P	
4	4	-	-	60
Maximum Marks	ISE			ESE
100	40			60

COURSE OBJECTIVES:

1. Understand major metabolic pathways and the biogenetic origin of primary and secondary phytoconstituents, including the use of modern tools for pathway studies.
2. Study and interpret the pharmacognostic features of crude drugs containing primary metabolites such as carbohydrates, proteins/enzymes, and lipids.
3. Study and interpret the pharmacognostic features of crude drugs containing secondary metabolites such as alkaloids, glycosides, tannins, resins, volatile oils, flavonoids, phenolics, and terpenoids.
4. Impart knowledge of conventional and modern extraction techniques and enable selection of appropriate extraction methods.
5. Develop competency in isolation, identification, characterization, and quality evaluation of medicinal plants and botanicals.

COURSE OUTCOME (CO):

CO No.	Upon successful completion of this course, the students will be able to:
1	Describe biosynthetic pathways and genetic tools involved in phytoconstituent production.
2	Classify and explain drugs containing primary and secondary metabolites.
3	Apply traditional and modern extraction and isolation methods.
4	Explain qualitative and quantitative analysis of plant metabolites.
5	Evaluate identity, purity, and quality of herbal raw materials.

COURSE CONTENT:

Unit.	Topics	Hours
I	Metabolic Pathways and Biogenetic Studies– Brief study of basic metabolic pathways and biosynthesis of secondary metabolites including: <ul style="list-style-type: none"> • Shikimic acid pathway • Acetate pathway • Amino acid pathways Utilization of radioactive isotopes in biogenetic studies. Introduction to pathway prediction tools and modern genetic tools such as CRISPR/Cas9.	10

II	<p>Primary Metabolites:</p> <p>General classification and identification tests</p> <p>Pharmacognostic study (biological source, distribution, identifying characters, chemical constituents, specific tests, therapeutic uses, and commercial applications) of:</p> <p>Carbohydrates: Acacia, Agar, Tragacanth, Honey</p> <p>Proteins and Enzymes: Gelatin, Casein, Proteolytic enzymes: Papain, Bromelain, Serratiopeptidase, Urokinase, Streptokinase, Pepsin</p> <p>Lipids (Waxes, Fats, Fixed Oils): Castor oil, Olive oil, Cocoa butter Wool fat, Beeswax</p>	12
III	<p>Secondary Metabolites–</p> <p>General classification and identification tests</p> <p>Pharmacognostic study (biological source, distribution, cultivation of underlined drugs, identifying characters, chemical constituents, specific tests, therapeutic uses, and commercial applications) of:</p> <p>Alkaloids: Vinca, Rauwolfia, Opium</p> <p>Volatile Oils: Lemongrass, Clove, Cinnamon, Fennel</p> <p>Tannins: Myrobalans, Catechu, Pomegranate</p> <p>Resins: Guggul, Asafoetida</p> <p>Glycosides: Senna, Liquorice, Digitalis</p> <p>Phenyl propanoids and Flavonoids: Green Tea, Ginkgo, Flaxseed</p> <p>Iridoids, Other Terpenoids and Naphthoquinones: Gentian, Artemisia</p>	12
IV	<p>Extraction Methods for Medicinal Plants– Conventional Methods of Extraction:</p> <p style="padding-left: 40px;">Infusion, Decoction, Digestion, Maceration, Percolation, Reflux, Distillation, Soxhlet extraction, Successive solvent extraction</p> <p>Modern Methods of Extraction:</p> <p style="padding-left: 40px;">Supercritical fluid extraction, Microwave-assisted extraction, Ultrasonic-assisted extraction, Enzyme-assisted extraction, Pressurized liquid extraction</p>	12
V	<p>Overview of Isolation, Identification and Characterization Techniques–</p> <p>Separation and Isolation Techniques:</p> <p style="padding-left: 40px;">Planar chromatography, Column chromatography, Preparative TLC, Flash chromatography</p> <p>Identification Techniques: Phyto chemical tests, Chromatographic techniques, Spectroscopic techniques, Finger printing of medicinal plants using TLC/HPTLC. Types and significance of markers (phytochemical reference standards).</p> <p>Screening and analysis of major metabolites:</p> <p style="padding-left: 40px;">Alkaloids, Glycosides, Saponins, Tannins, Resins, Flavonoids, Phenolics. Steroids</p>	14
<p>Recommended References (<i>Preferably latest editions</i>):</p> <ol style="list-style-type: none"> 1. Dewick, P.M., <i>Medicinal Natural Products: A Biosynthetic Approach</i>. John Wiley & Sons. 2. Evans, W.C., <i>Trease and Evans' Pharmacognosy</i>. W.B. Saunders & Co., London. 3. Wagner, H., and Bladt, S., <i>Plant Drug Analysis: A Thin Layer Chromatography Atlas</i>. Springer-Verlag. 4. Harborne, J. B., <i>Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis</i>. Chapman & Hall. 		

Program : B. Pharmacy	Class : First Year			Semester : 2
Course Code	Course Title			Course Type
BP206T	Physical Pharmaceutics (Theory)			Core
Credit	Hours Per Week (L-T-P)			Max. Hours
	L	T	P	
3	3	-	-	45
Maximum Marks	ISE			ESE
75	30			45

COURSE OBJECTIVES:

1. Provide a comprehensive understanding of the theory and principles of pharmaceutical processes and unit operations involved in drug manufacturing.
2. Impart knowledge of physicochemical phenomena such as solubility, dissolution, interfacial phenomena, rheology, and micromeritics relevant to dosage form design.
3. Develop understanding of colloidal and coarse dispersions, including suspensions and emulsions, and their pharmaceutical applications.
4. Familiarize students with rheological and micromeritic properties of powders and dispersions and their role in formulation development and evaluation.
5. Build a strong foundation for formulation development, process optimization, and quality control of pharmaceutical dosage forms.

COURSE OUTCOME (CO):

CO No.	Upon completion of this course, the students will able to:
1	Apply the principles of solubility, partitioning, phase rule, and buffer systems and interpret their significance in pharmaceutical and biological systems.
2	Illustrate the principles of surface and interfacial tension, adsorption, surface-active agents, wetting, and electrical properties of interfaces.
3	Explain the properties and stability of colloidal and coarse dispersions and analyze their sedimentation, flocculation, emulsification, and physical instability.
4	Differentiate Newtonian and non-Newtonian systems and evaluate thixotropy, viscoelasticity, and rheological properties of pharmaceutical systems.
5	Determine particle size, size distribution, surface area, and flow properties of powders and assess their significance.

COURSE CONTENT

Unit	Topic	Hours
I	Solubility distribution phenomenon & buffers Solubility expression, Solute solvent interactions, Solubility of liquid and liquids, Solubility of solids and liquids, Solubility of Gas in Liquids, Raoult's Law and its deviations. Factors affecting solubility, Measurement of saturation Solubility, Effect of pH on solubility, Phase rule and solubility. Applications of Solubility. Partition Coefficient – Measurement and significance, Critical Solution Temperature and Applications. Introduction to buffers, Buffers in pharmaceutical and biological system, pH determination methods (Electrometry and colorimetry). Buffer equation / Factors influencing the pH of buffer solutions, Factor influencing Buffer capacity, General procedure for preparing buffers, Indicators.	9
	Interfacial phenomenon	8

II	Liquid interface: Surface and interfacial tension, surface free energy, Measurement of surface and interfacial tension, Spreading coefficient, surface active agent, HLB, detergency, types of monolayers at liquid surface. Adsorption at solid interface, Liquid Interface (contact angle, activated charcoal and Wetting). Adsorption of surface-active agents. Electric properties of interface / Electric double layer, Nernst and zeta potential effect of electrolytes	
III	Colloidal and Coarse Dispersion Colloidal dispersions: Types of colloidal dispersions (Lyophobic, Lyophilic, Association colloids), Optical properties of colloids, Kinetic properties of colloids, Electrical properties of colloids, Size and shape of colloidal systems, Stability of colloidal system (peptization and protective action), Application of Colloidal System. Coarse Dispersions: Suspensions, stokes law (Theory of sedimentation), Effect of Brownian movement / Sedimentation of flocculated particles, sedimentation parameters. Flocculation and controlled structure flocculation. Theories of emulsification and stabilization (DLVO Theory, Monomolecular adsorption, Multimolecular adsorption, Film formation, Solid particle adsorption). Physical instabilities of emulsions (creaming, coalescence and breaking, and phase inversion).	12
IV	Rheological studies Newtonian systems and non-Newtonian systems. Thixotropy –measurement / Bulges and spurs. Negative thixotropy, Determination of rheological properties (Viscometers / single and multi-point) Viscoelasticity, psychorheology. Applications of rheology in pharmacy.	8
V	Micromeritics Particle size and size distribution, Particle Shape and Surface area: Methods for determination and significance. Flow properties of powders: determination, significance and methods of enhancement. Advanced flow properties of powders (Powder flow tester).	8

References (Preferably Latest Editions):

1. Sinko PJ. Martin's physical pharmacy and pharmaceutical sciences. Lippincott Williams & Wilkins.
2. Allen LV, Popovich NG. Ansel's pharmaceutical dosage forms and drug delivery systems. Philadelphia, PA, USA: Wolters Kluwer Health.
3. Remington JP. Remington: the science and practice of pharmacy. Lippincott Williams & Wilkins.
4. Aulton ME, Taylor K, editors. Aulton's pharmaceuticals: the design and manufacture of medicines. Elsevier Health Sciences.
5. Lachman L, Lieberman HA, Kanig JL. The theory and practice of industrial pharmacy. Philadelphia: Lea & Febiger.
6. Mendham J, Denney RC, Barnes JD. Textbook of Quantitative Chemical Analysis.
7. Myers, D., Surfaces, Interfaces, and Colloids: Principles and Applications. Ladisch, M.R., Rheology of Fluid and Semisolid Foods. Springer.

