KALYANI CHARITABLE TRUST'S
R.G.SAPKALCOLLEGE OF PHARMACY
Kalyani Hills, Sapkal Knowledge Hub, Anjaneri, Nashik-422 213

COURSE OUTCOMES FOR B. PHARM. PROGRAM:

F.Y.B. PHARM. SEM I BP101T

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

BP107P– Human Anatomy and Physiology – I

1. Explain the construction, working, care and handling of various materials, instruments, glassware and equipments required for understanding the practical.
2. Explain the precautions taken by student while doing the practical in the laboratory.
3. Demonstrate the simple laboratory techniques.
4. Clarify significance of bleeding time, clotting time, detection of blood group, haemoglobin Detection, and W.B. C. count, R.B. C. count of blood sample, ESR and blood pressure determination.
5. Identification of different types of bones

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

BP108P – Pharmaceutical Analysis

1. To develop analytical skills by applying theoretical knowledge of various titrations
2. To understand the calibration of various Instruments
3. To carryout various volumetric and electrochemical titrations using instruments.
4. To identify the pKa of Monobasic, dibasic and tribasic acids
5. To analyse the refractive index, molar refraction and optical rotation using refractometer and polarimeter

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

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

4. Preparation of various conventional dosage forms

BP109P – Pharmaceutics – I

1. Skill to learn weighing and measuring
2. Skill to understand basic knowledge
3. Skill to learn formulation
4. Skill to learn labeling and evaluation

BP104T – Pharmaceutical Inorganic Chemistry

Upon completion of course student shall be able to:

1. Explain the effects of impurities in pharmaceuticals.
2. Describe the principles and methods of limit tests to control common impurities in pharmaceutical substances.
3. Explain different pharmaceutical buffers, their preparations, uses in pharmaceutical system, measurement of tonicity.
4. Explain the medicinal importance of pharmaceutical inorganic compounds.
5. Discuss the principles and methodology of assay of several inorganic drugs.

BP110P – Pharmaceutical Inorganic Chemistry

1. Skill for use of Limit tests for ions
2. Skill for Identification test
3. Skill for Test for purity
4. Skill to Preparation of inorganic pharmaceuticals

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

BP111P – Communication Skills

1. Skill to learn modules using English language software
2. Skill to understand basic knowledge
3. Skill to learn pronunciation
4. Skill to learn advanced and implement in communication

BP106RBT – 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

R.G. SAPKAL COLLEGE OF PHARMACY Anjaneri Nashik 422213

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

BP112RBP – Remedial Biology

1. Skill to learn basic techniques
2. Skill to understand basic
3. Skill to handle samples from biological source
4. Skill to handle basic equipment

BP106RMT – 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

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

F.Y.B. PHARM. SEM II

BP201T– 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, hemoglobin 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.

BP207P – Human Anatomy and Physiology – II

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. To acquire Skill for 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
5.

BP208P – Pharmaceutical Organic Chemistry – I

1. Skill for Systematic qualitative analysis of unknown organic compounds
2. Skill for Preparation of the derivatives and confirmation of the unknown compound.
3. Skill for Construction of molecular models

BP203T – 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

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

conditions.

3. Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.

BP209P – Biochemistry

1. Knowledge to understand basic concept of macromolecule identification
2. Knowledge of enzyme and its kinetics
3. Knowledge for various diagnostic techniques for metabolic disorders.
4. Knowledge of handling basic equipment in biochemistry and biological samples

BP204T – 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.
3. Mention the complications of the diseases.

BP205T– 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

BP210P – Computer Applications in Pharmacy

1. Use the appropriate tags and design web technology program.
2. Design and implement database using MS Access.
3. Generate and print reports on database.
4. Exporting Tables, Queries, Forms and Reports to web pages and XML pages.

BP206T – 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

R.G. SAPKAL COLLEGE OF PHARMACY Anjaneri Nashik 422213.

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

S.Y.B. PHARM. SEM 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

BP305P – Pharmaceutical Organic Chemistry – II

1. Laboratory Techniques such as recrystallisation techniques , Steam distillation
2. Determination of oil values
3. 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 forms
2. Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
3. Demonstrate use of physicochemical properties in the formulation
4. Development and evaluation of dosage forms.

