Programme outcome.

PO 1. Students passing out of ITM are made industry ready by giving hands on training on sophisticated equipment such as GC, HPLC, FTIR, UVVIS, spectrophotometer and validation of this equipment in accordance to the principal of QC & QA. They are also implanted in to industry for a period of one month, where they view there theoretical knowledge in real time. Industry based training by industry personnel is part of skill development that infuses confidence to the students.

PO 2. Modern Techniques of biotechnology are also taught of explore newer efficiently and economical method of drug manufacture. Concepts of QC & QA, TQM, ICH, QbD, ISO 9000 & 14,000 are also deliberated upon deeply

PO 3. Projects and activities are designed interwoven with their syllabus in such manner that by the end of their of course they would gain functional knowledge rather than theoretical or even lab based. Such an experience would allowed them to excel in any career they would choose. In fact such functional knowledge would facilitate them to zero down on their career rather than moot on what to choose with friends and advisors.

PO 4. The exposure we infused in to the students in unison with the curriculum develop/adapt to have relevance to local / national / regional / global developmental with learning objective including programs specific outcomes and course outcomes of all programs offered in the university.

Program Specific Outcomes (PSO)

The curriculum of the school is based on the unified syllabus designed by the Pharmacy Council of India which is being implemented form 2017-18 batch. The syllabus for the undergraduate courses has been well designed and distributors into eight semester.

PSO 1. A student after a completion of the course, a thorough understanding of the human body etiology and pathogenesis of various diseases,

PSO 2. Deep understanding of identification, cultivation, preservation of various pathogens needed to understand testing of drug efficiency is achieved. Finally he is ready as a pharmacist

PSO 3. Various analytical techniques in the Pharmaceutical and laboratories formulatory science, engineering concepts and principles of pharmaceutical equipments, designing steps for organic synthesis for drug development, understanding its chemistry with relation to its pharmacology and a deep understanding of pharmacology that remains the backbone of the study.

Course Outcomes (CO)

I Semester

BP101T. HUMAN ANATOMY AND PHYSIOLOGY-I

Upon completion of this course the student should be able to

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

BP102T. PHARMACEUTICAL ANALYSIS

Upon completion of the course student shall be able to

1. understand the principles of volumetric and electro chemical analysis
2. carryout various volumetric and electrochemical titrations
3. develop analytical skills

BP103T. PHARMACEUTICS- I

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

1. Know the history of profession of pharmacy
2. Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations
3. Understand the professional way of handling the prescription
4. Preparation of various conventional dosage forms

BP104T. PHARMACEUTICAL INORGANIC CHEMISTRY

Upon completion of course student shall be able to

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

BP105T.COMMUNICATION SKILLS

Upon completion of the course the student shall be able to

1. Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation
2. Communicate effectively (Verbal and Non Verbal)

3. Effectively manage the team as a team player
4. Develop interview skills
5. Develop Leadership qualities and essentials

BP 106RBT.REMEDIAL BIOLOGY.

Upon completion of the course, the student shall be able to

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

BP 106RMT.REMEDIAL MATHEMATICS

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

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

Semester II

BP 201T. HUMAN ANATOMY AND PHYSIOLOGY-II

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

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

BP202T. PHARMACEUTICAL ORGANIC CHEMISTRY –I

Upon completion of the course the student shall be able to

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

BP203 T. BIOCHEMISTRY

Upon completion of course student shell able to

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

BP 204T.PATHOPHYSIOLOGY

Upon completion of the subject student shall be able to –

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

BP205 T. COMPUTER APPLICATIONS IN PHARMACY

Upon completion of the course the student shall be able to

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

BP 206 T. ENVIRONMENTAL SCIENCES

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

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

SEMESTER III
BP301T. PHARMACEUTICAL ORGANIC CHEMISTRY –II

Upon completion of the course the student shall be able to

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

BP302T. PHYSICAL PHARMACEUTICS-I

Upon the completion of the course student shall be able to

1. Understand various physicochemical properties of drug molecules in the designing the dosage form
2. Know the principles of chemical kinetics & to use them in assigning expiry date for formulation
3. Demonstrate use of physicochemical properties in evaluation of dosage forms.
4. Appreciate physicochemical properties of drug molecules in formulation research and development