Program : B. Pharmacy	Class: First Year			Semester : 1
Course Code	Course Title			Course Type
BP207P	Biochemistry (Practical)			Core
Credit	Hours Per Week (L-T-P)			Max. Hours L
	L	T	P	
1	--	--	1	--
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

1. To develop skills to identify and differentiate carbohydrates and proteins through classical qualitative biochemical tests.
2. To apply biochemical techniques for analysis of pathological conditions using urine and blood samples.
3. To perform estimations of clinically important biomolecules such as glucose, cholesterol, urea, creatinine, uric acid, and proteins in biological fluids.
4. To demonstrate enzymatic activity and study factors affecting enzyme function, including substrate concentration and temperature.
5. To interpret biochemical results and correlate them with clinical conditions such as diabetes, renal dysfunction, and lipid disorders.

COURSE OUTCOMES (CO):

CO No.	Upon completion of this course, the students will able to:
1	Identify proteins and carbohydrates using qualitative biochemical tests and explain their physiological relevance.
2	Detect normal and abnormal constituents in urine and interpret their diagnostic significance.
3	Estimate and interpret levels of glucose, cholesterol, urea, creatinine, uric acid, and serum proteins, and correlate results with clinical conditions.
4	Demonstrate enzyme- substrate reactions and evaluate the effect of temperature and substrate concentration on enzymatic activity.
5	Analyze, record, and report biochemical results accurately and relate practical findings to theoretical knowledge and clinical application.

COURSE CONTENT:

List of practical
<p>(Minimum 12 experiments must be performed)</p> <ol style="list-style-type: none"> 1. Identification tests for proteins (Albumin and Casein). 2. Qualitative analysis of carbohydrates* (Glucose, Fructose, Lactose, Sucrose, and Starch). 3. Qualitative analysis of urine for normal and abnormal constituents. 4. Estimation of blood glucose. 5. Estimation of total cholesterol and HDL cholesterol. 6. Estimation of urea, creatinine, and uric acid in serum. 7. Estimation of serum total protein and albumin. 8. Study of enzymatic hydrolysis of starch. 9. Study of the effect of temperature on salivary amylase activity. 10. Study of the effect of substrate concentration on salivary amylase activity. 11. Estimation of hemoglobin in blood by Sahli's method / Cyanmethemoglobin method. 12. Estimation of serum bilirubin (total and direct bilirubin).

13. Estimation of glycogen content

14. Estimation of SGOT and SGPT

Recommended References (Preferably latest editions):

1. Plummer, D. T. An Introduction to Practical Biochemistry. McGraw-Hill, New York.
2. Wilson, K., and Walker, J. Principles and Techniques of Biochemistry and Molecular Biology. Cambridge University Press.
3. Varley, H., Gowenlock, A. H., Bell, M., and Bell, J. L. Varley's Practical Clinical Biochemistry. Heinemann Medical Books.
4. Burtis, C. A., Ashwood, E. R., and Bruns, D. E. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. Elsevier.
5. Rodwell, V. W., Bender, D. A., Botham, K. M., Kennelly, P. J., and Weil, P. A. Harper's Illustrated Biochemistry. McGraw-Hill.
6. Freifelder, D. Essential Molecular Biology: A Practical Approach. Oxford University Press.

Program : B. Pharmacy	Class: First Year			Semester : 2
Course Code	Course Title			Course Type
BP208P	Human Anatomy, Physiology & Pathophysiology- II (Practical)			Core 4
Credits	Hours Per Week (L-T-P)			Max Hours
	L	T	P	
1	--	--	3	45
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

1. Provide foundational knowledge of the structure and functions of major organ systems of the human body.
2. Develop understanding of physiological mechanisms responsible for maintenance of homeostasis.
3. Explain the pathophysiology of diseases affecting different organ systems.
4. Explore causes of diseases and the body's responses to pathological conditions.
5. Build a strong base for clinical learning through the study of functional and structural changes in disease states.

COURSE OUTCOME (CO):

CO No.	Upon successful completion of this course, the students will be able to:
1	Explain the gross morphology, structures, and functions of various organs and organ systems of the human body.
2	Demonstrate basic emergency response procedures such as cardiopulmonary resuscitation (CPR).
3	Describe the etiology and pathogenesis of selected disease states
4	Identify signs and symptoms, risk factors, diagnostic methods, prevention, treatment strategies, and complications of diseases.
5	Understand coordinated working patterns of different organs of each system and perform experiments related to special senses and nervous system.

COURSE CONTENT

Sr. No.	List of Practical
<i>(Minimum of 12 experiments must be performed)</i> Practical HAPP allows the verification of physiological processes discussed in theory classes through experiments on living tissues, simulated videos, models, and charts.	
1.	Study of nervous system using specimens and models.
2..	Study of respiratory system using models.
3.	Study of gastrointestinal system using models.
4.	Study of reproductive system using models.
5.	Demonstration of general neurological examination.
6.	Demonstration of function of olfactory nerve.
7.	Examination of different types of taste.
8.	Demonstration of visual acuity.

9.	Demonstration of reflex activity.
10.	Recording of body temperature
11.	Determination of tidal volume and vital capacity.
12.	Recording of body mass index (BMI).
13.	Study of family planning devices and pregnancy diagnosis tests
14.	Understanding pathophysiology of IBD, peptic ulcer, jaundice, hepatitis, typhoid, asthma, tuberculosis, diabetes, and thyroid disorders through case files / case reports.
15.	Hands-on training in cardiopulmonary resuscitation (CPR).

Reference Books

1. Wilson, K. J. W., and Waugh, A. *Anatomy and Physiology in Health and Illness*. Churchill Livingstone, New York.
2. Best, C. H., and Taylor, N. B. *The Physiological Basis of Medical Practice*. Williams & Wilkins, Baltimore.
3. Guyton, A. C., and Hall, J. E. *Textbook of Medical Physiology*. Elsevier / W.B. Saunders, Philadelphia.
4. Tortora, G. J., and Grabowski, S. R. *Principles of Anatomy and Physiology*. John Wiley & Sons.
5. Brunton, L., Chabner, B., and Knollmann, B. *Goodman & Gilman's The Pharmacological Basis of Therapeutics*. McGraw-Hill, New York.
6. Colledge, N. R., Walker, B. R., and Ralston, S. H. *Davidson's Principles and Practice of Medicine*. Churchill Livingstone, London.

Program : B. Pharmacy	Class: First Year			Semester : 1
Course Code	Course Title			Course Type
BP209P	Pharmaceutical Organic Chemistry (Practical)			Core
Credit	Hours Per Week (L-T-P)			Max. Hours L
	L	T	P	
1	--	--	1	--
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

1. Understand and follow essential laboratory safety protocols for handling chemicals, glassware, and equipment.
2. Identify and analyze organic compounds through their physical properties and functional group reactivity.
3. Apply ball-and-stick molecular models to visualize and interpret the structure of organic compounds.
4. Perform purification techniques such as crystallization to isolate and refine organic substances.
5. Synthesize simple organic compounds and their derivatives using standard laboratory methods.

COURSE OUTCOMES (CO):

CO No.	Upon successful completion of this course, the students will be able to:
1	Recall and outline the preliminary qualitative tests used for identifying water- insoluble and immiscible organic compounds.
2	Interpret and analyze organic compounds through systematic qualitative analysis to confirm their chemical nature.
3	Understand the synthesis methods for preparing simple organic compounds and their derivatives.
4	Analyze and build 3D molecular structures using ball-and-stick models and software to predict their shapes, bonding, and properties.
5	Apply crystallization techniques to purify organic compounds effectively.
6	Analyze experimentally to detect elements and functional groups to identify unknown organic compounds.

