M. Pharm (Pharmacognosy) Syllabus

Course structure, Scheme of Instruction and Evaluation

Semester – I

COURSE NO.	SUBJECTS/ PAPER	Th/Pr.	Instruction Hours/Week		Evaluation		DURATION OF EXT EXAM.
			Theory	Practical	Int.	Ext.	Hrs
M PCC T.1. 101	Advanced Pharmaceutical Analysis	Th.	4	-	30	70	3
M PCG T.1-102	Advanced Pharmacognosy – I	Th.	4	-	30	70	3
M PCG T.1-103	Medicinal Plant Biotechnology	Th.	4	-	30	70	3
M PCG T.1-104	Phytochemistry – I	Th.	4	-	30	70	3
M PCG P.1-105	Advanced Pharm. Analysis Practicals	Pr.	-	6	30	70	6
M PCG P.1-106	Phytochemistry Practicals	Pr.	-	6	30	70	6
M PCC T.1-107	Scientific and Technical Writing	Tutorial	2		50		Assignments
	Seminar + Assignments	-	8	-	50		

Semester – II

COURSE NO.	SUBJECTS/ PAPER	Th/Pr	Instruction Hours / Week		Evaluation		DURATION OF EXT. EXAM.
			Theory	Practical	Int.	Ext.	Hrs
M PCC T.1-201	Intellectual Property Rights & Regulatory Affairs	Th.	4	-	30	70	3
M PCG T.1-202	Advanced Pharmacognosy – II	Th.	4	-	30	70	3
M PCG T.1-203	Herbal drug development & Standardization	Th.	4	-	30	70	3
M PCG T.1-204	Phytochemistry – II	Th.	4	-	30	70	3
M PCG P.1-205	Advanced Pharmacognosy Practicals	Pr.	-	6	30	70	6
M PCG P.1-206	Herbal drug development & Standardization Practicals	Pr.	-	6	30	70	6
M PCC T.1-207	Entrepreneurship Management	Tutotrial	2		50		Assignments
	Seminar + Assignments	-	8	-	50		

Semester III & IV

Dissertation Original research work carried out by the candidate under the guidance of Regular Teaching Faculty / Visiting Faculty of the Department should be submitted in a bound form.

Evaluation of the Dissertation shall be done by the external & internal examiners appointed by the university

Dissertation Viva-Voce Grade A/B/C/D/F
Dissertation Report Grade A/B/C/D/F

A: Excellent B: Very Good C: Good D: Fair F: Fail

ADVANCED PHARMACEUTICAL ANALYSIS

Subject Code : M.PCC T 1.101	Sessional : 30
Periods/week : 4	Examination : 70
Nature of Exam : Theory	Exam Duration: 3 Hrs

UNIT - I

a) Ultra-violet spectroscopy: Introduction, theory, instrumentation (components and their significance) and pharmaceutical applications (qualitative and quantitative).

b) Infra-Red spectroscopy: introduction, theory, instrumentation (components and their significance) and pharmaceutical applications (qualitative and quantitative).

UNIT - II

Nuclear Magnetic Resonance spectroscopy: Introduction, theory, instrumentation (components and their significance), solvents, Internal standard, chemical shift, Spin-Spin coupling, protons on hetero atoms, coupling of protons to other nucleus, strongly and weakly coupled spin systems, effect of chiral center, vicinal and geminal coupling in rigid systems, long-range coupling, spin-spin decoupling, shielding and deshielding, shift reagents and applications of proton NMR.

Brief introduction to Carbon-13 NMR spectroscopy 2 D NMR (Hetecor and Cosy) and LC-NMR techniques.

