



NATIONAL COLLEGE OF PHARMACY

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that the information given in the attached documents are verified by me and is true to the best of my knowledge.

Dr. Sujith Varma.K **PRINCIPAL**
Principal National College of Pharmacy
Manassery, Kozhikode
National College of Pharmacy
Manassery, Mukkam, Kozhikode





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Criterion 1	CURRICULAM ASPECTS
Key Indicator: 1.1	Curricular planning and implementation
Metric No : 1.3.1	Institution integrates cross cutting cross cutting issues relevant to professional ethics , Gender, Human Values, environment and sustainability transacting the curriculum

Sr. No	Particulars
1	LIST OF COURSES
2	SYLLABUS
3	LIST OF EVENTS
4	PROOFS OF EVENTS



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NATIONAL COLLEGE OF PHARMACY, MANASSERY

Courses addressing the Professional Ethics, Gender, Human values, Environment
Sustainability into the Curriculum

SL. NO	PROGRAM	YEAR	COURSE	COURSE DESCRIPTION	TOPICS
1.	Pharm D	2 nd year	2.3 Pharmacognosy and phytopharmaceutical	Deals with nature as source of drug and the students realise the importance of nature as a source of medicine	Chapter 1-16
2.	Pharm D	2 nd year	2.5 Community Pharmacy	Code of ethics for community pharmacists forms part of syllabus	Chapter 1 to 10
3.	Pharm D	2 nd year	2.6 Pharmacotherapeutics I	This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines following ethical principles	Chapter: 1 to 5
4.	Pharm D	2 nd year	2.6 Pharmacotherapeutics I (Practical)	This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines following ethical principles	Chapter: 1 to 5
5.	Pharm D	3 rd year	3.3 Pharmacotherapeutics II	This course is designed to impart knowledge and skills necessary for	Chapter 1 to 5





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				contribution to quality use of medicines following ethical principles	
6.	Pharm D	3 rd year	3.3 Pharmacotherapeutics II (Practical)	This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines following ethical principles	Hospital posting in various departments
7.	Pharm D	3 rd year	3.4 Pharmaceutical Jurisprudence	This course, among other things, deals with various aspects of ethics for Pharmacy professionals and prevention of cruelty to animals	Chapter 1 - 12
8.	Pharm D	4 th year	PD 4.1 Pharmacotherapeutics-III	This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines following ethical principles	Chapter: 1 - 6
9.	Pharm D	4 th year	PD 4.1 Pharmacotherapeutics-III (Practical)	This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines following ethical principles	Hospital posting
10.	Pharm D	4 th year	PD 4.2 Hospital pharmacy	the students are required to learn various skills like drug distribution, drug dispensing,	Chapter 1 - 09

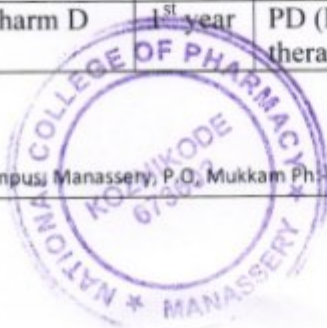




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				manufacturing of parenteral preparations, drug information, patient counselling, and therapeutic drug monitoring for improved patient care	
11.	Pharm D	4 th year	PD 4.3 Clinical Pharmacy	In this course Students directly deal with patients or their medical record. Hence the students are taught to follow ethics and teachers monitor whether the students adhere to ethical principle	Chapter 1-10
12.	Pharm D	4 th year	PD 4.3 Clinical Pharmacy (Practical)	In this course Students directly deal with patients or their medical record. Hence the students are taught to follow ethics and teachers monitor whether the students adhere to ethical principle	Case study, patient medication history and counseling
13.	Pharm D	1 st year	PD (PB) 1.1 Pharmaco therapeutics- I & II	This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines following ethical principles	Chapter: 1-10
14.	Pharm D	1 st year	PD (PB) 1.1 Pharmaco therapeutics- I & II	This course is designed to impart	Chapter 1-10



