RAMAIAH UNIVERSITY OF APPLIED SCIENCES

# Programme Specifications

## B.Pharm. Programme

| Programme: Bachelor of Pharmacy | Department: Pharmacy |
|---|---|

Faculty of Pharmacy
M.S. Ramaiah University of Applied Sciences

University House, New BEL Road, MSR Nagar, Bangalore – 560 054

www.msruas.ac.in

| Programme Specifications: B. Pharm. | |
|---|---|
| Faculty | Faculty of Pharmacy (FPH) |
| Programme | Bachelor of Pharmacy |
| Dean of Faculty | Prof. (Dr.) V. Madhavan |

**1. Title of the Award**

Bachelor of Pharmacy

**2. Modes of study**

Full-Time

**3. Awarding Institution / Body**

M.S.Ramaiah University of Applied Sciences – Bengaluru, India

**4. Joint Award**

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**5. Teaching Institution**

Faculty of Pharmacy

M.S.Ramaiah University of Applied Sciences - Bengaluru, India

**6. Date of Programme Specifications**

March 2017

**7. Date of Programme Approval by the Academic Council of MSRUAS**

April 2017

**8. Next Review Date**

March 2021

**9. Programme Approving Regulatory Body and Date of Approval**

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**10. Programme Accrediting Body and Date of Accreditation**

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**11. Grade Awarded by the Accreditation Body**

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**12. Programme Accreditation Validity**

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**13. Programme Benchmark**

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## 14. Rationale for the Programme

Pharmacists play a vital role in the health care system from manufacturing to dispensing of medications including educating the patients regarding rational use of the prescribed drugs. The spectrum of pharmacy profession is very wide, as it covers numerous opportunities in the pharma industry—R&D, manufacturing and retail, healthcare sector, pharmacy education and regulatory bodies. The current availability of pharmacists in terms of pharmacist to population ratio is inadequate in this country.

The rapid growth and diversification of the pharma industry and health care sector has created lots of opportunities for pharmacy graduates. The demand of pharmacists is further growing with the growth of the industry within the country and outsourcing from abroad. Among the biggest factors fuelling the growth is contract research for Pharma R&D and contract manufacturing for global pharma companies. The retail sector is also witnessing growth due to entry of major retail chains. The shortfall in supply of pharmacists globally and lucrative overseas opportunities for employment results in migration of the trained pharmacists from India to abroad.

The M.S. Ramaiah College of Pharmacy, now a constituent of MSRUAS as Faculty of Pharmacy has been in existence for more than two decades. Over the years, Faculty of Pharmacy of MSRUAS has grown and evolved as one of the Premier Institutions in the state of Karnataka. The University infrastructure with latest technologies will empower the students in depth knowledge and to pursue high quality research with creativity and innovation. During the last two decades, the institution has produced over 1000 graduates and 110 Post graduates. The presence of other faculties of applied sciences of the University will facilitate the students to experience more than the conventional curriculum.

The Faculty of Pharmacy of MSRUAS offer a four year B. Pharm. degree programme blending the art of science, technology and human relationships in a unique fashion. The curriculum offered at B. Pharm. level is outcome based and helps students to think critically and acquire practical skills for smooth transition from academics to competitive real life work environment.

## 15. Programme Mission

The purpose of the programme is creation of innovative problem solvers in multi-disciplinary settings, entrepreneurs and leaders applying the knowledge, understanding, cognitive abilities, practical skills and transferable skills gained through systematic, flexible and rigorous learning in the chosen academic domain.

## 16. Graduate Attributes

1. Ability to apply knowledge of basic science and pharmaceutical science fundamentals to solve complex problems in pharmacy
2. Ability to analyse health problems, interpret data and arrive at meaningful conclusions involving scientific inferences
3. Ability to design drugs and drug delivery systems to meet desired needs considering public health and safety, and the cultural, societal, and environmental considerations
4. Ability to understand and solve complex problems in pharmacy by conducting experimental investigations
5. Ability to apply appropriate tools and techniques and understand utilization of resources appropriately to complex activities in pharmacy
6. Ability to understand the effect of pharmaceutical solutions on legal, cultural, social and public health and safety aspects
7. Ability to develop sustainable solutions and understand their effect on society and environment
8. Ability to apply ethical principles to pharmacy practices and professional responsibilities
9. Ability to work as a member of a team, to plan and to integrate knowledge of various disciplines in pharmacy and to lead teams in multidisciplinary settings
10. Ability to make effective oral presentations and communicate technical ideas to a broad audience using written and oral means
11. Ability to lead and manage multidisciplinary teams by applying principles of pharmaceutical science and management principles
12. Ability to adapt to the changes and advancements in technology and engage in independent and life-long learning

## 17. Programme Goal

The programme goal is to produce fully trained pharmacists with knowledge and understanding of formulations, manufacture and evaluation of dosage forms; and the ability to think independently, to pursue a career in the domain of Pharmacy

## 18. Programme Objectives

The objectives of the programme are to enable the students to:

1. To impart adequate knowledge and scientific information regarding basic principles of Pharmaceutical Chemistry, Pharmaceutics (including cosmetics), Pharmacology and Pharmacognosy (including Herbal drugs) to develop and evaluate dosage forms
2. To enhance the understanding of practical techniques to enable the synthesis, manufacture and analysis of various formulations and herbal medicines
3. To impart adequate knowledge of practical aspects of Pharmacological screening, biological standardization and in-vivo interactions to ensure the safety and efficacy of the formulations.
4. To impart adequate knowledge of practical aspects to deliver quality assured products as per the Pharmacopoeial standards
5. To provide adequate knowledge of practical aspects of product detailing to optimize the marketing of Pharmaceutical products
6. To educate on professional ethics, economics, social sciences and interpersonal skills relevant to professional practice
7. To enable the student to cope in various situations, irrespective of the different cultures or constraints involved and develop leadership and entrepreneurial skills
8. To provide a general perspective on lifelong learning and opportunities for a career in industry, business and commerce

## 19. Intended Learning Outcomes of the Programme

The Intended Learning Outcomes (ILOs) are listed under four headings:
1. Knowledge and Understanding, 2. Cognitive Skills 3. Practical Skills and 4. Capability / Transferable Skills.

### 1. Knowledge and Understanding

After undergoing this programme, a student will be able to:

**KU1:** Explain the principles of Pharmaceutical Chemistry, Pharmaceutics, Pharmacology and Pharmacognosy to develop formulations

**KU2:** Explain the procedure in formulating a dosage form, storage, dispensing, reading and checking the prescriptions; manufacturing of the medicinal agents at a commercial scale

**KU3:** Describe the quality assurance principles including legal and ethical aspects to ensure safety

**KU4:** Describe the theoretical aspects of extraction, purification and identification of natural products, and screening for pharmacological activity using animal model software and animals

### 2. Cognitive Skills

After undergoing this programme, a student will be able to:

**CS1:** Develop and modify the processes of extraction and purification of natural products

**CS2:** Analyse the relationship between the molecular structure and biological activity of drugs to improve their therapeutic activity

**CS3:** Select appropriate method for screening of various drugs to establish the pharmacological activity

**CS4:** Standardise the processes of formulation and storage pertaining to the prescription and manufacture of the formulations at a commercial scale

### 3. Practical Skills

After undergoing this programme, a student will be able to:

**PS1:** Identify herbs and natural products having therapeutic value

**PS2:** Prepare and evaluate drug molecules as per the Pharmacopoeial standards

**PS3:** Conduct experiments on animal model software and animals to evaluate the therapeutic activity of drug molecules

**PS4:** Formulate dosage forms as per the requirement

### 4. Capability / Transferable Skills

After undergoing this programme, a student will be able to:

**TS1:** Manage information, develop technical reports and make presentations

**TS2:** Build, Manage and Lead a team to successfully complete a project and communicate across teams and organizations to achieve professional objectives

**TS3:** Work under various constraints to meet project targets

**TS4:** Adopt to the chosen profession by continuously upgrading his/her knowledge and understanding through Life-long Learning philosophy

## 20. Programme Structure

**SEMESTER 1**

| Sl.No. | Code | Course Title | Theory (h/W/S) | Tutorials (h/W/S) | Practical (h/W/S) | Total Credits | Max. Marks |
|---|---|---|---|---|---|---|---|
| **1** | BP101T | Human Anatomy and Physiology I– Theory Theory | 3 | 1 | 0 | 4 | 100 |
| **2** | BP102T | Pharmaceutical Analysis-I Theory | 3 | 1 | 0 | 4 | 100 |
| **3** | BP103T | Pharmaceutics - I Theory | 3 | 1 | 0 | 4 | 100 |
| **4** | BP104T | Pharmaceutical Inorgani Chemistry- Theory | 3 | 1 | 0 | 4 | 100 |
| **5** | BP105T | Communication skills – Theory* | 2 | 0 | 0 | 2 | 50 |
| **6** | BP106RBT/ BP106RMT | Remedial Mathematics/Remedial Biology* | 2 | 0 | 0 | 2 | 50 |
| **7** | BP107P | Human Anatomy and Physiology I– Practical | 0 | 0 | 4 | 2 | 50 |
| **8** | BP108P | Pharmaceutical Analysis I– Practical | 0 | 0 | 4 | 2 | 50 |
| **9** | BP109P | Pharmaceutics – I Practical | 0 | 0 | 4 | 2 | 50 |
| **10** | BP110P | Pharmaceutical Inorganic Chemistry- Practical | 0 | 0 | 4 | 2 | 50 |
| **11** | BP111P | Communication skills – Practical* | 0 | 0 | 2 | 1 | 25 |
| **12** | BP112RBP | Remedial Biology – Practical* | 0 | 0 | 2 | 1 | 25 |
| | | **Total** | **16** | **04** | **20** | **30** | **750** |
| **Total number of contact hours per week** | | | **36/38$/40# hours** | | | | |
| **Total Number of credits to be registered** | | | **27/29/30** | | | | |

