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C B C P
CHILKUR BALAJI COLLEGE OF PHARMAC
(Affiliated to JNTUH, Approved by PCI, Accredited by NAAC)
R.V.S. Nagar, Aziz Nagar (Post), Moinabad Road, Near: T. S. Police Academy
HYDERABAD – 500 075.

COURSE OUTCOMES OF M.PHARM (PHARMACEUTICAL ANALYSIS) R19 REGULATIONS

M.PHARMACY (PHARMACEUTICAL ANALYSIS) I YEAR I SEMESTER	
COURSE CODE: PC I	**MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES**
CO1	Gain insight towards modern pharmaceutical analysis.
CO2	Apply knowledge in developing new methods for determination and validate procedures.
CO3	Imply theories in the analysis of various bulk drugs and their formulations.
CO4	Elaboration of knowledge in various instrumentation techniques.
COURSE CODE: PC II	**PHARMACEUTICAL FOOD ANALYSIS**
CO1	Application of various analytical techniques in determination of various food constituents and finished food products.
CO2	Able to apply analytical techniques in analyzing food additives.
CO3	Possess awareness on food regulations and legislations.
CO4	To analyze biomolecules in various food products.

COURSE CODE: PE I	ADVANCED PHARMACEUTICAL ANALYSIS
CO1	Perception on qualitative determination of various organic compounds
CO2	Accomplished with spectral analysis, dissolution parameters and microbial assays.

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CO3	Knowledge on principles and procedures involved in determination of organic functional groups.
CO4	Performing different tests on excipients such as bulk density, particle size distribution etc.

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PE I	DRUG REGULATORY AFFAIRS
CO1	Mind full of technical aspects pertaining to the marketing authorization application.
CO2	Detailed study of regulatory aspects that effect drug product design and pharmaceutical and bulk drug manufacture.
CO3	Appraised of different competent regulatory authorities globally.
CO4	Well versed with quality, safety and legislation for cosmetic products and herbal products.
PE I	**PHYTO CHEMISTRY**
CO1	Comprehension on various types of phytoconstituents present in plants
CO2	Detailed study of isotropic tracer techniques.
CO3	Lead structure selection process and optimization.
CO4	Separation of phytoconstituents by vaccum and flash column chromatography.
COURSE CODE: PE II	**QUALITY CONTROL AND QUALITY ASSURANCE**
CO1	Understand the cGMP aspects in pharmaceutical industry.
CO2	To appreciate the importance of documentation in pharmaceutical industry.
CO3	To comprehend with the scope of quality certifications.
CO4	Proficiency and responsibilities of QA and QC.
PE II	**COSMETICS AND COSMECEUTICALS**
CO1	To know regarding regulatory biological aspects of cosmetics, excipients used for various formulations.

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CO2	Designing of cosmeceuticals and herbal products.
CO3	Factors affecting microbial preservatives efficacy.
CO4	Sunscreen's classifications and regulatory aspects.
PE II	**STABILITY OF DRUGS AND DOSAGE FORMS**
CO1	Describe the evaluation of stability of solutions, solids and formulations against adverse conditions.
CO2	Be able to suggest retain stability and storage conditions for retaining the efficacy of the dosage forms.
CO3	Have overview on physical stability of novel drug carriers, liposomes, niosomes and nano particles.

C04	Quantitative determination of preservatives, antioxidants, colouring materials, emulsifiers and stabilizers used in pharmaceutical formulations.
COURSE CODE: MC	**RESEARCH METHODOLOGY AND INTELLECTUAL PROPERTY RIGHTS**
CO1	To scrutinize the research related information.
CO2	To accentuate the need of information about intellectual property rights among students.
CO3	Inspect out research problems and formulations.
CO4	Investigations of solutions, research problems, data collection, analysis and interpretation of data.
COURSE CODE: Lab I	**MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES LAB**
CO1	To study Incompatibility studies
CO2	Identification of functional groups and determination by FTIR

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CO3	Separation and calculation of Rf values by using paper chromatography, TLC, HPTLC
CO4	Estimation of multi component containing formulations by UV Spectrophotometry.
COURSE CODE: Lab II	**PHARMACEUTICAL AND FOOD ANALYSIS LAB**
CO1	Determination of fat content and rancidity in food products
CO2	Determination of pesticide residue in food products
CO3	Assay of analgesics and antipyretic drugs(API dosage forms) official in IP
CO4	Determination of saponification value, iodine value, peroxide value, acid value in food products.
COURSE CODE: AUDIT COURSE I	**ENGLISH FOR RESEARCH PAPER WRITING**
CO1	To know how to improve writing skills and level of readability.
CO2	Comprehend the skills needed when writing Title Ensure the good quality of paper at very first submission.
CO3	Ascertain about what to write in each section.
CO4	Flourish with skills needed when writing methods, results, conclusions etc.
AUDIT COURSE I	**DISASTER MANAGEMENT**

CO1	Learn to demonstrate and critical understanding of key concepts in disaster risk reduction and humanitarian response.
CO2	Critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives.