COURSE CONTENT:

List of practicals
<p>(Minimum 12 experiments to be performed)</p> <p>1. Systematic qualitative analysis of minimum of five water-insoluble or water-immiscible unknown organic compounds from different chemical classes/ functional groups :</p> <p>a. Preliminary tests: Color, odour, Solubility tests, test for aromaticity, test for saturation/unsaturation etc.</p> <p>b. Detection of elements such as nitrogen, sulphur and halogens by Lassaigne's test</p> <p>c. Determination of Functional group tests such as phenols, amides, amines, carboxylic acids, aldehydes and ketones, alcohols, esters, aromatic and halogenated hydrocarbons and nitro compounds.</p> <p>d. Preparation of the derivatives and confirmation of the unknown organic compound by melting point / boiling point.</p> <p>2. Synthesis, purification and TLC characterization of Acetanilide / Benzophenone</p> <p>3. Building Molecular Models:</p> <p>Students will use ball-and-stick models to create structures of molecules and understand their shapes and bonding.</p> <p>4. Demonstration on chemistry structure software like Chems sketch/ Chem-draw</p>

5. Crystallization Method

Students will learn how to purify three organic compounds using the crystallization technique.

Recommended References (Preferably latest editions):

1. Plummer, D. T. An Introduction to Practical Biochemistry. McGraw-Hill, New York.
2. Wilson, K., and Walker, J. Principles and Techniques of Biochemistry and Molecular Biology. Cambridge University Press.
3. Varley, H., Gowenlock, A. H., Bell, M., and Bell, J. L. Varley's Practical Clinical Biochemistry. Heinemann Medical Books.
4. Burtis, C. A., Ashwood, E. R., and Bruns, D. E. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. Elsevier.
5. Rodwell, V. W., Bender, D. A., Botham, K. M., Kennelly, P. J., and Weil, P. A. Harper's Illustrated Biochemistry. McGraw-Hill.
6. Freifelder, D. Essential Molecular Biology: A Practical Approach. Oxford University Press.

Program : B. Pharmacy	Class: First Year			Semester: II
Course Code	Course Title			Core
BP210P	Pharmacognosy and Phytochemistry (Practical)			8
Credit	Hours Per Week (L-T-P)			Max. Hours
	L	T	P	
1	-	-	3	45
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

1. Perform chemical tests for the identification of gums, resins, oils, fats, waxes, and unorganized drugs.
2. Examine crude drugs using transverse section and powder microscopy for correct identification.
3. Apply suitable extraction techniques and study their effect on yield of crude extracts.
4. Isolate and identify important Phyto-constituents and volatile oils using standard procedures.
5. Evaluate herbal raw materials collected from field/market sources as per Pharmacopeial standards.

COURSE OUTCOME (CO):

CO No.	Upon successful completion of this course, the students will be able to:
1	Identify unorganized crude drugs using specific chemical tests.
2	Analyze organized crude drugs through microscopy and powder analysis.
3	Select and perform appropriate extraction methods for herbal drugs.
4	Isolate and characterize Phyto-constituents using laboratory techniques and TLC.
5	Assess and compare the quality and purity of herbal raw materials with official standards.

COURSE CONTENT:

List of practicals
(Minimum 12 experiments must be performed)
<ol style="list-style-type: none"> 1. Chemical tests for identification of Agar, Acacia, Tragacanth, Honey, Castor oil, Olive oil, Wool fat, Bees wax, Asafoetida, Catechu, Aloe. 2. Transverse section and powder microscopy of a vinca leaf. 3. Transverse section and powder microscopy of a cinnamon bark. 4. Transverse section and powder microscopy of a fennel fruit. 5. Transverse section and powder microscopy of a clove flower bud and Isolation of volatile oil and its TLC. 6. Transverse section and powder microscopy of a Tulsi stem. 7. Transverse section and powder microscopy of a Licorice roots. 8. Study of effect of different extraction techniques on yield of crude extract (maceration, decoction, soxhlation) Candidate drug: Rauwolfia. 9. Isolation of caffeine from tea. 10. Isolation of Hesperidin from lemon peel. 11. Isolation of Glycyrrhizin from licorice roots. 12. Isolation of Pectin from orange peel. 13. Experiential learning-based experiment involving evaluation and comparison of field/market-collected herbal raw materials with pharmacopeial standards. (Candidate drug: Eucalyptus)

Recommended References (*Preferably Latest Editions*):

1. Trease, G. E. and Evans, W.C. Pharmacognosy. Elsevier.
2. Harborne, J. B. Phytochemical Methods: A Guide to Modern Techniques of Plant Analysis. Springer.
3. Wallis, T. E. Textbook of Pharmacognosy. CBS Publishers & Distributors, New Delhi.
4. Tyler, V. E., Brady, L. R. and Robbers, J.E. Pharmacognosy. Lea & Febiger.

Program : B. Pharmacy	Class : First Year			Semester : 2
Course Code	Course Title			Course Type
BP211P	Physical Pharmaceutics (Practical)			Core
Credit	Hours Per Week (L-T-P)			Max. Hours
	L	T	P	
1	-	-	3	45
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

1. Introduce basic laboratory techniques for determining physicochemical properties such as surface tension, viscosity, and density in pharmaceutical systems.
2. Develop understanding of interfacial phenomena and surfactant behavior, including micelles, critical micellar concentration (CMC), and HLB in formulation design.
3. Train students in evaluating disperse systems through sedimentation studies and the effect of suspending agents.
4. Provide practical experience in powder characterization, including particle size distribution, density, flow properties, porosity, and the role of glidants.
5. Develop skills in determining solubility, partition coefficient, buffer capacity, and related equilibria relevant to drug formulation.

COURSE OUTCOME (CO):

CO No.	Upon completion of this course, the students will able to:
1	Evaluate solubility, partition coefficient, critical solution temperature, buffer capacity, pKa, and isotonicity of pharmaceutical systems.
2	Determine surface tension, CMC, HLB value, and specific surface area of pharmaceutical systems.
3	Assess the viscosity of pharmaceutical liquids using Ostwald's and Brookfield viscometers.
4	Evaluate particle size, size distribution, density, porosity, and flow properties of pharmaceutical powders.

List of practicals

(Minimum 12 experiments must be performed)

1. Determination of solubility of a drug at different pH/buffer systems at room temperature.
2. Determination of partition coefficient of a drug in n-octanol and water system.
3. Determination of partition coefficient of a drug in benzene and water system
4. Determination of critical solution temperature and composition of phenol–water system.
5. Determination of buffer capacity at various stages of titration of a weak acid against a strong base and determination of pKa.
6. Calculation of isotonicity by different methods (Sodium Chloride Equivalent Method).
7. Determination of surface tension of given liquids by drop count method and drop weight method.
8. Determination of critical micellar concentration (CMC) of surfactants.
9. Determination of HLB value of a surfactant.
10. Determination of specific surface area of charcoal by adsorption of acetic acid on activated charcoal.
11. Determination of viscosity of liquids using Ostwald's viscometer and Brookfield viscometer.
12. Determination of particle size and particle size distribution using microscopic method.
13. Determination of particle size and particle size distribution using sieving method.

14. Determination of densities and derived properties of powders (bulk density, tapped density, Hausner ratio, Carr's compressibility index), true density, and porosity.
15. Determination of angle of repose and influence of glidants on angle of repose.

Note: Wherever applicable, compare the experimental values of physicochemical and micromeritic properties with standard/literature values or values reported for marketed pharmaceutical formulations.

Program : B. Pharmacy	Class : First Year			Semester : 2
Course Code	Course Title			Course Type
BP212PSEC1	Communication Skills (Practical)			Elective
Credit	Hours Per Week (L-T-P)			Max. Hours
	L	T	P	
1	-	-	2	30
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

1. Enhance verbal and non-verbal communication skills in academic, clinical, and professional pharmacy settings.
2. Develop competence in patient counselling, prescription communication, and inter professional dialogue.
3. Promote empathetic and ethical communication in diverse cultural and patient contexts.
4. Use digital tools and professional formats (e.g., email, reports, posters) for effective communication.
5. Foster confidence, active listening, and clarity in pharmacy-related presentations and conversations.

COURSE OUTCOME (CO):

CO No.	Upon completion of this course, the students will able to:
BP212PSEC1.1	Demonstrate effective verbal, non-verbal, listening, and observation skills in pharmacy-related communication.
BP212PSEC1.2	Apply appropriate communication techniques to counsel patients and manage different patient interactions in pharmacy practice.
BP212PSEC1.3	Prepare and demonstrate clear and appropriate written and digital communication for professional pharmacy practice.
BP212PSEC1.4	Demonstrate effective presentation, group discussion, interview, and professional communication skills in pharmacy-related situations.
BP212PSEC1.5	Apply professional, ethical, and structured communication practices while interacting with patients and healthcare professionals.