BP306P – Physical Pharmaceutics – I

1. Operate different pharmaceutical laboratory instruments used in determining
2. various physicochemical properties such as surface tension, viscosity, adsorption and solubility, HLB and partition coefficient.
3. Study effect of various factors on states of matter
4. Study of complexation by different methods

BP303T– Pharmaceutical Microbiology

Upon completion of the subject student shall be able to:

1. Understand methods of identification, cultivation and preservation of various microorganisms
2. To understand the importance and implementation of sterilization in pharmaceutical processing and industry
3. Learn sterility testing of pharmaceutical products.
4. Carried out microbiological standardization of Pharmaceuticals.
5. Understand the cell culture technology and its applications in pharmaceutical industries.

BP307P – Pharmaceutical Microbiology

1. Skill to learn basic techniques of aseptic handling and sterilization
2. Skill to understand basics in microbiology

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

3. Skill to handle microorganisms
4. Skill to learn standardization of pharmaceutical products microbiologically

BP304T [illegible] – Pharmaceutical Engineering

Upon completion of the course student shall be able to:

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

BP308P – Pharmaceutical Engineering

1. To know various unit operations used in Pharmaceutical industries.
2. To perform various processes involved in pharmaceutical manufacturing process.
3. To appreciate and comprehend significance of plant lay out design for optimum use of resources

R.G. SAPKAL COLLEGE OF PHARMACY Anjaneri Nashik 422213

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

S. Y. B. PHARM. SEM 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

BP406P – Medicinal Chemistry – I

1. Skill to make correct use of various equipments and take safety measures while working in Medicinal Chemistry Laboratory.
2. Skill to Synthesize medicinally important compounds and purify them using, TLC & Column Chromatography.
3. Skill to Characterize the synthesized compounds using IR and NMR spectra's
4. Skill to Purify the solvents using fractional and vacuum distillation.
5. Skill to Explain reaction mechanisms involved in synthesis of medicinally important compounds.

BP403T– 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 forms
2. Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
3. Demonstrate use of physicochemical properties in the formulation
4. Development and evaluation of dosage forms

BP407P – Physical Pharmaceutics – II

1. Study various micromeritic and rheological properties
2. Study effect of various factors on suspensions and colloids
3. Study and determine various kinetic parameters

BP404T– Pharmacology – I

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

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

BP405T– Pharmacognosy and Phytochemistry – I

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

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

BP408P – Pharmacognosy and Phytochemistry – I

1. Analysis of crude drugs by chemical tests: (i)Tragaccanth (ii) Acacia (iii)Agar (iv) Gelatin (v) starch (vi) Honey (vii) Castor oil
2. Determination of stomatal number and index
3. Determination of vein islet number, vein islet termination and paliside ratio.
4. Determination of size of starch grains, calcium oxalate crystals by eye piece micrometer
5. Determination of Fibre length and width
6. Determination of number of starch grains by Lycopodium spore method

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

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

BP408P – Pharmacology – I

1. Understand the in vivo and in vitro experiments, use of software for the study of preclinical experiments.
2. Observe the effect of drugs on animals by simulated experiments
3. Get knowledge about recent development in pharmacology

R.G. SAPKAL COLLEGE OF PHARMACY • Anjaneri Nashik 422213

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

T. Y. B. PHARM. SEM 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

BP502T – Industrial Pharmacy – I

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

BP506P – Industrial Pharmacy – I

1. State the correct use of various equipments in Pharmaceutics laboratory
2. Relevant to tablets, capsules &coating.
3. Explain formulation, evaluation and labeling of tablets &capsules.
4. Perform pharmaceutical calculations to determine evaluation parameters like
5. Hausner ratio, Heckel plot & Kawakita plot of preparations.
6. To understand rational behind use of formulation ingredients.

BP503T – 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

BP507P – Pharmacology – II

1. The guidelines for animal experimentations. Various routes of drug administration, methods for blood collection from experimental animals.
2. Composition of physiological salt solutions and basic instruments used in experimental pharmacology.
3. Performance of isolated experiments using various isolated preparation and the effects of different drugs on the concentration response curves.
4. Study the action of various drugs using preclinical models/computer simulations.