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CO3	Planning and programming in different countries, particularly their home country or the countries they work in.
CO4	Critically understand the strengths and weakness of disaster management approaches.
AUDIT COURSE I	**SANSKRIT FOR TECHNICAL KNOWLEDGE**
CO1	To obtain working knowledge in illustrious Sanskrit, the scientific language in the world.
CO2	Learning of Sanskrit to improve brain functioning.
CO3	The engineering scholars equipped with Sanskrit will be able to explore the huge knowledge from ancient literature.
CO4	Learning of Sanskrit to develop the logic in mathematics, science, and other subjects enhancing the memory power.
AUDIT COURSE I	**VALUE EDUCATION**
CO1	Sympathise value of education and self development
CO2	Imbibe good values in students.
CO3	Developing the overall personality.
CO4	learn the importance of character and competence.
M.PHARMACY (PHARMACEUTICAL ANALYSIS) I YEAR II SEMESTER	
COURSE CODE: PC III	**ADVANCED INSTRUMENTAL ANALYSIS I**
CO1	Thorough knowledge on various spectral aspects of X ray, IR, SEM
CO2	Be familiar with principles, instrumentation of ORD
CO3	Overview on CE in pharmaceutical analysis

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CO4	Principles, instrumentation, pharmaceutical application of supercritical fluid chromatography
COURSE CODE: PC IV	**MODERN BIOANALYTICAL TECHNIQUES**
CO1	Able to understand extraction of drugs from biological sources
CO2	Familiar with separation of drugs using different techniques
CO3	Know the guidelines for BA & BE studies
CO4	Well versed with automation and computer aided analysis in sampling

COURSE CODE: PE III	**PHARMACEUTICAL VALIDATION**
CO1	Be acquainted with the knowledge of validation of instruments and equipment's.
CO2	Carry out validation of manufacturing processes
CO3	Interpretation of various methods of validation.
CO4	Application of various methodologies in pharmaceutical validation.
PE III	**HERBAL COSMETICS**
CO1	Gain knowledge on classification, economic aspects and regulatory provisions related to manufacture of cosmetics.
CO2	Get exposed to processes involved in manufacturing of herbal cosmetics related to skin.
CO3	Brief account on herbal extracts and herbal products of cosmetic importance.
CO4	Elaborative study of formulations related to hair care with regard to their composition and claims for various herbs used in them.
PE III	**PHARMACOEPIDEMIOLOGY AND PHARMACOECONOMICS**

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CO1	Perceive various epidemiological methods and their applications.
CO2	Be able to understand fundamental principles of Pharmacoeconomics.
CO3	Should perform the key Pharmacoeconomics analysis methods.
CO4	Understand Pharmacoeconomics decision analysis methods and their applications.
PE IV	**ADVANCED INSTRUMENTAL ANALYSIS II**
CO1	Thorough knowledge on various electrochemical methods like fluorimetry, ELISA, RIA, etc.
CO2	Introduction and applications of conductometry
CO3	Methods of potentiometric titration to determine the end point
CO4	Working and applications of dropping mercury and rotating platinum electrodes
PE IV	**NUTRACEUTICALS**
CO1	Recognise the occurrence and characteristic features of phytochemicals as nutraceuticals.
CO2	Know the importance of nutraceuticals in various common problems with the concept of free radicals.
CO3	Acknowledge the role of antioxidants in free radical induced disease conditions.

CO4	Expose to various food laws and regulations, health claims and dietary supplement claims.
PE IV	**CLINICAL RESEARCH AND PHARMACOVIGILANCE**
CO1	**To explain the regulatory requirements for conducting clinical trials**
CO2	To demonstrate the types of clinical trial designs

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CO3	Execute safety monitoring, reporting and close out activities
CO4	Detect new adverse drug reactions and their assessment
COURSE CODE: LAB III	**ADVANCED INSTRUMENTAL ANALYSIS I LAB**
CO1	To determine chlorides and sulphates by nephloturbidometry
CO2	To estimate riboflavin by flourimetry
CO3	To perform assay of official compounds by potentiometry and conductometric titrations
CO4	To determine phosphate interference on absorption of calcium
COURSE CODE: LAB IV	**MODERN BIOANALYTICAL TECHNIQUES LAB**
CO1	To analyse biomolecules quantitatively by gel electrophoresis
CO2	Isolation of analgesics from biological fluids
CO3	Protocol preparation and performance of bioanalytical method validation
CO4	Indicate the stability development by HPLC of API's
	MINI PROJECT WITH SEMINAR
CO1	Allows the students to study, do research and act by themselves using their abilities.
CO2	Improves communication skills and networking with others.
CO3	Helps in gaining expert knowledge and renewing motivational confidence.
CO4	Provides latest information in the field of science and technology.

