Programme : I/II M.Pharmacy

Semester/Year of Study : Ist Semester

Branch : **Pharmacology**

Subject Name : Modern PharmaceuticalAnalytical Techniques

Subject code : **21S01101** T (Theory)

C1101.1	Understand the basic knowledge on assay ofsingle and multiple componentpharmaceuticals by using various analytical instruments.
C1101.2	Develop the theoretical knowledge on various instrumental techniques available for analysis of organic substances by using analytical instruments.
C1101.3	Improve skills in selecting the suitable techniques for analysis of drugs and pharmaceuticals.
C1101.4	Interpret spectra of UV-visible, IR, NMR andMass to identity the given compound.
C1101.5	Describe the general methods for separation and purification of components from a mixture and their application to pharmaceutical industry.
C1101.6	Apply the knowledge learnt in developing newprocedures of their own design.

Programme : I/II M.Pharmacy

Semester/Year of Study : Ist Semester

Branch : **Pharmacology**

Subject Name : Advanced Pharmacology - I

Subject code : **21S01102** T (Theory)

C1102.1	Discuss the pathophysiology andpharmacotherapy of certain diseases.
C1102.2	Explain the mechanism of drug actions atcellular and molecular level.
C1102.3	Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases.
C1102.4	Study the General aspects and steps involvedin neurotransmission.
C1102.5	Demonstrate the physiological and pathologicalrole of hormones in the human body.

Programme : I/II M.Pharmacy

Semester/Year of Study : Ist Semester

Branch : **Pharmacology**

Subject Name : Clinical Pharmacology & Pharmacotherapeutics

Subject code : **21S01103** T (Theory)

C1103.1	Understand the pathophysiology of selected disease states and the rationale for drug therapy.
C1103.2	Outline the importance of preparation of individualized therapeutic plans based on diagnosis.
C1103.3	Identify the needs to the patient-specificparameters relevant in initiating drug therapy.
C1103.4	Study the drug therapy of pediatric, geriatricsand pregnant women's.
C1103.5	Summarize the therapeutic approach tomanagement of various diseases.

Programme : I/II M.Pharmacy

Semester/Year of Study : Ist Semester

Branch : **Pharmacology**

Subject Name : Cellular and Molecular Pharmacology

Subject code : **21S01104** T (Theory)

C1104.1	Understand the interaction of cellularcomponents with drugs.
C1104.2	Describe the receptor signal transductionprocesses.
C1104.3	Study of the molecular pathways affected bydrugs.
C1104.4	Explain the applicability of molecular pharmacology and biomarkers in drug discovery process.
C1104.5	Illustrate molecular biology techniques asapplicable for pharmacology.

Programme : I/II M.Pharmacy

Semester/Year of Study : Ist Semester

Branch : **Pharmacology**

Subject Name : Modern Pharmaceutical Analytical Techniques Lab

Subject code : **21S01105** L (Practical)

C1103.1	Recall and relate the principle of spectroscopy, chromatography and other commonly usedinstrumental methods of analysis.
C1103.2	Train the students and to give hands ontraining on these sophisticated instruments.
C1103.3	Perform quantitative & qualitative analysis ofdrugs using various analytical instruments like UV-visible and IR spectrophotometer andHPLC.
C1103.4	Plan and select lab experiments using appropriate analytical skills. Evaluate thequantity of a drug in a given formulation.
C1103.5	Practice them on solving spectral problems andgenerate a comprehensive analytical report on the findings.
C1105.6	Interpret spectra of UV-visible, IR, NMR andMass to identity the given compound.

Programme : I/II M.Pharmacy

Semester/Year of Study : Ist Semester

Branch : **Pharmacology**

Subject Name : Advanced Pharmacology - I Lab

Subject code : **21S01106** L (Practical)

C1106.1	Demonstrate the various routes of drugadministration in experimental animals.
C1106.2	Compute various techniques of blood samplingin experimental animals.
C1106.3	Employ different bio assay techniques inisolated preparations of experimental animals.
C1106.4	Practice anaesthetic techniques inexperimental animals.
C1106.5	Operate dose response curve of Ach using isolated ileum/rectus abdominis muscle preparation.