List of practical's
<ol style="list-style-type: none"> 1. Introduction to Communication in Pharmacy <ul style="list-style-type: none"> • Types of communication: verbal, non-verbal, written • Importance in clinical, academic, and retail pharmacy 2. Listening and Observation Skills Workshop <ul style="list-style-type: none"> • Active listening techniques, barriers to listening • Observation of cues: patient posture, tone, compliance 3. Non-verbal Communication Skills <ul style="list-style-type: none"> • Body language, eye contact, gestures, tone of voice • Cross-cultural sensitivity in pharmacy communication 4. Role-play: Communicating with a Patient for Dispensing a Prescription <ul style="list-style-type: none"> • Explanation of dosage, frequency, side effects, and precautions 5. Role-play: Handling Difficult Conversations (e.g., Angry Patient or Confused Elderly) <ul style="list-style-type: none"> • Empathy, patience, tone modulation, de-escalation techniques 6. Patient Counseling Practice (Case-Based) <ul style="list-style-type: none"> • Counseling for chronic illness (e.g., hypertension, diabetes) • Role-playing real-life counseling situations 7. Written Communication I: Professional Email Writing & Documentation <ul style="list-style-type: none"> • Writing emails to doctors, suppliers, institutions

<ul style="list-style-type: none">• Structure, etiquette, and clarity in pharmacy communications <p>8. Written Communication II: Preparing Patient Information Leaflets and Drug Labels</p> <ul style="list-style-type: none">• Use of simple language, drug facts, precautions, icons• Creating flyers for common conditions (e.g., diabetes, asthma) <p>9. Digital Communication Skills for Pharmacists</p> <ul style="list-style-type: none">• Creating a simple health blog, social media awareness post• Basics of tele consultation and e Pharmacy chat support <p>10. Presentation Skills I–Basic Techniques</p> <ul style="list-style-type: none">• Voice projection, clarity, use of visuals• Individual practice with simple pharmacy topics <p>11. Presentation Skills II–Group Presentations</p> <ul style="list-style-type: none">• Topics: health awareness campaigns, drug education, OTC safety• Peer and faculty feedback <p>12. Mock Interview/Group Discussion Practice</p> <ul style="list-style-type: none">• Industry/clinical job interview scenarios• GD on topics like “Generic vs Branded Medicines” <p>13. Communicating with Healthcare Professionals</p> <ul style="list-style-type: none">• Case hand off, drug information request, referral writing• Using SBAR (Situation, Background, Assessment, Recommendation) format <p>14. Ethics and Professionalism in Communication</p> <ul style="list-style-type: none">• Confidentiality, patient rights, informed consent• Role-play ethical dilemmas in pharmacy <p>15. Assessment & Reflection</p> <ul style="list-style-type: none">• Final presentation or counseling demo• Feedback, self-evaluation, and faculty observation
<p>References (Preferably Latest Edition):</p> <ol style="list-style-type: none">1. Communication Skills in Pharmacy Practice–E. M. Kelly & S. L. Svarstad, Lippincott Williams & Wilkins2. Developing Communication Skills for Pharmacy –Catherine Langford, Pharmaceutical Press.3. Patient Counseling Guidelines for Pharmacists–WHO India, World Health Organization.

Program: B. Pharmacy	Class: First Year			Semester: II
Course Code	Course Title			Course Type
BP212P SEC2	Mental Well-Being, Stress and Conflict Management (Practical)			Elective-1
Credit	Hours Per Week (L-T-P)			Max. Hours
	L	T	P	
1	-	-	2	30
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

1. Introduce students to the concepts of mental well-being and stress.
2. Equip students with techniques to manage stress, anxiety, and emotional well-being.
3. Develop conflict resolution skills for personal and professional life.
4. Encourage emotional intelligence and interpersonal communication.
5. Promote resilience and positive mindset development.

COURSE OUTCOME (CO):

CO No.	Upon successful completion of this course, the students will be able to:
BP212P SEC2.1	Identify sources and effects of stress in personal and professional life.
BP212P SEC2.2	Apply stress management techniques such as mindfulness, journaling, and relaxation exercises.
BP212P SEC2.3	Utilize conflict management strategies to resolve interpersonal and workplace conflicts.
BP212P SEC2.4	Demonstrate improved emotional intelligence and resilience.
BP212P SEC2.5	Develop effective communication skills for personal and professional growth.

COURSE CONTENT:

List of practical's
<p style="text-align: center;">(Minimum 12 experiments must be performed)</p> <ol style="list-style-type: none"> 1. Self-assessment of stress levels using Perceived Stress Scale (PSS) 2. Journaling activity: Maintain a 7-day emotional diary 3. Mindfulness breathing exercise and reflection 4. Guided meditation session and feedback form 5. Time management activity using Eisenhower Matrix 6. Role-play exercise on workplace conflict resolution 7. SWOT analysis of personal behavior and coping mechanisms 8. Cognitive restructuring worksheet for negative thoughts 9. Group discussion: "How do you respond to stress?" 10. Conflict styles self-test (Thomas-Kilmann Conflict Mode Instrument) 11. Visualization technique to reduce anxiety 12. Progressive muscle relaxation practice 13. Team activity: Building trust through icebreakers and communication 14. Reflection report after practicing gratitude for 5 days 15. Case study analysis: Conflict scenario in a healthcare/pharma setup

Recommended References (*Preferably Latest Editions*):

1. The Relaxation and Stress Reduction Workbook – Martha Davis, Elizabeth Robbins Eshelman & Matthew McKay, New Harbinger Publications
2. Managing Stress: Principles and Strategies for Health and Well-Being – Brian Luke Seaward, Jones & Bartlett Learning
3. Emotional Intelligence – Daniel Goleman, Bantam Books
4. The 7 Habits of Highly Effective People – Stephen R. Covey, Simon & Schuster
5. Conflict Management: A Practical Guide to Developing Negotiation Strategies – Barbara A. Budjac Corvette, Pearson Education
6. Mindfulness: An Eight-Week Plan for Finding Peace in a Frantic World – Mark Williams & Danny Penman, Rodale Books
7. Stress Management for Life: A Research-Based Experiential Approach – Michael Olpin & Margie Hesson, Cengage Learning
8. Crucial Conversations: Tools for Talking When Stakes Are High – Kerry Patterson, Joseph Grenny, Ron McMillan & Al Switzler, McGraw-Hill Education

Program : B. Pharmacy	Class : First Year			Semester : 2
Course Code	Course Title			Course Type
BP212PSEC3	Fundamentals of Computer Operations (Practical)			Elective
Credit	Hours Per Week (L-T-P)			Max. Hours
	L	T	P	
1	-	-	2	30
Maximum Marks	ISE			ESE
50	20			30

COURSE OBJECTIVES:

1. Provide foundational knowledge of computer systems, operating environments, and digital tools used in academic and professional settings.
2. Develop practical skills in digital documentation, data handling, and presentation using commonly available office productivity tools.
3. Familiarize students with file management practices and digital communication methods used in professional environments.
4. Enhance the ability to access, search, and retrieve scientific and academic information from online resources.
5. Prepare students to utilize computer-based tools for managing pharmaceutical data, documentation, and basic professional tasks.

COURSE OUTCOME (CO):

CO No.	Upon completion of this course, the students will able to:
BP212PSEC3.1	Demonstrate basic computer operations and manage files and folders using an operating system
BP212PSEC3.2	Prepare well-formatted digital documents using word-processing and document-editing tools.
BP212PSEC3.2	Apply spreadsheet tools, formulas, functions, and data visualization techniques for data management and analysis.
BP212PSEC3.2	Demonstrate effective use of digital tools for academic communication, information retrieval, and presentation.
BP212PSEC3.2	Explore and utilize digital technologies and platforms used for learning and pharmacy practice.