*Faculty Examination

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

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

**SEMESTER 2**

| Sl. No. | Code | Course Title | Theory (h/W/S) | Tutorials (h/W/S) | Practical (h/W/S) | Total Credits | Max. Marks |
|---|---|---|---|---|---|---|---|
| 1 | BP201T | Human Anatomy and Physiology II– Theory | 3 | 1 | **0** | 4 | 100 |
| 2 | BP202T | Pharmaceutical Organic Chemistry I- Theory | 3 | **1** | 0 | 4 | 100 |
| 3 | BP203T | Biochemistry- Theory | 3 | **1** | 0 | 4 | 100 |
| 4 | BP204T | Pathophysiology- Theory | 3 | **1** | 0 | 4 | 100 |
| 5 | BP205T | Computer Applications in Pharmacy – Theory* | 3 | **0** | 0 | 3 | 75 |
| 6 | BP206T | Environmental Sciences- Theory* | 3 | 0 | 0 | 3 | 75 |
| 7 | BP207P | Human Anatomy and Physiology II– Practical | 0 | 0 | 4 | 2 | 50 |
| 8 | BP208P | Pharmaceutical Organic Chemistry I – Practical | 0 | 0 | 4 | 2 | 50 |
| 9 | BP209P | Biochemistry- Practical | 0 | 0 | 4 | 2 | 50 |
| 10 | BP210P | Computer Applications in Pharmacy – Practical* | 0 | 0 | 2 | 1 | 25 |
| | | **Total** | **18** | **4** | **14** | **29** | **725** |
| | | **Total number of contact hours per week** | **36 hours** | | | | |
| | | **Number of credits to be registered** | **29** | | | | |

* Faculty Examination

**SEMESTER 3**

| Sl.No. | Code | Course Title | Theory (h/W/S) | Tutorials (h/W/S) | Practical (h/W/S) | Total Credits | Max. Marks |
|---|---|---|---|---|---|---|---|
| 1 | BP301T | Pharmaceutical Organic Chemistry II- Theory | 3 | 1 | 0 | **4** | 100 |
| 2 | BP302T | Physical Pharmaceutics- I Theory | 3 | 1 | 0 | 4 | 100 |
| 3 | BP303T | Pharmaceutical Microbiology- Theory | 3 | 1 | 0 | 4 | 100 |
| 4 | BP304T | Pharmaceutical Engineering- Theory | 3 | 1 | 0 | 4 | 100 |
| 5 | BP305P | Pharmaceutical Organic Chemistry II- Practical | 0 | 0 | 4 | 2 | 50 |
| 6 | BP306P | Physical Pharmaceutics -1 Practical | 0 | 0 | 4 | 2 | 50 |
| 7 | BP307P | Pharmaceutical Microbiology – Practical | 0 | 0 | 4 | 2 | 50 |
| 8 | BP308P | Pharmaceutical Engineering – Practical | 0 | 0 | 4 | 2 | 50 |
| | | **Total** | **12** | **4** | **16** | **24** | **600** |
| | | **Total number of contact hours per week** | **32 hours** | | | | |
| | | **Number of credits to be registered** | **24** | | | | |

**SEMESTER 4**

| Sl.No. | Code | Course Title | Theory (h/W/S) | Tutorials (h/W/S) | Practical (h/W/S) | Total Credits | Max. Marks |
|---|---|---|---|---|---|---|---|
| 1 | BP401T | Pharmaceutical Organic Chemistry III– Theory | 3 | 1 | 0 | **4** | 100 |
| 2 | BP402T | Medicinal Chemistry I – Theory | 3 | 1 | 0 | 4 | 100 |
| 3 | BP403T | Physical Pharmaceutics II – Theory | 3 | 1 | 0 | 4 | 100 |
| 4 | BP404T | Pharmacology I – Theory | 3 | 1 | 0 | 4 | 100 |
| 5 | BP405T | Pharmacognosy and Phytochemistry I– Theory | 3 | 1 | 0 | 4 | 100 |
| 6 | BP406P | Medicinal Chemistry I – Practical | 0 | 0 | 4 | 2 | 50 |
| 7 | BP407P | Physical Pharmaceutics II – Practical | 0 | 0 | 4 | 2 | 50 |
| 8 | BP408P | Pharmacology I – Practical | 0 | 0 | 4 | 2 | 50 |
| 9 | BP409P | Pharmacognosy and Phytochemistry- I Practical | 0 | 0 | 4 | 2 | 50 |
| **Total** | | | **15** | **5** | **16** | **28** | **700** |
| **Total number of contact hours per week** | | | **36 hours** | | | | |
| **Number of credits to be registered** | | | **28** | | | | |