Programme : I/II M.Pharmacy

Semester/Year of Study : Ist Semester

Branch : **Pharmacology**

Subject Name : Disaster Management

Subject code : **21DAC101b** T (Theory)

C101b.1	Analyze the vulnerability of an area to natural and man-made disasters/hazards as per the guidelines to solve complex problems using appropriate techniques ensuring safety, environment and sustainability.
C101b.2	Propose appropriate mitigation strategies for earthquake and tsunami impacts as per code of practice using suitable techniques ensuring safety, environment and sustainability beside communicatingeffectively in graphical form.
C101b.3	Analyze the causes and impacts of floods,cyclones and droughts using appropriate tools and techniques and suggest mitigation measures ensuring safety, environment and sustainability besides communicatingeffectively in graphical form.
C101b.4	Analyze the causes and impacts of landslides using appropriate tools and techniques and suggest mitigation measures ensuring safety, environment and sustainability.
C101b.5	Design disaster management strategies to solve pre, during and post disaster problems using appropriate tools and techniques following the

Programme : I/II M.Pharmacy

Semester/Year of Study : IInd Semester

Branch : **Pharmacology**

Subject Name : Advanced Pharmacology-II

Subject code : **21S01201** T (Theory)

C1201.1	Explain the mechanism of drug actions atcellular and molecular level.
C1201.2	Discuss the Pathophysiology andpharmacotherapy of certain diseases.
C1201.3	Understand the adverse effects, contraindications and clinical uses of drugs used in treatment of diseases.
C1201.4	Understand the chemotherapystrategies ofvarious diseases in the human body.
C1201.5	Demonstrate the free radical pharmacology inthe treatment of diseases.

Programme : I/II M.Pharmacy

Semester/Year of Study : II[nd] Semester

Branch : **Pharmacology**

Subject Name : Pharmacological Screening Methods & Toxicology

Subject code : **21S01202** T (Theory)

C1202.1	Describe the regulations and ethical requirement for the usage of experimentalanimals.
C1202.2	Describe the various animals used in the drugdiscovery process and good laboratory.
C1202.3	Reproduce the practices in maintenance andhandling of experimental animals.
C1202.4	Describe the various newer screening methodsinvolved in the drug discovery process.
C1202.5	Compare and correlate the preclinical data tohumans.

Programme : **I/II** M.Pharmacy

Semester/Year of Study : II[nd] Semester

Branch : **Pharmacology**

Subject Name : Principles of Drug Discovery

Subject code : **21S01203** T (Theory)

C1203.1	Explain the various stages of drug discovery.
C1203.2	Summarize the importance of the role of genomics, proteomics and bioinformatics in drug discovery.
C1203.3	Describe various targets for drug discovery.
C1203.4	Explain various lead seeking method and leadoptimization.
C1203.5	Memorize the importance of the role ofcomputer aided drug design in drug discovery.

Programme : I/II M.Pharmacy

Semester/Year of Study : II[nd] Semester

Branch : **Pharmacology**

Subject Name : Clinical research andPharmacovigilance

Subject code : **21S01204** T (Theory)

C1204.1	Understand the regulatory requirements forconducting clinical trial.
C1204.2	Describe the types of clinical trial designs.

C1204.3	Discuss the responsibilities of key playersinvolved in clinical trials.
C1204.4	Explain the principles of Pharmacovigilance.
C1204.5	Detect new adverse drug reactions and theirassessment.

Programme : **I/II** M.Pharmacy

Semester/Year of Study : IInd Semester

Branch : **Pharmacology**

Subject Name : Advanced Pharmacology – II Lab

Subject code : **21S01205** L (Practical)

C1205.1	Isolation and identification of DNA from various sources like Bacteria, Cauliflower, onion and Goat liver.
C1205.2	Analysis of enzyme based *in-vitro* assays.
C1205.3	Examine DNA fragmentation assay by agarosegel electrophoresis.
C1205.4	Identify Enzyme inhibition and inductionactivity using virtual software's.