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

BP504T– Pharmacognosy and Phytochemistry – II

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

1. Know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
2. Understand the preparation and development of herbal formulation.
3. Understand the herbal drug interactions
4. Carryout isolation and identification of phytoconstituents

BP508P – Pharmacognosy and Phytochemistry – II

1. Morphology, histology and powder characteristics & extraction & detection of: Cinchona, Cinnamon, Senna, Clove, Ephedra, Fennel and Coriander
2. Exercise involving isolation & detection of active principles a. Caffeine - from tea dust.b. Diosgenin from Dioscorea c. Atropine from Belladonna d. Sennosides from Senna
3. Analysis of crude drugs by chemical tests: (i) Asafoetida (ii) Benzoin (iii) Colophony (iv) Aloes (v) Myrrh
4. Distillation of volatile oils and detection of phytoconstitutents by TLC

BP505T – 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 of pharmaceuticals.
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

R.G. SAPKAL COLLEGE OF PHARMACY Anjaneri Nashik 422213

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

T. Y. B. PHARM. SEM 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.

BP607P – Medicinal Chemistry – III

1.Make correct use of various equipments and take safety measures while working in Medicinal Chemistry Laboratory.
2. Synthesize medicinally important compounds and purify them using recrystallization techniques.
3. Synthesize medicinally important compounds by microwave assisted synthesis.
4. Characterize the synthesized compounds using IR and NMR spectra's.
5 .Purify the solvents using fractional and vacuum distillation.
6. Explain reaction mechanisms involved in synthesis of medicinally important compounds.

BP602T – Pharmacology – III

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 poisonings and appreciate correlation of pharmacology with related medical sciences.
3. Students would have studied elaborately on mechanism of drug action and its relevance in the treatment of different infectious diseases
4. They comprehended the principles of toxicology and treatment of various poisonings and They came across the methods of toxicity studies
5. They studied about symptoms of several poisonings

BP608P – Pharmacology – III

1. The basic principles of bioassay, types of bioassay along with advantages and disadvantages.
2. Performance of isolated experiments using various isolated preparation and the effect of different drugs on the concentration response curves.
3. Study the preclinical screening of various drugs.

BP603T & BP609P – 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

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

4. Appreciate patenting of herbal drugs, GMP

BP609P – Herbal Drug Technology

1. To perform preliminary phytochemical screening of crude drugs.
2. Determination of the alcohol content of Asava and Arista
3. Evaluation of excipients of natural origin
4. Incorporation of prepared and standardized extract in cosmetic formulations like creams,lotions and shampoos and their evaluation.
5. Incorporation of prepared and standardized extract in formulations like syrups, mixtures and tablets and their evaluation as per Pharmacopoeial requirements.

BP604T – Biopharmaceutics and Pharmacokinetics

Upon completion of the course student shall be able to:

1. Understand the basic concepts in biopharmaceutics and pharmacokinetics and their significance.
2. Use of plasma drug concentration-time data to calculate the pharmacokinetic parameters to describe the kinetics of drug absorption, distribution, metabolism, excretion, elimination.
3. To understand the concepts of bioavailability and bioequivalence of drug products and their significance.
4. Understand various pharmacokinetic parameters, their significance & applications.

BP605T – 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

BP606T – Pharmaceutical 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

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

Final. Y. B. PHARM. SEM VII

4.7.1 T STERILE PRODUCTS

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

1. Describe the General requirements, routes of administration, significance of tonicity adjustment and sterility and Pre-formulation of sterile products.
2. Describe various packaging materials used, types, choice of containers, official quality control tests and methods of evaluation.
3. Describe the GMP and design and layout of Parenteral Production Facility, environmental control zones, heating ventilation air conditioning (HVAC), HEPA filter and laminar area flow systems.
4. Explain Classification and formulation of SVP, types and selection of vehicles and added substance, processing, manufacturing and Quality control of SVPs along with Special types of SVPs and Pilot plant scale up.
5. Explain Large Volume Parenterals (LVPs),Types, concept of formulation, influence of physiological factors, processing, manufacturing and Quality control of LVPs, along with Parenteral Nutrition, intravenous admixture and Peritoneal dialysis fluid and Pilot plant scale up.
6. Explain General requirements, formulation, types and evaluation of ophthalmic Products, blood products and surgical dressings.