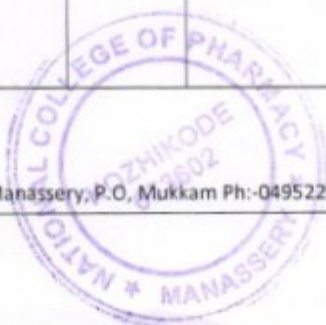
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			II (Practical)	knowledge and skills necessary for contribution to quality use of medicines following ethical principles	
15.	Pharm D	1 st year	PD (PB) 1.2 Pharmacotherapeutics III	Impart knowledge and skills necessary for contribution to quality use of medicines.	Chapter : 1-6
16.	Pharm D	1 st year	PD (PB) 1.3 Hospital Pharmacy	Learn various skills like drug distribution, drug dispensing, manufacturing of parenteral preparations, drug information, patient counselling, and therapeutic drug monitoring for improved patient care.	Chapter: 1-9
17.	Pharm D	5 th year	5.1- Clinical Research	Students learn Ethical guidelines in Clinical Research	Chapter 1 and 2
18.	Pharm D	5 th year	5.4 Clerkship	Students perform the real time Pharmaceutical service in hospitals under the supervision of faculty members and	Hospital posting



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				they are inculcated the practice of ethical principle while dealing with patients	
19.	M.Pharm	1 st sem	MPP101T Clinical Pharmacy Practice	In this course Students directly deal with patients or their medical record. Hence the students are taught to follow ethics and teachers monitor whether the students adhere to ethical principle	Chapter 1-5
20.	M.Pharm	1 st sem	MPP102T Pharmacotherapeutics – I	This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines following ethical principles	Chapter: 1-5
21.	M.Pharm	1 st sem	MPP103T Hospital & Community Pharmacy	Code of ethics for community pharmacists forms part of syllabus	Chapter 1-5
22.	M.Pharm	1 st sem	MPP104T Clinical Research	Students learn Ethical guidelines in Clinical Research	Chapter : 1-5
23.	M.Pharm	1 st sem	MPP 105P Pharmacy Practice Practical –I	Students perform the real time Pharmaceutical service in hospitals under the supervision of	Hospital posting , casestudy analysis



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				faculty members and they are inculcated the practice of ethical principle while dealing with patients	
24.	M.Pharm	2 nd sem	MPP202T Pharmacotherapeutics II	This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines following ethical principles	Chapter: 1-5
25.	M.Pharm	2 nd sem	MPP 205P Pharmacy Practice Practical –II	Students perform the real time Pharmaceutical service in hospitals under the supervision of faculty members and they are inculcated the practice of ethical principle while dealing with patients	Hospital posting, case study
26.	M.Pharm	1 st sem	MPH104T Regulatory Affairs	Course include the regulatory perspective of Pharmacy Professional ethics	Unit 1-4
27.	M.Pharm	2 nd sem	MPA203T Quality control and Quality assurance	Students learn Good Manufacturing practice, Good clinical Practice, Good Laboratory practice	Unit 1-5
28.	BPharm	1 st sem	BP105T.Communication Skills (Theory)	Prepare the young pharmacy student to interact	Unit -1-5



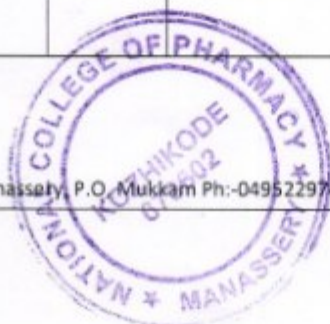
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				effectively with doctors, nurses, dentists, physiotherapists and other health workers. The student will get the soft skills set to work cohesively with the team as a team player and will add value to the pharmaceutical business.	
29.	BPharm	1 st sem	BP106 RBT Remedial Biology	learn and understand the components of living world, structure and functional system of plant and animal kingdom	Unit -1-5
30.	B.Pharm	2 nd sem	BP 206 T Environmental Sciences	Students learn the environmental system, the status of its inherent or induced changes on organisms, the social and cultural factors and the impact of man on environment.	Unit 1-3
31.	B.Pharm	4 th sem	BP405T Pharmacognosy and Phytochemistry I	Deals with nature as source of drug and the students realise the importance of nature as a source of medicine	Unit 1-5



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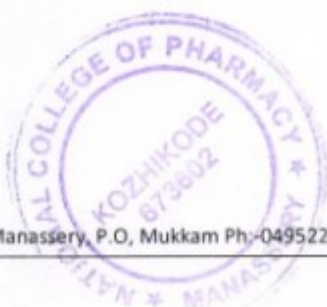
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32.	B.Pharm	4 th sem	BP409P Pharmacognosy I	Deals with nature as source of drug and the students realise the importance of nature as a source of medicine	Unit 1-5
33.	B.Pharm	5 th sem	BP504T Pharmacognosy and Phytochemistry II	Deals with nature as source of drug and the students realise the importance of nature as a source of medicine	Unit 1-5
34.	B.Pharm	5 th sem	BP 505 T.Pharmaceutical Jurisprudence	This course, among other things, deals with various aspects of ethics for Pharmacy professionals and prevention of cruelty to animals	Unit 1-5
35.	B.Pharm	7 th sem	BP706 PS Practice School	Students are placed in Industry where they learn environmental protection practice followed in Pharmaceutical Industry and its importance	Research work