BP 303 T. PHARMACEUTICAL MICROBIOLOGY

Upon completion of the subject student shall be able to;

1. Understand methods of identification, cultivation and preservation of various microorganisms
2. Importance of sterilization in microbiology. and pharmaceutical industry
3. Learn sterility testing of pharmaceutical products.
4. Microbiological standardization of Pharmaceuticals.
5. Understand the cell culture technology and its applications in pharmaceutical industries

BP 304 T. PHARMACEUTICAL ENGINEERING

Upon completion of the course student shall be able:

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

SEMESTER IV

BP401T. PHARMACEUTICAL ORGANIC CHEMISTRY –III

At the end of the course, the student shall be able to

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

BP402T. MEDICINAL CHEMISTRY – I

Upon completion of the course the student shall be able to

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

BP 403 T. PHYSICAL PHARMACEUTICS-II

Upon the completion of the course student shall be able to

1. Understand various physicochemical properties of drug molecules in the designing the dosage form
2. Know the principles of chemical kinetics & to use them in assigning expiry date for Formulation
3. Demonstrate use of physicochemical properties in evaluation of dosage forms.
4. Appreciate physicochemical properties of drug molecules in formulation research and Development

BP 404 T. PHARMACOLOGY-I

Upon completion of this course the student should be able to

1. Understand the pharmacological actions of different categories of drugs
2. Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.
3. Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
4. Observe the effect of drugs on animals by simulated experiments
5. Appreciate correlation of pharmacology with other bio medical sciences

BP 405 T.PHARMACOGNOSY AND PHYTOCHEMISTRY I

Upon completion of the course, the student shall be able

1. to know the techniques in the cultivation and production of crude drugs
2. to know the crude drugs, their uses and chemical nature
3. know the evaluation techniques for the herbal drugs
4. to carry out the microscopic and morphological evaluation of crude drugs

SEMESTER V

BP501T. MEDICINAL CHEMISTRY – II

Upon completion of the course the student shall be able to

1. Understand the chemistry of drugs with respect to their pharmacological activity
2. Understand the drug metabolic pathways, adverse effect and therapeutic value of drugs
3. Know the Structural Activity Relationship of different class of drugs
4. Study the chemical synthesis of selected drugs

BP 502 T. FORMULATIVEPHARMACY

Upon completion of the course the student shall be able to

1. Know the various pharmaceutical dosage forms and their manufacturing techniques.
2. Know various considerations in development of pharmaceutical dosage forms
3. Formulate solid, liquid and semisolid dosage forms and evaluate them for their quality

BP503.T. PHARMACOLOGY-II

Upon completion of this course the student should be able to

1. Understand the mechanism of drug action and its relevance in the treatment of different diseases
2. Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments
3. Demonstrate the various receptor actions using isolated tissue preparation
4. Appreciate correlation of pharmacology with related medical sciences

BP504 T. PHARMACOGNOSY AND PHYTOCHEMISTRY II

Upon completion of the course, the student shall be able

1. to know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
2. to understand the preparation and development of herbal formulation.
3. to understand the herbal drug interactions
4. to carryout isolation and identification of phytoconstituents

BP 505 T. PHARMACEUTICAL JURISPRUDENCE

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

1. The Pharmaceutical legislations and their implications in the development and marketing
2. Various Indian pharmaceutical Acts and Laws
3. The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
4. The code of ethics during the pharmaceutical practice

SEMESTER VI

BP601T. MEDICINAL CHEMISTRY – III

Upon completion of the course student shall be able to

1. Understand the importance of drug design and different techniques of drug design.
2. Understand the chemistry of drugs with respect to their biological activity.
3. Know the metabolism, adverse effects and therapeutic value of drugs.
4. Know the importance of SAR of drugs.

