**BHARATI VIDYAPEETH (DEEMED TO BE UNIVERSITY)**
**POONA COLLEGE OF PHARMACY, PUNE**
**CO-PO mapping for B. Pharm. (CBCS-2015 Course) (Program Code: 919)**

**Year Semester:** First Year B. Pharm. Semester I
**Subject Name:** Pharmaceutical Chemistry I (Inorganic) (Theory)
**Course:** 2015 syllabus
**Course Code:** 13683

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Describe the relevance and significance of inorganic chemistry with reference to pharmaceutical sciences. | 3 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2: Understand monographs of inorganic pharmaceuticals. | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 3 |
| CO3: Refer official Pharmacopoeias to detect impurities. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 |
| CO4: Review the official electrolytes intended for replacement therapy and maintaining acid-base balance. | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO5: Discuss and apply the physicochemical properties, assay, and uses of inorganic gastrointestinal agents. | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 |
| CO6: Explain physiological role of essential and trace elements along with deficiency symptoms associated with them. | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 |
| **Average** | **3.0** | **2.2** | **2.5** | **3.0** | **2.5** | **2.8** | **3.0** | **2.8** | **2.7** | **2.5** | **2.8** |

**Year Semester:** First Year B. Pharm. Semester I
**Subject Name:** Pharmaceutical Chemistry I (Inorganic) (Practical)
**Course:** 2015 syllabus
**Course Code:** 13683

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Comprehend basic practical terms and concepts used inorganic chemistry. | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO2: Apply the monograph of pharmaceuticals from official compendia. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3: Analyze qualitatively samples in a binary mixture. | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO4: Prepare and determine purities of inorganic compounds. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5: Identify impurities in pharmaceutical compounds as per Indian pharmacopoeia | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 |
| CO6: Compute, analyze and record data. | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 |
| **Average** | **3.0** | **3.0** | **2.8** | **2.5** | **3.0** | **2.5** | **3.0** | **2.5** | **3.0** | **2.8** | **2.8** |

**Year Semester:** First Year B. Pharm. Semester I
**Subject Name:** Pharmaceutical Chemistry II (Organic) (Theory)
**Course:** 2015 syllabus
**Course Code:** 13684

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand fundamental concepts of organic chemistry. | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 3 | 2 | 2 | 3 |
| CO2: Apply IUPAC nomenclature in naming organic compounds. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Elucidate nucleophilic and electrophilic reaction mechanisms. | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Conceptualize the basics of stereochemistry. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Predict the effect of substituted aromatic ring towards different chemical reactions. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Describe types of reagents, intermediates, types of mechanisms and theories related to reaction mechanism. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.16** | **3** | **2.66** | **2.16** | **2.66** | **2.33** | **3** | **2.83** | **2.83** | **3** |

**Year Semester:** First Year B. Pharm. Semester I
**Subject Name:** Pharmaceutical Chemistry II (Organic) (Practical)
**Course:** 2015 syllabus
**Course Code:** 13684

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Practice safety measures and inculcate Good Laboratory Practices. | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 3 | 2 | 2 | 3 |
| CO2: Identify organic compounds qualitatively. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Synthesize suitable derivatives of organic compounds. | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Prepare recrystallized derivatives to purify organic compounds. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Determine melting and boiling points of organic compound and their derivatives. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Record, compute and analyse the data. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.16** | **3** | **2.66** | **2.16** | **2.66** | **2.33** | **3** | **2.83** | **2.83** | **3** |

**Year Semester:** First Year B. Pharm. Semester I
**Subject Name:** Modern Dispensing Pharmacy (Theory)
**Course:** 2015 syllabus
**Course Code:** 13685

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Evaluate the prescription for rational drug therapy | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 3 |
| CO2: Explain principles of modern dispensing practices | 2 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 2 |
| CO3: Recommend patients about pharmaceutical dosage forms | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO4: Compound and dispense dosage forms | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 3 | 3 | 2 | 2 |
| CO5: Practice ethics in community pharmacy | 3 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 2 |
| CO6: Apply basic principles and calculations in formulation development | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 |
| **Average** | **2.5** | **2.16** | **2.33** | **2.16** | **2** | **2.16** | **2.16** | **2.33** | **2.33** | **2.16** | **2.5** |

**Year Semester:** First Year B. Pharm. Semester I
**Subject Name:** Modern Dispensing Pharmacy (Practical)
**Course:** 2015 syllabus
**Course Code:** 13685

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Interpret prescription | 3 | 2 | 3 | 1 | 2 | 3 | 2 | 2 | 2 | 1 | 2 |
| CO2: Apply skills in compounding and dispensing of pharmaceutical dosage forms | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 1 | 2 | 2 |
| CO3: Counsel the patients for appropriate use of medicines | 2 | 2 | 3 | 1 | 2 | 2 | 2 | 3 | 2 | 2 | 3 |
| CO4: Understand the fundamentals of dosage forms | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO5: Maintain patient medication records | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 |
| CO6: Create patient counselling aids | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 |
| **Average** | **2.33** | **2.16** | **2.66** | **2.16** | **2.5** | **2.33** | **2** | **2.16** | **2.16** | **2.16** | **2.5** |

**Year Semester:** First Year B. Pharm. Semester I
**Subject Name:** Human Anatomy and Physiology-I (Theory)
**Course:** 2015 syllabus
**Course Code:** 13686

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the terminologies related to human anatomy and physiology. | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 3 |
| CO2: Describe the structure and functions of various systems of the human body. | 3 | 2 | 2 | 3 | 1 | 1 | 1 | 2 | 1 | 1 | 3 |
| CO3: Illustrate the synchronous working of various organs and assess imbalance of homeostasis in diseases. | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 1 | 3 |
| CO4: Justify modern technologies for evaluating physiological functions. | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5: Comprehend the common disorders prevalent in the society. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Correlate environmental conditions with induction of lifestyle disorders. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.33** | **2.5** | **2.67** | **2.33** | **2.17** | **2.17** | **2.67** | **2.33** | **2** | **3** |

**Year Semester:** First Year B. Pharm. Semester I
**Subject Name:** Human Anatomy and Physiology-I (Practical)
**Course:** 2015 syllabus
**Course Code:** 13686

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Examine blood samples for hematological parameters and correlate with clinical conditions | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2: Measure and interpret the blood pressure and heart rate by different techniques. | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3: Identify bones and explain their anatomy and physiology. | 3 | 1 | 3 | 1 | 1 | 2 | 2 | 3 | 2 | 1 | 3 |
| CO4: Describe the histology of various tissues. | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 3 | 1 | 1 | 3 |
| CO5: Determine blood group and explain its significance. | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Communicate effectively the importance of hematological parameters and healthcare to the society. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **1.7** | **2.7** | **2.5** | **2.3** | **2.5** | **2.5** | **3** | **2.5** | **2.3** | **3** |

**Year Semester:** First Year B. Pharm. Semester I
**Subject Name:** Pharmaceutical Engineering-I (Theory)
**Course:** 2015 syllabus
**Course Code:** 13687

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Explain the pharmaceutical unit operations. | 2 | 3 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 |
| CO2: Select the appropriate process and equipment for pharmaceutical manufacturing. | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO3: Apply engineering technologies in the pharmaceutical manufacturing. | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 2 |
| CO4: Understand the importance of industrial hazards. | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 |
| CO5: Recommend cost effective and eco-friendly methods as per the product requirements. | 2 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 2 |
| CO6: Implement various safety precautions in pharmaceutical industries. | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 1 | 3 | 2 | 3 |
| **Average** | **2.5** | **2** | **2.1** | **2.5** | **2.33** | **2.16** | **2.33** | **2** | **2.5** | **2.16** | **2.16** |

**Year Semester:** First Year B. Pharm. Semester I
**Subject Name:** Pharmaceutical Statistics (Theory)
**Course:** 2015 syllabus
**Course Code:** 13688

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Apply appropriate study design for given data | 3 | 1 | 1 | 2 | 3 | 2 | 1 | 3 | 3 | 2 | 2 |
| CO2: Plot graphs of given data and interpret the results. | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 |
| CO3: Develop problem solving approach by applying probability and bi-variate data analysis | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 |
| CO4: Examine, organize, and analyse pharmaceutical data using different statistical software. | 3 | 1 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 3 |
| CO5: To apply sampling theory to experimental data | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 |
| CO6: To determine level of significance in data by applying statistical test. | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 |
| **Average** | **2.8** | **2.2** | **2.3** | **2.3** | **2.3** | **2.3** | **2.2** | **2.3** | **2.7** | **2.3** | **2.3** |

**Year Semester:** First Year B. Pharm. Semester I
**Subject Name:** Computer Applications in Pharmacy (Practical)
**Course:** 2015 syllabus
**Course Code:** 13689

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the basic components of computer | 3 | 2 | 2 | 3 | 2 | 3 | 1 | 3 | 3 | 2 | 3 |
| CO2: Explain the function and fundamental operating systems of computer. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO3: Apply appropriate software for data processing | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO4: Evaluate the available data in graphical or pictorial manner. | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO5: Design effective presentations using software | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Practice ethical use of internet and electronic communication system | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.33** | **2.83** | **3.00** | **2.33** | **3.00** | **2.17** | **3.00** | **3.00** | **2.33** | **3.00** |

**Year Semester:** First Year B. Pharm. Semester II
**Subject Name:** Pharmaceutical Chemistry III (Inorganic) (Theory)
**Course:** 2015 syllabus
**Course Code:** 13690