List of practical
(Perform any 12 Experiments)
<ol style="list-style-type: none">1. Basic operation and navigation of a computer operating system, including system settings and file explorer functions.2. Creating, renaming, organizing, moving, and deleting files and folders within a computer system.3. Using cloud-based storage platforms for saving, organizing, and sharing academic or pharmacy-related files and data.4. Preparing a structured academic or pharmacy-related report using a word-processing application with appropriate formatting, tables, headers, and page layout.5. Inserting equations, images, and formatted elements while preparing documents such as reports, notices, or certificates using document editing tools.6. Preparing and submitting digital assignments using word-processing, spreadsheet, or presentation tools.7. Creating spreadsheets for pharmacy-related calculations such as dose calculations, inventory records, or sales data using spreadsheet applications.8. Applying basic spreadsheet formulas and functions such as summation, averaging, conditional calculations, and counting operations.9. Generating graphs, charts, and data visualizations from experimental or pharmaceutical data using spreadsheet tools.10. Preparing a short academic presentation (approximately five slides) using presentation software with text, images, and basic design elements.11. Performing effective internet browsing and academic search techniques using online scientific literature databases and search platforms.12. Writing and sending professional emails including file attachments, proper subject lines, and appropriate use of CC and BCC with correct communication etiquette.13. Introduction to digital systems used in pharmacy practice such as billing, inventory management, or prescription management through demonstration or simulation.14. Exploring digital health technologies such as pharmacy-related mobile applications or electronic health tools used in healthcare practice.15. Accessing and utilizing online learning platforms for professional education and course materials.
References (Preferably Latest Edition): <ol style="list-style-type: none">1. Norton P. Introduction to computers. McGraw-Hill Education, New Delhi.2. Miller M. Computer basics: Absolute beginner's guide. Que Publishing.

General Instruction on Digital Tools

Open-source digital tools are preferred for teaching and learning purposes. However, institutions may choose appropriate software platforms, applications, or online services depending on availability, institutional policy, and infrastructure. The selected tools should enable students to perform the required digital and documentation tasks effectively. The specific software may vary, but the skills and competencies listed below must be achieved using suitable tools.

Appendix I

List of Recommended Electives (AEC/SEC/VAC courses to be prescribed by HEI)

Semester	Elective	Course Code	Course Title	Type	Category
II	Elective 1	BP212P SEC1	Communication Skills	Practical	SEC
		BP212P SEC2	Mental Well-Being, Stress & Conflict Management	Practical	SEC
		BP212P SEC3	Fundamentals of Computer Operations	Practical	SEC
III	Elective 2	BP312P AEC1	Nutraceuticals and Functional Foods	Practical	AEC
		BP312P AEC2	Food Analysis	Practical	AEC
		BP312P AEC3	Yoga and Life Sciences	Practical	AEC
VI	Elective 3	BP607T AEC1	Green Chemistry	Theory	AEC
		BP607T AEC2	Maternal and Child Health	Theory	AEC
		BP607T AEC3	Scientific Writing	Theory	AEC
		BP607T AEC4	Drug Store and Business Management	Theory	AEC
		BP607T AEC5	Career Building in Cultivation of Medicinal Plants	Theory	AEC
		BP607T AEC6	Active Pharmaceutical Ingredients and Excipient Sciences	Theory	AEC
	Elective 4	BP610P SEC1	Computer Aided Drug Design	Practical	SEC
		BP610P SEC2	Analytical Method Development and Validation	Practical	SEC
		BP610P SEC3	Principles of Preclinical Studies	Practical	SEC

AMRUTVAHINI COLLEGE OF PHARMACY, SANGAMNER
(AN AUTONOMOUS COLLEGE)

	Elective 5	BP611P VAC1	Professional Skills	Practical	VAC
		BP611P VAC2	Process Analytical Technology (PAT) and QbD in Formulation Science	Practical	VAC
VII	Elective 6	BP708T AEC1	Current Good Manufacturing Practices (cGMP)	Theory	AEC
		BP708T AEC2	Pharmaceutical Automation	Theory	AEC
		BP708T AEC3	Modern Techniques in Cellular Biology	Theory	AEC
		BP708T AEC4	Medical Devices	Theory	AEC
		BP708T AEC5	Transformation of Food Waste into Medicinal Products	Theory	AEC
		BP708T AEC6	Biosimilars, Vaccines & Macromolecules	Theory	AEC
		BP708T AEC7	Precision Medicine	Theory	AEC
VIII	Elective 7	BP806T AEC1	Pharmaceutical Packaging	Theory	AEC
		BP806T AEC2	Supply Chain Management	Theory	AEC
		BP806T AEC3	Industrial Safety and Waste Management	Theory	AEC
		BP806T AEC4	Traditional Healing Practices of India	Theory	AEC
		BP806T AEC5	Futuristic Pharma through AR/VR: Pharma 4.0	Theory	AEC
		BP806T AEC6	Herbal Cosmetics for Industry Perspective	Theory	AEC
	Elective 8	BP809P VAC1	Cleaning Validation	Practical	VAC
		BP809P VAC2	Basic Training in Aseptic Handling Techniques	Practical	VAC
		BP809P VAC3	Impurity Profiling	Practical	VAC
	SEC – Skill Enhancement Course AEC – Ability Enhancement Course VAC –Value Added Course				



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Since 1978

Amrutvahini Sheti & Shikshan Vikas Sanstha's
Amrutvahini College of Pharmacy,
Amrutnagar, P.O. Sangamner

(An Autonomous College Affiliated to Savitribai Phule Pune University, Pune)



Rules Book for Examination and Evaluation of
Undergraduate and Postgraduate Program

PREFACE

Amrutvahini College of Pharmacy (AVCOP) established in 2004 by Amrutvahini Sheti & Shikshan Vikas Sanstha's at Amrutnagar, Sangamner. Amrutvahini College of Pharmacy is the milestone of Pharmacy profession in rural area. The college is a center of excellence at all levels in the field of pharmaceutical sciences consigned to create self-disciplined physically fit mentally robust & morally strong professionals with high degree of integrity & diverse knowledge. Our students are not only superior in the field of education but also capable to meet challenges of every advancing technology in modern pharmaceuticals & globalization for benefit of society in healthcare profession. AVCOP is recognized for its rigor in academics and dedicated faculty, successful alumnae being its outcome. AVCOP has a strong relationship with the industry and is recognized for providing quality recruits for the industry. Due to its association with prestigious international universities, students are exposed to international standards of education. The organizational structure of AVCOP aims for accountability and transparency in the system. The college administration receives periodic inputs for improvement from various feedback mechanisms from different stakeholders. AVCOP believes in imparting quality education and providing good governance. Hence, it goes through periodic quality audit of academics and governance conducted by premier national accreditation agency, the National Assessment and Accreditation Council (NAAC).

AVCOP has more than 21+ years of experience in imparting quality technical education and has made its mark in the field of technical education and industry. It has a well-balanced, responsive and sustained governing body. The committed and experienced faculty guide the students to reach their potential and achieve success. It is essential for AVCOP to continue this march towards excellence. This is possible by driving academic policies on its own which enables AVCOP to provide academic freedom to the faculty in designing and teaching courses. This in turn inculcates learning methods in students by providing academic flexibility and professional practice. Therefore, the logical step is for the institute to embrace autonomy. AVCOP currently offers undergraduate programme, three postgraduate programmes and a Ph.D. Programme. These programmes aim at developing fundamentals and introducing students to recent trends in their respective branches. They also offer flexibility in learning along with introducing the multidisciplinary domains. In short, these programmes prepare students for the ever changing world of technology. The courses in social sciences, soft skills, arts and sports ensure all-round development of the students. AVCOP strives to develop the ability to think and learn in its students. It teaches the students to collaborate and work in teams and mould themselves into good human beings with social and professional values. This copy of the ordinance provides comprehensive information about the rules and regulations for B. Pharmacy and M.Pharmacy degree programmes at AVCOP. This ordinance will serve as a guide and bring transparency to our system. We encourage our students to become our partners in this academic journey.

Dr. M. J. Chavan
Principal

Abbreviations:

PCI	Pharmacy Council of India
DTE	The Directorate of Technical Education, Mumbai, Government of Maharashtra
UGC	University Grant Commission
SPPU	Savitribai Phule Pune University
Act	Maharashtra University Act
SGPA	Semester Grade Point Average
CGPA	Cumulative Grade Point Average
UG	Under Graduate Programme
PG	Post Graduate Programme
Dean	Dean of Respective Functions
HOD	Head of Department
DAC	Disciplinary Action Committee
ISE	In Semester Examination
ESE	End Semester Examination
CA	Continuous Assessment

Glossary:

B. Pharmacy	Bachelor of Pharmacy
M. Pharmacy	Master of Pharmacy
Earned Credits	The sum of course credits for credit courses in which a student has passed.
Letter Grade	Assessment of the student's performance in a course indicated by O, A, B, C, D, F, I, DT, PP, NP
Grade Point	Number equivalent of the letter grades given by 10, 9, 8, 7, 6, 0 corresponding to grades by O, A, B, C, D, Fail grade "F" carry zero marks, "DT" grade for Detained or Incomplete Term also carry zero marks, and for Non Credit course, Grade Letter PP and NP.
Semester Grade Point Average (SGPA)	SGPA is the ratio of the sum of the products of the number of credits of a course (Ci) and the grade points scored in that course (GPi), taken for all the courses, to the sum of the number of credits of all the courses (n) in the semester.
Cumulative Grade Point Average (CGPA)	Sum of the semester grade points for all semesters, undergone by a student till the time of calculation of cumulative credits.
In-Semester Examinations	All students registered for the academic year will be eligible for the sessional examinations, continuous assessments, re-sessional and improvement examinations subject to the fulfilment of attendance criteria.
End Semester Examination	All students who fulfil the criteria of the term completion and semester progression as per the PCI norms will be eligible to appear the ESE.
Supplementary Examination	Students who failed in Course or Courses with F Grade of an academic year can register for supplementary examination.