**SEMESTER 5**

| Sl.No. | Code | Course Title | Theory (h/W/S) | Tutorials (h/W/S) | Practical (h/W/S) | Total Credits | Max. Marks |
|---|---|---|---|---|---|---|---|
| 1 | BP501T | Medicinal Chemistry II – Theory | 3 | 1 | **0** | **4** | 100 |
| 2 | BP502T | Industrial Pharmacy I– Theory | 3 | 1 | 0 | 4 | 100 |
| 3 | BP503T | Pharmacology II – Theory | 3 | 1 | 0 | 4 | 100 |
| 4 | BP504T | Pharmacognosy and Phytochemistry II– Theory | 3 | 1 | 0 | 4 | 100 |
| 5 | BP505T | Pharmaceutical Jurisprudence – Theory | 3 | 1 | 0 | 4 | 100 |
| 6 | BP506P | Industrial Pharmacy – Practical | 0 | 0 | 4 | 2 | 50 |
| 7 | BP507P | Pharmacology II – Practical | 0 | 0 | 4 | 2 | 50 |
| 8 | BP508P | Pharmacognosy and Phytochemistry- II Practical | 0 | 0 | 4 | 2 | 50 |
| **Total** | | | **15** | **5** | **12** | **26** | **650** |
| **Total number of contact hours per week** | | | **32 hours** | | | | |
| **Number of credits to be registered** | | | **26** | | | | |

**SEMESTER 6**

| Sl.No. | Code | Course Title | Theory (h/W/S) | Tutorials (h/W/S) | Practical (h/W/S) | Total Credits | Max. Marks |
|---|---|---|---|---|---|---|---|
| 1 | BP601T | Medicinal Chemistry III – Theory | 3 | 1 | 0 | **4** | 100 |
| 2 | BP602T | Pharmacology III – Theory | 3 | 1 | 0 | 4 | 100 |
| 3 | BP603T | Herbal Drug Technology – Theory | 3 | 1 | 0 | 4 | 100 |
| 4 | BP604T | Biopharmaceutics and Pharmacokinetics – Theory | 3 | 1 | 0 | 4 | 100 |
| 5 | BP605T | Pharmaceutical Biotechnology – Theory | 3 | 1 | 0 | 4 | 100 |
| 6 | BP606T | Quality Assurance –Theory | 3 | 1 | 0 | 4 | 100 |
| 7 | BP607P | Medicinal chemistry III – Practical | 0 | 0 | 4 | 2 | 50 |
| 8 | BP608P | Pharmacology III – Practical | 0 | 0 | 4 | 2 | 50 |
| 9 | BP609P | Herbal Drug Technology – Practical | 0 | 0 | 4 | 2 | 50 |
| **Total** | | | **18** | **6** | **12** | **30** | **750** |
| **Total number of contact hours per week** | | | **36 hours** | | | | |
| **Number of credits to be registered** | | | **30** | | | | |

**SEMESTER 7**

| Sl.No. | Code | Course Title | Theory (h/W/S) | Tutorials (h/W/S) | Practical (h/W/S) | Total Credits | Max. Marks |
|---|---|---|---|---|---|---|---|
| 1 | BP701T | Instrumental Methods of Analysis – Theory | 3 | **1** | **0** | **4** | 100 |
| 2 | BP702T | Industrial Pharmacy II – Theory | **3** | 1 | 0 | 4 | 100 |
| 3 | BP703T | Pharmacy Practice – Theory | **3** | 1 | 0 | 4 | 100 |
| 4 | BP704T | Novel Drug Delivery System – Theory | **3** | 1 | 0 | 4 | 100 |
| 5 | BP705P | Instrumental Methods of Analysis – Practical | **0** | 0 | 4 | 2 | 50 |
| 6 | BP706PS | Practice School* | **0** | 0 | 12 | 6 | 150 |
| **Total** | | | **12** | **4** | **16** | **24** | **600** |
| **Total number of contact hours per week** | | | **32 hours** | | | | |
| **Number of credits to be registered** | | | **24** | | | | |

**SEMESTER 8**

| Sl.No. | Code | Course Title | Theory (h/W/S) | Tutorials (h/W/S) | Practical (h/W/S) | Total Credits | Max. Marks |
|---|---|---|---|---|---|---|---|
| 1 | BP801T | Biostatistics and Research Methodology | 3 | 1 | 0 | **4** | 100 |
| 2 | BP802T | Social and Preventive Pharmacy | 3 | 1 | 0 | 4 | 100 |
| 3 | BP803ET | Pharma Marketing Management | 3+3=6 | 1+1=2 | 0 | 4+4=8 | 100+100=200 |
| 4 | BP804ET | Pharmaceutical Regulatory Science | | | 0 | | |
| 5 | BP805ET | Pharmacovigilance | | | 0 | | |
| 6 | BP806ET | Quality Control and Standardization of Herbals | | | 0 | | |
| 7 | BP807ET | Computer Aided Drug Design | | | 0 | | |
| 8 | BP808ET | Cell and Molecular Biology | | | 0 | | |
| 9 | BP809ET | Cosmetic Science | | | 0 | | |
| 10 | BP810ET | Experimental Pharmacology | | | 0 | | |
| 11 | BP811ET | Advanced Instrumentation Techniques | | | 0 | | |
| 12 | BP812ET | Dietary Supplements and Nutraceuticals | | | 0 | | |
| 13 | BP813PW | Project Work | 12 | 0 | 0 | 6 | **150** |
| **Total** | | | **24** | **4** | **0** | **22** | **550** |
| **Total number of contact hours per week** | | | **28 hours** | | | | |
| **Number of credits to be registered** | | | **22** | | | | |

