

R.R. COLLEGE OF PHARMACY

Chikkabanavara, Bangalore-560090

Affiliated to Rajiv Gandhi University of Health Sciences Bangalore, and recognised by PCI, AICTE and Govt of Karnataka

Internal Quality Assurance Cell

Course out Comes and Programme outcomes (PO)**Name of Course:** Modern Pharmaceutical Analytical Techniques**Program:** M. PHARM I SEM**Section:** Theory (60 Hours)**ACADEMIC YEAR :** 2020-2021**Faculty in Charge:** Mr. Syed Nizamuddin

Upon completion of the course student shall be able to:

Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
Explain general principles and theory of spectroscopy	U	F,C,P	PO1,PO3,PO4.
Understand the basic instrumentation of HPTLC, HPLC, GC for identification, and characterization of compounds.	U	C,P	PO1,PO3,PO4.
Understand the basic concept and instrumentation of Chromatographic techniques and identification of compounds by electrophoresis technique.	U	C,P	PO1,PO3,PO4.
Understand the basic concept and instrumentation of nmr & mass spectrophotometer	U	C,P	PO1,PO3,PO4.
Understand the basic principles and instrumentation of fluorimeter and atomic absorption spectrometer	U	C,P	PO1,PO3,PO4.
Identify organic compounds by –X-ray crystallography	U	C,P	PO1,PO3.

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Course out Comes and Programme outcomes (PO)**Name of Course:** Modern Pharmaceutical Analytical Techniques**Program:** M. PHARM I SEM**Section:** Practical**ACADEMIC YEAR :** 2020-2021**Faculty in Charge:** Mr. Syed Nizamuddin

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Demonstrate the working procedure of UV-Visible Spectroscopy and explain the study of max.	U	F,C,P	PO1,PO3,PO4.
02	Experiment with UV -Visible Spectroscopy and determine the Percentage purity of Drugs and Formulation.	U	C, P	PO1,PO3,PO4.
03	Measure the amount and percentage purity of Drug and formulation by using HPLC and GC.	U	C, P	PO1,PO3,PO4.
04	Utilize the Flame photometry equipment to determine the concentration of metals	U	C, P	PO1,PO3,PO4.
05	Discuss the interpretation of Mass spectrum with the support of Mass spectrum	U	C, P	PO1,PO3,PO4.
06	Utilize the fluorimetry equipment to determine the concentration of fluorescent compounds	U	C, P	PO1,PO3,PO4.

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Course out Comes and Programme outcomes (PO)**Name of Course:** Advanced Pharmacognosy I**Program:** M. PHARM I SEM**Section:** Theory (60 Hours)**ACADEMIC YEAR :** 2020-2021**Faculty in Charge:** Mrs. Akila E

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Explain Advances in the cultivation, production and conservation of medicinal plants	U	F,P	PO1,PO2,PO6
02	Explain Marine natural products and its isolation, purification, advances in marine research.	U, An	C,P	PO1,PO2,PO3,PO4,PO11
03	Summarize the nutraceuticals/herbs and their health benefits	U, AP	C	PO1,PO2,PO3, PO4, PO11
04	Explain various phytopharmaceuticals and their source & utilization and medicinal value	U	C,P	PO1,PO2,PO4
05	Summarize Pharmacovigilance of drugs of natural origin	U	F	PO1,PO2,PO6

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Course out Comes and Programme outcomes (PO)**Name of Course:** Phytochemistry I**Program:** M. PHARM I SEM**Section:** Theory (60 Hours)**ACADEMIC YEAR :** 2020-2021**Faculty in Charge:** Dr. V B Narayanaswamy

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	List the different classes of phytoconstituents with properties and its importance in herbal industries	U,AP	F,P	PO1,PO2,PO6
02	Explain the general process of natural product drug discovery and development	U,AP	C,P	PO1,PO2,PO3,PO4,PO11
03	Infer in the isolation, characterization and purification of phytoconstituents using advanced technology	U,AP	C,P	PO1,PO2,PO3, PO4, PO11
04	Determine the pharmacological uses of natural drugs by using pharmacological screening techniques	U, AP	C,P	PO1,PO2,PO4,PO11

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Course out Comes and Programme outcomes (PO)**Name of Course:** Industrial Pharmacognostical Technology**Program:** M. PHARM I SEM**Section:** Theory (60 Hours)**ACADEMIC YEAR :** 2020-2021**Faculty in Charge:** Mrs. Pruthvi N