4.7.1 P STERILE PRODUCTS

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

1. Formulation development and Pharmacopoeial evaluation and labeling of SVPs, LVPs, and ophthalmicp reparations, expertise in sealing of ampoules.
2. Describe use of ingredients in formulation and category of formulation
3. Pharmacopoeial evaluation of packaging materials.
4. Importance and validation of aseptic area.
5. Evaluation of marketed preparations.
6. Significance and Accelerated stability testing of marketed samples.

4.7.2 T PHARMACEUTICAL ANALYSIS –V

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

1. Explain the different types of instrumental analytical techniques available for quality control of APIs & formulations.
2. Adopt various sampling techniques employed in analysis of solid, semisolid and liquid dosage forms while working in industry
3. Explain the principles, instrumentation and applications of UV-VIS, Flourimetry, Atomic absorption, atomic emission spectroscopies, Flame photometry, Phosphorimetry and Nepheloturbidimetry.

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

4.7.2 PPHARMACEUTICAL ANALYSIS – V

Upon completion of the course student shall be able to:

1. Independently operate, calibrate various analytical instruments for the assay of various APIs and formulations as per Pharmacopoeial standards.
2. Independently process, interpret the data obtained through experimentation and report the results as per regulatory requirements.
3. Take appropriate safety measures while handling instruments, chemicals and apparatus.

4.7.3 T MEDICINAL CHEMISTRY-III

Upon completion of the course student shall be able to:

1. Know the general aspects of design of the drugs, history, classification, nomenclature, structure activity relationship (SAR), mechanism of action, therapeutic uses, adverse effects and recent developments in the antibiotics, anti-infective agents and antineoplastic agents.

4.7.3 P MEDICINAL CHEMISTRY-III

Upon completion of the course student shall be able to:

1. Make correct use of various equipments and take safety measures while working in Medicinal Chemistry Laboratory.
2. Synthesize medicinally important compounds and purify them using column chromatography.
3. Characterize the synthesized compounds using IR and NMR spectras.
4. Purify the solvents using fractional and vacuum distillation.
5. Explain reaction mechanisms involved in synthesis of medicinally important compounds.

4.7.4 T PHARMACOLOGY- IV

Upon completion of the course student shall be able to:

1. Classification, mechanism of action, antibacterial spectrum, resistance, therapeutic uses, adverse effects and contraindications of various antibiotics.
2. Various endocrine hormones, its types, receptors involved and mechanisms involved.
3. Biosynthesis, Mechanism of action, Pharmacology and regulation of Thyroid, antithyroid drugs and Parathyroid hormones.
4. Biosynthesis, Secretion, Mechanism of action, Pharmacology of insulin and glucagon and Pharmacotherapy of Diabetes Mellitus.
5. Pharmacology of Androgens, Estrogens, Progestin and oral contraceptives.

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

R.G. SAPKAL COLLEGE OF PHARMACY Anjaneri Nashik 422213

4.7.4 P PHARMACOLOGY- IV

Upon completion of the course student shall be able to:

1. Use of isolated tissue preparations for bioassay methods.
2. Basic aspects to carryoutCritical appraisal of marketed fixed dose combinations (FDC).
3. Understanding Prescription auditing and standard treatment protocols.

4.7.5 T NATURAL DRUG TECHNOLOGY

Upon completion of the course student shall be able to:

1. Comprehend & explain various factors affect on level of secondary metabolites, how these can be minimized to ensure quality in raw material, effect of post harvesting manipulations,and changes during storage etc& methods to control these modification.
2. Explain variousguidelines issued by WHO in relation with cultivation, collection, storage etc.
3. Understand & explain concept of health & pathogenesis, philosophical basis, diagnosis &treatment aspects of Ayurveda, Unani, Siddha &Homoepatic system of medicine; Understand& explain method of preparation of Ayurvedic dosage forms; significance of novel drugdelivery of natural products; herbs used in cosmetic preparation & methods of their formulations.
4. Understand and explain the applications of plant tissue culture for Secondary metabolite production.
5. Explain in vitro screening methods and its applications for biological evaluation of natural products
6. Explain the approaches and potentials of herbal new drug delivery systems like liposomes, phytosomes, nanoparticles and vesicles
7. Understand & explain various physical, chemical, spectroscopic means & methods used instructural elucidation of natural products. He/she should be able to interpret data generated from above techniques.