Programme : **I/II** M.Pharmacy

Semester/Year of Study : IInd Semester

Branch : **Pharmacology**

Subject Name : Pharmacological Screening Methods and Toxicology Lab

Subject code : **21S01206** L (Practical)

C1206.1	Recall the various newer screening methodsinvolved in the drug discovery process.
C1206.2	Identify and correlate the preclinical data tohumans.
C1206.3	Identify the regulations and ethical requirement for the usage of experimentalanimals.
C1206.4	List the various animals used in the drugdiscovery process and good laboratory.
C1206.5	Demonstrate the practices in maintenance andhandling of experimental animals.

Programme : I/II M.Pharmacy

Semester/Year of Study : IInd Semester

Branch : **Pharmacology**

Subject Name : Pedagogy Studies

Subject code : **21DAC201a** T (Theory)

C201a.1	Recognize the theories underlyingmethodology, searching, and learning.
C201a.2	Describe the pedagogical approaches of teachers in formal and informal classrooms in developing countries practice.
C201a.3	Analysis of pedagogical practices effectiveness.
C201a.4	Describe the teacher's classroom professionaldevelopment in detail.
C201a.5	Determine and fill research gaps for futureresearch actions.

Programme : II/I M.Pharmacy

Semester/Year of Study : IIIrd Semester

Branch : **Pharmacology**

Subject Name : Research Methodology and Intellectual Property Rights

Subject code : **21DRM101** T (Theory)

CM101.1	Understand Research Problem formulation.
CM101.2	Analyze research Related information.
CM101.3	Follow research ethics.
CM101.4	Understand that today's world is controlled by computer, Information technology, but tomorrow world will be ruled by ideas, concept, and creativity.
CM101.5	Understand that when IPR would take suchimportant place in growth of individuals &nation, it is needless to emphasis the need of information about Intellectual Property Rightto be promoted among students in general &engineering in particular.
CM101.6	Understand that IPR protection provides an incentive to inventors for further research workand investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.

Programme	**:**	II/I M.Pharmacy
Semester/Year of Study	**:**	IIIrd Semester
Branch	**:**	**Pharmacology**
Subject Name	**:**	Entrepreneurship Management
Subject code	**:**	**21SOE301c** T (Theory)

C204.1	To define enterprise, types of enterprises, government policies and schemes for enterprise development.
C204.2	To outline the process entrepreneurship development, interpersonal skills, creativity and factors affecting entrepreneur.
C204.3	To plan for launching an enterprise, its organization and SWOT analysis.
C204.4	To analyze the resources, raw materials, manpower, market and quality control of an enterprises.
C204.5	To appraise the performance, assessment of growth, networking and profitability of an enterprise.

Subject Name: ASSIGNMENTS Year of Study: 1stM.Pharmacy 1st and 2nd Semester	
C.1	To recall the fundamentals of proposed topic and carry out literature review.
C.2	To classify / compare, interpret the various methods and techniques.
C.3	To organize the collected data in chronological order and develop writing skills.
C.4	To analyze the data and interpret the relationships.
C.5	To evaluate and conclude the given topic.
C.6	To propose, design research in given concept and improve presentation skills.

Subject Name: SEMINARS Year of Study: 1stM.Pharmacy 1st and 2nd Semester	
C.1	To recall the fundamentals of proposed topic and carry out literature review.
C.2	To classify / compare, interpret the various methods and techniques.
C.3	To organize the collected data in chronological order and develop writing skills.
C.4	To analyze the data and interpret the relationships.
C.5	To evaluate and conclude the given topic.
C.6	To propose, design research in given concept and improve presentation skills.

Subject Name: RESEARCH WORK I & II Year of Study: 2nd M.Pharmacy 3rd & 4th Semester	
C.1	To recall the fundamentals, carry out literature review on proposed research topic and identify research problem.
C.2	To outline the requirements toper form the proposed research.
C.3	To construct the research hypothesis.
C.4	To take part in research experiments meticulously and documentation as per format.
C.5	To evaluate and conclude the results using statistical analysis.
C.6	To appraise societal application and appreciation.