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Classify topical agents and describe their mechanism of action along with monographs of official compounds. | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 2 |
| CO2: Explain theoretical aspects and applications of pharmaceutical aids. | 3 | 2 | 2 | 3 | 2 | 1 | 3 | 2 | 2 | 2 | 1 |
| CO3: Discuss the physicochemical properties, assay, and uses of dental products. | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 3 |
| CO4: Understand physiological role of expectorant, emetics, and antidotes. | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 2 |
| CO5: Describe properties, handling, and uses of inhalants and respiratory stimulants. | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 2 |
| CO6: Outline principle, dosimetry, and applications of radiopharmaceuticals. | 2 | 3 | 2 | 2 | 3 | 1 | 3 | 3 | 2 | 2 | 2 |
| **Average** | **2.5** | **2.2** | **2.2** | **2.3** | **2.5** | **1.8** | **2.7** | **2.5** | **2.5** | **2.5** | **2.0** |

**Year Semester:** First Year B. Pharm. Semester II
**Subject Name:** Pharmaceutical Chemistry III (Inorganic) (Practical)
**Course:** 2015 syllabus
**Course Code:** 13690

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Paraphrase with basic terms and concepts used inorganic chemistry | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 1 | 2 | 1 |
| CO2: Understand the significance of official standards for drug substance and pharmaceutical aids. | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 1 |
| CO3: Analyse qualitatively inorganic samples in a binary mixture. | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 |
| CO4: Prepare official inorganic compounds. | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 |
| CO5: Determine purity of inorganic pharmaceuticals. | 3 | 2 | 3 | 3 | 3 | 1 | 2 | 2 | 2 | 3 | 2 |
| CO6: Analyse, record, and compile data. | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 |
| **Average** | **3** | **2.3** | **2.7** | **2.5** | **2.3** | **2.2** | **2.3** | **2** | **1.8** | **2.3** | **1.7** |

**Year Semester:** First Year B. Pharm. Semester II
**Subject Name:** Pharmaceutical Chemistry IV (Organic) (Theory)
**Course:** 2015 syllabus
**Course Code:** 13691

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Sketch mechanism of alkene addition reactions. | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 3 | 2 | 2 | 3 |
| CO2: Apply Markovnikov's rule to predict the regiospecificity of alkene addition reactions. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Illustrate methodologies for the preparations of aldehydes and ketones. | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Identify aldehydes and ketone sand illustrate their reactions. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Understand the classification, mechanism, and orientation rules of elimination reactions. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Describe the chemistry of amines, phenols, and carboxylic acids. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.16** | **3** | **2.66** | **2.16** | **2.66** | **2.33** | **3** | **2.83** | **2.83** | **3** |

**Year Semester:** First Year B. Pharm. Semester II
**Subject Name:** Pharmaceutical Chemistry IV (Organic) (Practical)
**Course:** 2015 syllabus
**Course Code:** 13691

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Practice the safety measures and inculcate Good Laboratory Practices. | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 3 | 2 | 2 | 3 |
| CO2: Demonstrate important laboratory techniques. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Apply suitable techniques to separate organic binary mixture. | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Prepare recrystallized derivatives to purify organic compounds. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Apply qualitative tests for identification of organic compounds. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Record, compute and analyse the data. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.16** | **3** | **2.66** | **2.16** | **2.66** | **2.33** | **3** | **2.83** | **2.83** | **3** |

**Year Semester:** First Year B. Pharm. Semester II
**Subject Name:** Pharmaceutical Biochemistry I (Theory)
**Course:** 2015 syllabus
**Course Code:** 13692

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Describe Biochemical Composition of Cell and Structure description of Macro –bio-molecules. | 3 | 1 | 2 | 2 | 1 | 1 | 1 | 3 | 1 | 1 | 3 |
| CO2: Understand Structure function relationship of bio-molecules | 3 | 3 | 3 | 3 | 1 | 2 | 1 | 3 | 2 | 2 | 3 |
| CO3: Illustrate protein structure and demonstrate the application of Protein Data Bank in Pharmacy. | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 3 | 3 | 2 | 3 |
| CO4: Recognize the importance of carbohydrate and Lipid in biological systems. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5: Review biophysical properties and functions of bio-membrane. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Summarize enzymes as biocatalyst. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.67** | **2.83** | **2.83** | **2.17** | **2.5** | **2** | **3** | **2.5** | **2.33** | **3** |

**Year Semester:** First Year B. Pharm. Semester II
**Subject Name:** Pharmaceutical Biochemistry I (Practical)
**Course:** 2015 syllabus
**Course Code:** 13692

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Develop skills for handling laboratory instruments and biological samples. | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 3 |
| CO2: Estimate proteins, sugars, and Vitamins. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO3: Isolate and characterize proteins. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Describe and evaluate of kinetic parameters and factors affecting enzymatic reaction. | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 3 | 1 | 1 | 3 |
| CO5: Describe role of PDB in Pharmacy. | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO6: Compute, analyse and record biochemical data. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3.00** | **2.33** | **2.33** | **2.50** | **2.33** | **2.33** | **2.17** | **3.00** | **2.17** | **2.33** | **3.00** |

**Year Semester:** First Year B. Pharm. Semester II
**Subject Name:** Pharmaceutical Engineering-II (Theory)
**Course:** 2015 syllabus
**Course Code:** 13693

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the pharmaceutical unit operations. | 2 | 3 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 |
| CO2: Analyse the selection process and functioning of different equipment. | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO3: Create the manufacturing knowledge of engineering technology involved in pharmaceuticals. | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 2 |
| CO4: Get acquainted with concept and importance of industrial safety. | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 |
| CO5: Recommend cost effective and eco-friendly methods as per the product requirements. | 2 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 2 |
| CO6: Implement various safety precautions in pharmaceutical industries. | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 1 | 3 | 2 | 3 |
| **Average** | **2.5** | **2** | **2.1** | **2.5** | **2.33** | **2.16** | **2.33** | **2** | **2.5** | **2.16** | **2.16** |

**Year Semester:** First Year B. Pharm. Semester II
**Subject Name:** Pharmaceutical Engineering-II (Practical)
**Course:** 2015 syllabus
**Course Code:** 13693

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Demonstrate pharmaceutical unit operations | 2 | 3 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 2 | 1 |
| CO2: Explain the functioning of pharmaceutical equipment. | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO3: Select and recommend appropriate pharmaceutical packaging materials. | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 2 |
| CO4: Apply the concept of industrial safety. | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 |
| CO5: Select cost effective process to quality products. | 2 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 2 |
| CO6: Comprehend the various safety precautions in pharmaceutical industries. | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 1 | 3 | 2 | 3 |
| **Average** | **2.5** | **2** | **2.1** | **2.5** | **2.33** | **2.16** | **2.33** | **2** | **2.5** | **2** | **2.16** |

**Year Semester:** First Year B. Pharm. Semester II
**Subject Name:** Community Pharmacy & Hospital Pharmacy (Theory)
**Course:** 2015 syllabus
**Course Code:** 13694

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Establish community pharmacy and hospital pharmacy | 3 | 2 | 3 | 1 | 2 | 3 | 2 | 2 | 2 | 1 | 2 |
| CO2: Handle and interpret prescriptions | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO3: Implement inventory control and drug distribution system in hospital | 2 | 3 | 3 | 1 | 2 | 2 | 2 | 3 | 2 | 2 | 3 |
| CO4: Apply ethical practices for rational drug therapy | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CO5: Counsel the patients and provide health screening services | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 |
| CO6: Promote the role of community pharmacist in the society | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 |
| **Average** | **2.33** | **2.5** | **2.66** | **2.16** | **2.5** | **2.33** | **2.16** | **2.16** | **2.33** | **2.16** | **2.5** |

**Year Semester:** First Year B. Pharm. Semester II
**Subject Name:** Community Pharmacy & Hospital Pharmacy (Practical)
**Course:** 2015 syllabus
**Course Code:** 13694

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Establish community pharmacy and hospital pharmacy | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 2 |
| CO2: Analyse prescription errors and counsel the patients | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 2 |
| CO3: Design pharmaceutical counselling aids | 2 | 3 | 3 | 1 | 2 | 2 | 2 | 3 | 3 | 2 | 3 |
| CO4: Practice health screening services | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 |
| CO5: Apply ethical pharmacy practices | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO6: Implement inventory control and drug distribution system in hospital | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 3 |
| **Average** | **2.33** | **2.5** | **2.66** | **2.33** | **2.5** | **2.5** | **2.66** | **2.16** | **2.5** | **2.5** | **2.5** |

**Year Semester:** First Year B. Pharm. Semester II
**Subject Name:** Human Anatomy and Physiology-II (Theory)
**Course:** 2015 syllabus
**Course Code:** 13695

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Describe the structure and functions of various systems of the human body. | 3 | 1 | 2 | 2 | 1 | 1 | 1 | 3 | 1 | 1 | 3 |
| CO2: Explain the synchronous working of various organs and assess imbalance of homeostasis in diseases. | 3 | 3 | 3 | 3 | 1 | 2 | 1 | 3 | 2 | 2 | 3 |
| CO3: Justify modern technologies for evaluating physiological functions. | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 3 | 3 | 2 | 3 |
| CO4: Appreciate the impact of social and environmental factors on body systems. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5: Understand the role of various body systems in sports and exercise. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Communicate effectively to society the importance of exercise in maintaining disease free lifestyle. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.67** | **2.83** | **2.83** | **2.17** | **2.5** | **2** | **3** | **2.5** | **2.33** | **3** |

**Year Semester:** First Year B. Pharm. Semester II
**Subject Name:** Human Anatomy and Physiology-II (Practical)
**Course:** 2015 syllabus
**Course Code:** 13695