4.7.5 P NATURAL DRUG TECHNOLOGY

Upon completion of the course student shall be able to:

1. Prepare, label & evaluate herbal/TSM formulations
2. Evaluate marketed cosmetic & nutraceutical formulations
3. Conduct preformulation parameters & understand underlying rationale
4. Conduct in vitro assays for correlation with biological efficacy
5. Able to handle various equipments as per SOPs & learn various demonstrations (of experiments).
6. Listen carefully, raise logical query, draw information, understand rationale during fieldvisits & prepare brief report for evaluation.

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

R.G. SAPKAL COLLEGE OF PHARMACY Anjaneri Nashik 422213.

4.7.6 T BIO-PHARMACEUTICS & PHARMACOKINETICS

Upon completion of the course student shall be able to:

1. Understanding the concept of biopharmaceutics and its applications in formulation development.
2. Studying pharmacokinetic processes and their relevance in efficacy of dosage form.
3. Learning the concepts of bioavailability and bioequivalence studies.
4. Learning various compartmental models and non compartmental analysis methods.
5. Understanding concept and mechanisms of dissolution and in vitro in vivo Correlation.

4.7.7 T PHARMACEUTICAL JURISPRUDENCE

Upon completion of the course student shall be able to:

1. To understand .Basic principles, purpose and dimensions of the laws the significance and relevance of Pharmaceutical laws in India
2. Important rules and regulations and procedures made to execute the laws.
3. To discuss the purpose of the Board
4. To explain the definitions in the Act, the rule-making authority of the Board.
5. To describe the qualifications for membership and the make-up of the Board.
6. To discuss the responsibilities of the Board; inspections by the Board or its representative.
7. To learn the various laws governing the manufacturing, sale, research & usage of drugs
8. To understand significance of Schedule M and Schedule Y related Manufacturing & clinical trials.
9. Identify potential fraud and abuse legal issues of narcotic &psychotropic substance. To study quality & prices of essential medicine.

PRINCIPAL
R G Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

Final. Y. B. PHARM. SEM VIII

4.8.1T ADVANCED DRUG DELIVERY SYSTEM

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

1. Describe the Fundamental Concept of Modified Drug Release and Pre requisites of drug candidates, along with various approaches and classification.
2. Describe Polymers with respect to introduction to polymers, classification, types, selection, application and examples.
3. Describe. Introduction, formulation, merits, demerits, application and evaluation of Novel Drug Delivery Systems
4. Explain Therapeutic Aerosols along with typical formulations from, metered dose, intranasal and topical applications,
5. Explain concept of microencapsulation, merits, demerits and application, Types of Microencapsulation and Evaluation of microcapsules
6. Explain Basic concept of optimization

4.8.1 P ADVANCED DRUG DELIVERY SYSTEM

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

1. Formulation development and evaluation of sustained release, transdermal, gastroretentive formulations
2. Micro encapsulation techniques
3. Evaluation of marketed preparations
4. Optimization studies using 2^3 factorial design

4.8.2 T COSMETIC SCIENCE

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

1. Understand the concepts of cosmetics; anatomy of skin v/s hair, general excipients used in cosmetics.
2. Explain formulation of cosmetics for skin, manufacturing, equipment & evaluation of creams like cold cream, vanishing cream etc. & powder cosmetics.
3. Explain formulation of cosmetics for hair, manufacturing & evaluation of hair shampoos, tonics etc.
4. Describe formulation of cosmetics for eyes, manufacturing & evaluation of eye mascara, shadow etc.
5. Understand formulation of manicure products like nail lacquer, remover etc.
6. Learn formulation, manufacture & evaluation of baby cosmetics like baby oils, Powders etc.
7. Explain the concept of cosmeceuticals, history, difference between cosmetics & cosmeceuticals & cosmeceuticals agents.