UNIT - III

Mass spectroscopy: introduction, theory and instrumentation (components and their significance). Mass spectrum, molecular-ion peak, types of fragmentation, rearrangement and nitrogen rule. Chromatography combined mass spectroscopy techniques like Combined gas chromatography – mass spectrometry (GC/MS), High performance liquid chromatography-mass spectrometry (HPLC/MS). Theory and principle of Electro-spray mass spectroscopy (ES-MS), Chemical ionisation mass spectrometry (CIMS), Field ionisation mass spectroscopy (FIMS) and Fast atom bombardment mass spectroscopy (FAS). Pharmaceutical applications of the above techniques.

UNIT - IV

Introduction, types, sample preparation, mobile phase, pumps, columns, detectors, selection of wave length, quantitative methods, method of validation, comparison of HPLC and HPTLC.

UNIT - V

Electrophoresis: Introduction, Types of electrophoresis viz., Paper electrophoresis and Gel Electrophoresis. Capillary electrophoresis- Principles, instrumentation and applications. Brief account to capillary electro- chromatography.

Gas chromatography: Introduction, Theory, principle and instrumentation (components and their significance) carrier gas, columns, injection systems and detectors. Pharmaceutical applications of gas chromatography. Brief account of capillary gas-chromatography.

Recommended Books:

1. A. H. Beckett & J. B. Stenlake , Practical Pharmaceutical Chemistry, CBS Pub
2. Skoog Holler Nieman, Principles of instrumental analysis.

3. B. K. Sharma, Instrumental methods of chemical analysis.
4. Indian Pharmacopoeia, European Pharmacopoeia, US & British Pharmacopoeia.
5. Remington's Pharmaceutical Sciences.
6. Silver stein, Identification of organic compounds.

ADVANCED PHARMACOGNOSY – I

Subject Code : M.PCG T 1.102 Sessional : 30
Periods/week : 4 Examination : 70
Nature of Exam: Theory Exam Duration: 3 Hrs

Unit –I:

General introduction to the importance of Pharmacognosy in herbal drug industry. General aspects involved in the cultivation of medicinal plants.
Factors involved in production of crude drugs. (i) Exogenous (ii) Endogenous factors (iii) Mineral supplements (iv) Nutrients and (v) Growth regulators and inhibitors. Pest control and study of pesticides with special importance to natural pesticides.

Unit – II

Systematic study of medicinal plants cultivated in India with reference to constituents and uses of Senna, Clove, Opium, Ispaghula, Solanum, Lkhasianum, Vinca, Garcinia, Ashwagandha, Lemongrass, Acorus calamus, Safed musli, Turmeric, Pepper, Coffee, Aloe and Henna.

Unit – III

Principles of Ayurvedic systems of medicines, their merits and demerits, Introduction to different dosage forms,Preparation Methods of Ayurvedic medicines. Approximate equivalents of doses in Indian and Metric system, English equivalents of Ayurvedic clinical conditions and diseases.

Unit – IV

Principles of homeopathy and Unani systems of medicines, their merits and demerits. Introduction to different dosage forms and methods of preparation of Homeopathy and Unani medicines.

Unit – V

Study of information retrieval methods of natural plants and herbal data base. Phytochemical and Pharmacological literature review of Gymnema sylvestre, Azadirahcta indica, Adhatoda vasica, Asparagus racemosus, Commiphora mukul, Podophyllum Hexandrug, Ocimum sanctum, Shankapushpi and Tylophora asthamatica.

Recommended Books :

1. Cultivation of Medicinal Plants by CK Atal and BM Kapoor.
2. Cultivation and Utilization of aromatic plants by CK Atal and BM Kapoor.
3. Ayurvedic formulary of India, Govt. of India.
4. Homeopathic Pharmacopoeia
5. Unani Medical Systems
6. Bibiliography of Pharmacognosy of Medicinal Plants by Mitra Roma, ELBS Edn.
7. Indian meidicinal Plants by Kirthikar, Basu.
8. Indian material Medica by K.M. Madkarni

Reference Books :

1. Plant propagation – principle & practices by hertamann Kester.
2. Pharmacopoeial Standards for Ayurvedic formulations – CCRAS, Delhi.
3. Selected topics in Experimental Pharmacology – VK Seth
4. The use of Pharmacological techniques for the evaluation of natural products by BN Chavan and RC Srimal (CDRI).

