



# P. RAMI REDDY MEMORIAL COLLEGE OF PHARMACY

44/35-1, Prakruthi Nagar, Utukur, Kadapa – 516 003 A.P.

Approved by AICTE & PCI, New Delhi, Recognised by Govt. of A.P.

Affiliated to JNTUA, Ananthapuramu. Recognised U/S 2(f) & 12(B) of UGC Act, 1956.

## COURSE OUTCOMES – M.PHARMACY (PHARMACOGNOSY)

M.Pharmacy (Pharmacognosy) I Year I Semester (R21) (I Semester)		
Subject Name & Code	CO's Number	Course Outcomes (CO'S) Upon completion of the course student will be able to
Modern Pharmaceutical Analytical Techniques 21S01101	C06111.1	Understand the principle and instrumentation, Applications of various spectroscopic techniques like UV-Visible, IR and spectrofluorimetry and flame emission and atomic absorption spectroscopy.
	C06111.2	Learn and apply the knowledge of NMR-Spectroscopy instruments for effective practical handling and use.
	C06111.3	Gain knowledge on mass spectroscopic technique for the qualitative and quantitative evaluation of drug.
	C06111.4	Develop the Chromatographic techniques for identification, characterization and quantification of drugs.
	C06111.5	Explain Instrumentation and relate identification of compounds by electrophoresis technique and X-ray crystallography and Immunological assays.
Advanced Pharmacognosy - I 21S06101	C06112.1	Understand and acknowledge importance of herbal drug industry, explain the advances in cultivation and production of crude drugs, and utilization of medicinal and aromatic plants such as ashwagandha, saffron, safed musli etc.
	C06112.2	Explain about chemical and pharmacological aspects of few medicinal plants which act as immunomodulators, antidiabetics, hepatoprotectives and cardioprotective.
	C06112.3	Appraise the medicinal importance of marine drugs which are used as cardiovascular, anticancer, antiviral, antimicrobial, antiparasitic, anticoagulant and anti-inflammatory agents.
	C06112.4	Define functional foods, nutraceuticals and dietary supplements, classify nutraceuticals and explain about health problems that can be cured by use of these Understand and explain source, chemical nature, medicinal uses and health benefits of some nutraceuticals like soyaban, ginseng etc.
	C06112.5	Aknowledge and explain isolation and characteristic features of phytopharmaceuticals like carotenoids, limonoids, flavonoids, phenolic acids, saponins, and vitamins.



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### M.Pharmacy (Pharmacognosy) I Year I Semester (R21) (I Semester)

Subject Name & Code	CO's Number	Course Outcomes (CO'S) Upon completion of the course student will be able to
Phytochemistry 21S06102	C06113.1	Explain phytochemical aspects and biogenesis of various secondary metabolites like atropine, morphine etc., and radiotracer techniques.
	C06113.2	Describe the importance of drug discovery, sourcing, archiving, evaluating and identifying biologically active natural products.
	C06113.3	Understand and explain extraction/isolation methods for phytochemical groups, and Discuss recent trends and advances in the field of Phytochemistry like sophisticated extraction techniques such as super critical fluid extraction etc.
	C06113.4	Apply the principles of HPTLC and LCMS/GCMS in characterization of herbal extracts and Elucidate the structure of phytoconstituents like carvone, citral menthol etc.
	C06113.5	Explain and utilize natural colorants, flavours and perfumes like indigo, caramel, orange oil, geranium oil etc.
Industrial Pharmacognostical Technology 21S06103	C06114.1	Describe infrastructure and quality regulations involved in herbal drug industries and GMP and GLP.
	C06114.2	Know and explain the requirements for setting herbal drug industry and concept of quality assurance in herbal drug industry.
	C06114.3	Develop skills for the quality control of herbal drugs and formulations and design monographs of herbal drugs.
	C06114.4	Explain validation of analytical procedures, methods of stabilization and analysis of natural products and drugs.
	C06114.5	Discuss Intellectual property rights and regulatory affairs for herbal products, recent trends, quality and regulatory requirements of herbal industries.



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M.Pharmacy (Pharmacognosy) I Year I Semester (R21) (I Semester)		
Subject Name & Code	CO's Number	Course Outcomes (CO'S) Upon completion of the course student will be able to
Modern Pharmaceutical Analytical Techniques Lab 21S01105	C06115.1	Analysis of pharmacopoeial compounds by spectroscopic technique.
	C06115.2	Perform to select suitable analytical techniques for the qualitative and quantitative evaluation of drugs
	C06115.3	Apply the theoretical knowledge of instruments for effective practical handling and use.
	C06115.4	Estimate the compounds by various chromatographic compounds.
	C06115.5	Evaluate structure of organic compounds using suitable spectroscopic tools.
Advanced Pharmacognosy – I Lab 21S06104	C06116.1	Analyse herbal extracts for the identification of phytoconstituents by phytochemical screening.
	C06116.2	Perform TLC and HPTLC studies of Phytoconstituents.
	C06116.3	Determination of leaf constants and volatile oil content and perform monograph analysis of fixed and volatile oils.
	C06116.4	Identification and estimation of bioactive constituents from plant extracts.
	C06116.5	Formulate and evaluate different types of herbal dosage forms.