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Understand the requirements for setting up the herbal drug industry & modernization of the herbal formulations.	R, U, AP, C	P, MC	PO1, PO2, PO3, PO4, PO5, PO11.
02	Understand the regulatory requirements, global marketing, TDM, GMP, GLP and ISO-9000.	R, U, AP	C, P, MC	PO1, PO5, PO6, PO7, PO9, PO11.
03	Explain the monographs of herbal drugs and comparative study with IP, USP, Ayurvedic pharmacopoeias etc and WHO guidelines in quality assessment of herbal drug	R, U, An	F, C	PO1, PO3, PO4, PO5.
04	Describe the testing of natural products and drugs.	R, U, An, E	F, C	PO1, PO2, PO3, PO4, PO5, PO11.
05	Understand the Indian and International patent laws, GI, Copyrights, procedure for patent filling and various aspects of patent.	R, U, AP	F, C, MC	PO1, PO2, PO3, PO5, PO9, PO11.

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Course out Comes and Programme outcomes (PO)**Name of Course:** Pharmacognosy Practical I**Program:** M. PHARM I SEM**Section:** Theory (60 Hours)**ACADEMIC YEAR :** 2020-2021**Faculty in Charge:** Mrs. Pruthvi N

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Analysis of the herbal formulation by UV spectrophotometer.	AP, An	F, C	PO1, PO3, PO4
02	Perform different methods of extraction, phytochemical screening & identification of bioactive constituents of plant extracts.	AP, An	F, C	PO1, PO3, PO4
03	Perform chromatographic evaluation.	AP, An, E	F, C	PO1, PO3, PO4
04	Analysis of unorganised drugs with reference to monograph.	AP, An, E	F, C, P	PO1, PO3, PO4

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Course out Comes and Programme outcomes (PO)**Name of Course:** Medicinal Plant Biotechnology**Program:** M. PHARM II SEM**Section:** Theory (60 Hours)**ACADEMIC YEAR :** 2020-2021**Faculty in Charge:** Mrs. Pruthvi N

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Explain the plant biotechnology as a source of medicinal plants and its applications in pharmacy and allied fields.	U,AP	C,P	PO1,PO2,PO6
02	Determine the tissue culture techniques of medicinal and aromatic plants and their applications.	U,AP	C,P	PO1,PO2,PO4,PO6, PO11
03	Explain the immobilization techniques of plant cell and its application on Secondary metabolite production	U,AP	C,P	PO1,PO2,PO6
04	Determine the quality of medicinal plants improvement using advanced biotechnological techniques	U,AP,AN	C,P	PO1,PO2,PO4,PO6, PO11
05	Explain Fermentation Technology and production of phytopharmaceuticals.	U,AP	C,P	PO1,PO2,PO4,PO6,PO11.

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Course out Comes and Programme outcomes (PO)**Name of Course:** Medicinal Plant Biotechnology**Program:** M. PHARM II SEM**Section:** Practical**ACADEMIC YEAR :** 2020-2021**Faculty in Charge:** Mrs. Pruthvi N

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Perform isolation of nucleic acid from cauliflower and RNA from Yeast	U,AN	C,P	PO1,PO2,PO6
02	Estimate DNA and immobilize the whole cell	U,AN	C,P	PO1,PO2,PO4,PO6
03	Perform the Quantitative estimation of aldehyde , Phenolic, Alkaloidal, Flavonoid content in Herbal raw materials	AN, R, E	C,P	PO1,PO2,PO4,PO6
04	Explain the Callus and suspension culture in medicinal plants for higher yield of Phytopharmaceuticals.	U,AN	C,P	PO1,PO2,PO4,PO6

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Course out Comes and Programme outcomes (PO)**Name of Course:** Advanced Pharmacognosy II**Program:** M. PHARM II SEM**Section:** Theory (60 Hours)**ACADEMIC YEAR :** 2020-2021**Faculty in Charge:** Mrs. Akila E

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3.....PO11
01	Explain Herbal remedies ,toxicity and validation of herbal remedies	U, AN	C,P	PO1,PO2,PO3,PO4,PO11
02	Explain methods of detection of adulteration and evaluation techniques for the herbal drugs	U, AN	C,P	PO1,PO2,PO3,PO4,PO11
03	Summarize the Ethnobotany and Ethnopharmacology	U, AP	C	PO1,PO2,PO3, PO4, PO11
04	Explain various analytical profiles of herbal drugs	U, AN	C,P	PO1,PO2,PO3,PO4,PO11
05	Summarize methods of screening of herbals for various biological properties	U, AN	C,P	PO1,PO2,PO3,PO4,PO11