MEDICINAL PLANT BIOTECHNOLOGY

Subject Code : M.PCG T 1.103 Sessional : 30
Periods/week : 4 Examination : 70
Nature of Exam : Theory Exam Duration: 3 Hrs

Unit – I

Introduction to Genetics & Melecular Biology: structural, molecular & chromosomal organization of cell, cytogenetics, cellcycle, mitosis and meiosis, genetic code & gene mutation, genetic engineering, genetic mapping and molecular maps of plant genomes
Plant genetics: Reproduction in plants, Variation in plants, Heritability, Gene recombination and Basis of plant breeding

Unit – II

Gene transfer in plants: Using vectors of Agrobacterium, Ti, Ri, Co-intergrative and intermediate plasmid, DNA mediated gene transfer techniques electroporation, microprojection, micro & macroinjection, liposomes, ultrasonication and localization of transferred gene in genetically modified plants.
(a) plant chromosome analysis, (b) use of markers and (c) DNA hybidisation

Unit – III

Crop quality improving methods: Chemodemes, Hybrization, Mutation & Polyploidy
Applications of transgenic plants: Resistance to physiological stress, insects, fungus, virus and herbicides, Production of Phytopharmaceuticals and edible vaccines

Unit – IV

Tissue culture: Laboratory organisation, Media, Aseptic Manipulation.
Culture methods: Organogenesis, Embryogenesis, Micro propogation, Somacional variation, Haploid culture and Synthelic seeds
Immobilization Methods

Unit – V

Strategies for Production of secondary metabolites: Biotransformation - Use of precursors, Growth regulators and elicitors,
Methods: Batch culture, Continuous culture, Hairy root culture and their applications.
Production of important secondary metabolites, Ex: Ajmalicine, Shikonin, Artemicin, Cinnamic acids, Flavonoids and Anthraquinones.

Recommended Books:

1. Introduction to plant tissue culture by M.K. Razadam
2. Molecular biology & Biotechnology by J.M. Walker & E.D. Gingo
3. Advanced methods in plant breeding & biotiechnology by David R Mirray
4. Experiments in plant tissue culture by John, H.D. & Lorin W.R.
5. Plant cell & tissue culture by Jafferey. W. Pollard & John. M. Walker

Reference Books :

1. Essentials of Molecular biology by Dovid. F.A. George. M.M.
2. Breeding field crops by John M.P. & David. A.S.
3. Pharmaceuticals Biotiechnology S.P. Vyas & V.K. Dixit
4. Biotechnology theory & technique vol I by Jack. G. C.

5. Pharmacognosy by G.E. Trease & W.C.Evans ELBS.
6. Biotechnology by purohit & Matherr
7. Comprehensive biotechnology by Mooyoung
8. Biotechnology application to tissue culture by Shargool.
9. Plant tissue culture by Dixon
10. Plant tissue culture by Street
11. Elements of Biotechnology by P.K. Gupta.

PHYTOCHEMISTRY-I

Subject Code : M.PCG T 1.104 Sessional : 30
Periods/week : 4 Examination : 70
Nature of Exam: Theory Exam Duration: 3 Hrs

Unit –I

Natural products as leads for New drugs: Approaches to discovery and development of natural products as potential new drugs, selection and optimization of lead compounds for further development with suitable examples from CNS, anticancer, antibiotics and Cardiovascular drugs.

Unit – II

Steriods : Stereochemistry, SAR, structural modifications and pharmacokinetic properties, Source and structure elucidation of cholesterol ergosterol, stigmosterol and diosgenis.

Unit – III

Terpenoids : Source and structure elucidatioin of camphor, eugenol, Taxol and artemisinin.

Unit – IV

Carotenoids Source and structure elucidation of Lycopene, Vitamin A, β-Carotene, and Bixin.