1. Attendance Rule:

- All students must attend every registered course regularly. Attendance of 75% is mandatory for each course lectures, tutorials, laboratories, seminars, mini-projects, and projects, etc.
- A maximum of 25% absence may be permitted only on valid grounds such as illness or other emergency reasons beyond the control of the student, subject to approval by the concerned authorities. For such students, the performance and completion of all practical's is mandatory before the end-semester examination.
- Students participating in co-curricular activities, sports, cultural events, or NSS during a semester may receive an attendance waiver, subject to approval by the concerned authorities.
- A student with less than 75% attendance in any course during the semester will be detained from that semester. Such a student will not be eligible to appear for the end-semester examinations of any course in that semester.

2. Continuous Absence and Withdrawal from Courses / College:

A student who has been admitted to an undergraduate degree program or post graduate degree program at the Institute may be permitted to withdraw temporarily for a maximum period of one year due to prolonged illness or an acute family problem that compelled her to stay at home, provided:

- She applies to the Institute within 15 days of the commencement of the semester, fully stating the reasons for such withdrawal, along with supporting documents and the endorsement of her parents/guardian. The student must register for that semester afresh.
- The authority concerned is satisfied that, inclusive of the period of withdrawal, the student is likely to complete his/her degree requirements within a period of 6 years for UG and 4 years for PG.
- There are no outstanding dues or demands from the student by the College, Department, Library, or Hostel.

3. Assessment of Performance

A. Assessment of Theory Course

- A student shall be assessed for her academic performance in theory course through In-Semester Examination (ISE) and End Semester Examination (ESE).
- The assessment of In-Semester Examination shall have two components i.e ISE and Continuous Assessment. The continuous assessment modes such as quiz, assignment, open book test, field work, group discussion, seminar, Student teacher interaction, attendance etc.
- The ISE shall be a written Examination (Pen- Paper).
- If a student remains absent for ISE or CA without approval from the competent authority, a re-examination will not be conducted for that student.
- The 50% passing criterion is there for ISE Examination.
- End Semester Examination shall be a written examination (Pen- Paper).
- If a student remains absent for the ESE due to reasons approved by the competent authority, a supplementary examination will be conducted for such a student.

- A student shall earn course credits only if she scores a minimum of 50% of the total maximum marks for the course.
- If a student fails to score 50% of maximum marks for total marks or remains absent for ESE, she is eligible to register for supplementary exam in that academic year. In such cases, student can carry forward her ISE marks.
- A student who has obtained "F" grade in supplementary examination can appear for backlog examination in next academic year.

B. Assessment of Laboratory Course

- The assessment of laboratory course shall be continuous and based on practical assignments and regularity in laboratory.
- The laboratory courses with Examination scheme ISE and ESE shall have continuous assessment of the Practical's performed by the student throughout the semester and ESE shall have practical and oral examination.
- If a laboratory course includes both ISE and ESE, the student shall earn laboratory course credits only if she scores a minimum of 50% of the total maximum marks for the course.
- If a student remains absent for the ESE due to approved reasons; she is eligible to register for supplementary exam in that academic year.
- A student who has obtained "F" grade in supplementary examination can appear for backlog examination in next academic year.

4. Resessional Examination

Students who fail to secure a minimum of 50% marks in the Internal Assessment shall be required to appear for a re-session examination. The re-session assessment shall be conducted within the respective semester only.

5. 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 sessional examinations for failed candidates shall be conducted only once for the purpose of improving their sessional marks, without changing their continuous internal assessment. If students fail in Re Examination of End Semester Exam.

6. Earned Credits

- At the end of each course, a letter grade is awarded for each course to which a student has registered. Upon obtaining a passing grade, the student accumulates course credits as earned credits. The student's performance in a course is measured by the letter grade she has earned.
- An extra course is a non-credit course offered to students from the second year onwards. This is a compulsory non-credit course for the students. The student can select any one of the extra non-credit courses mentioned in the program structure.

- It is mandatory for the student to complete all assignments for non-credit courses. A student who completes the assignments for the non-credit course is awarded the grade 'PP' while the grade 'NP' is awarded if the assignments are not completed.

7. Registration for Re-Examination

Students who fail any theory or practical course during the academic year are eligible to register for that course in the Re- examination. The Re-examination will be conducted at the end of the each semester for all the courses. Students registering for the Re-examination within seven days of declaration of result. The Re-examination for students shall be conducted within 30 days from the date of declaration of result of regular ESE of a particular semester

8. Registration for Supplementary Examination

In case a student fails in both the End-Semester Examination (ESE) and the End Semester re-examination in a particular semester, he/she shall be given an opportunity to clear the failed subject(s) through the Supplementary Examination conducted in the Next semester.

9. Backlog Registration and Examination

Students who fail in the Theory course or practical course during the supplementary examination can register for the backlog examination in the next academic year. The backlog examination will be conducted according to the on-going semester.

10. Rules of Promotion to the Next Programme Year

- Students must earn a minimum of 50% of the total credits for the current academic year to be eligible for admission to the next academic year's semester.
- Students must earn all the credits for the First Year (F.Y.) B. Pharm. and a minimum of 50% of the total credits for the Second Year (S.Y.) B. Pharm. to become eligible for admission to the Third Year B. Pharm. Additionally, students must earn all the credits for the S.Y. B. Pharm. and a minimum of 50% of the total credits for the Third Year B. Pharm. to become eligible for admission to the Final Year B. Pharm.

11. The Grading System

A) Award of Grade for Regular Examination

For each course taken by a student, a grade shall be assigned based on their combined performance in ISE and ESE, including all assessments of theory and laboratory courses. The grade reflects a qualitative assessment of the student's performance and is associated with an equivalent numerical value, called a grade point.

Grading Scheme

Letter Grade	Grade Points	Performance
O	10	Outstanding
A	9	Excellent
B	8	Good
C	7	Fair
D	6	Average
F	0	Fail
DT/AB	0	Fail
PP	-	Passed (Only for Extra course)
NP	-	Not passed (Only for extra course)
DT: Detained, AB: Absent		

Letter grades and grade points equivalent 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/DT	0	Fail
-	PP	-	Passed (Only for Extra course)
-	NP	-	Not passed (Only for Extra course)

CGPA and Class Awarded

Sr. No.	CGPA	Class
1	CGPA of. 7.50 and above	First Class with Distinction
2	CGPA of. 6.00 to 7.49	First Class
3	CGPA of. 5.00 to 5.99	Second Class

Calculation of Semester Grade point Average (SGPA)

- The Semester Grade Point Average (SGPA) for each semester will be calculated only for students who have passed all the courses of that semester.

$$\text{SGPA} = \frac{\text{Grade points earned in each course} \times \text{Credits for earned in each course}}{\text{Total credits for the semester}}$$

- SGPA or GPA is the ratio of the sum of the products of the number of credits of each course (C_i) and the grade points scored in that course (G_{Pi}), taken for all the courses, to the sum of the number of credits of all the courses (n) in the semester.

Where n is the number of courses in that semester.

Calculation of Cumulative Grade point Average (CGPA)

- Cumulative Grade Point Average (CGPA) up to any semester will be calculated only for students who have passed all the courses up to that semester.
- The CGPA will be calculated as follows:

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

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, As seen from the above formula, CGPA is not the average of SGPA.

Calculation of Cumulative Grade point Average (CGPA) to Percentage:

The performance of students who are pursuing pharmacy programs in Amrutvahini College of Pharmacy, Sangamner Dist. Ahilyanagar is awarded on a Grading-Scheme. In this system, the top band (top 10%) of students who score highest marks are placed at O which is equivalent to 10 grade point (maximum). Thus, 10 GPA or CGPA is equivalent to 100%. Accordingly, 1 GPA or CGPA is equivalent to 10%. Based on this, the following formula is applied to convert GPA or CGPA to an appropriate percentage:

	if O grade then $20 \times \text{CGPA} - 100$
	if A+ grade then $12 \times \text{CGPA} - 25$
	if A grade then $10 \times \text{CGPA} - 7.5$
% of Marks =	if B+ grade then $5 \times \text{CGPA} - 26.25$
	if B grade then $10 \times \text{CGPA} - 2.5$
	if C grade then $10 \times \text{CGPA} - 2.50$
	if D grade then $6.6 \times \text{CGPA} + 13.6$

B) Award of Grade for End Semester Examination, Supplementary or Backlog Examination

For every course taken by a student in the ESE, Supplementary or Backlog Examination, she shall be assigned a grade based on her performance in both theory and laboratory courses. The grade reflects a qualitative assessment of the student's performance and is associated with an equivalent numerical value called a grade point.