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2.3 - PHARMACOGNOSY & PHYTOPHARMACEUTICALS (THEORY)

Theory : 3 Hrs. /Week

1. Scope and objectives: This subject has been introduced for the pharmacy course in order to make the student aware of medicinal uses of various naturally occurring drugs its history, sources, distribution, method of cultivation, active constituents, medicinal uses, identification tests, preservation methods, substitutes and adulterants.

2. Upon completion of the course student shall be able to:

- a. understand the basic principles of cultivation, collection and storage of crude drugs;
- b. know the source, active constituents and uses of crude drugs; and
- c. appreciate the applications of primary and secondary metabolites of the plant.

3. Course materials:

Text books

- a. Pharmacognosy by G.E. Trease & W.C.Evans.
- b. Pharmacognosy by C.K.Kokate,Gokhale & A.C.Purohit.

Reference books

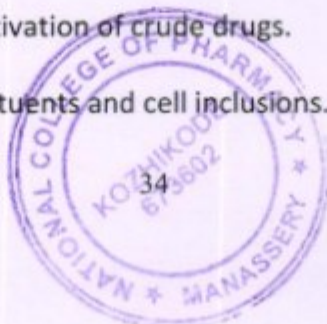
- a. Pharmacognosy by Brady & Tyler.E.
- b. Pharmacognosy by T.E.Wallis.
- c. Pharmacognosy by C.S. Shah & Qadery.
- d. Pharmacognosy by M.A. Iyengar.

4. Lecture wise programme:

Topics

1. Introduction.
2. Definition, history and scope of Pharmacognosy.
3. Classification of crude drugs.
4. Cultivation, collection, processing and storage of crude drugs.
5. Detailed method of cultivation of crude drugs.
6. Study of cell wall constituents and cell inclusions.

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7. Microscopical and powder Microscopical study of crude drugs.
8. Study of natural pesticides.
9. Detailed study of various cell constituents.
10. Carbohydrates and related products.
11. Detailed study carbohydrates containing drugs.(11 drugs)
12. Definition sources, method extraction, chemistry and method of analysis of lipids.
13. Detailed study of oils.
14. Definition, classification, chemistry and method of analysis of protein.
15. Study of plants fibers used in surgical dressings and related products.
16. Different methods of adulteration of crude drugs.

2.3 PHARMACOGNOSY & PHYTOPHARMACEUTICALS (PRACTICAL)

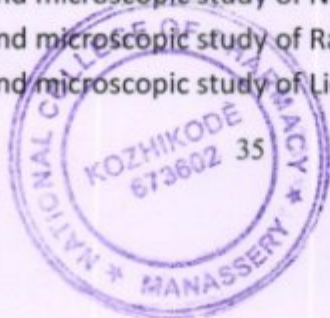
Practical : 3 Hrs./Week

General Requirements: Laboratory Napkin, Observation Book 150 pages Zero brush, Needle, Blade, Match box.

List of experiments:

1. Introduction of Pharmacognosy laboratory and experiments.
2. Study of cell wall constituents and cell inclusions.
3. Macro, powder and microscopic study of Datura.
4. Macro, powder and microscopic study of Senna.
5. Macro, powder and microscopic study of Cassia.cinnamon.
6. Macro, powder and microscopic study of Cinchona.
7. Macro, powder and microscopic study of Ephedra.
8. Macro, powder and microscopic study of Quassia.
9. Macro, powder and microscopic study of Clove
10. Macro, powder and microscopic study of Fennel.
11. Macro, powder and microscopic study of Coriander.
12. Macro, powder and microscopic study of Isapgol.
13. Macro, powder and microscopic study of Nux vomica.
14. Macro, powder and microscopic study of Rauwolfia.
15. Macro, powder and microscopic study of Liquorice.