Unit – V

Polypeptides and Proteins : General methods of separation, general methods of degradation and end group analysis, general methods of synthesis of peptides. Sequence analysis, secondary and tertiary structure of proteins; chemistry of Insulin.

Recommended Books:

1. Natural products chemistry – Nakanishi Golo
2. Introduction to Molecular Phytochemistry by CHJ Wells. (Chapman and Hall)
3. Comparative Phytochemistry, edited by T. Swain.
4. Photochemistry, Vol. I to IV, Miller Jan Nostrant Reinhold.
5. Burger's medicinal chemistry edited by Alfred Burger.

Reference Books:

1. Modern methods of plant analysis by Peach & M.V. Tracey, Vol. I to VII
2. Recent advances in Phytochemistry – Vol.I to IV scikel runeckles – Appletaon century crofts.
3. Chemistry natural products – Vol.I onwards IWPAC.
4. Natural products – A Laboratory guide by Raphel Ikhan
5. The essential oils by Ernest Guenther and Robert E. Kreiger
6. The Alkaloids : Chemistry & Physiology by RHF Manske (Volume)
7. Chemistry of Marine Natural Products by Paul J Schewer

8. Marine Phamacognosy by Dean F. Martin & George Padilla
9. Marine Natural Products, Vol. 1 to 4.

ADVANCED PHARMACEUTICAL ANALYSIS PRACTICALS

Subject Code : M.PCG P 1.105	Sessional : 30
Periods/week : 6	Examination : 70
Nature of Exam : Practicals	Exam Duration: 6 Hrs

List of Experiments.

Experiments based on theory.

Minimum 8 experiments shall be conducted.

PHYTOCHEMISTRY PRACTICALS

Subject Code : M.PCG P 1.106	Sessional : 30
Periods/week : 6	Examination : 70
Nature of Exam : Practicals	Exam Duration: 6 Hrs

List of Experiments.

Experiments based on theory.

Minimum 8 experiments shall be conducted.

SCIENTIFIC AND TECHNICAL WRITING

Subject Code : M.PCC T 1.107 Sessional : 50
Periods/week : 2 Examination : --
Nature of Exam : Tutorials Exam Duration: --

Course Objectives

To be able to appreciate and understand importance of writing scientifically.

- To Develop competence in writing and abstracting skills.
- To write either a draft research proposal or a chapter of dissertation.

UNIT – I: COLLECTION AND EVALUATION OF NFORMATION

Identification sources, searching information, classifying information under fact/opinion, tabulating information, summarizing a text and presenting sequence of topics in different forms.

UNIT – II: WRITING AS A MEANS OF COMMUNICATION

- Different forms of scientific and technical writing.
- Articles in journals, Research notes and reports, Review articles, Monographs, Dissertations, Bibliographies.

How to formulate outlines: The reasons for preparing outlines

- as a guide for plan of writing
- as skeleton for the manuscript

Kinds of outline: topic outlines, conceptual outline, sentence outlines and combination of topic and sentence outlines

UNIT – III: DRAFTING TITLES, SUB TITLES, TABLES, ILLUSTRATIONS

- Tables as systematic means of presenting data in rows and columns and lucid way of indicating relationships and results.
- Formatting Tables: Title, Body stab, Stab Column, Column Head, Spanner Head, Box Head
- Appendices: use and guidelines

The Writing process: Getting started, Use outline as a starting device, Drafting, Reflecting and Re-reading

Checking: Organization, Headings, Content, Clarity and Grammar

Brevity and Precision in writing - Drafting and Re-drafting based on critical evaluation

UNIT - IV: PARTS OF DISSERTATION/RESEARCH REPORT/ARTICLE

Introduction, Review of Literature, Methodology, Results and Discussion

Ask questions related to: content, continuity, clarify, validity internal consistency and objectivity during writing each of the above parts.