BP602 T. PHARMACOLOGY-II

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

1. understand the mechanism of drug action and its relevance in the treatment of different infectious diseases
2. comprehend the principles of toxicology and treatment of various poisoningsand
3. Appreciate correlation of pharmacology with related medical sciences.

BP 603 T. HERBAL DRUG TECHNOLOGY

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

1. understand raw material as source of herbal drugs from cultivation to herbal drug product
2. know the WHO and ICH guidelines for evaluation of herbal drugs
3. know the herbal cosmetics, natural sweeteners, nutraceuticals
4. Appreciate patenting of herbal drugs, GMP .

BP 604 T. BIOPHARMACEUTICS AND PHARMACOKINETICS

Upon completion of the course student shall be able to:

1. Understand the basic concepts in biopharmaceutics and pharmacokinetics.
2. Use plasma data and derive the pharmacokinetic parameters to describe the process of drug absorption, distribution, metabolism and elimination.
3. Critically evaluate biopharmaceutic studies involving drug product equivalency
4. Design and evaluate dosage regimens of the drugs using pharmacokinetic and biopharmaceutic parameters.
5. detect potential clinical pharmacokinetic problems and apply basic pharmacokinetic principles to solve them

BP 605 T. PHARMACEUTICAL BIOTECHNOLOGY

Upon completion of the subject student shall be able to;

1. Understanding the importance of Immobilized enzymes in Pharmaceutical Industries
2. Genetic engineering applications in relation to production of pharmaceuticals
3. Importance of Monoclonal antibodies in Industries
4. Appreciate the use of microorganisms in fermentation technology

BP606TPHARMACEUTICAL QUALITY ASSURANCE

Upon completion of the course student shall be able to:

1. understand the cGMP aspects in a pharmaceutical industry
2. appreciate the importance of documentation
3. understand the scope of quality certifications applicable to pharmaceutical industries
4. understand the responsibilities of QA & QC departments

SEMESTER VII

BP701T. INSTRUMENTAL METHODS OF ANALYSIS

Upon completion of the course the student shall be able to

1. Understand the interaction of matter with electromagnetic radiations and its applications in drug analysis
2. Understand the chromatographic separation and analysis of drugs.
3. Perform quantitative & qualitative analysis of drugs using various analytical instruments.

BP 702 T. INDUSTRIAL PHARMACY

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

1. Know the process of pilot plant and scale up of pharmaceutical dosage forms
2. Understand the process of technology transfer from lab scale to commercial batch
3. Know different laws and acts that regulate pharmaceutical industry in India and US
4. Understand the approval process and regulatory requirements for drug products

BP 703T. PHARMACY PRACTICE

Upon completion of the course, the student shall be able to

1. know various drug distribution methods in a hospital
2. appreciate the pharmacy stores management and inventory control
3. monitor drug therapy of patient through medication chart review and clinical review
4. obtain medication history interview and counsel the patients
5. identify drug related problems
6. detect and assess adverse drug reactions
7. interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states
8. know pharmaceutical care services
9. do patient counseling in community pharmacy;
10. appreciate the concept of Rational drug therapy. .