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Course out Comes and Programme outcomes (PO)**Name of Course:** Indian System of Medicine**Program:** M. PHARM II SEM**Section:** Theory (60 Hours)**ACADEMIC YEAR :** 2020-2021**Faculty in Charge:** Dr. V B Narayanaswamy

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Explain the fundamental concepts and dosage forms of Ayurveda, Siddha, Unani and Homeopathy.	U,AP	C,P	PO1,PO2,PO3,PO4,PO6, PO9,P10,PO11
02	Explain the basic principles of Naturopathy, Yoga and Aromatherapy.	U,AP	C,P	PO1,PO2,PO5,PO6, PO9, P10, PO11
03	Explain the formulation development of various systems of medicine.	U,AP, AN	C,P	PO1,PO2,PO3,PO4, PO5, PO6, PO9,P10,PO11
04	Explain the Good Manufacturing Practice of Indian System of Medicine.	U,AP	C,P	PO1,PO2,PO3,PO4,PO6, PO9,P10,PO11
05	Summarize the various government skills in Indian system of medicine institutes.	U,AP	C,P	PO1,PO2,PO3,PO4,PO6, PO9,P10,PO11

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Course out Comes and Programme outcomes (PO)**Name of Course:** Herbal Cosmetics**Program:** M. PHARM II SEM**Section:** Theory (60 Hours)**ACADEMIC YEAR :** 2020-2021**Faculty in Charge:** Dr. V B Narayanaswamy

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Explain the basic principles and GMP of herbal/natural cosmetic preparations.	U,AP	C,P	PO1,PO2,PO3,PO4,PO6, PO9,P10,PO11
02	Outline the herbal cosmetics for skin and cosmeceuticals of herbal and natural origin.	U,AP,AN	C,P	PO1,PO2,PO5,PO6, PO9, P10, PO11
03	Explain the materials and excipients used in herbal cosmetic formulations.	U,AP, AN	C,P	PO1,PO2,PO3,PO4, PO5, PO6, PO9,P10,PO11
04	Explain the cosmetics analysis, toxicity screening and quality control tests.	U,AP	C,P	PO1,PO2,PO3,PO4,PO6, PO9,P10,PO11

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Course out Comes and Programme outcomes (PO)**Name of Course:** Herbal Cosmetics**Program:** M. PHARM II SEM**Section:** Practical**ACADEMIC YEAR :** 2020-2021**Faculty in Charge:** Mrs. Pruthvi N

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Formulation of various cosmetics	R, U, AP	F, C,P	PO1, PO3, PO4, PO11.
02	Formulation of dermatological preparations, herbal tablets, capsules, aromatherapy formulations & cough syrup.	R, U, AP, An	F, C, P	PO1, PO3, PO4, PO9, PO11.
03	Preparation and standardization of Ayurveda, Siddha, Homeopathy and Unani formulary	R, U, AP, An, E	F, C, P	PO1, PO3, PO4, PO9, PO11.

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Course out Comes and Programme outcomes (PO)**Name of Course: Research Methodology And Biostatistics****Program: M. PHARM III SEM****Section: Theory****ACADEMIC YEAR : 2020-2021****Faculty in Charge: Mrs. K S. Srilatha**

Upon completion of the course student shall be able to:

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An /E/C	Knowledge Categories (KC) F/C/P/MC	Programme outcomes (PO) PO1/PO2,PO3....PO11
01	Understand Statistics, Biostatistics, Frequency distribution. Measures of central tendency, Measures of dispersion and Correlation.	R, U A and E	C, P	PO1, PO4,PO11
02	Understand Regression,Probability and Parametric test.	R, U A and E	C, P	PO1, PO2, PO3 , PO4 and PO11
03	Explain Non Parametric tests.	R, U A and E	C, P	PO1, PO2, PO3 , PO4 and PO11
04	Know the need for design of Experiments, Experiential Design Technique, plagiarism, Graphs and Designing the methodology for formulation.	R, U A and E	C, P	PO1, PO2, PO3 , PO4 and PO11
05	Know the CPCSEA guidelines for laboratory animal facility.	R, U A and E	C, P	PO1, PO2, PO3 , PO4 and PO11
06	Know the declaration of Helsinki.	R, U A and E	C,P	PO1, PO2, PO3 , PO4 and PO11