UNIT – V: WRITING FOR GRANTS

- Clearly state the question to be addressed
- Rationale and importance of the question being address
- Emperial and theoretical conceptualization
- Presenting pilot study/data
- Research proposal of method
- Clarity, specificity of method.
- Clear organization
- Outcome of study and its implications
- Budgeting

- Available infra-structure and recourses
- Executive summary

References

1. APA (1984): Publication Manual of Americal Psychological Association (3rd Edition), Washington: APA.
2. Cooper, H.M. (1990): Integrating Research: A Guide for Literature Reviews (2nd Edition). California: Sage.
3. Dunn, F.V & Others.(Ed.) (1984): Disserninating Research: Changing Practice. NY:Sage.

INTELLECTUAL PROPERTY RIGHTS & REGULATORY AFFAIRS

Subject Code : M.PCC T 1.201	Sessional : 30
Periods/week : 4	Examination : 70
Nature of Exam: Theory	Exam Duration: 3 Hrs

Unit –I

Patents and Intellectual Property Rights (IPR) : Definition, scope, objectives, sources of patent information, patent processing & application, Patents, copyrights, trademarks, salient features, trade related aspects (TRIPS), international & regional agreements.

Unit –II

GATT and WTO : GATT – Historical perspective, objectives, fundamental principles, impact on developing countries. WTO – objectives, scope, functions, structure, status, membership & withdrawal, dispute settlement, impact on globalization, India – tasks & challenges.

Unit – III

Regulatory affairs : Indian context – Requirments and guidelines of GMP, understanding of Drugs and Cosmetic Act 1940 and rules 1945 with reference to schedule M, U and Y.

Unit-IV

Related quality systems : Objectives and guidelines of USFDA, WHO and ICH, Introduction to ISO series.

Unit – V

Documentation : Types related to pharmaceuticals industry, protocols, Harmonizing formulation development for global filings, NDA, ANDA, CTD, dealing with post-approval changes – SUPAC, handling and maintenance including electronic documentation.

Recommended Books

1. Good manufacturing practices for pharmaceuticals, SH Willing, Vol. 78, Marcel Dekker, NY.
2. Protection of industrial property rights, P Das and Gokul Das.
3. Law and drugs, las Publ. S.N. Katju
4. Original laws published by Govt. of India
5. Laws of drugs in India, Hussain

6. New drug approval process, RA Guarino, Vol 100, Marcel Dekker, NY
7. fda.org.wipo.int.patentlawlinks.com,hc-sc.gc,inch.org.cder.org.

ADVANCED PHARMACOGNOSY – II

Subject Code : M.PCG T 1.202 Sessional : 30
Periods/week : 4 Examination : 70
Nature of Exam: Theory Exam Duration: 3 Hrs

Unit –I

General methods and Principles of extraction methods, types of extraction and their merits and demerits. Selection and purification of solvents for extraction, methods of isolation, purification and identification of photoconstituents.

Chromatography: General Principles and Applications of Adsorption, Ion-exchange, Molecular-sieve, Affinity, Hydrophobic and Chiral chromatography, Detailed study of TLC, Coloumn chromatography and high pressure thin layer chromatography, HPLC and GLC.

Unit – II

Methods of investigation in Biogenetic studies. The investigation of biosynthetic pathways by isotopic tracer techniques. Study of important biosynthetic pathways of plants like photosynthesis, carbohydrate utilization and basic metabolic pathways.

Unit -III

Detailed study of following Natural products with special importance to biosynthesis: Atropine, Reserpine, Morphine, Digoxin, Diosgenin, Flavonoids, Glycyrrhetinic acid, Ergometrin, Terpenes, Sennosides.

Unit – IV

Methods of isolation and estimation of the following phytoconstituents: Digoxin, Sennosides, Diosgenine, Hesperidin, Quinine, Atropine, Emetine, Recinolic acid, Eugenol and Citral.