BP 704T: NOVEL DRUG DELIVERY SYSTEMS

Upon completion of the course student shall be able

1. To understand various approaches for development of novel drug delivery systems.
2. To understand the criteria for selection of drugs and polymers for the development of Novel drug delivery systems, their formulation and evaluation

SEMESTER VIII

BP801T. BIOSTATISITCS AND RESEARCH METHODOLOGY

Upon completion of the course the student shall be able to

1. Know the operation of M.S. Excel, SPSS, R and MINITAB®, DoE (Design of Experiment)
2. Know the various statistical techniques to solve statistical problems
3. Appreciate statistical techniques in solving the problems**.**

BP 802T SOCIAL AND PREVENTIVE PHARMACY

After the successful completion of this course, the student shall be able to:

1. Acquire high consciousness/realization of current issuesrelated to health and pharmaceutical problems within the country and worldwide.
2. Have a critical way of thinking based on current healthcare development.
3. Evaluate alternative ways of solving problems related tohealth and pharmaceutical issues

BP803ET. PHARMACEUTICAL MARKETING

1. The course aim is to provide an understanding of marketing concepts and techniques and the application of the same in the pharmaceutical industry.

BP804 ET: PHARMACEUTICAL REGULATORY SCIENCE

Upon completion of the subject student shall be able to;

1. Know about the process of drug discovery and development
2. Know the regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
3. Know the regulatory approval process and their registration in Indian and international markets

BP 805T: PHARMACOVIGILANCE

Upon completion of the subject student shall be able to;
(know, do, and appreciate):

1. Why drug safety monitoring is important?
2. History and development of pharmacovigilance
3. National and international scenario of pharmacovigilance
4. Dictionaries, coding and terminologies used in pharmacovigilance
5. Detection of new adverse drug reactions and their assessment
6. International standards for classification of diseases and drugs
7. Adverse drug reaction reporting systems and communication in pharmacovigilance

8. Methods to generate safety data during pre clinical, clinical and post approval phases of drugs' life cycle
9. Drug safety evaluation in paediatrics, geriatrics, pregnancy and lactation
10. Pharmacovigilance Program of India (PvPI)
11. ICH guidelines for ICSR, PSUR, expedited reporting, pharmacovigilance planning
12. CIOMS requirements for ADR reporting
13. Writing case narratives of adverse events and their quality

BP 806 ET. QUALITY CONTROL AND STANDARDIZATION OF HERBALS (Theory)

Upon completion of the subject student shall be able to;

1. know WHO guidelines for quality control of herbal drugs
2. know Quality assurance in herbal drug industry
3. know the regulatory approval process and their registration in Indian and international markets
4. appreciate EU and ICH guidelines for quality control of herbal drugs

BP 807 ET. COMPUTER AIDED DRUG DESIGN

Upon completion of the course, the student shall be able to understand

1. Design and discovery of lead molecules
2. The role of drug design in drug discovery process
3. The concept of QSAR and docking
4. Various strategies to develop new drug like molecules.
5. The design of new drug molecules using molecular modeling software

BP808ET: CELL AND MOLECULAR BIOLOGY (Elective subject

Upon completion of the subject student shall be able to;

1. Summarize cell and molecular biology history.
2. Summarize cellular functioning and composition.
3. Describe the chemical foundations of cell biology.
4. Summarize the DNA properties of cell biology.
5. Describe protein structure and function.
6. Describe cellular membrane structure and function.
7. Describe basic molecular genetic mechanisms.
8. Summarize the Cell Cycl

BP809ET. COSMETIC SCIENCE

Upon completion of the subject student shall be able to;

1. To understand cosmetic formulations
2. Its formulatory aspect
3. To understand pharmaceutical concepts of cosmetic formulations

BP810 ET.EXPERIMENTAL PHARMACOLOGY

Upon completion of the course the student shall be able to,

1. Appreciate the applications of various commonly used laboratory animals.
2. Appreciate and demonstrate the various screening methods used in preclinical research
3. Appreciate and demonstrate the importance of biostatistics and researchmethodology
4. Design and execute a research hypothesis independently

BP 811 ET. ADVANCED INSTRUMENTATION TECHNIQUES

Upon completion of the course the student shall be able to

1. understand the advanced instruments used and its applications in drug analysis
2. understand the chromatographic separation and analysis of drugs.
3. understand the calibration of various analytical instruments
4. know analysis of drugs using various analytical instruments.