## 21. Programme Delivery

As per Time Table

## 22. Teaching and Learning Methods

The module delivery comprises of a combination of few or all of the following:

1. Face to face lectures using audio-visuals
2. Workshops-group discussions, debates, presentations
3. Demonstrations
4. Guest lectures
5. Laboratory-work/Field work/Workshop
6. Industry visit
7. Seminars
8. Group Exercises
9. Project Work
10. Project Exhibitions
11. Technical Events

## 23. Table 2 Assessment and Grading

### Semester I

| Course code | Name of Course | Internal Assessment | | | | Semester End Examination | | Total marks |
|---|---|---|---|---|---|---|---|---|
| | | Continuous Mode | Sessional Exams | | Total | Marks | Duration | |
| | | | Marks | Duration | | | | |
| BP101T | Human Anatomy and Physiology I– Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP102T | Pharmaceutical Analysis I –Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP103T | Pharmaceutics I – Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP104T | Pharmaceutical Inorganic Chemistry – Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP105T | Communication skills –Theory* | 5 | 10 | 1 h | 15 | 35 | 1.5 h | 50 |
| BP106RBT BP106RMT | Remedial Biology/Mathematics – Theory* | 5 | 10 | 1 h | 15 | 35 | 1.5 h | 50 |
| BP107P | Human Anatomy and Physiology – Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP108P | Pharmaceutical Analysis I –Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP109P | Pharmaceutics I – Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP110P | Pharmaceutical Inorganic Chemistry – Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP111P | Communication skills –Practical* | 5 | 5 | 2 h | 10 | 15 | 2 h | 25 |
| BP112RBP | Remedial Biology –Practical* | 5 | 5 | 2 h | 10 | 15 | 2 h | 25 |

* Faculty Examination

### Semester II

| Course code | Name of Course | Internal Assessment | | | | Semester End Examination | | Total marks |
|---|---|---|---|---|---|---|---|---|
| | | Continuous Mode | Sessional Exams | | Total | Marks | Duration | |
| | | | Marks | Duration | | | | |
| BP201T | Human Anatomy and Physiology II– Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP202T | Pharmaceutical Organic Chemistry I- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP203T | Biochemistry- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP204T | Pathophysiology- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP205T | Computer Applications in Pharmacy – Theory* | 10 | 15 | 1 h | 25 | 50 | 2 h | 75 |
| BP206T | Environmental Sciences- Theory* | 10 | 15 | 1 h | 25 | 50 | 2 h | 75 |
| BP207P | Human Anatomy and Physiology II– Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP208P | Pharmaceutical Organic Chemistry I – Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP209P | Biochemistry- Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP210P | Computer Applications in Pharmacy – Practical* | 5 | 5 | 2 h | 10 | 15 | 2 h | 25 |

*Faculty Examination

### Semester III

| Course code | Name of Course | Internal Assessment | | | | Semester End Examination | | Total marks |
|---|---|---|---|---|---|---|---|---|
| | | Continuous Mode | Sessional Exams | | Total | Marks | Duration | |
| | | | Marks | Duration | | | | |
| BP301T | Pharmaceutical Organic Chemistry II- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP302T | Physical Pharmaceutics I- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP303T | Pharmaceutical Microbiology- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP304T | Pharmaceutical Engineering- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP305P | Pharmaceutical Organic Chemistry II- Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP306P | Physical Pharmaceutics I- Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP307P | Pharmaceutical Microbiology- Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP308P | Pharmaceutical Engineering- Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |

## Semester IV

| Course code | Name of Course | Internal Assessment | | | | Semester End Examination | | Total marks |
|---|---|---|---|---|---|---|---|---|
| | | Continuous Mode | Sessional Exams | | Total | Marks | Duration | |
| | | | Marks | Duration | | | | |
| BP401T | Pharmaceutical Organic Chemistry III- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP402T | Medicinal Chemistry I- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP403T | Physical Pharmaceutics II- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP404T | Pharmacology I- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP405T | Pharmacognosy and Phytochemistry I- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP406P | Medicinal Chemistry I- Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP407P | Physical Pharmaceutics II -Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP408P | Pharmacology I- Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP409P | Pharmacognosy and Phytochemistry I- Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |

## Semester V

| Course code | Name of Course | Internal Assessment | | | | Semester End Examination | | Total marks |
|---|---|---|---|---|---|---|---|---|
| | | Continuous Mode | Sessional Exams | | Total | Marks | Duration | |
| | | | Marks | Duration | | | | |
| BP501T | Medicinal Chemistry II- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP502T | Industrial Pharmacy I- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP503T | Pharmacology II- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP504T | Pharmacognosy and Phytochemistry II- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP505T | Pharmaceutical Jurisprudence- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP506P | Industrial Pharmacy I- Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP507P | Pharmacology II- Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP508P | Pharmacognosy and Phytochemistry II- Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |

## Semester VI

| Course code | Name of Course | Internal Assessment | | | | Semester End Examination | | Total marks |
|---|---|---|---|---|---|---|---|---|
| | | Continuous Mode | Sessional Exams | | Total | Marks | Duration | |
| | | | Marks | Duration | | | | |
| BP601T | Medicinal Chemistry III- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP602T | Pharmacology III- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP603T | Herbal Drug Technology - Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP604T | Biopharmaceutics and Pharmacokinetics- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP605T | Pharmaceutical Biotechnology- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP606T | Quality Assurance- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP607P | Medicinal Chemistry III- Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP608P | Pharmacology III- Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP609P | Herbal Drug Technology -Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |

## Semester VII

| Course code | Name of Course | Internal Assessment | | | | Semester End Examination | | Total marks |
|---|---|---|---|---|---|---|---|---|
| | | Continuous Mode | Sessional Exams | | Total | Marks | Duration | |
| | | | Marks | Duration | | | | |
| BP701T | Instrumental Methods of Analysis- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP702T | Industrial Pharmacy- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP703T | Pharmacy Practice - Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP704T | Novel drug delivery System- Theory | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP705P | Instrumental Methods of Analysis- Practical | 5 | 10 | 4 h | 15 | 35 | 4 h | 50 |
| BP706PS | Practice School* | 25 | -- | -- | 25 | 125 | 5 h | 150 |

## Semester VIII

| Course code | Name of Course | Internal Assessment | | | | Semester End Examination | | Total Marks |
|---|---|---|---|---|---|---|---|---|
| | | Continuous Mode | Sessional Exams | | Total | Marks | Duration | |
| | | | Marks | Duration | | | | |
| BP801T | Biostatistics and Research Methodology | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP802T | Social and Preventive Pharmacy | 10 | 15 | 1 h | 25 | 75 | 3 h | 100 |
| BP803ET | Pharma Marketing Management | 10+10=20 | 15+15=30 | 1+1=2 h | 25+25=50 | 75+75=150 | 3+3= 6 h | 100+100 =200 |
| BP804ET | Pharmaceutical Regulatory Science | | | | | | | |
| BP805ET | Pharmacovigilance | | | | | | | |
| BP806ET | Quality Control and Standardization of Herbals | | | | | | | |
| BP807ET | Computer Aided Drug Design | | | | | | | |
| BP808ET | Cell and Molecular Biology | | | | | | | |
| BP809ET | Cosmetic Science | | | | | | | |
| BP810ET | Experimental Pharmacology | | | | | | | |
| BP811ET | Advanced Instrumentation Techniques | | | | | | | |
| BP812ET | Dietary Supplements and Nutraceuticals | | | | | | | |
| BP813PW | Project Work | | | | | | | |

### Table 3:- Scheme for awarding internal assessment: Continuous mode

| Theory | | |
|---|---|---|
| **Criteria** | **Maximum Marks** | |
| Attendance (Refer Table below) | 4 | 2 |
| Academic activities (Assignment and interaction with students) | 6 | 3 |
| **Total** | 10 | 5 |
| **Practical** | | |
| **Criteria** | **Maximum Marks** | |
| Attendance (Refer Table below) | 2 | |
| Based on Practical Records, Regular viva voce, etc. | 3 | |
| **Total** | 5 | |

**Table 4:- Guidelines for the allotment of marks for attendance**

| Percentage of Attendance | Theory | Practical |
|---|---|---|
| 95 – 100 | 4 | 2 |
| 90 – 94 | 3 | 1.5 |
| 85 – 89 | 2 | 1 |
| 80 – 84 | 1 | 0.5 |
| Less than 80 | 0 | 0 |

Two Sessional exams shall be conducted for each theory / practical course as per the schedule fixed. The scheme of question paper for theory and practical Sessional examinations is given below. The average marks of two Sessional exams shall be computed for internal assessment as per the requirements given in Tables – 2.

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

**Question paper pattern for theory Sessional examinations**

**For courses having University exam**

I. Multiple Choice Questions (MCQs) (Answer all questions) = 10×1=10
II. Long Answers (Answer 1 out of 2) =1×10=10
III. Short Answers (Answer 2 out of 3) = 2×5=10
**Total= 30 marks**

**For courses having Faculty exam**

I. Multiple Choice Questions (MCQs) (Answer all questions) = 10×1=10
II. Long Answers (Answer 1 out of 2) =1×10=10
III. Short Answers (Answer 2 out of 3) = 2×5=10
**Total= 30 marks**

**Question Paper pattern for Practical sessional examination**

I. Synopsis = 10
II. Experiments =25 (30:30:40)
III. Viva Voce = 5
**Total= 40 marks**

**Question paper pattern for Semester End theory examinations**

**For 75 Marks paper**

I. Multiple Choice Questions (MCQs) (Answer all questions) = 20×1=20
II. Long Answers (Answer 2 out of 3) =2×10=20
III. Short Answers (Answer 7 out of 9) = 7×5=35
**Total= 75 marks**