Unit – IV

Methods of isolation and estimation of the following phytoconstituents: Curcumin, caffeine, Capsaicin, Tannic acid, Vincristin, Eemetine, Withaferin, Vascine, Andrographolides, Lupeol and glycerrhetinic acid.

Recommended Books:

1. Thin layer chromatography: Stahl.
2. Clarke's isolation & identification of drugs – AC Mottal
3. Phytochemical methods of chemical analysis by Harborne.
4. Plant phydiology by Frank B. Salisburry, Cleon, W.Ross, CBS, Delhi.
5. Phramcognosy by G.E. Trease, W.C. Evans, ELBS.

Reference Books:

1. Chromatography of Alkaloids by Varpoorte Swendson
2. Elements of chromatography by PK Lata.
3. Jenkins Quantitative pharmaceutical chemistry – AN Kenwell
4. Pharmacognosy by VE Tyler, LR Brady and JE Robbers (KM Varghese & Co., Bombay).
5. Text book of Pharmacognosy by T.E.Wallis, CBS, Delhi.
6. Practical Pharmacognosy: Kokate C.K., Vallabh prakashan, New Delhi.
7. Practical Pharmacognosy: Khandelwal K.R., Nirali Praksahan, Pune.
8. Introduction to Molecular Phytochemistry, C.H.J. Wells, Chapman & Hall

9. Modern methods of plant analysis – peach & M.V. Tracey. Vol.I to VII
10. Chemistry of Marine Natural Products by Paul J Schewer
11. Marine Phrmacognosy by Dean F. Martin & George Padilla.

HERBAL DRUG DEVELOPMENT AND STANDARDIZATION

Subject Code : M.PCG T 1.203 Sessional : 30
Periods/week : 4 Examination : 70
Nature of Exam: Theory Exam Duration: 3 Hrs

Unit – I

Herbal based Industry: Scope, study of infrastructure, staff requirement, project profiles, plant and equipment, processing, research and development, regulatory requirement. Pilot scale up techniques.

Unit – II

a) Indusrial methods and preparation of standardized extracts, principle, methods, merits and demerits. Preparations of standardized extracts of Garcinea, Forskolin, Garlic, Turmeric and Capsicum.

b) Preparation and Standardizations of herbal formulation : Shapoo's syrups, Chyanvanprash, powders, Pintments, face packs, tablets and capsules.

Unit – III

Nutraceuticals: Scope, herbal sources of food supplements, taste enhancers, colours, volatile oils of commercial significance, perfume industries.

Standardization of Ayurvedic and Homeopathic medicines. Problems in Standardization of these

Products, WHO Guide lines.

Unit-IV

Bio-statistics and design of experiments: Regression, tests of significance, F-test and analysis of variance : 1-way, 2-way classification, chi-square test.

Principles of randomization, replication and local control, completely randomized block of the above designs in pharmaceutical research. Bio assay-different types: dose effect relationships, calculation of LD50, ED50, probit analysis. Statistical quality control, process control, control charts, acceptance sampling – sampling plans.

Unit V

Screening of natural products for the following biological activities – analgesics, anti-inflammatory, antidiabetic, diuretic, antifertility, antiepileptic, antihypertensive and antiarrhythmic activities.

Recommended Books :

1. Vogel HG and Vogel WH, Drug discovery and evaluaion, pharmacological assays, springer – verlag.
2. Ayurvedic Pharmacopoeia
3. Thin layer chromatography by E. Stahi
4. Herbal Phamacopoeia
5. Herbal drugs industry by R.D. Chaudari.
6. SC Gupta and VK Kapoor, Fundamentals to applied statistics

Reference Books:

1. Alvin E. Lewis, Bio statistics
2. Homeopathic pharmacopoeia

3. Wealth of India CSIR, New Delhi.

PHYTOCHEMISTRY – II

Subject Code : M.PCG T 1.204 Sessional : 30
Periods/week : 4 Examination : 70
Nature of Exam: Theory Exam Duration: 3 Hrs

Unit – I: Glycosides and Flavanoids
Introduction, Sources, general methods of structural determination. Constitution (chemical & spectral analysis) of Amygdalin, arbution, digoxin, hesperidin and quercetin.