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

4.8.2 P COSMETIC SCIENCE

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

1. State the correct use of various equipment in Pharmaceutics laboratory relevant to cosmetics.
2. Perform formulation, evaluation and labeling of cosmetics like moisturizing cream, vanishing cream etc.
3. Perform formulation, evaluation of eye cosmetics, nail lacquer &shampoo.
4. Perform formulation, evaluation &labeling of shaving cream, after shave & baby products.
5. Describe use of ingredients in formulation and category of formulation. Prepare labels as per regulatory requirements.

4.8.3 T PHARMACEUTICAL ANALYSIS -VI

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

1. Explain principles, instrumentation of NMR & ESR spectroscopy, Mass Spectrometry and their applications in Pharmaceutical research, quality control of APIs & formulations.

4.8.3 P PHARMACEUTICAL ANALYSIS-VI

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

1. Independently operate and calibrate various analytical instruments for the assay of various APIs and formulations as per Pharmacopoeial standards.
2. Independently process, interpret the data obtained through experimentation and report the results as per regulatory requirements.
3. Take appropriate safety measures while handling instruments, chemicals and Apparatus.

4.8.4 T MEDICINAL CHEMISTRY-IV

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

1. Know the general aspects of design of the drugs, history, classification, nomenclature, structure activity relationship (SAR), mechanism of action, therapeutic uses, adverse effects and recent developments in the antihistaminics, proton pump inhibitors, Serotonergic agents, Autacoids, NSAIDs, analgesics & antipyretics, Narcotic agents, Steroidal Drugs, Hormones, Insulin & Oral Anti-hyperglycemic drugs and Diagnostic agents.

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

4.8.4 P MEDICINAL CHEMISTRY-IV

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

1. Make correct use of various equipments and take safety measures while working in Medicinal Chemistry Laboratory.
2. Synthesize medicinally important compounds and purify them using column chromatography.
3. Characterize the synthesized compounds using IR and NMR spectras.
4. Purify the solvents using fractional and vacuum distillation.
5. Explain reaction mechanisms involved in synthesis of medicinally important compounds.

4.8.5 T PHARMACOLOGY- V, (Including Biostatistics)

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

1. Important aspect, classification, mechanism of drug-drug interaction and ADRs.
2. Basic aspects of drug safety and Pharmacovigilance in relation to monitoring and reporting of ADRs.
3. Functioning and role of hospital pharmacy and practice of rational drug therapy and methods of assessment of patient compliance and non-compliance.
4. Clinical trials, ethics and practice of Good Clinical Practice involved in clinical trials.
5. Process, working and personnel involved in clinical data management and their roles.

4.8.5 P PHARMACOLOGY- V, (Including Biostatistics)

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

1. Use of isolated tissue preparations for antagonistic bioassay methods.
2. Basic aspects to carry out neurobehavioral characterization.
3. Understanding various parametric and non-parametric tests used in biostatistics.

4.8.6 T NATURAL PRODUCTS: COMMERCE, INDUSTRY & REGULATIONS

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

1. Understand & realize the significance of natural products in daily life. He/she should be able to classify different segments in market, demand & supply position; export & import potential; position of Indian herbal drug industry in global contest; government organizations& policies for promotion; their regulation in India & other countries, various regulatory guidelines, ethical issues etc.
2. Realize the market potential of natural products & explore entrepreneurship skills to Grab these opportunities.
3. Understand & explain safe use of natural products, possible toxicities &interaction, Toxicities in most venerable group (elderly patients), need &significance of Pharmacovigilance systems; WHO guidelines in this regard.

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213

4.8.7 T QUALITY ASSURANCE TECHNIQUES

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

1. Explain significance of quality in Pharmaceutical manufacturing, Role of Regulatory
2. Agencies in deciding Quality Standards, significance of validation in quality assurance.
3. Follow cGMP, GLP and GDP while working in Pharmaceutical industry.
4. Explain the concept of QbD.

PRINCIPAL
R.G. Sapkal College of Pharmacy
Anjaneri, Nashik - 422213