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Examine blood samples for hematological parameters and correlate with clinical conditions. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO2: Describe the histology of various organs and tissues. | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 3 | 1 | 1 | 3 |
| CO3: Determine the respiratory volumes and interpret its significance. | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO4: Understand the use and mechanisms of various family planning devices. | 3 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5: Explain the anatomy and physiology of various human systems with simulated models. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO6: Communicate effectively the importance of different family planning devices to the society. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.33** | **2.5** | **2.83** | **2.67** | **2.67** | **2.5** | **3** | **2.5** | **2.67** | **3** |

**Year Semester:** Second Year B. Pharm. Semester III
**Subject Name:** Pharmaceutical Chemistry V (Organic) (Theory)
**Course:** 2015 syllabus
**Course Code:** 13696

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the `fundamentals of various organic reactions. | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO2: Explain the significance of stereochemistry in biological action of drugs | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO3: Describe reactions mediated by free radicals | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 |
| CO4: Discuss mechanism and stereochemistry involved in certain reactions | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 3 |
| CO5: Sketch molecular rearrangements in electron deficient reaction system | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO6: Recognize migration mechanism of rearrangement reactions in electron rich systems | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **Average** | **3** | **2** | **3** | **2** | **2** | **2** | **2** | **2** | **2** | **2** | **2** |

**Year Semester:** Second Year B. Pharm. Semester III
**Subject Name:** Pharmaceutical Chemistry V (Organic) (Practical)
**Course:** 2015 syllabus
**Course Code:** 13696

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Utilize chemical properties of organic compounds for synthesis. | 3 | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 |
| CO2: Practice safety measures in handling of chemicals. | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO3: Use analytical tools to detect purity of organic compounds | 3 | 2 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 2 | 3 |
| CO4: Plan synthesis of organic compounds | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 |
| CO5: Describe the importance of various analytical parameters of oils and fats | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO6: Record, compute and analyse the data. | 3 | 2 | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 2 | 3 |
| **Average** | **3** | **3** | **3** | **3** | **2** | **2** | **2** | **2** | **1** | **2** | **3** |

**Year Semester:** Second Year B. Pharm. Semester III
**Subject Name:** Pharmaceutical Biochemistry II (Theory)
**Course:** 2015 syllabus
**Course Code:** 13697

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the basic concepts of quantitative and qualitative analysis. | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO2: Describe theory and applications of aqueous and non-aqueous titrimetric methods to evaluate purity of drugs. | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO3: Explain theoretical aspects of redox titrations and apply the concepts to analyse different drugs quantitatively. | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO4: Understand and apply the principle involved in complexometric titrations for the assay of pharmaceutical inorganic compounds. | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO5: Analyse various compounds based on the precipitation titration | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO6: Compare and compute data using various mathematical tools for quantitative analysis and strategies for minimization of errors. | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 1 | 3 |
| **Average** | **3** | **2.16** | **3** | **2.16** | **2** | **2** | **2.33** | **2** | **1** | **2** | **3** |

**Year Semester:** Second Year B. Pharm. Semester III
**Subject Name:** Pharmaceutical Biochemistry II (Practical)
**Course:** 2015 syllabus
**Course Code:** 13697

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand significance of calibration in analytical chemistry and safety measures for handling reagents. | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 3 |
| CO2: Observe, record, and analyse the practical aspects of each experiment with developing hands-on expertise in titrimetric analysis | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO3: Apply the fundamental principles underlying different titrations for determination of purity of reagents/drugs. | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO4: Describe procedures for preparation and standardization of reagents and analysis of drugs as per Indian Pharmacopoeia | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO5: Correlate physicochemical properties with analytical methods for evaluation of various compounds | 3 | 1 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO6: Analyse, record and effectively communicate the experimental data. | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 1 | 3 |
| **Average** | **3** | **2.66** | **3** | **2.66** | **2.33** | **2** | **2.5** | **2.33** | **1.16** | **2.16** | **3** |

**Year Semester:** Second Year B. Pharm. Semester III
**Subject Name:** Pharmaceutical Analysis I (Theory)
**Course:** 2015 syllabus
**Course Code:** 13698

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the basic concepts of quantitative and qualitative analysis. | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO2: Describe theory and applications of aqueous and non-aqueous titrimetric methods to evaluate purity of drugs. | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO3: Explain theoretical aspects of redox titrations and apply the concepts to analyse different drugs quantitatively. | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO4: Understand and apply the principle involved in complexometric titrations for the assay of pharmaceutical inorganic compounds. | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO5: Analyse various compounds based on the precipitation titration | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO6: Compare and compute data using various mathematical tools for quantitative analysis and strategies for minimization of errors. | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 1 | 3 |
| **Average** | **3** | **2.16** | **3** | **2.16** | **2** | **2** | **2.33** | **2** | **1** | **2** | **3** |

**Year Semester:** Second Year B. Pharm. Semester III
**Subject Name:** Pharmaceutical Analysis I (Practical)
**Course:** 2015 syllabus
**Course Code:** 13698

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand significance of calibration in analytical chemistry and safety measures for handling reagents. | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 3 |
| CO2: Observe, record, and analyse the practical aspects of each experiment with developing hands-on expertise in titrimetric analysis | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO3: Apply the fundamental principles underlying different titrations for determination of purity of reagents/drugs. | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO4: Describe procedures for preparation and standardization of reagents and analysis of drugs as per Indian Pharmacopoeia | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 1 | 3 | 3 |
| CO5: Correlate physicochemical properties with analytical methods for evaluation of various compounds | 3 | 1 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO6: Analyse, record and effectively communicate the experimental data. | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 1 | 3 |
| **Average** | **3** | **2.66** | **3** | **2.66** | **2.33** | **2** | **2.5** | **2.33** | **1.16** | **2.166** | **3** |

**Year Semester:** Second Year B. Pharm. Semester III
**Subject Name:** Physical Pharmacy I (Theory)
**Course:** 2015 syllabus
**Course Code:** 13699

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand physicochemical properties of drugs and excipients. | 3 | 2 | 3 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 3 |
| CO2: Use modern analytical tools to assess physicochemical properties of drugs | 3 | 3 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 3 |
| CO3: Relate physicochemical properties of pharmaceuticals for formulation design. | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 |
| CO4: Apply principles of chemical kinetics in stability testing and estimation of shelf life of formulations. | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO5: Justify the role of stable formulations for effective therapeutic outcome. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO6: Analyse and tackle problems encountered in formulation development. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 |
| **Average** | **3.00** | **2.83** | **2.67** | **2.50** | **2.00** | **2.50** | **2.17** | **2.17** | **2.17** | **2.00** | **3.00** |

**Year Semester:** Second Year B. Pharm. Semester III
**Subject Name:** Physical Pharmacy I (Practical)
**Course:** 2015 syllabus
**Course Code:** 13699

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Evaluate physicochemical properties of drug molecules using modern analytical tools. | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 2 | 1 | 1 | 3 |
| CO2: Understand significance of physicochemical properties of pharmaceuticals in formulation development. | 3 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO3: Estimate chemical kinetic parameters. | 3 | 3 | 3 | 3 | 1 | 3 | 2 | 1 | 3 | 2 | 3 |
| CO4: Calculate shelf life of pharmaceuticals. | 3 | 3 | 3 | 3 | 1 | 3 | 2 | 1 | 3 | 2 | 3 |
| CO5: Compute, analyse and record data. | 3 | 3 | 1 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO6: Identify and tackle problems encountered in formulation development by working in a team. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3.00** | **3.00** | **2.50** | **2.50** | **2.00** | **2.83** | **2.00** | **2.00** | **2.33** | **2.00** | **3.00** |

**Year Semester:** Second Year B. Pharm. Semester III
**Subject Name:** Pharmaceutical Microbiology I (Theory)
**Course:** 2015 syllabus
**Course Code:** 13700

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Integrate the basic knowledge of microbiology with pharmaceutical sciences. | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 3 | 2 | 3 | 3 |
| CO2: Apply techniques for identification of microorganisms. | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO3: Understand process of sterilization and disinfection | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Implement good laboratory practices in pharmaceutical microbiology. | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO5: Explain the microbial cultivation and isolation techniques. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO6: Justify the use of microorganisms considering the ecological and ethical issues. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **3** | **3** | **2.66** | **2.33** | **3** | **2.33** | **3** | **2.83** | **2.67** | **3** |

**Year Semester:** Second Year B. Pharm. Semester III
**Subject Name:** Pharmaceutical Microbiology I (Practical)
**Course:** 2015 syllabus
**Course Code:** 13700

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Apply sterilization and disinfection techniques in pharmacy. | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 3 | 2 | 3 | 3 |
| CO2: Prepare culture media for various microorganisms. | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 |
| CO3: Isolate and identify microorganisms. | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO4: Assess aseptic conditions in pharmaceutical laboratories as per GLP | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO5: Determine the microbial count using modern analytical tools. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO6: Compute, analyse and record data. | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| **Average** | **3** | **3** | **3** | **2.33** | **2.33** | **3** | **2.33** | **2.33** | **2.83** | **2.83** | **3** |

**Year Semester:** Second Year B. Pharm. Semester III
**Subject Name:** Pathophysiology (Theory)
**Course:** 2015 syllabus
**Course Code:** 13701