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M.Pharmacy (Pharmacognosy) I Year II Semester (R21) (II Semester)		
Subject Name & Code	CO's Number	Course Outcomes (CO'S) Upon completion of the course student will be able to
Advanced Pharmacognosy - II 21S06201	C06121.1	Develop skills for the detection of adulteration and evaluation techniques.
	C06121.2	Discuss the various analytical profiles for the validation of herbal drugs and explain standardization parameters of herbal drugs.
	C06121.3	Understand and explain source, chemical nature and description of vegetable bitters and laxatives.
	C06121.4	Describe the role of ethnobotany and ethnopharmacology in drug discovery and evaluation and recent trends and advancements in drug discovery related to natural products.
	C06121.5	Apply the various phyto-pharmacological screening methods for various biological properties.
Indian Systems of Medicine 21S06202	C06122.1	Explain the basic principles, history and development of Indian systems of medicine.
	C06122.2	Define and describe the preparation methods of ayurvedic formulations like vati, taila, bhasma etc and their uses.
	C06122.3	Discuss the basic principles and treatment modalities of naturopathy and yoga.
	C06122.4	Explain the history, fundamental concept and method of preparation of dosage forms of homeopathy. Discuss siddha systems of medicine, merits and demerits
	C06122.5	Explain the basic principles, various dosage forms and method of preparation of unani system of medicine and aromatherapy.
Nutraceuticals and Herbal cosmetics 21S06203	C06123.1	Define and classify functional foods, dietary supplements, nutraceuticals and describe characteristic features of various phytochemicals as nutraceuticals in various diseased conditions.
	C06123.2	Describe various phytochemicals as nutraceuticals such a carotenoids, sulfides etc.
	C06123.3	Describe and discuss measurement of free radicals and role of antioxidants in free radical induced disease conditions.
	C06123.4	Develop the skill to formulate and analyze herbal cosmetics and explain toxicity screening methods.
	C06123.5	Describe various food laws and regulations along with adulteration of foods.



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<b>M.Pharmacy (Pharmacognosy) I Year II Semester (R21) (II Semester)</b>		
<b>Subject Name &amp; Code</b>	<b>CO's Number</b>	<b>Course Outcomes (CO'S) Upon completion of the course student will be able to</b>
Medicinal Plant Biotechnology 21S06204	C06124.1	Explain the history and applications of plant biotechnology.
	C06124.2	Describe different tissue culture techniques.
	C06124.3	Discuss the immobilization techniques and secondary metabolite production.
	C06124.4	Understand and explain biotransformation and transgenesis and application of PCR in plant genome analysis.
	C06124.5	Appraise the application technology, production of ergot alkaloids etc.
Advanced Pharmacognosy – II Lab 21S06205	C06125.1	Preparation and standardization of herbal dosage forms.
	C06125.2	Estimation of aldehyde, phenol, alkaloid content, volatile oil content in herbal raw materials.
	C06125.3	Determination of sennoside content, alkaloid content by colorimetry and determination of moisture content, heavy metals and ash values of crude drugs.
	C06125.4	Perform microscopic evaluation of powder crude drugs.
	C06125.5	Study of analytical profile of any two plants and perform screening of herbal extracts.
Nutraceuticals and Herbal cosmetics Lab 21S06206	C06126.1	Prepare herbarium, preparation and standardization of various simple ayurvedic dosage forms., ORS, Protein powder, nutraceuticals, and multivitamin formulations.
	C06126.2	Formulate and evaluate herbal formulations and herbal cosmetics for its quality and purity.
	C06126.3	Preparation of ORS, Protein powder, nutraceuticals, and multivitamin formulations.
	C06126.4	Prepare iron supplements.
	C06126.5	Prepare and evaluate herbal acid balanced shampoo.



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<b>M.Pharmacy (Pharmacognosy) II Year I Semester (R21) (III Semester)</b>		
<b>Subject Name &amp; Code</b>	<b>CO's Number</b>	<b>Course Outcomes (CO'S) Upon completion of the course student will be able to</b>
Research Methodology and Intellectual Property Rights 21DRM101	C06211.1	Illustrate research problem formulation.
	C06211.2	Analyze research related information and research ethics.
	C06211.3	Learn how to write research proposal and the effective technical writing.
	C06211.4	Explain how IPR would take such important place in growth of individuals & nation, to summarize the need of information about Intellectual Property Right to be promoted among student community.
	C06211.5	Relate that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about economic growth and social benefits.
Pharmaceutical Validation 21SOE301a	C06212.1	Student shall be able to explain the aspects of validation and qualification of equipment.
	C06212.2	Able to perform qualification of analytical instruments and glass wares.
	C06212.3	Learn about validation of utility systems and qualification of laboratory equipment understand the importance of cleaning validation.
	C06212.4	Understand the importance of cleaning validation.
	C06212.5	It develops proper understanding of analytical method validation ICH guidelines and USP.