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16. Macro, powder and microscopic study of Ginger.
17. Macro, powder and microscopic study of Podophyllum.
18. Determination of Iodine value.
19. Determination of Saponification value and unsaponifiable matter.
20. Determination of ester value.
21. Determination of Acid value.
22. Chemical tests for Acacia.
23. Chemical tests for Tragacanth.
24. Chemical tests for Agar.
25. Chemical tests for Starch.
26. Chemical tests for Lipids.(castor oil,sesame oil, shark liver oil,bees wax)
27. Chemical tests for Gelatin.

Scheme of Practical Examination:

	Sessionals	Annual
Identification	04	10
Synopsis	04	10
Major Experiment	07	20
Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance.

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2.5 - COMMUNITY PHARMACY (THEORY)

Theory : 2 Hrs. /Week

- 1 **Scope:** In the changing scenario of pharmacy practice in India, Community Pharmacists are expected to offer various pharmaceutical care services. In order to meet this demand, students will be learning various skills such as dispensing of drugs, responding to minor ailments by providing suitable safe medication, patient counselling, health screening services for improved patient care in the community set up.
- 2 **Objectives:** Upon completion of the course, the student shall be able to –
 - a. know pharmaceutical care services;
 - b. know the business and professional practice management skills in community pharmacies;
 - c. do patient counselling & provide health screening services to public in community pharmacy;
 - d. respond to minor ailments and provide appropriate medication;
 - e. show empathy and sympathy to patients; and
 - f. appreciate the concept of Rational drug therapy.

Text Books:

- a. Health Education and Community Pharmacy by N.S.Parmar.
- b. WHO consultative group report.
- c. Drug store & Business management by Mohammed Ali & Jyoti.

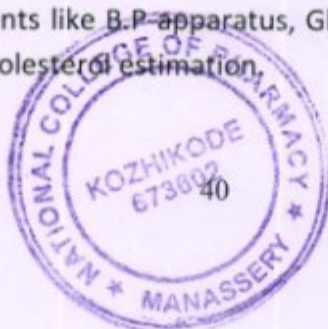
Reference books:

- a. Handbook of pharmacy – health care. Edt. Robin J Harman. The Pharmaceutical press.
- b. Comprehensive Pharmacy Review – Edt. Leon Shargel. Lippincott Williams & Wilkins.

Special requirements:

- 1 Either the college is having model community pharmacy (meeting the schedule N requirement) or sign MoU with at least 4-5 community pharmacies nearby to the college for training the students on dispensing and counselling activities.
- 2 Special equipments like B.P apparatus, Glucometer, Peak flow meter, and apparatus for cholesterol estimation.

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3. Scheme of evaluation (80 Marks)

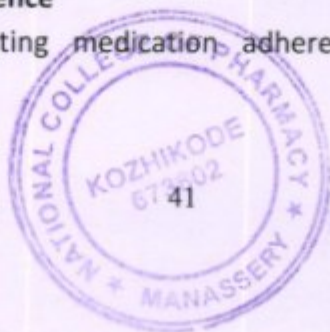
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| 1. | Synopsis | 10 |
| 2. | Major Experiment
(Counselling of patients with specific diseases – emphasis should be given on Counselling introduction, content, process and conclusion) | 30 |
| 3. | Minor Experiment(Ability to measure B.P/ CBG / Lung function) | 15 |
| 4. | Prescription Analysis (Analyzing the prescriptions for probable drug interaction and ability to tell the management) | 15 |
| 5. | Viva – Voce | 10 |

4. Lecture wise programme :

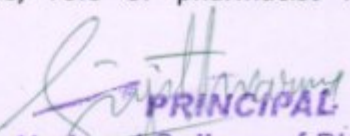
Topics

- 1 Definition, scope, of community pharmacy**
Roles and responsibilities of Community pharmacist
- 2 Community Pharmacy Management**
 - a. Selection of site, Space layout, and design
 - b. Staff, Materials- coding, stocking
 - c. Legal requirements
 - d. Maintenance of various registers
 - e. Use of Computers: Business and health care soft wares
- 3 Prescriptions – parts of prescription, legality & identification of medication related problems like drug interactions.**
- 4 Inventory control in community pharmacy**
Definition, various methods of Inventory Control
ABC, VED, EOQ, Lead time, safety stock
- 5 Pharmaceutical care**
Definition and Principles of Pharmaceutical care.
- 6 Patient counselling**
Definition, outcomes, various stages, barriers, Strategies to overcome barriers
Patient information leaflets- content, design, & layouts, advisory labels
- 7 Patient medication adherence**
Definition, Factors affecting medication adherence, role of pharmacist in improving the adherence.