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Describe the etiopathogenesis of diseases. | 3 | 1 | 3 | 3 | 1 | 2 | 1 | 3 | 3 | 3 | 3 |
| CO2: Elucidate the pathological changes, correlate with the clinical course, and identify therapeutic targets. | 3 | 2 | 3 | 3 | 1 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO3: Summarize the signs and symptoms of diseases. | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO4: Understand the conventional and modern techniques for diagnosis of diseases. | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO5: Interpret the complications of diseases and their implications in society. | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Communicate effectively the measures for prevention of diseases to the society. | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3.00** | **2.00** | **2.83** | **2.50** | **1.83** | **2.33** | **2.17** | **3.00** | **3.00** | **3.00** | **3.00** |

**Year Semester:** Second Year B. Pharm. Semester IV
**Subject Name:** Pharmaceutical Chemistry VI (Organic) (Theory)
**Course:** 2015 syllabus
**Course Code:** 13702

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the fundamentals of various organic reactions. | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO2: Discuss the reaction mechanisms | 3 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 3 |
| CO3: Describe the chemistry of carbohydrates. | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO4: Review the chemistry of heterocyclic compounds | 3 | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 3 |
| CO5: Apply rules of disconnection approach for designing the synthesis of organic compounds | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO6: Summarize the chemistry of amino acids and lipids | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| **Average** | **3** | **3** | **3** | **2** | **2** | **2** | **2** | **2** | **1** | **2** | **3** |

**Year Semester:** Second Year B. Pharm. Semester IV
**Subject Name:** Pharmaceutical Chemistry VI (Organic) (Practical)
**Course:** 2015 syllabus
**Course Code:** 13702

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Relate chemical properties with synthetic tools for synthesis of organic compounds | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 3 |
| CO2: Practice safety measures in handling of chemicals. | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO3: Plan synthesis of organic compounds | 3 | 2 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 2 | 3 |
| CO4: Determine reactive groups quantitatively | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO5: Use analytical tools to detect purity of organic compounds | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO6: Record, analyse and document the results | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 |
| **Average** | **3** | **3** | **3** | **3** | **2** | **2** | **2** | **2** | **1** | **2** | **3** |

**Year Semester:** Second Year B. Pharm. Semester IV
**Subject Name:** Pharmaceutical Microbiology II (Theory)
**Course:** 2015 syllabus
**Course Code:** 13703

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand microbial spoilage in pharmaceutical products. | 3 | 3 | 3 | 1 | 1 | 3 | 1 | 3 | 2 | 3 | 3 |
| CO2: Explain the principles of industrial microbiology and fermentation technology. | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Assess pharmaceutical products, antimicrobials and disinfectants using modern analytical tools. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Review various aspects of immunology and their applications in pharmaceutical sciences. | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO5: Describe the significance of probiotics in pharmacy | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO6: Create social awareness regarding biohazards. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **3** | **2.83** | **2.66** | **2.33** | **3** | **2.33** | **3** | **2.83** | **2.67** | **3** |

**Year Semester:** Second Year B. Pharm. Semester IV
**Subject Name:** Pharmaceutical Microbiology II (Practical)
**Course:** 2015 syllabus
**Course Code:** 13703

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Determine efficacy of disinfectants using official tests. | 3 | 3 | 3 | 1 | 1 | 2 | 1 | 3 | 2 | 3 | 3 |
| CO2: Investigate efficacy of antibiotics using microbial assays. | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 1 | 3 |
| CO3: Design microbial evaluation protocols for pharmaceuticals as per pharmacopoeia | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO4: Estimate microbial burden in raw materials. | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO5: Apply practical skills and ethical practices for Bioremediation. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO6: Compute, analyse and record data. | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| **Average** | **3** | **3** | **3** | **2.33** | **2.33** | **2.83** | **2.33** | **2.33** | **2.83** | **2.67** | **3** |

**Year Semester:** Second Year B. Pharm. Semester IV
**Subject Name:** Pharmaceutical Analysis II (Theory)
**Course:** 2015 syllabus
**Course Code:** 13704

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Use instrumental techniques to determine titrimetric end point. | 3 | 3 | 3 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 |
| CO2: Describe the basics of electroanalytical techniques | 3 | 2 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 2 | 3 |
| CO3: Apply conductometric, polarimetric, refractometric methods for analysis of drug. | 3 | 2 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 2 | 3 |
| CO4: Understand the advantages of potentiometric and gravimetric techniques in drug analysis. | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO5: Compare advantages and challenges of various instrumental methods for drug analysis. | 3 | 2 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 2 | 3 |
| CO6: Construct and analyse different graphical/ mathematical tools for data treatment. | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| **Average** | **3.00** | **2.50** | **3.00** | **2.50** | **1.50** | **2.00** | **1.50** | **2.00** | **1.67** | **2.17** | **3.00** |

**Year Semester:** Second Year B. Pharm. Semester IV
**Subject Name:** Pharmaceutical Analysis II (Practical)
**Course:** 2015 syllabus
**Course Code:** 13704

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO 1: Understand the significance of calibration in analytical chemistry. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO2: Apply techniques for handling electrochemical equipment and their calibration. | 3 | 2 | 3 | 3 | 1 | 2 | 1 | 2 | 1 | 2 | 3 |
| CO3: Discuss reaction mechanism and principle involved in the electrochemical method of analysis. | 3 | 2 | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 2 | 3 |
| CO4: Justify selection criteria for electrochemical analytical method in drug analysis. | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO5: Compute results, create graphs and analyse the effectiveness of the technique. | 3 | 2 | 3 | 2 | 1 | 2 | 3 | 2 | 1 | 2 | 3 |
| CO6: Analyse, observe, record experimental data. | 3 | 3 | 3 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 |
| **Average** | **3.00** | **2.50** | **3.00** | **2.33** | **1.67** | **2.17** | **2.00** | **2.00** | **1.67** | **2.17** | **3.00** |

**Year Semester:** Second Year B. Pharm. Semester IV
**Subject Name:** Physical Pharmacy II (Theory)
**Course:** 2015 syllabus
**Course Code:** 13705

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand physicochemical properties of drugs and excipients. | 3 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 3 |
| CO2: Use modern analytical tools to assess physicochemical properties of drugs | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 3 |
| CO3: Relate physicochemical properties of pharmaceuticals for formulation design. | 3 | 3 | 2 | 2 | 1 | 3 | 2 | 2 | 2 | 2 | 3 |
| CO4: Describe principles of compression and compaction in tablet manufacturing. | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 1 | 3 |
| CO5: Understand factors governing stability of finished pharmaceutical products. | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 3 |
| CO6: Analyze and tackle problems encountered in formulation development. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3.00** | **2.50** | **2.67** | **2.17** | **1.67** | **2.33** | **2.00** | **2.17** | **2.17** | **1.83** | **3.00** |

**Year Semester:** Second Year B. Pharm. Semester IV
**Subject Name:** Physical Pharmacy II (Practical)
**Course:** 2015 syllabus
**Course Code:** 13705

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Evaluate physicochemical properties of pharmaceuticals using modern analytical tools. | 3 | 3 | 3 | 3 | 1 | 2 | 1 | 1 | 1 | 1 | 3 |
| CO2: Understand significance of physicochemical properties of pharmaceuticals in formulation development. | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 3 | 1 | 3 |
| CO3: Apply use of micromeritic properties in design of solid dosage form | 3 | 3 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 1 | 3 |
| CO4: Apply use of derived properties in design of pharmaceutical liquids. | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 3 |
| CO5: Compute, analyse and record data. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO6: Identify and tackle problems encountered in formulation development by working in a team. | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3.00** | **2.83** | **2.67** | **2.67** | **2.00** | **2.33** | **2.00** | **2.00** | **2.50** | **2.00** | **3.00** |

**Year Semester:** Second Year B. Pharm. Semester IV
**Subject Name:** Pharmacognosy I (Theory)
**Course:** 2015 syllabus
**Course Code:** 13706

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the scope of Pharmacognosy. | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 2 | 2 | 3 |
| CO2: Comprehend the relevance of traditional medicines. | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Explain the concepts of cultivation and collection of crude drugs. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Justify and recommend the methods for processing and storage of crude drugs. | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Describe the biosynthetic pathways of primary and secondary metabolites of the plant. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Apply the holistic approach of alternative medicines for benefit of society. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **3** | **3** | **3** | **2** | **2.66** | **2.33** | **3** | **2.83** | **2.83** | **3** |

**Year Semester:** Second Year B. Pharm. Semester IV
**Subject Name:** Pharmacognosy I (Practical)
**Course:** 2015 syllabus
**Course Code:** 13706

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Evaluate different plant tissues and their characteristics. | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 3 | 2 | 2 | 3 |
| CO2: Characterize the crude drugs based on morphological and microscopical characters | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Analyze crude drugs using chemical tests | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Apply the techniques for extraction of phyto-constituents from crude drugs | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Describe the cultivation and manufacturing process of herbal drugs | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Understand and conduct the survey of marketed herbal products | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.5** | **3** | **2.66** | **2.16** | **2.66** | **2.33** | **3** | **2.83** | **2.83** | **3** |

**Year Semester:** Second Year B. Pharm. Semester IV
**Subject Name:** Pharmacology I (Theory)
**Course:** 2015 syllabus
**Course Code:** 13707

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Describe the fundamental concepts of pharmacology | 3 | 2 | 2 | 2 | 1 | 2 | 1 | 3 | 2 | 2 | 3 |
| CO2: Explain the pharmacological basis of therapeutics. | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO3: Justify the molecular basis of drug action with clinical uses. | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 3 |
| CO4: Understand the adverse effects of drugs and drug interactions. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5: Apply the pharmacological knowledge in the prevention and treatment of various diseases. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Communicate measures to minimize adverse drug effects and drug interactions to the society. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.50** | **2.83** | **2.67** | **2.50** | **2.50** | **2.33** | **3.00** | **2.83** | **2.67** | **3.00** |