**For 50 Marks paper**

| | |
|---|---|
| I. Long Answers (Answer 2 out of 3) | =2×10=20 |
| II. Short Answers (Answer 6 out of 8) | = 6×5=30 |
| | **Total= 50 marks** |

**For 35 Marks paper**

| | |
|---|---|
| I. Long Answers (Answer 1 out of 2) | =1×10=10 |
| II. Short Answers (Answer 5 out of 7) | = 5×5=25 |
| | **Total= 35 marks** |

**For Consideration Courses**

Answer 5 out of 6 = 5×10=50 marks

**Question paper pattern for Semester End theory examinations**

| | |
|---|---|
| I. Synopsis | = 5 |
| II. Experiments | =25 (10:60:30) |
| III. Viva Voce | = 5 |
| **Total= 35 marks** | |

## 24. Attendance

A minimum of 80% attendance compulsory to appear for semester end examinations.

Any condoning is as per the Academic Regulations.

## 25. Award of Class

As per the Academic Regulations for B. Pharm. Programme.

## 26. Student Support for Learning

Students are given the following support:

1. Course notes
2. Reference books in the library
3. Magazines and Journals
4. Internet facility
5. Computing facility
6. Laboratory facility
7. Workshop facility
8. Staff support
9. Lounges for discussions
10. Any other support that enhances their learning

## 27. Quality Control Measures

Following are the Quality Control Measures:

1. Review of course notes
2. Review of question papers and assignment questions
3. Student Feedback
4. Moderation of assessed work
5. Opportunities for the students to see their assessed work
6. Review by external examiners and external examiners reports
7. Staff Student Consultative Committee meetings
8. Student exit feedback
9. Subject Assessment Board (SAB)
10. Programme Assessment Board (PAB)

## 28. Curriculum Map

| Course Code | | | | | | | | Intended Learning Outcomes | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Knowledge and Understanding | | | | Cognitive (Thinking) Skills (Critical, Analytical, Problem Solving) | | | | Practical skills | | | |
| HSS | BSC | LSC | AFC | DFC | PDC | MSC | OPD | KU1 | KU2 | KU3 | KU4 | CS1 | CS2 | CS3 | CS4 | PS1 | PS2 | PS3 | PS4 |
| a | b | c | d | e | f | g | h | | | | | | | | | | | | |
| 105T | 106RB | 102T | 101T | 803E | 801T | 813P | | cd | c | c | bd | | | | | | | | |
| 111P | 106R | 108P | 103T | 804E | 802T | | | bcd | cd | ce | | | | | d | | | | |
| 206T | 112RBP | 110P | 107P | 805E | | | | cd | d | e | bd | | | | | | | | |
| 101A | 205T | 202T | 109P | 806E | | | | bde | e | e | e | e | | | d | e | | | |
| 201A | 210P | 203T | 201T | 807E | | | | b | c | | d | | | | | | | | |
| | | 208P | 204T | 808E | | | | c | d | | | | | | | | | | |
| | | 209P | 207P | 809E | | | | e | d | | d | | | | | | | | |
| | | 301T | 304T | 810E | | | | d | d | | e | | | e | | | | | |
| | | 302T | 308P | 811E | | | | c | cd | | | | | | | | | | |
| | | 303T | 401T | 812E | | | | c | c | c | e | | | | | | | | |
| | | 305P | 402T | | | | | cd | cd | | | | d | | | | | | |
| | | 306P | 403T | | | | | c | c | | | | | | | | | | |
| | | 307P | 404T | | | | | c | c | c | d | | | | | | | | |
| | | | 405T | | | | | d | d | | d | d | | | | d | | | |
| | | | 406P | | | | | d | d | | | | d | | | | d | | |
| | | | 407P | | | | | d | d | | | | | | | | | | |
| | | | 408P | | | | | d | d | | d | | | d | | | | d | |
| | | | 409P | | | | | d | d | | d | d | | | | d | | | |
| | | | 501T | | | | | d | d | | | | d | | | | | | |
| | | | 502T | | | | | d | d | | | | | | d | | | | |
| | | | 503T | | | | | d | d | | d | | | | | | | | |
| | | | 504T | | | | | d | d | | d | d | | | | d | | | |
| | | | 505T | | | | | d | d | d | | | | | | | | | |
| | | | 506P | | | | | d | d | | | | | | d | | | | d |
| | | | 507P | | | | | d | d | | d | | | d | | | | d | |
| | | | 508P | | | | | d | d | | d | d | | | | d | | | |
| | | | 601T | | | | | d | d | | | | d | | | | | | |
| | | | 602T | | | | | d | d | | d | | | | | | | | |
| | | | 603T | | | | | d | d | | d | d | | | | d | | | |
| | | | 604T | | | | | d | d | | | | | | | | | | |
| | | | 605T | | | | | d | d | | | | | | | | | | |
| | | | 606T | | | | | d | d | d | | | | | | | | | |
| | | | 607P | | | | | d | d | | | | | | | | d | | |
| | | | 608P | | | | | d | | | d | | | d | | | | d | |
| | | | 609P | | | | | d | d | | d | d | | | | d | | | |
| | | | 701T | | | | | d | d | d | | | | | | | | | |
| | | | 702T | | | | | d | d | | | | | | d | | | | |
| | | | 703T | | | | | d | d | | | | | | | | | | |
| | | | 704T | | | | | d | d | | | | | | | | | | |
| | | | 705P | | | | | d | d | d | | | | | | | | | |
| | | | 706PS | | | | | d | d | | | | | | | | | | |
| **06** | **07*** | **42** | **136** | **08** | **04** | **06** | **Total** | **0** | **07*** | **4** | **136** | **0** | **0** | **06** | **Tota** | **0** | **0** | **42** | **1** |