Unit – II: Glycosides and Flavanoids
Sources, uses, chemistry and structural elucidation (chemical and spectral analysis) of diosgenin, glycyrheteric acid and gymnemic acid, Introduction to chemistry and sources of lignans and coumarins.

Unit – III: Carbohydrates
Introduction, Nomenclature, chemistry, determination of configuration. Ring structure of monosaccharides. Conversion of ascending and descending series. Constitution and structural elucidation of ascorbic acid, maltose and sucrose. Chemistry of polysacchorides and molecular weight determination.

Unit – IV: Terpenoids
Introduction, Nomenclature, chemistry and general methods of structural determination of Terpenoids. Structural elucidation (by chemical and spectral analysis) of camphor, Eugenol, Menthol and Curcumin, Chemistry and uses of Artemiscinin and Taxol.

Unit –V: Carotenoids
Introduction, Nomenclature, chemistry and general methods of structural determination of carotenoids. Structural elucidation (chemical and spectral analysis) of vitamin-A, β-Carotene and α-Carotene. Chemistry and sources of Lycopene, Bixin and Chlorophyll.

Recommended Books:

1 Natural products chemistry – Nakanishi Golo
2 Introduction to Molecular Phytochemistry by CHJ Wells. (Chapman and Hall)
3 Comparative Phytochemistry, edited by T. Swain.
4 Photochemistry, Vol. I to IV, Miller Jan Nostrant Reinhold.
5 Burger's medicinal chemistry edited by Alfred Burger.

6 Reference Books:

7 Modern methods of plant analysis by Peach & M.V. Tracey, Vol. I to VII
8 Recent advances in Phytochemistry – Vol.I to IV scikel runeckles – Appletaon century crofts.
9 Chemistry natural products – Vol.I onwards IWPAC.
10 Natural products – A Laboratory guide by Raphel Ikhan
11 The essential oils by Ernest Guenther and Robert E. Kreiger
12 The Alkaloids : Chemistry & Physiology by RHF Manske (Volume)
13 Chemistry of Marine Natural Products by Paul J Schewer
14 Marine Phamacognosy by Dean F. Martin & George Padilla

15 Marine Natural Products, Vol. 1 to 4.

ADVANCED PHARMACOGNOSY PRACTICALS

Subject Code : M.PCG P.1.205	Sessional : 30
Periods/week : 6	Examination : 70
Nature of Exam: Practicals	Exam Duration: 6 Hrs

List of Experiments.

Experiments based on theory.

Minimum 8 experiments shall be conducted.

HERBAL DRUG DEVELOPMENT & STANDARDIZATION PRACTICALS

Subject Code : M.PCG P 1.206	Sessional : 30
Periods/week : 6	Examination : 70
Nature of Exam: Practicals	Exam Duration: 6 Hrs

List of Experiments.

Experiments based on theory.

Minimum 8 experiments shall be conducted.

ENTREPRENEURSHIP MANAGEMENT

Subject Code : M.PCC T 1.207 Sessional : 50
Periods/week : 2 Examination : --
Nature of Exam: Tutorials Exam Duration: --

Course Objectives:

- To provide conceptual inputs regarding entrepreneurship management.
- To sensitise and motivate the students towards entrepreneurship management.
- To orient and impart knowledge towards identifying and implementing entrepreneurship opportunities.
- To develop management skills for entrepreneurship management.