**Year Semester:** Third Year B. Pharm. Semester V
**Subject Name:** Medicinal Chemistry I (Theory)
**Course:** 2015 syllabus
**Course Code:** 13708

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Sketch the structure and name the drugs and their intermediates | 3 | 2 | 3 | 2 | 2 | 3 | 1 | 3 | 1 | 1 | 3 |
| CO2: Distinguish different classes of drugs in a particular category | 3 | 2 | 3 | 2 | 2 | 3 | 1 | 3 | 1 | 1 | 3 |
| CO3: Describe the mechanism actions of categories of drugs | 3 | 2 | 3 | 2 | 2 | 3 | 1 | 3 | 3 | 1 | 3 |
| CO4: Relate influence of substituents on the physico-chemical properties and biological activity of drugs. | 3 | 2 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 1 | 3 |
| CO5: Explain the uses and adverse reactions of drugs belonging to different classes for the benefit of society | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO6: Write the routes of synthesis of drugs. | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 1 | 1 | 3 |
| **Average** | **3** | **2.2** | **3.0** | **2.2** | **2.5** | **3.0** | **1.2** | **3.0** | **2.0** | **1.3** | **3.0** |

**Year Semester:** Third Year B. Pharm. Semester V
**Subject Name:** Medicinal Chemistry I (Practical)
**Course:** 2015 syllabus
**Course Code:** 13708

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Apply principles of organic chemistry for synthesis of drugs and drug intermediates with emphasis on environment and safety. | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 3 | 3 | 3 | 3 |
| CO2: Demonstrate TLC techniques for monitoring reactions and checking purity of synthesized compounds. | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 3 | 1 | 2 | 3 |
| CO3: Use principles of qualitative analysis for identification and structural confirmation of synthesized compounds. | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 3 | 3 | 1 | 3 |
| CO4: Employ the skills for preliminary physico chemical characterization of the synthesized molecules. | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 3 | 2 | 1 | 3 |
| CO5: Compute, analyse and record the observations | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO6: Evaluate the need of advancements in the therapy of diseases | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 1 | 3 |
| **Average** | **3** | **3.0** | **3.0** | **2.2** | **3.0** | **2.2** | **1.5** | **3.0** | **2.3** | **1.8** | **3.0** |

**Year Semester:** Third Year B. Pharm. Semester V
**Subject Name:** Pharmaceutical Analysis III (Theory)
**Course:** 2015 syllabus
**Course Code:** 13709

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the basic concepts of chromatography and its significance. | 3 | 3 | 3 | 3 | 1 | 2 | 2 | 3 | 1 | 2 | 3 |
| CO2: Describe the principle, technique, and applications of Column chromatography. | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 3 | 1 | 2 | 3 |
| CO3: Explain the fundamentals and applications of Paper chromatography. | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 3 | 1 | 2 | 3 |
| CO4: Discuss the principle, process and instrumentation of Gas, Ion exchange and Gel permeation chromatography. | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 3 | 1 | 2 | 3 |
| CO5: Apply various chromatographic techniques for analysis of pharmaceuticals. | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 3 | 1 | 2 | 3 |
| CO6: Develop approaches in solving problems related to chromatographic techniques. | 3 | 3 | 3 | 2 | 3 | 1 | 3 | 3 | 2 | 2 | 3 |
| **Average** | **3** | **2.3** | **3.0** | **2.2** | **1.3** | **1.8** | **2.2** | **3.0** | **1.2** | **2.0** | **3.0** |

**Year Semester:** Third Year B. Pharm. Semester V
**Subject Name:** Pharmaceutical Analysis III (Practical)
**Course:** 2015 syllabus
**Course Code:** 13709

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Analyze and identify various samples using Paper chromatography. | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 1 | 3 | 3 |
| CO2: Use Column chromatographic techniques to separate various samples. | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 1 | 3 | 3 |
| CO3: Apply Ion exchange chromatographic technique to separate ionic samples. | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 1 | 3 | 3 |
| CO4: Interpret, evaluate, and compare different chromatograms. | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 1 | 3 | 3 |
| CO5: Select the suitable chromatographic technique for analysis of various samples. | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 1 | 3 | 3 |
| CO6: Compute, analyse and record the data. | 3 | 3 | 3 | 2 | 3 | 1 | 3 | 3 | 2 | 3 | 3 |
| **Average** | **3** | **3.0** | **3.0** | **2.0** | **2.7** | **1.8** | **3.0** | **3.0** | **1.2** | **3.0** | **3.0** |

**Year Semester:** Third Year B. Pharm. Semester V
**Subject Name:** Pharmaceutical Technology I (Theory)
**Course:** 2015 syllabus
**Course Code:** 13710

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand cGMP for large scale manufacturing of pharmaceuticals. | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO2: Design appropriate plant layout for pharmaceutical manufacturing. | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO3: Explain physicochemical, biopharmaceutical and therapeutic aspects for formulation design. | 3 | 3 | 3 | 3 | 1 | 3 | 2 | 2 | 2 | 1 | 3 |
| CO4: Describe the IPQC and quality control tests. | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 2 | 3 | 2 | 3 |
| CO5: Review evaluation parameters of pharmaceutical dosage forms and cosmeceuticals | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO6: Implement regulatory guidelines and ethical practices in manufacturing. | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 1 | 3 | 2 | 3 |
| **Average** | **3.00** | **3.00** | **3.00** | **3.00** | **1.50** | **2.50** | **2.33** | **1.83** | **2.00** | **1.83** | **3.00** |

**Year Semester:** Third Year B. Pharm. Semester V
**Subject Name:** Pharmaceutical Technology I (Practical)
**Course:** 2015 syllabus
**Course Code:** 13710

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Review of marketed drug products. | 3 | 1 | 2 | 1 | 2 | 3 | 2 | 2 | 1 | 2 | 3 |
| CO2: Formulate liquid and semisolid pharmaceuticals and cosmetics. | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO3: Select appropriate manufacturing equipment. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 3 |
| CO4: Evaluate quality of pharmaceuticals and cosmetics. | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 |
| CO5: Compute, analyse and record data. | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 3 | 3 | 3 |
| CO6: Adapt Good Laboratory Practices. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.67** | **2.67** | **2.50** | **2.67** | **2.83** | **2.67** | **2.17** | **2.33** | **2.33** | **3.00** |

**Year Semester:** Third Year B. Pharm. Semester V
**Subject Name:** Pharmacology II (Theory)
**Course:** 2015 syllabus
**Course Code:** 13711

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Identify drug targets considering pathophysiology of diseases. | 3 | 1 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 1 | 3 |
| CO2: Correlate the molecular basis of drug action with clinical uses. | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | 3 |
| CO3: Understand the adverse effects and drug interactions. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Suggest appropriate drug therapy for diseases. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5: Compare efficacy, safety, and cost-effectiveness of drug therapy. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Recommend measures for prevention and management of lifestyle diseases. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3.00** | **2.50** | **2.67** | **2.83** | **2.67** | **2.83** | **2.50** | **3.00** | **2.67** | **2.50** | **3.00** |

**Year Semester:** Third Year B. Pharm. Semester V
**Subject Name:** Pharmacology II (Practical)
**Course:** 2015 syllabus
**Course Code:** 13711

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the importance of use of animals in drug discovery and development | 3 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 2 | 2 | 3 |
| CO2: Apply ethical principles in animal experimentation. | 3 | 2 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO3: Outline the principles and applications of bioassay. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 |
| CO4: Justify the need of alternatives to animals and demonstrate computer simulated animal experiments. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5: Assess the safety and efficacy profile of drugs using ‘Drug Information Software’s. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Evaluate prescriptions and recommend treatment protocols for patients. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3.00** | **2.50** | **2.33** | **2.33** | **2.17** | **2.67** | **3.00** | **3.00** | **2.67** | **2.83** | **3.00** |

**Year Semester:** Third Year B. Pharm. Semester V
**Subject Name:** Pharmacognosy II (Theory)
**Course:** 2015 syllabus
**Course Code:** 13712

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the basics of crude drugs. | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 3 |
| CO2: Explain the categories of plant constituents with their characteristics | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Describe pharmacognostic account of important secondary metabolites. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Review the drugs from marine source. | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Apply modern tools to check adulteration in herbal drugs for industrial utility. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Create awareness of medicinal uses, drug interactions and toxicities of herbal medicines. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **3** | **3** | **3** | **2** | **2.83** | **2.5** | **3** | **2.83** | **2.83** | **3** |

**Year Semester:** Third Year B. Pharm. Semester V
**Subject Name:** Pharmacognosy II (Practical)
**Course:** 2015 syllabus
**Course Code:** 13712

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Evaluate different plant tissues and their characteristics. | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 3 | 2 | 3 | 2 |
| CO2: Characterize the crude drugs on the basis of morphological and microscopical characters | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Analyze crude drugs using chemical tests | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Apply the techniques for extraction of phyto-constituents from crude drugs | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Describe the cultivation and manufacturing process of herbal drugs | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Understand and conduct the survey of marketed herbal products | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.5** | **3** | **2.66** | **2.16** | **2.66** | **2.33** | **3** | **2.83** | **3** | **2.83** |

**Year Semester:** Third Year B. Pharm. Semester V
**Subject Name:** Pharmaceutical Jurisprudence (Theory)
**Course:** 2015 syllabus
**Course Code:** 13713