Subject Name: Co-Curricular activities Year of Study: 2nd M.Pharmacy 4th Semester	
C.1	To select the scientific concept based on literature and define the objectives ofresearch.
C.2	To outline the hypothesis and summarize the concept for presentation.
C.3	To plan for a meeting, discuss SOWT analysis, the design and methods usedin concept.
C.4	To analyze the variables and their inter relationships.
C.5	To conclude the results and to discuss its significance.
C.6	To appraise the concept for societal needs, acknowledge and improve presentation skills.

M.PHARMACY PROGRAMME

PHARMACOLOGY

M. PHARMACY PROGRAMME – PHARMACOLOGY	
PROGRAMME OUTCOMES (PO's)	
PO 1	**Drug Expertise :** Acquire knowledge on various classes of drugs and their mode of actions to unveil the remedies for many ailments.
PO 2	**Analytical Reasoning:** Identify assumptions and reveal the evidence based reason for the disease or disorder take place, to select the type of relevant treatment.
PO 3	**Experimental Ethics :** Consider and follow ethics and guidelines specified by the authorities of various agencies and Government of India for animal congenial laboratory practice.
PO 4	**Interdisciplinary engagement :** Obtain skill oriented practical proficiency by exposing and utilizing the needs of pharmacy in all disciplines to emerge as potent researcher.
PO 5	**Professional Identity :** Be committed and responsible person to play a proactive role with fidelity to community and empower society.
PO 6	**Statistical Skills :** Apply and analyze quantitative metrics to gain safety data on dosage, also to compare the effectiveness among experimental groups.
PO 7	**Intellectual Flexibility :** Engage in critical thinking and gain insight to identify, design and formulate pharmaceutical products that are in need of current aspects by using material from natural sources.
PO 8	**Lifelong learning :** Understand and apply the concepts in day to day life activities for the benefit of self and for the welfare of society and its concerns.

M. PHARMACY PROGRAMME – PHARMACOLOGY	
PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)	
PEO 1	**Innovation Culture :** Devise research strategies for empowering and promoting culture of innovation among students for the industrial needs. Also encourage and excel the students to perform their skills in the areas of interest to promote the potency and zeal towards research.
PEO 2	**Professional Interaction :** Develop comprehensive skills by identifying time to time life situations and keep updating the knowledge professionally for community up-liftment. Also acquire higher order thinking skills and become professionally competent to take up careers in academics, health care and service industry.
PEO 3	**Global Health Care :** Integrate and apply techniques to advance the research scenario for the welfare of Global health care. Also acquire knowledge on diagnostic, therapeutic, rehabilitative and preventive health care for qualitative skills.
PEO 4	**Entrepreneurial Spirit :** Build capacities and develop practical awareness which results in smooth transition from education to self-employment and finally to entrepreneurship. Also relocate the gained knowledge, skills and training to their own personal interests for socio economic empowerment. o promote the potency and zeal towards research.

M.PHARMACY PROGRAMME – PHARMACOLOGY	
PROGRAMME SPECIFIC OUTCOMES (PSOs)	
PSO 1	**Integrative and Applied Learning :** An Approach where learning through connections and relativity to the concepts of theoretical aspect with preclinical experimentation. Apply knowledge and skills developed in traditional classroom learning to hands-on and real-world settings.
PSO 2	**Biological Research :** Demonstrate an understanding of the action of drugs, and test samples with isolated organs or non invasive methods by in-vitro and in-vivo techniques. Biological research leads to analyze and compare the safety and toxicity of products at initiation.
PSO 3	**Technical Advancements :** Exhibit the usage of various advanced equipment to analyze and assess the potency of drug by using the animals. Creates innovative screening methods and best practices to identify and evaluate parameters for various pharmacological activities.
PSO 4	**Ethical Reasoning :** Apply ethical principles to validate the pre clinical experiments. Plan, implement and evaluate the procedures as per the CPCSEA guidelines. Enhance the functional skills and transparency by record keeping.
PSO 5	**Employability:** Acquire in depth knowledge on life sciences and exhibit critical thinking, problem solving and decision making to enhance employability. Apply skill based knowledge in various sectors and relate the principles of scientific advancement.