UNIT – I: CONCEPTUAL FRAME WORK

- Concept need and process in entrepreneurship development.
- Role of enterprise in national and global economy
- Types of enterprise – Merits and Demerits
- Government policies and schemes for enterprise development
- Institutional support in enterprise development and management

UNIT – II: THE ENTREPRENEUR

- Entrepreneurial motivation – dynamics of motivation.
- Entrepreneurial competency – Concepts.
- Developing Entrepreneurial competencies - requirements and understanding the process of entrepreneurship development, self awareness, interpersonal skills, creativity, assertiveness, achievement, factors affecting entrepreneur'' role.

UNIT – III: LAUNCHING AND ORGANISING AN ENTERPRISE

- Environment scanning – Information, sources, schemes of assistance, problems.
- Enterprise selection, market assessment, enterprise feasibility study, SWOT Analysis.
- Resource mobilisation - finance, technology, raw material, site and manpower.
- Costing and marketing management and quality control.
- Feedback, monitoring and evaluation.

UNIT – IV: GROWTH STRATEGIES AND NETWORKING

- Performance appraisal and assessment
- Profitability and control measures, demands and challenges
- Need for diversification
- Future Growth – Techniques of expansion and diversification, vision strategies
- Concept and dynamics
- Methods, Joint venture, co-ordination and feasibility study

UNIT – V: PREPARING PROJECT PROPOSAL TO START ON NEW ENTERPRISE

- Project work – Feasibility report; Planning, resource mobilisation and implementation.

Reference

1. Akhauri, M.M.P.(1990): Entrepreneurship for Women in India, NIESBUD, New Delhi.
2. Hisrich, R.D & Brush, C.G.(1996) The Women Entrepreneurs, D.C. Health & Co., Toranto.

3. Hisrich, R.D. and Peters, M.P. (1995): Entrepreneurship – Starting, Developing and Managing a New Enterprise, Richard D., Inwin, INC, USA.
4. Meredith, G.G. etal (1982): Practice of Entrepreneurship, ILO, Geneva.
5. Patel, V.C.(1987): Women Entrepreneurship – Developing New Entrepreneurs, Ahmedabad EDII.

RECOMMENDATIONS:

1. Today all Knowledge is interdisciplinary and these recommendations are made in a spirit of openness and continuous improvement of curriculum at both undergraduate and postgraduate levels of Pharmacy Education.
2. In view of the fact that B.Pharm is a Professional degree with diverse employment potential, the pharmacy curriculum be revised and upgraded relevant to the emerging professional needs by incorporating recent developments in the field of Pharmacy education, in order to meet the challenges of post GATT era.
3. In the proposed undergraduate and postgraduate programs of teaching in pharmacy, considerable time has been allotted for both in theory as well as in laboratory courses. The syllabus is designed in tune with the requirements of AICTE (5 Theory and 3 Lab Courses per semester) and also mandatory courses by PCI for undergraduate currriculum.
4. The focus is to give an opportunity to the student to learn on his/her own or through discussions by substantially providing anadditional hours of in-built time (8-10 Hrs/Week). It is strongly recommended that this should be utilized properly so as to generate a sense of curiosity and creativity among students.
5. Application of communication skills and information technology in pharmacy has been introduced at undergraduate level as essential components of teaching. There is a provision of separate laboratory for these courses and were introduced, so as to develop skills of communication, improve problem solving ability and learn essentials of information management. It is recommended that the institutions should gearup to the requirements of emerging needs of the society.
6. It is recommended that the earlier practical work load is minimized and the laboratory courses were improved, to perform most of the ‘wet’ experiments at semi-micro level and special exercises are provide for better training to understand the principles dealt within the theory classes. More attention should be focused on safety measures and disposal of the laboratory waste.
7. The revised curriculum provides appropriate education and training so as to meet the conceptual, technical, integrative and career competencies, especially to qualify in GATE (Graduate Aptitude Test in Engineering), FPGEE (Foreign Pharmacy Graduate Equivalence Examination) and other examinations of professional competence.
8. An important area that requires greater focus is the training of the teachers for effective implementation of the new syllabuses. An Orientation / Refresher courses of two weeks is primarily designed to update the knowledge of undergraduate teachers.