12. Showing Answer Sheets to Students

- Faculty members will show the assessed papers of the written ISE to the students in their classes before submitting them to the examination section. The assessed answer sheets will be shown to the students only, not to their friends or relatives.

- The assessed papers of the ESE will be made available to students through a course-wise web link after the results are declared. After reviewing their answer sheets, students can apply for re-verification or revaluation by using the prescribed form and paying the appropriate fee.

13. Revaluation Rule:

The benefit of revaluation shall be granted to a candidate if the marks obtained after revaluation exceed the original marks by 10% or more of the maximum end-semester examination marks (greater than or equal to 5) for the theory course(s). Only these marks will be accepted by the college and will be binding on the candidate.

14. Grade Report Card

After the results are declared, the grade card will be issued at the end of the semester to each student and shall contain the following:

- The credits and letter grade obtained for each course registered in that academic year.
- Any non-credit course(s) undertaken by the student in that academic year.
- The CGPA up to that semester, if the student has passed all courses up to that semester.

The grade card shall not indicate class, division, or rank. However, a conversion from CGPA to percentage will be indicated on the back of the grade card.

15. Award of Provisional Degree Certificate

A student becomes eligible for the award of the B.Pharm./M.Pharm. Degree provided she has:

- Registered for and passed all the prescribed courses under the given programme.
- Satisfactorily completed all the extra (non-credit) courses with 'PP' grade
- Obtained a CGPA ≥ 5.0
- Paid all institute dues, including hostel (if applicable)
- No case of indiscipline pending against her.

The college authorities will recommend the award of the **Bachelor of Pharmacy or Master of Pharmacy** degree to a student who meets the eligibility and qualification criteria outlined above. The final degree, however, will be conferred by **Savitribai Phule Pune University (SPPU)**.

16. Passing Rules and Regulations

- To obtain a passing grade in any course, students must score a minimum of 50% of the total maximum marks for the course.
- Grades will be allotted based on the performance in both ISE and ESE.
- If a student fails in any course, she will be allowed to reappear for the re-examination, which will be conducted immediately after the results. If she is unable to obtain a passing grade in the supplementary examination, her registration for the program will be cancelled. (Admitted 2025-26)
- Students are permitted to progress to the next semester even if they fail a course. However, to appear for the Semester VIII end semester examination, a student must have successfully completed all courses up to Semester VII. The final CGPA shall be awarded only after successful completion of all courses from Semester I to Semester VIII within the maximum duration prescribed by PCI. Lateral entry students shall

successfully complete all courses from Semester III to Semester VII before appearing for the Semester VIII end semester examination. (Admitted 2026-27 NEP Pattern)

17. Interpretation of Regulations

In case of any dispute or difference of opinion regarding the interpretation of these regulations, or any other matter not covered in these regulations, the decision of the Chairman of the Governing Body of Amrutvahini College of Pharmacy, Sangamner shall be final and binding.

18. Revision of Rules and Regulations

The Governing Body may revise, amend, or alter regulations, courses of study, and syllabi as needed. Additionally, any other relevant rules requiring urgent revisions can be framed and implemented by the Chairman of the Governing Body, subject to ratification at the subsequent Governing Body meeting.

19. Power to Modify

Notwithstanding all that has been stated above, the Governing Body reserves the right to modify any of the above rules and regulations from time to time.

❖ General Guidelines for Students

- All students must strictly follow the timeline for all examination-related activities.
- If a student does not fill out the regular exam form, they will not be allowed to appear for the supplementary exam.
- Arrive at least 15 minutes in the exam hall before the start of the examination. However, the CoE may allow late entry up to 30 minutes after the exam starts at his discretion. No entry will be permitted beyond this.
- Mobile phone, smart watch, ear phones, and any other electronic devices are strictly prohibited in the exam hall.
- Every candidate shall maintain discipline and silence in the examination hall.
- Hall ticket and the College ID card are mandatory for appearing the examination.
- Only writing material in a transparent pouch is allowed in the examination hall.
- Writing pad is not allowed in the examination hall.
- In case of loss/forget the Hall ticket or ID card a written permission of the Principal must be taken before entering the examination hall.
- The students can only leave the examination hall during last 30 min or in the case of any emergency with due permission of the invigilator.
- Listen carefully to instructions. Students are required to comply with the instructions of invigilators at all times.
- No supplements will be provided to the student.
- Bags, books, and personal belongings must be left outside the examination hall.
- Follow the seating plan and instructions given by invigilators.
- Students must not communicate with each other in any form.
- If any student writes inappropriate or irrelevant content in the answer sheet, strict action will be taken.
- Any suspicion of malpractice (talking, copying, and possessing unauthorized materials) will result in immediate reporting and disciplinary action.

- Raise your hand to get the attention of an invigilator for any clarification.
- No student may leave the hall before 30 minutes of the exam start and within the last 10 minutes.
- Students must stop writing when time is called and submit answer booklets as instructed.
- Do not remove any sheets from the answer booklet or damage college property.
- Leave the examination hall quietly without disturbing others.
- Handicapped Examinees using a writer are eligible for: extra 1 hour for the writer **or** 30 minutes extra for the writer of a visually or orthopedically handicapped Examinee.

Conditions for Allowing a Writer

- a. The examinee must apply to the CoE in the prescribed format, requesting permission to use a writer.
- b. The medical certificate shall be verified by the CoE.
- c. Upon verification, the CoE shall issue a written permission letter to the examinee.
- d. The writer:
 - Must not be a student of any program under B. Pharm at the Institute, or
 - Any other technical diploma or degree course from any institute.
- e. The CoE shall also obtain a signed undertaking from the writer in the prescribed format, confirming eligibility and adherence to exam protocols.
- f. The examinee must present the permission letter to the invigilator at the start of each examination in which the writer will be used.
 - Orthopedically/visually handicapped Examinees may avail **extra time** (1 hour) during the exam by obtaining **prior permission** from the CoE as follows

Condition for Physically disabled examinees

To avail of this facility, the examinee must:

1. **Submit a formal request** to the **CoE** seeking extra writing time;
2. Provide a **valid medical certificate** issued by a **Civil Surgeon**, clearly stating the nature of the disability and the need for additional time;
3. Ensure that the request is made **well in advance** of the commencement of the examination schedule.

Upon verification of the certificate, the CoE shall issue written permission authorizing the additional time.

This permission must be presented to the invigilator at the beginning of each examination session.

- If a student does not have their College ID Card or Admit Card, an undertaking shall be taken by the Invigilator, and the student shall pay a fine.
- Students detained or punished for unfair means shall not appear for the examination of that course. If they do so, disciplinary action will be taken.
- In case of a change in detention status, the Examinee must immediately submit the Admit Card to the CoE for correction.
- Examinees must write correct question numbers on the answer book. Otherwise, zero marks will be awarded.
- The Institution reserves the right to cancel the admission of students at any stage if found in violation of examination or admission rules.

- Malpractice during the examination is strictly prohibited and disciplinary action will be taken as per the Maharashtra University Act No. XXXI of 1982.
 - *Malpractices: Writing on the question paper, sharing of the question paper or answer sheets, talking with other students, carrying cheats, writing on the bench or body, disturbing other students, use of abusive language with the supervisors, leaving the exam hall without permission, involvement in mass copying, carrying any electronic gadgets (except scientific calculator when prescribed for a particular subject).*

❖ **Instruction to Students at the time of Exam**

1. The candidate should ensure that no objectionable material that may lead to an unfair means case is lying around his/her seat prior to the commencement of the examination. It is the sole responsibility of the candidate to inform the supervisor if any such material is found.
2. The candidate must verify that the answer book pages are properly printed and free from any damage. If any page is missing or defective, the candidate must get the answer book replaced before writing anything by informing the supervisor. No pages of the answer book should be removed or damaged by the candidate.
3. Enter your PRN number, examination name, course code, course name, date of examination, class and semester in the appropriate spaces provided.
4. The candidate must paste the Barcode/QR sticker and verify their own PRN number in the appropriate space provided on the front page
5. Do not write your name, number, or any mark in the answer book that may reveal your identity.
6. Do not write anything on the main page in the space provided for examiner or college use.
7. Write the relevant answers to the questions in clear and legible handwriting on both sides of the answer book.
8. Begin each new question on a separate page and write your answers using only blue or black pen.
9. Candidates are not allowed to write marks or anything on the question paper (except the PRN number in the space provided). The last page of the answer book used for rough work should be clearly marked as 'Rough Work'.
10. No candidate will be allowed to leave the examination hall during the first 45 minutes from the commencement of the examination and during the last 10 minutes of the examination session.
11. Do not leave your seat under any circumstances without prior permission from the block supervisor.
12. If any objectionable material related to the examination, mobile phone, programmable calculator, electronic or non-electronic device, handwritten or printed paper, chit, writings on cloth or body parts, or any other prohibited item is found with a candidate, or if a candidate is found exchanging any of these items, or exchanging answer books or question papers, the candidate will be immediately expelled, and final punishment will be imposed as per college rules and regulations.
13. The candidate must use their own pen, pencil, ruler, eraser, and other stationery items. They are strictly prohibited from sharing, exchanging, or communicating any stationery

items with anyone other than the invigilator, both inside and outside the examination hall. Engaging in any other form of communication will be considered a violation of the examination rules. Candidates found copying, receiving assistance, or offering assistance to others will be punished as per the college rules.