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand pharmaceutical legislations related to drugs and cosmetics in India. | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO2: Explain the Consumer Protection Act for the benefit of society | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 1 | 3 |
| CO3: Apply practice of Professional ethics. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO4: Comprehend the regulatory system for safe and effective medicine. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO5: Review the role of international drug regulatory agencies. | 3 | 3 | 3 | 1 | 2 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO6: Describe the Intellectual Property Rights. | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 1 | 3 |
| **Average** | **3.00** | **2.83** | **3.00** | **2.17** | **2.67** | **3.00** | **3.00** | **3.00** | **3.00** | **1.67** | **3.00** |

**Year Semester:** Third Year B. Pharm. Semester VI
**Subject Name:** Medicinal Chemistry II (Theory)
**Course:** 2015 syllabus
**Course Code:** 13714

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Describe the metabolic pathways and understand routes of synthesis of clinically important drugs. | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 3 | 2 | 2 | 3 |
| CO2: Categorize different classes of drugs in a particular category | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Describe the mechanism actions of drugs | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Relate influence of structure on biological activity of drugs. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Explain the uses and adverse reactions of drugs belonging to different classes for the benefit of society | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Write the routes of synthesis of drugs. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.16** | **3** | **2.66** | **2.16** | **2.66** | **2.33** | **3** | **2.83** | **2.83** | **3** |

**Year Semester:** Third Year B. Pharm. Semester VI
**Subject Name:** Medicinal Chemistry II (Practical)
**Course:** 2015 syllabus
**Course Code:** 13714

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Apply principles of organic chemistry for synthesis of drugs and drug intermediates with emphasis on environment and safety. | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 3 | 3 | 3 | 3 |
| CO2: Demonstrate TLC techniques for monitoring reactions and checking purity of synthesized compounds. | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 3 | 1 | 2 | 3 |
| CO3: Apply principles of qualitative analysis for identification and structural confirmation of synthesized compounds. | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 3 | 3 | 1 | 3 |
| CO4: Employ the skills for preliminary physico chemical characterization of the synthesized molecules. | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 3 | 2 | 1 | 3 |
| CO5: Compute, analyse and record the observations | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO6: Evaluate the need of advancements in the therapy of diseases | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 1 | 3 |
| **Average** | **3** | **3.0** | **3.0** | **2.2** | **3.0** | **2.2** | **1.5** | **3.0** | **2.3** | **1.8** | **3.0** |

**Year Semester:** Third Year B. Pharm. Semester VI
**Subject Name:** Pharmaceutical Analysis IV (Theory)
**Course:** 2015 syllabus
**Course Code:** 13715

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand basics of chromatographic techniques. | 3 | 3 | 3 | 3 | 1 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO2: Apply principles of planar chromatographic techniques for analysis of pharmaceuticals. | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO3: Know different methods to identify adulterants present in food items. | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO4: Explain the fundamentals and applications of Column chromatographic techniques. | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO5: Apply various chromatographic techniques for analysis of pharmaceuticals. | 3 | 2 | 3 | 2 | 1 | 2 | 2 | 3 | 3 | 3 | 3 |
| CO6: Evaluate and compare the methodologies involved in separation analysis. | 3 | 3 | 3 | 2 | 3 | 1 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.3** | **3.0** | **2.2** | **1.3** | **1.8** | **2.2** | **3.0** | **3.0** | **3.0** | **3.0** |

**Year Semester:** Third Year B. Pharm. Semester VI
**Subject Name:** Pharmaceutical Analysis IV (Practical)
**Course:** 2015 syllabus
**Course Code:** 13715

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Correlate principles of separation using chromatographic techniques for qualitative determination of pure drug. | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO2: Analyze various compounds using chromatographic techniques. | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO3: Determine the various adulterants present in food items. | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO4: Interpret, evaluate, and compare different chromatograms. | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO5: Understand working of sophisticated chromatographic instruments. | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO6: Compute, analyse and record the data. | 3 | 3 | 3 | 2 | 3 | 1 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **3.0** | **3.0** | **2.0** | **2.7** | **1.8** | **3.0** | **3.0** | **3.0** | **3.0** | **3.0** |

**Year Semester:** Third Year B. Pharm. Semester VI
**Subject Name:** Pharmaceutical Technology II (Theory)
**Course:** 2015 syllabus
**Course Code:** 13716

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Explain concept of formulation of solid dosage forms. | 3 | 3 | 3 | 3 | 1 | 2 | 1 | 1 | 1 | 1 | 3 |
| CO2: Describe manufacturing and evaluation of solid dosage forms. | 3 | 2 | 3 | 2 | 1 | 3 | 2 | 2 | 3 | 1 | 3 |
| CO3: Understand specialized solid dosage form. | 3 | 3 | 2 | 3 | 1 | 3 | 1 | 1 | 2 | 1 | 3 |
| CO4: Select and recommend appropriate packaging for solid dosage form. | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 3 |
| CO5: Design layout for manufacturing of solid dosage forms. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO6: Identify appropriate quality control equipments for pharmaceuticals. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.83** | **2.83** | **2.83** | **1.67** | **2.83** | **2.00** | **1.83** | **2.50** | **2.00** | **3.00** |

**Year Semester:** Third Year B. Pharm. Semester VI
**Subject Name:** Pharmaceutical Technology II (Practical)
**Course:** 2015 syllabus
**Course Code:** 13716

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Review of marketed drug products of various dosage forms. | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 3 |
| CO2: Justify the composition, containers, labels, expiry period, economy, acceptance drug Products. | 3 | 3 | 3 | 1 | 2 | 3 | 2 | 2 | 3 | 2 | 3 |
| CO3: Formulate solid dosage forms and suppositories | 3 | 3 | 3 | 3 | 1 | 2 | 2 | 2 | 3 | 2 | 3 |
| CO4: Select appropriate manufacturing equipment's. | 3 | 3 | 3 | 3 | 1 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO5: Evaluate quality of solid dosage forms and suppositories | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 |
| CO6: Adapt Good Laboratory Practices. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.83** | **2.83** | **2.50** | **1.83** | **2.50** | **2.17** | **2.00** | **2.67** | **2.17** | **3.00** |

**Year Semester:** Third Year B. Pharm. Semester VI
**Subject Name:** Pharmacognosy III (Theory)
**Course:** 2015 syllabus
**Course Code:** 13717

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Describe the botanical sources, chemical constituents, and uses of traditional drugs. | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 3 |
| CO2: Understand herbal drug standardization as per WHO guidelines. | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Apply biotechnological techniques to enrich phytoconstituents in medicinal plants. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Review drugs of mineral origin | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Explain the techniques for extraction of phytoconstituents from medicinal plants. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Apply use of natural fibers as sutures and surgical dressings | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **3** | **3** | **3** | **2** | **2.83** | **2.5** | **3** | **2.83** | **2.83** | **3** |

**Year Semester:** Third Year B. Pharm. Semester VI
**Subject Name:** Pharmacognosy III (Practical)
**Course:** 2015 syllabus
**Course Code:** 13717

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Evaluate different plant tissues and their characteristics. | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 3 | 2 | 3 | 2 |
| CO2: Characterize the crude drugs on the basis of morphological and microscopical characters | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Analyze crude drugs using chemical tests | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Apply the techniques for extraction of phyto-constituents from crude drugs | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Describe the cultivation and manufacturing process of herbal drugs | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Understand and conduct the survey of marketed herbal products | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.5** | **3** | **2.66** | **2.16** | **2.66** | **2.33** | **3** | **2.83** | **3** | **2.83** |

**Year Semester:** Third Year B. Pharm. Semester VI
**Subject Name:** Pharmaceutical Biotechnology (Theory)
**Course:** 2015 syllabus
**Course Code:** 13718

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Recall types, characteristics, and origin of DNA, RNAs and genetic code. | 3 | 1 | 3 | 3 | 1 | 3 | 1 | 3 | 2 | 2 | 3 |
| CO2: Illustrate techniques involved in DNA manupulation | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Demonstrate recombinant DNA technology and its applications in pharmacy | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Review antigen-antibody reactions and immune responses | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Explain enzyme immobilization techniques and fermentation process | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 6: Develop biotechnological aptitude and values required for self-motivated, lifelong learning and professional development. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2** | **3** | **3** | **2.16** | **3** | **2.33** | **3** | **2.83** | **2.83** | **3** |

**Year Semester:** Third Year B. Pharm. Semester VI
**Subject Name:** Pharmaceutical Biotechnology (Practical)
**Course:** 2015 syllabus
**Course Code:** 13718

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Characterize DNA and RNA | 3 | 1 | 3 | 3 | 1 | 3 | 1 | 3 | 2 | 2 | 3 |
| CO2: Illustrate techniques involved in DNA manupulation | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3 Demonstrate key steps in recombinant DNA technology | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Analyse DNA amplification in PCR and describe its applications in diagnostics | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Explain and illustrate enzyme immobilization techniques | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Design, observe, record, compute, analyse and interprete experimental data | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2** | **3** | **3** | **2.16** | **3** | **2.33** | **3** | **2.83** | **2.83** | **3** |

**Year Semester:** Third Year B. Pharm. Semester VI
**Subject Name:** Pharmacology III (Theory)
**Course:** 2015 syllabus
**Course Code:** 13719