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COURSE CODE: AUDIT COURSE II	CONSTITUTION OF INDIA
CO1	Understandinge the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
CO2	Confer the intellectual origins of the frame work of argument that informed the conceptualization of social reforms leading to revolution in India.
CO3	Dissertate the circumstances surrounding the foundation of the congress socialist party under the leadership of Jawaharlal Nehru and eventual failure of the proposal of direct elections through adult suffrage in the Indian constitution.
CO4	Discuss the passage of the Hindu Code Bill of 1956.
AUDIT COURSE II	**PEDAGOGY STUDIES**
CO1	Figure out what pedagogical practices are being used by teachers in formal and informal class rooms in developing countries.
CO2	The evidence on the effectiveness of these pedagogical practices, in what conditions and with what population of learners.
CO3	How can teacher education, school curriculum and guidance materials best support effective pedagogy?
CO4	Identify critical evidence gaps to guide the development.
AUDIT COURSE II	**STRESS MANAGEMENT BY YOGA**
CO1	Develop healthy mind in a healthy body thus improving social health.
CO2	Improve efficiency
CO3	overcome stress.
CO4	To get well acquinted with types of pranayama.

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AUDIT COURSE II	PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS
CO1	Study of Shrimad-Bhagwad-Geeta help the student in developing his personality and achieve the highest goal in life.
CO2	Study of neethishatakam will help in developing versatile personality of students.
CO3	To awaken wisdom in students.
CO4	To became a person with stable mind, pleasing personality and determination.

M.PHARMACY (PHARMACEUTICAL ANALYSIS)
II YEAR I SEMESTER

COURSE CODE: PE V	BIOSTATISTICS
CO1	Discuss the basic concept and importance of statistical analysis.
CO2	Explain various methods of testing hypothesis.
CO3	Dissert the methods of collection of data, analysis and interpretation.
CO4	To understand the basic aspects of statistics such as central tendency, dispersion and correlation.
PE V	**SCALE UP AND TECHNOLOGY TRANSFER**
CO1	Manage the scale up process in pharmaceutical industry.
CO2	Assist in technology transfer.
CO3	To establish safety guidelines which prevent industrial hazards.
CO4	Be aware of process validation.
PE V	**PRODUCTION AREA DESIGN AND PACKAGING DEVELOPMENT**

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CO1	To elaborate the current good manufacturing practices.
CO2	To maximise knowledge on pharmaceutical packaging and design.
CO3	To familiarise the packaging of solids, semisolids, parenterals, ophthalmic and aerosols.
CO4	To be acquainted with components of packaging and packaging materials.
COURSE CODE: OE	**SCREENING METHODS IN PHARMACOLOGY**
CO1	Know various techniques for screening of drugs for different pharmacological activities.
CO2	Aware of guidelines and regulations for screening new drug molecules on animals.
CO3	Notice the guidelines for handling animals and animal ethics for screening of drugs.
CO4	Care handling and breeding techniques of laboratory animals.
OE	**ENTREPRENEURSHIP MANAGEMENT**
CO1	Be able to involve in the role of enterprise in national and global economy.
CO2	Able to handle entrepreneurship concepts
CO3	Should meet the demands and challenges of growth strategies and networking.
CO4	Be able to launch and organise an enterprise.

OE	**COSMETIC SCIENCE**
CO1	Know various cosmetics their preparation, properties, MOA and uses.

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CO2	Understanding the properties and evaluation of cosmetics by analytical methods.
CO3	Should be able to suggest proper usage of cosmetics.
CO4	Application of skin care products in the formulation of cosmeceuticals.
OE	**HAZARDS AND SAFETY MANAGEMENT**
CO1	Should disclose environmental problems among learners.
CO2	Develop an attitude of concern for the industrial environment.
CO3	Ensure safety standards in pharmaceutical industry.
CO4	Empower ideas to clear mechanism and management in different kinds of hazard management system.
OE	**AUDITS AND REGULATORY COMPLIANCE**
CO1	Capable of understanding the importance of auditing.
CO2	Have sound knowledge on methodology of auditing.
CO3	Understand the process of auditing in pharmaceutical industries.
CO4	Be competent with the planning process, responsibilities and administration.
COURSE CODE: DISSERTATION	**DISSERTATION WORK REVIEW II**
CO1	Search and evaluate the available literature in your given subject or chosen topic area
CO2	Read the selected articles thoroughly and evaluate them
CO3	Organise the selected papers by looking for patterns and by developing subtopics
CO4	Analyse critically a segment of published body of knowledge through summary

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M.PHARMACY (PHARMACEUTICAL ANALYSIS) II YEAR II SEMESTER	
COURSE CODE: DISSERTATION	**DISSERTATION WORK REVIEW III**
CO1	Apply knowledge and understanding in relation to the agreed area of study
CO2	Communicate in written form by integrating, analysing and applying key texts and practices
CO3	Demonstrate advanced critical research skills in relation to career development
CO4	Integrate the theory and practice in evaluation
COURSE CODE: DISSERTATION	**DISSERTATION VIVA VOCE**
CO1	Demonstrate knowledge in the program domain
CO2	Presenting views cogently and precisely
CO3	Exhibit professional etiquette suitable for career progression
CO4	Exhibit sustained curiosity and have an attitude of attention in detailing of the project

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