## 29. Capability / Transferable Skills Map

| Subject Code | | | | | | Skills | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HSC | BSC | PSS | PCS | PCE | MCC | MP/S | GK | SL | WC | OC | P | B | IM | PM | L |
| a | b | c | d | e | f | g | | | | | | | | | |
| 105T | 106RBT | 102T | 101T | 803ET | 801T | 813PW | abcdefg | abcdef | acd | acd | abc | g | acdg | ab | g |
| 111P | 106RMT | 108P | 103T | 804ET | 802T | | abdcdef | abcdef | d | d | abc | ac | d | ab | |
| 206T | 112RBP | 110P | 107P | 805ET | | | abdcd | abcde | a | a | abc | bc | a | ab | |
| 101A | 205T | 202T | 109P | 806ET | | | abdcd | abcde | abc | bc | abcde | | bc | ab | |
| 201A | 210P | 203T | 201T | 807ET | | | abdcd | abcde | acd | cd | abcde | b | cd | abcde | |
| | | 208P | 204T | 808ET | | | cde | cde | d | d | cde | c | d | cd | |
| | | 209P | 207P | 809ET | | | cde | cde | | | cde | c | | cd | |
| | | 301T | 304T | 810ET | | | cde | cde | cd | cd | cde | c | cd | cd | |
| | | 302T | 308P | 811ET | | | cde | cde | c | c | cde | | c | cd | |
| | | 303T | 401T | 812ET | | | cde | cde | cd | cd | cde | | cd | cd | |
| | | 305P | 402T | | | | cd | cd | d | d | cd | c | d | cd | |
| | | 306P | 403T | | | | cd | cd | d | d | cd | c | d | cd | |
| | | 307P | 404T | | | | cd | cd | d | d | cd | c | d | cd | |
| | | | 405T | | | | cd | d | d | d | d | | d | d | |
| | | | 406P | | | | cd | d | | | d | d | | d | |
| | | | 407P | | | | d | d | | | d | d | | d | |
| | | | 408P | | | | d | d | | | d | d | | d | |
| | | | 409P | | | | d | d | | | d | d | | d | |
| | | | 501T | | | | d | d | d | d | d | d | d | d | |
| | | | 502T | | | | d | d | d | d | d | | d | d | |
| | | | 503T | | | | d | d | d | d | d | | d | d | |
| | | | 504T | | | | d | d | d | d | d | | d | d | |
| | | | 505T | | | | d | d | d | d | d | | d | d | |
| | | | 506P | | | | d | d | | | d | d | | d | |
| | | | 507P | | | | d | d | | | d | d | | d | |
| | | | 508P | | | | d | d | | | d | d | | d | |
| | | | 601T | | | | d | d | d | d | d | | d | d | |
| | | | 602T | | | | d | d | d | d | d | | d | d | |
| | | | 603T | | | | d | d | d | d | d | | d | d | |
| | | | 604T | | | | d | d | d | d | d | | d | d | |
| | | | 605T | | | | d | d | d | d | d | | d | d | |
| | | | 606T | | | | d | d | d | d | d | | d | d | |
| | | | 607P | | | | d | d | | | d | d | | d | |
| | | | 608P | | | | d | d | | | d | d | | d | |
| | | | 609P | | | | d | d | | | d | d | | d | |
| | | | 701T | | | | d | d | d | d | d | | d | d | |
| | | | 702T | | | | d | d | d | d | d | | d | d | |
| | | | 703T | | | | d | d | d | d | d | | d | d | |
| | | | 704T | | | | d | d | d | d | d | | d | d | |
| | | | 705P | | | | d | d | | | d | d | | d | |
| | | | 706PS | | | | | d | | | d | d | | d | |
| **08** | **07** | **3** | **130** | **02** | **06** | **Total = 202 credits** | | | | | | | | | |

*GK: Group Work; SL: Self Learning; WC: Written Communication; OC: Oral Communication P: Presentation; B: Behavioural; IM: Information Management; PM: Personal Management L: Leadership*

**30. Co-curricular Activities**

Students are encouraged to take part in co-curricular activities like seminars, conferences, symposium, paper writing, attending industry exhibitions, project competitions and related activities to enhance their knowledge and network.

**31. Cultural and Literary Activities**

To remind and ignite the creative endeavours annual cultural festivals held and the students are made to plan and organize the activities.

**32. Sports and Athletics**

Students are encouraged to develop a habit of taking part in outdoor and indoor games on regular basis.