## 1. Course Outcomes (COs)

| Course Name | Course Code | Course Outcomes | |
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| **B. Pharm 7th Sem** | | | |
| Instrumental Methods of Analysis Theory | BP701T | **C701.1** | Understand interaction of matter with electromagnetic radiations and describe the principle, instrumentation and applications of UV-Visible, Fluorescence spectroscopy. Able to correlate it with compendial and non-compendial methods of drug analysis. *(Level 3)* |
| | | **C701.2** | Persuade the principle, instrumentation and applications of infrared, atomic absorption atomic emission and nepheloturbidometry. Capable to correlate it with compendial and non-compendial methods of drug analysis. *(Level 3)* |
| | | **C701.3** | Understand the basics concept of chromatography as a separation technique and capable of distinguishing various techniques according to state (stationary/mobile) of phase dimension of stationary phase, principle of separation as per the type of sample. *(Level 3)* |
| | | **C701.4** | Anticipate the fundamentals of various sophisticated instrumental technique like GC, HPLC, HPTLC and can apply this knowledge to different sample analysis. *(Level 3)* |
| Industrial Pharmacy II Theory | BP702T | **C702.1** | Develop the process of pilot plant scale up activities for several pharmaceutical dosage forms viz Solid, liquid orals and semisolid dosage form. *(Level 3)* |
| | | **C702.2** | Demonstrate the practice and the process of technology transfer from lab scale to commercial. Illustrate the role and responsibility of regulatory affairs professionals. *(Level 3)* |
| | | **C702.3** | Explain about the tools of Quality Management System – Six Sigma, QbD, TQM, ISO, Change Control, and OOS to improve the pharmaceutical process and eliminate defects. *(Level 3)* |
| | | **C702.4** | Illustrate the regulatory requirement and approval procedure for new drug – NDA, ANDA, IND, COPP and CDSCO guidelines. *(Level 2)* |
| Pharmacy Practice | | **C703.1** | Illustrate organization structure of hospital, hospital |

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| Theory | BP703T | | pharmacy, and community Pharmacy, and interpret functions including ADR monitoring, reporting and drug distribution system in hospital pharmacy. *(Level 4)* |
| | | **C703.2** | Explain the process design for pharmacy and therapeutic committee, drug formulary, Therapeutic drug monitoring, medication adherence, and outline various medication management process inside hospital pharmacy. *(Level 3)* |
| | | **C703.3** | Outline the design and constitution of drug information services, patient counselling, clinical pharmacy, medication chart review in the hospitals and community setup. *(Level 4)* |
| | | **C703.4** | Explain the objective, principles, procedure of pharmacist intervention, ward round participation, medication history, pharmacy budget preparations drug store management and inventory control, and Interpretation of Clinical Laboratory Tests. *(Level 5)* |
| Novel Drug Delivery System Theory | BP704T | **C704.1** | Outline and discuss the basic components and formulation approaches for Controlled drug delivery systems and transdermal drug delivery systems and describe the role of polymer to design novel drug delivery systems. *(Level 2)* |
| | | **C704.2** | Illustrate the concept, theories, development, and types of osmotic pump, mucosal DDS, and methods of microencapsulation. *(Level 4)* |
| | | **C704.3** | Demonstrate molecular aspect of targeted drug delivery system and discuss liposome, noisome and nanoparticle. *(Level 3)* |
| | | **C704.4** | Extrapolate significance of ocular, Gastro retentive, Naso-pulmonary, and intrauterine drug delivery systems. *(Level 3)* |
| Instrumental Methods of Analysis Practical | BP705P | **C705.1** | To study the basic principle of various spectroscopical and chromatographic methods. *(Level 3)* |
| | | **C705.2** | To estimate the content of drug using single and multicomponent analysis single and simultaneous estimation using different spectroscopical methods. *(Level 3)* |
| | | **C705.3** | To estimate and calculate the content of different drug samples / chemical substance using spectroscopic and chromatographic methods. *(Level 3)* |

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| | | **C705.4** | Able to understand, anticipate and communicate by applying the knowledge of spectroscopy and chromatography. Also, can explain the working of sophisticated instruments like HPLC and GC. *(Level 3)* |
| **B. Pharm 8th Sem** | | | |
| Biostatistics and Research Methodology | BP801T | **C801.1** | Compute the measure of central tendency, measure of dispersion and correlation coefficient for given experimental data. *(Level 3)* |
| | | **C801.2** | Explain the probability distribution, sampling technique, type of hypothesis and graphical representation of experimental data for analysis. *(Level 2)* |
| | | **C801.3** | Relate and apply the parametric test and non-parametric test for two or more experimental groups and estimate significance level of data. *(Level 4)* |
| | | **C801.4** | Apply factorial design, central composite design, optimization techniques to experimental methods by utilizing statistical software such as DOE, MINITAB, R-online, SPSS. *(Level 5)* |
| Social and Preventive Pharmacy_ | BP802T | **C802.1** | Compare and categories health and disease, social and health education, sociology and its implication to health and hygiene. *(Level 5)* |
| | | **C802.2** | Connect the general principles of prevention and control of diseases, outline the preventive measures on communicable diseases. *(Level 4)* |
| | | **C802.3** | Summarize objectives, functioning and outcome of the National health programmes which is implemented at various levels in country. *(Level 5)* |
| | | **C802.4** | Summarize roles, responsibilities, and objectives for National health intervention programmes with special emphasis on elderly, mother and child welfare in country and explain, promote and distinguish role and functions of the community services in rural, urban and school health. *(Level 5)* |
| Pharmacovigilance | | **C805.1** | Illustrate about pharmacovigilance, ADR, basic terminologies used in pharmacovigilance, drug disease classification. *(Level 5)* |

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| | BP805ET | **C805.2** | Explain in detail process of establishing pharmacovigilance, coding system of pharmacovigilance, various information resources and vaccine pharmacovigilance. *(Level 4)* |
| | | **C805.3** | Illustrate in detail principles, objectives and methodologies of various pharmacovigilance methods, process involved in the safety data generations, and process of communication in the pharmacovigilance. *(Level 6)* |
| | | **C805.4** | Explain the formations and functions of various governing bodies involved in the pharmacovigilance process and activities, principles of pharmacogenomics and drug safety evaluations. *(Level 5)* |
| Advanced Instrumentation Techniques | BP811ET | **C811.1** | Able to recognize, understand, discuss and explain about the specific procedures given for qualitative or quantitative analysis of given sample by using anyone of the following like – NMR, MASS spectrometer. *(Level 4)* |
| | | **C811.2** | Persuade the principle, instrumentation and applications of DTA, DSC, TGA and XRD. Capable to correlate it with compendia and non-compendial methods of drug analysis. Also, can able to apply this knowledge in working (calibration) of different instruments like electronic balance, UV-Visible, IR spectrophotometer, Fluorimeter, Flame Photometer, HPLC and GC. *(Level 5)* |
| | | **C811.3** | Understand the basics concept of calibration and validation as per ICH and USFDA guidelines. various separation technique like RIA, SPE, SPME and Liquid-liquid extraction. Also get capable of select suitable techniques according to state (stationary/mobile) of phase dimension of stationary phase, principle of separation as per the type of sample. *(Level 5)* |
| | | **C811.4** | Anticipate the fundamentals of various hyphenated technique like LC-MS-MS, GC-MS-MS, HPTLC-MS and can apply this knowledge to different sample analysis. *(Level 6)* |

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