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41


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2.6 - PHARMACOTHERAPEUTICS - I (THEORY)

Theory : 3 Hrs. /Week

1. **Scope of the Subject:** This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.
2. **Objectives:** At completion of this subject it is expected that students will be able to understand –
 - a. the pathophysiology of selected disease states and the rationale for drug therapy;
 - b. the therapeutic approach to management of these diseases;
 - c. the controversies in drug therapy;
 - d. the importance of preparation of individualised therapeutic plans based on diagnosis;
 - e. needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects);
 - f. describe the pathophysiology of selected disease states and explain the rationale for drug therapy;
 - g. summarise the therapeutic approach to management of these diseases including reference to the latest available evidence;
 - h. discuss the controversies in drug therapy;
 - i. discuss the preparation of individualised therapeutic plans based on diagnosis; and
 - j. identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).

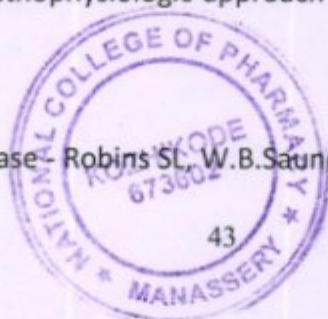
Text Books

- a. Clinical Pharmacy and Therapeutics - Roger and Walker, Churchill Livingstone publication.
- b. Pharmacotherapy: A Pathophysiologic approach - Joseph T. Dipiro et al. Appleton & Lange.

Reference Books

- a. Pathologic basis of disease - Robins SL, W.B.Saunders publication.

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- b. Pathology and therapeutics for Pharmacists: A Basis for Clinical Pharmacy Practice - Green and Harris, Chapman and Hall publication.
- c. Clinical Pharmacy and Therapeutics - Eric T. Herfindal, Williams and Wilkins Publication.
- d. Applied Therapeutics: The clinical Use of Drugs. Lloyd Young and Koda-Kimble MA
- e. Avery's Drug Treatment, 4th Edn, 1997, Adis International Limited.
- f. Relevant review articles from recent medical and pharmaceutical literature.

3. Detailed syllabus and lecture wise schedule :

Etiopathogenesis and pharmacotherapy of diseases associated with following systems/ diseases

Title of the topic

- 1 **Cardiovascular system:** Hypertension, Congestive cardiac failure, Angina Pectoris, Myocardial infarction, , Hyperlipidaemias , Electrophysiology of heart and Arrhythmias
- 2 **Respiratory system :** Introduction to Pulmonary function test, Asthma, Chronic obstructive airways disease, Drug induced pulmonary diseases **Endocrine system :** Diabetes, Thyroid diseases, Oral contraceptives, Hormone replacement therapy, Osteoporosis
- 3 **General prescribing guidelines for**
 - i. Paediatric patients
 - ii. Geriatric patients
 - iii. Pregnancy and breast feeding
- 4 **Ophthalmology:** Glaucoma, Conjunctivitis- viral & bacterial
- 5 **Introduction to rational drug use**
Definition, Role of pharmacist Essential drug concept Rational drug formulations

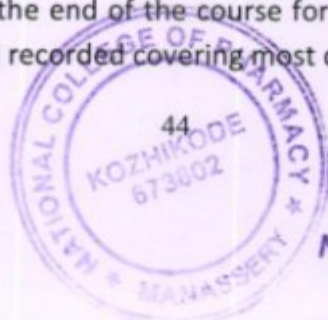
2.6 - PHARMACOTHERAPEUTICS - I (PRACTICAL)

Practical : 3 Hrs./Week

Practicals :

Hospital postings in various departments designed to complement the lectures by providing practical clinical discussion; attending ward rounds; follow up the progress and changes made in drug therapy in allotted patients; case presentation upon discharge. Students are required to maintain a record of cases presented and the same should be submitted at the end of the course for evaluation. A minimum of 20 cases should be presented and recorded covering most common diseases.

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Assignments :

Students are required to submit written assignments on the topics given to them. Topics allotted should cover recent developments in drug therapy of various diseases. A minimum of THREE assignments [1500 – 2000 words] should be submitted for evaluation.

Format of the assignment:

- 1 Minimum & Maximum number of pages.
- 2 Reference(s) shall be included at the end.
- 3 Assignment can be a combined presentation at the end of the academic year.
- 4 It shall be computer draft copy.
- 5 Name and signature of the student.
- 6 Time allocated for presentation may be 8+2 Min.