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Comprehend the molecular basis of drug action. | 3 | 1 | 1 | 2 | 2 | 1 | 1 | 3 | 1 | 1 | 3 |
| CO2: Illustrate the clinical uses of drugs. | 3 | 1 | 1 | 2 | 1 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO3: Analyze the adverse effects and drug interactions with measures to minimize them. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Interpret the rationale behind pharmacotherapy of diseases. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5: Sensitize the society about judicious use of psychoactive substances and OTC products. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Integrate and apply the general management of poisoning and drug toxicity. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.33** | **2.33** | **2.67** | **2.5** | **2.5** | **2.67** | **3** | **2.67** | **2.5** | **3** |

**Year Semester:** Final Year B. Pharm. Semester VII
**Subject Name:** Medicinal Chemistry III (Theory)
**Course:** 2015 syllabus
**Course Code:** 13720

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the principles of chemotherapy | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| CO2: Sketch the structure and name the drugs and their intermediates | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 |
| CO3: Distinguish different classes of drugs | 3 | 2 | 3 | 3 | 1 | 2 | 1 | 2 | 2 | 2 | 2 |
| CO4: Demonstrate influence of structural modification of drugs on the physic-chemical properties and biological activity. | 3 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO5: Describe the synthesis of important drugs. | 3 | 1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| CO6: Explain the uses and adverse reactions of drugs belonging to different classes for the benefit of society | 3 | 2 | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |
| **Average** | **3.00** | **1.67** | **2.67** | **2.33** | **1.67** | **1.83** | **1.83** | **1.83** | **1.67** | **1.83** | **2.17** |

**Year Semester:** Final Year B. Pharm. Semester VII
**Subject Name:** Medicinal Chemistry III (Practical)
**Course:** 2015 syllabus
**Course Code:** 13720

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Apply principles of organic chemistry for synthesis of drugs and drug intermediates with emphasis on environment and safety. | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 3 |
| CO2: Apply principles of qualitative analysis for identification and structural confirmation of synthesized compounds. | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 3 |
| CO3: Analyze the drugs as per official monograph | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 |
| CO4: Interpret IR and UV spectral data | 3 | 1 | 2 | 3 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| CO5: Compute, analyze and record the observations. | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| CO6: Justify the advancements in the therapy of diseases | 3 | 1 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| **Average** | **3.00** | **2.17** | **2.67** | **2.67** | **1.83** | **1.50** | **2.00** | **2.00** | **1.67** | **1.67** | **2.17** |

**Year Semester:** Final Year B. Pharm. Semester VII
**Subject Name:** Pharmaceutical Technology III (Theory)
**Course:** 2015 syllabus
**Course Code:** 13721

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the concept of formulation design of sterile products. | 3 | 2 | 3 | 1 | 2 | 3 | 1 | 1 | 2 | 1 | 3 |
| CO2: Design layout for manufacturing sterile dosage form considering environmental factors | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3: Recommend appropriate processes and equipment for the manufacturing & packaging of sterile formulations | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO4: Review blood related products | 3 | 2 | 1 | 1 | 1 | 3 | 2 | 2 | 3 | 1 | 3 |
| CO5: Assess quality of sterile formulations as per compendial standards using modern analytical tools | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 1 | 3 | 2 | 3 |
| CO6: Formulate stable sterile dosage form for mankind. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3.00** | **2.67** | **2.67** | **2.17** | **2.00** | **2.83** | **2.33** | **2.00** | **2.83** | **2.00** | **3.00** |

**Year Semester:** Final Year B. Pharm. Semester VII
**Subject Name:** Pharmaceutical Technology III (Practical)
**Course:** 2015 syllabus
**Course Code:** 13721

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Apply the concept of biopharmaceutical and therapeutic aspects in formulation design. | 3 | 3 | 3 | 2 | 2 | 3 | 1 | 2 | 2 | 1 | 3 |
| CO2: Design layout for manufacturing sterile dosage form considering environmental factors | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 |
| CO3: Select appropriate process and equipment for the manufacturing & packaging of sterile formulations | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 3 |
| CO4: Compute, analyse and record data. | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 3 |
| CO5: Formulate and evaluate stable sterile dosage form by working in a team. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO6: Review regulatory guidelines for environment control. | 3 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 3 | 3 |
| **Average** | **3.00** | **2.67** | **2.67** | **2.17** | **2.00** | **2.67** | **2.33** | **2.00** | **2.50** | **2.00** | **3.00** |

**Year Semester:** Final Year B. Pharm. Semester VII
**Subject Name:** Biopharmaceutics and Pharmacokinetics (Theory)
**Course:** 2015 syllabus
**Course Code:** 13722

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the concept of absorption, distribution, metabolism, and excretion of drug. | 3 | 1 | 2 | 2 | 1 | 2 | 1 | 3 | 3 | 2 | 3 |
| CO2: Calculate pharmacokinetic parameters of drugs. | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO3: Explain the significance of bioavailability in rational drug therapy. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO4: Design bioavailability-bioequivalence study protocol to establish the quality of generic drugs. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO5: Describe the role of biopharmaceutics in drug development. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Explore application of pharmacokinetic principles to special populations. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.33** | **2.83** | **2.83** | **2.33** | **2.83** | **2.66** | **3** | **3** | **2.5** | **3** |

**Year Semester:** Final Year B. Pharm. Semester VII
**Subject Name:** Biopharmaceutics and Pharmacokinetics (Practical)
**Course:** 2015 syllabus
**Course Code:** 13722

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Estimate physicochemical parameters of drugs and relate their influence on bioavailability. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 |
| CO2: Carryout absorption, distribution, metabolism, and excretion studies. | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| CO3: Determine the bioavailability/bioequivalence parameters. | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO4: Estimate pharmacokinetic parameters of drugs. | 3 | 3 | 1 | 1 | 3 | 2 | 3 | 3 | 3 | 2 | 3 |
| CO5: Design bioavailability-bioequivalence study protocol to establish the quality of generic drugs. | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Compute, analyse and record data | 3 | 3 | 1 | 3 | 1 | 2 | 3 | 3 | 1 | 1 | 3 |
| **Average** | **3** | **3** | **2.5** | **2.16** | **2.67** | **2.5** | **3** | **3** | **2.67** | **2** | **3** |

**Year Semester:** Final Year B. Pharm. Semester VII
**Subject Name:** Pharmacognosy IV (Theory)
**Course:** 2015 syllabus
**Course Code:** 13723

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Relate aspects of drug discovery and development from natural products. | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 3 |
| CO2: Justify safe use of herbal cosmetics and their formulations. | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Describe the use of natural products as functional excipients and therapeutic agents | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Explain role, importance, and regulatory aspects of nutraceuticals. | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Comprehend herbal drug regulatory affairs. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Apply the concept of pharmacovigilance for herbal drugs. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **3** | **3** | **3** | **2** | **2.83** | **2.5** | **3** | **2.83** | **2.83** | **3** |

**Year Semester:** Final Year B. Pharm. Semester VII
**Subject Name:** Pharmacognosy IV (Practical)
**Course:** 2015 syllabus
**Course Code:** 13723

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Describe the protocols of Herbal Monograph. | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 3 | 2 | 3 | 2 |
| CO2: Develop and evaluate Ayurvedic dosage forms and skin and hair care herbal cosmetics. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Understand the role and importance of Nutraceuticals. | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Apply modern analytical tools to evaluate adulteration in crude drug. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Design and conduct the survey of marketed herbal products. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Design and conduct the survey of marketed herbal products. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | 3 | 2.5 | 3 | 2.66 | 2.16 | 2.66 | 2.33 | 3 | 2.83 | 3 | 2.83 |

**Year Semester:** Final Year B. Pharm. Semester VII
**Subject Name:** Pharmaceutical Analysis V (Theory)
**Course:** 2015 syllabus
**Course Code:** 13724

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Comprehend the basic concepts of spectroscopy. | 3 | 1 | 1 | 3 | 1 | 2 | 1 | 3 | 2 | 1 | 3 |
| CO2: Understand general components and their functions of spectroscopic instruments. | 3 | 2 | 2 | 3 | 1 | 2 | 1 | 3 | 2 | 1 | 3 |
| CO3: Apply fundamentals of UV Visible spectroscopy for pharmaceutical analysis. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 3 |
| CO4: Elaborate the concept and applications of vibrational spectroscopy | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO5: Interpret UV and IR spectra for structural elucidation | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 |
| CO6: Explain the principles and applications of emission spectroscopy | 3 | 1 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 3 |
| **Average** | **3.00** | **2.00** | **2.50** | **3.00** | **2.17** | **2.33** | **2.33** | **3.00** | **2.17** | **1.50** | **3.00** |

**Year Semester:** Final Year B. Pharm. Semester VII
**Subject Name:** Clinical Pharmacy (Theory)
**Course:** 2015 syllabus
**Course Code:** 13725

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Appraise biomedical literature from scientific journals. | 3 | 1 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 1 | 3 |
| CO2: Employ drug use evaluation in a hospital | 3 | 1 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO3: Apply patient counselling skills in practice | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 |
| CO4: Explain drug information to community and all healthcare professionals. | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 |
| CO5: Assess and report adverse drug reactions. | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO6: Interpret laboratory data with respect to patient's condition | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 1 | 3 |
| **Average** | **3** | **2** | **2.83** | **2.17** | **3** | **3** | **2.33** | **3** | **3** | **1.33** | **3** |

**Year Semester:** Final Year B. Pharm. Semester VII
**Subject Name:** Soft skills (Practical)
**Course:** 2015 syllabus
**Course Code:** 13726