14. The supervisor will announce a warning bell 15 minutes before the completion of the examination.
15. The candidate must immediately surrender the answer book to the supervisor upon the final bell at the completion of the examination. Leaving the examination hall without doing so will result in action against the candidate as per college rules and regulations.
16. The candidate will not be allowed to take the question paper out of the examination hall until he/she has completed the examination and submitted the answer book.
17. Any damage to, tearing, swallowing, or taking away of the answer book is considered an offense, and disciplinary action will be taken accordingly.
18. Disciplinary action will be taken against any candidate who disobeys the supervisor's instructions, misbehaves, or violates the code of conduct of Amrutvahini College of Pharmacy examinations.

❖ Grace Marks

Ref- Savitribai Phule Pune University Circular No. 396 of 2002, Dated: 24/10/2002

The grace marks for UG and PG program are shown in the form of dollar (\$).

1) For passing in each Head of Passing (Ordinance 1)

The examinee shall be given the benefit of grace marks only for passing in each head of passing, (Theory/Practical/Oral/Sessional) in External or Internal examinations as follow

Sr. No.	Head of Passing	Grace Marks Up to
1	Up to 50	2
2	51-100	3
3	101-150	4
4	151-200	5
5	201-250	6
6	251-300	7
7	301-350	8
8	351-400	9
9	401 & above	10

Provided that benefit of such gracing marks given in different heads of passing shall not exceed 1% of the aggregate marks in that examination. Provided further that this gracing is concurrent with the rules and guidelines of professional statutory bodies at the All-India level such as PCI, UGC etc.

2) Condonation (Ordinance 4)

Ref- Savitribai Phule Pune University Circular No. 396 of 2002, Dated: 24/10/2002

If a candidate fails in only one head of passing, having passed in all other heads of passing, his or her deficiency of marks in such a head of passing may be condoned by not more than 1% of the aggregate marks of the examination or 10% of the total number of marks of that head of passing in which he or she is failing, whichever is less.

However, condonation, whether in one head of passing or aggregate head of passing, be restricted to a maximum of 10 marks only. Condonation of deficiency of marks be shown in the grade card in the form of an asterisk and an ordinance number. Provided that this condonation of marks is concurrent with the rules and guidelines of professional statutory bodies at the all-India level such as PCI, UGC etc.

Notes for Ordinances 4:

- If a candidate fails in a head of passing that is included in another head of passing of the same course, he shall be entitled to the benefit of the condonation in both heads, if necessary, subject to the maximum limit of condonation permissible.
- If a deficiency of marks is condoned, the class or grade in the examination concerned by the candidate shall be declared on the actual marks obtained by the candidate.
- The benefit of not more than one ordinance shall only be given for one examination of one course.
- The benefits of the above-mentioned ordinances may be given to the candidates appearing in the examination with a backlog and/or exemption whenever such an exemption or system of backlog has been provided.
- The benefits under the above-mentioned ordinances shall be given at the time of declaration of final examinations only.
- The final examination for the purposes of these ordinances means and includes such examinations on the basis of the marks on which a class or grade is awarded.

❖ **Grant of Additional Marks for Extra Activities (Ordinance 163 / 1+163)**

Ref- Savitribai Phule Pune University Circular No. 75 of 2015, Dated: 23/04/2015 regarding ordinance 163 and letter received on 03rd February 2024

- 1) A student appearing for an autonomous examination in any degree program may be awarded up to ten extra marks as an incentive for participating in one or more of the following activities, regardless of what are stated in any other ordinance.
 - (a) National Service Scheme,
 - (b) Inter-University, National, or International sports tournaments, debating, educational competitions, dramatics, moot court, and other such events as may be approved by the Executive Council from time to time.
 - (c) National Physical efficiency drive,
 - (d) Adult Education Programme
- 2) The additional marks shall be added
 - (a) to any head/s of passing or to any subject/s, as case may be in the examination if the student has failed in such head/s of passing/subject/s and if such additional marks enable the student to get necessary passing marks; or
 - (b) to any subject if such additional marks enable the student to get benefits of exemption. Such additional marks only as are required for examination shall be given. If after the grant of additional marks under clause (a) and (b) above, if there is any balance of marks, it shall be added to the total number of marks of the examinations.

OR

- (c) to the total number of marks, secured by the candidate in the examination.

Provided that the additional marks shall not be taken into consideration for the purpose of award of any prize, scholarship, merit list or for such other similar purposes.

- 3) The additional marks shall be granted to the candidate only for that examination during the course of which the candidate has participated in the activities mentioned in Clause No. 1.
Note: The candidate shall be eligible to get maximum five additional marks only once, for any of the activities mentioned above, if performed by him any year, and only for an examination of one course.

Illustration: Candidate has taken admission for B.Pharmacy Course, simultaneously in the year 2025. He has participated in the Inter-University elocution competition in the year 2025. Such a candidate shall be eligible to get benefits of the five marks on the basis of said elocution competition either for the examination of B.Pharmacy Course for which he has taken admission in 2025.

- 4) The additional marks shall be granted to the student subject to the conditions mentioned here under:

(a) NCC: Candidate enrolled in NCC must have passed 'B' and/or 'C' certificate examination.

[and/or candidate enrolled in NCC must have attended 75% parades out of total No. of parades and one camp prescribed for NCC]

(b) NSS: Candidate enrolled in NSS must have completed 120 hours of effective work and attended the necessary number of camps, as required under NSS Programme.

(c) National Physical Efficiency/Drive: Candidate enrolled in National Physical Efficiency Drive must have acquired three stars under the programme.

(d) Inter-University Tournaments/Competition: Candidate must have participated in the Inter-University Tournaments/Competition as a Representative of this University.

(e) National/International Tournaments/Competition: Candidate must have participated as a representative of State of Maharashtra/India.

(f) Adult Education Programme: A candidate must have completed at least 200 clock hours work to the satisfaction of the project in-charge and secured necessary certificate of the course.

- 5) A student shall submit an application before the date of commencement of his examination along with fee of Rs. 10/- for the grant of additional marks along with necessary original certificate or copies thereof countersigned by the Principal of the College. No application received after commencement of examination shall be entertained by the Examination Department.

- 6) If any difficulty arises in giving effect to provisions of this Ordinance, the Principal may in consultation with the COE of the Examination concerned give his decision in such a particular case. The decision of the Principal shall be final and binding in such matters.

❖ **Autonomous Examination Work Flow for End Semester Exam (Tentative)**

Sr. No.	Activity
1	Examination form filling for Regular Exam
2	Examiner list given by BoS chairman as per course wise
3	Online QP submission by the course chairperson
4	Display of Detention list by academics
5	TH/PR/OR Marks Entry in MIS
6	Display of Exam Time Table
7	Distribution of Hall tickets
8	Regular Examination TH & PR
9	Date of Result Declaration
10	Open House Facility
11	Rechecking & Revaluation Application Date
12	Appointment of Revaluator
13	Revaluation Period
14	Date of Revaluation Result Declaration
15	Exam form filling for Re-Examination
16	Display of Exam Time Table
17	Distribution of Hall tickets
18	Re-Examination of TH & PR
19	Result Declaration for Re-Examination
20	Open House Facility for Re-Examination
21	Rechecking & Revaluation Application Date for Re-Examination
22	Appointment of Revaluator for Re-Examination
23	Revaluation Period for Re-Examination
24	Date of Revaluation Result Declaration for Re-Examination
25	Exam form filling for Supplementary Exam
26	Display of Exam Time Table
27	Distribution of Hall tickets
28	Re-Examination of TH & PR
29	Result Declaration for Supplementary Exam
30	Open House Facility for Supplementary Exam
31	Rechecking & Revaluation Application Date for Supplementary Exam
32	Appointment of Revaluator for Supplementary Exam
33	Revaluation Period for Supplementary Exam
34	Date of Revaluation Result Declaration for Supplementary Exam