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Communicate confidently with a good understanding of people's skills. | 3 | 3 | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 3 |
| CO2: Apply effective writing and listening skills at personal and professional level. | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO3: Acquire knowledge of technical writing skills. | 3 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 |
| CO4: Illustrate presentation skills. | 3 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO5: Demonstrate self and time management. | 3 | 3 | 3 | 3 | 1 | 2 | 1 | 2 | 2 | 2 | 3 |
| CO6: Develop behavioural traits to function effectively in pharmaceutical operations. | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 2 |
| **Average** | **3.00** | **2.33** | **2.83** | **2.50** | **1.83** | **1.67** | **1.83** | **2.00** | **1.33** | **1.67** | **2.67** |

**Year Semester:** Final Year B. Pharm. Semester VIII
**Subject Name:** Medicinal Chemistry IV (Theory)
**Course:** 2015 syllabus
**Course Code:** 13727

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the principles of drug design and QSAR. | 3 | 3 | 3 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 3 |
| CO2: Sketch out the synthesis of important drugs. | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 |
| CO3: Correlate structural modification on the drug with biological activity. | 3 | 2 | 3 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 2 |
| CO4: explain the uses and adverse reactions of drugs belonging to different classes for the benefit of society | 3 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 |
| CO5: Discuss the chemistry and actions of hormones and related drugs | 3 | 3 | 3 | 3 | 1 | 2 | 1 | 2 | 2 | 2 | 3 |
| CO6: Explain the principles of combinatorial chemistry and microwave assisted drug synthesis | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 2 |
| **Average** | **3.00** | **2.33** | **2.83** | **2.50** | **1.83** | **1.67** | **1.83** | **2.00** | **1.33** | **1.67** | **2.67** |

**Year Semester:** Final Year B. Pharm. Semester VIII
**Subject Name:** Medicinal Chemistry IV (Practical)
**Course:** 2015 syllabus
**Course Code:** 13727

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Apply principles of organic chemistry for synthesis of drugs and drug intermediates with emphasis on environment and safety. | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 3 |
| CO2: Apply principles of qualitative analysis for identification and structural confirmation of synthesized compounds. | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 3 |
| CO3: Determine physicochemical parameters like partition coefficient, molar refractivity, and dissociation constant | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 |
| CO4: Apply microwave assisted techniques for synthesis of drug and drug intermediates. | 3 | 1 | 2 | 3 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| CO5: Compute, analyse and record the observations. | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 |
| CO6: Critique the need of advancements in the therapy of diseases | 3 | 1 | 3 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| **Average** | **3.00** | **2.17** | **2.67** | **2.67** | **1.83** | **1.50** | **2.00** | **2.00** | **1.67** | **1.67** | **2.17** |

**Year Semester:** Final Year B. Pharm. Semester VIII
**Subject Name:** Pharmaceutical Analysis VI (Theory)
**Course:** 2015 syllabus
**Course Code:** 13728

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the principles and explore applications of NMR spectroscopy | 3 | 1 | 1 | 3 | 1 | 2 | 2 | 2 | 1 | 1 | 3 |
| CO2: Describe the basics of Flame photometry, atomic absorption and Mass spectroscopic techniques and their applications | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 3 |
| CO3: Interpret proton NMR and mass spectra | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 3 |
| CO4: Summarize the analytical method validation parameters as per ICH guidelines | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 3 |
| CO5: Explain the basics and applications of X-ray diffraction and thermal analytical techniques. | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 3 |
| CO6: Apply suitable instrumental analytical techniques to asses purity and safety of pharmaceuticals for the benefit of society | 3 | 1 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 3 |
| **Average** | **3.00** | **2.00** | **2.50** | **3.00** | **2.50** | **2.33** | **2.00** | **2.17** | **1.67** | **1.17** | **3.00** |

**Year Semester:** Final Year B. Pharm. Semester VIII
**Subject Name:** Pharmaceutical Analysis VI (Practical)
**Course:** 2015 syllabus
**Course Code:** 13728

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Select and apply suitable analytical technique to assess purity and safety of pharmaceuticals for the benefit of society. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 1 | 3 |
| CO2: Design protocol for quantitative analysis of drugs and formulations | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 3 |
| CO3: Handle analytical instruments | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 3 |
| CO4: Interpret UV, IR, proton NMR and Mass spectra | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 1 | 2 | 3 |
| CO5: Apply problem solving approach in pharmaceutical analysis | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 |
| CO6: Compute, analyse and record data | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 |
| **Average** | **3.00** | **3.00** | **3.00** | **3.00** | **2.67** | **2.83** | **2.83** | **2.00** | **1.67** | **1.50** | **3.00** |

**Year Semester:** Final Year B. Pharm. Semester VIII
**Subject Name:** Pharmaceutical Technology IV (Theory)
**Course:** 2015 syllabus
**Course Code:** 13729

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the concept of Controlled drug delivery systems. | 3 | 3 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 3 |
| CO2: Design and formulate Novel Drug Delivery Systems. | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 3 | 2 | 3 | 3 |
| CO3: Recommend appropriate processes and equipment for manufacturing & packaging of NDDS formulations. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 |
| CO4: Review ICH guidelines in dosage form development | 3 | 3 | 1 | 1 | 2 | 2 | 1 | 2 | 3 | 2 | 3 |
| CO5: Assess quality of NDDS formulations as per compendial standards using modern analytical tools. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 |
| CO6: Review the concept of quality assurance in pharmaceutical products | 3 | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 3 |
| **Average** | **3.00** | **2.67** | **2.33** | **2.00** | **2.00** | **2.67** | **2.00** | **2.00** | **2.17** | **2.00** | **3.00** |

**Year Semester:** Final Year B. Pharm. Semester VIII
**Subject Name:** Pharmaceutical Technology IV (Practical)
**Course:** 2015 syllabus
**Course Code:** 13729

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the concept of Controlled drug delivery. | 3 | 2 | 2 | 1 | 1 | 3 | 1 | 2 | 1 | 2 | 3 |
| CO2: Apply the concept of physicochemical, biopharmaceutical and therapeutic aspects in NDDS formulation design | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 |
| CO3: Assess quality of CR and IR tablets as per compendial standards using modern analytical tools. | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 2 | 3 |
| CO4: Design validation protocol for equipments and aseptic area by working in a team. | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 3 |
| CO5: Compute, analyze and create study protocol and reports for manufacturing of dosage forms. | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 2 | 1 | 2 | 3 |
| CO6: Perform accelerated stability testing of dosage forms. | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 |
| **Average** | **3.00** | **2.83** | **2.50** | **2.50** | **2.00** | **2.83** | **2.17** | **2.00** | **2.00** | **2.00** | **3.00** |

**Year Semester:** Final Year B. Pharm. Semester VIII
**Subject Name:** Pharmacology IV (Theory)
**Course:** 2015 syllabus
**Course Code:** 13730

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Understand the mechanism of drug action considering pathophysiology of diseases. | 3 | 1 | 3 | 1 | 1 | 1 | 1 | 3 | 2 | 2 | 3 |
| CO2: Comprehend the challenges in development of chemotherapeutic agents. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO3: Select drugs for the treatment of diseases based on safety, efficacy, and cost-effectiveness. | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Plan treatment modalities for special population. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 |
| CO5: Recommend rational use of antimicrobial agents. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Explain various measures for prevention of diseases in the society. | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.16** | **3** | **2.66** | **2.16** | **2.66** | **2.33** | **3** | **2.83** | **2.83** | **3** |

**Year Semester:** Final Year B. Pharm. Semester VIII
**Subject Name:** Pharmacology IV (Practical)
**Course:** 2015 syllabus
**Course Code:** 13730

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Explain treatment protocols for diseases. | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO 2: Assess risks and benefits for pharmacotherapy of diseases. | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO3: Justify rational and irrational fixed dose combination. | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO4: Design drug promotional literature. | 3 | 3 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO5: Audit prescriptions and analyse prescription patterns. | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Demonstrate animal experiments using computer simulation softwares. | 3 | 3 | 1 | 3 | 1 | 2 | 3 | 3 | 1 | 1 | 3 |
| **Average** | **3** | **3** | **2.17** | **2.17** | **2.67** | **2.83** | **3** | **3** | **2.67** | **2.5** | **3** |

**Year Semester:** Final Year B. Pharm. Semester VIII
**Subject Name:** Pharmaceutical Management (Theory)
**Course:** 2015 syllabus
**Course Code:** 13731

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Describe influence of GATT, WTO, Dunkel Text on Pharmacy profession | 3 | 2 | 2 | 3 | 2 | 3 | 1 | 3 | 3 | 2 | 3 |
| CO2: Understand Drug development process. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO3: Explain the concept of ISO standardization and Quality Management System. | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO4; Apply management principles in pharmaceutical production, marketing, and sales. | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 3 |
| CO5: Explore the basics and applications of IPR in pharmacy | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CO6: Practice ethics and inculcate human values in pharma sector | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **Average** | **3** | **2.33** | **2.83** | **3.00** | **2.33** | **3.00** | **2.17** | **3.00** | **3.00** | **2.33** | **3.00** |

**Year Semester:** Final Year B. Pharm. Semester VIII
**Subject Name:** Pharmacovigilance and Medication Safety (Theory)
**Course:** 2015 syllabus
**Course Code:** 13732

| Course Outcomes | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CO1: Classify different ADRs | 3 | 1 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 1 | 3 |
| CO2: Identify ADRs in a patient's clinical profile | 3 | 1 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO3: Assess the severity/causality of ADRs | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 |
| CO4: Analyze preventability of ADRs | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 |
| CO5: Synthesize ADR reports | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 |
| CO6: Evaluate medication safety literature | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 1 | 3 |
| **Average** | **3** | **2** | **2.83** | **2.17** | **3** | **3** | **2.33** | **3** | **3** | **1.33** | **3** |