Scheme of Practical Examination:

	Sessionals	Annual
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

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3.3 - PHARMACOTHERAPEUTICS – II (THEORY)

Theory : 3 Hrs. /Week

1. Scope of the Subject: This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.

2. Objectives of the Subject Upon completion of the subject student shall be able to –

- a. know the pathophysiology of selected disease states and the rationale for drug therapy
- b. know the therapeutic approach to management of these diseases;
- c. know the controversies in drug therapy;
- d. know the importance of preparation of individualised therapeutic plans based on diagnosis; and
- e. appreciate the needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).

Text books (Theory)

- a. Clinical Pharmacy and Therapeutics - Roger and Walker, Churchill Livingstone publication

Reference books (Theory)

- a. Pharmacotherapy: A Pathophysiologic approach - Joseph T. Dipiro et al. Appleton & Lange
- b. Clinical Pharmacy and Therapeutics - Eric T. Herfindal, Williams and Wilkins Publication
- c. Applied Therapeutics: The clinical Use of Drugs. Lloyd Young and Koda-Kimble MA]

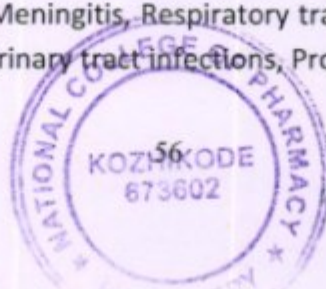
3. Detailed syllabus and lecture wise schedule :

Etiopathogenesis and pharmacotherapy of diseases associated with following systems / diseases –

Title of the topic

- 1 Infectious disease:** Guidelines for the rational use of antibiotics and surgical Prophylaxis, Tuberculosis, Meningitis, Respiratory tract infections, Gastroenteritis, Endocarditis, Septicemia, Urinary tract infections, Protozoal infection- Malaria, HIV

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& Opportunistic infections, Fungal infections, Viral infections, Gonorrhoea and Syphilis

2 Musculoskeletal disorders

Rheumatoid arthritis, Osteoarthritis, Gout, Spondylitis, Systemic lupus erythematosus.

3 Renal system

Acute Renal Failure, Chronic Renal Failure, Renal Dialysis, Drug induced renal disorders

4 Oncology: Basic principles of Cancer therapy, General introduction to cancer chemotherapeutic agents, Chemotherapy of breast cancer, leukemia. Management of chemotherapy nausea and emesis

5 Dermatology: Psoriasis, Scabies, Eczema, Impetigo

3.3 - PHARMACOTHERAPEUTICS – II (PRACTICAL)

Practical : 3 Hrs./Week

Practicals :

Hospital postings in various departments designed to complement the lectures by providing practical clinical discussion; attending ward rounds; follow up the progress and changes made in drug therapy in allotted patients; case presentation upon discharge. Students are required to maintain a record of cases presented and the same should be submitted at the end of the course for evaluation.

The student shall be trained to understand the principle and practice involved in selection of drug therapy including clinical discussion.

A minimum of 20 cases should be presented and recorded covering most common diseases.

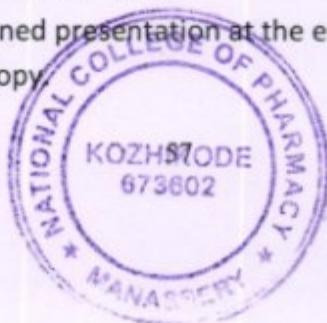
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- 5 Name and signature of the student.
- 6 Time allocated for presentation may be 8+2 Min.

Scheme of Practical Examination :

	Sessionals	Annual
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

3.4 - PHARMACEUTICAL JURISPRUDENCE (THEORY)

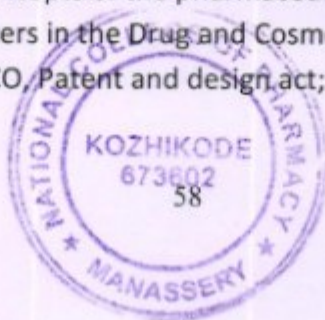
Theory : 2 Hrs. /Week

1. Scope of the Subject: (4-6 lines): This course exposes the student to several important legislations related to the profession of pharmacy in India. The Drugs and Cosmetics Act, along with its amendments are the core of this course. Other acts, which are covered, include the Pharmacy Act, dangerous drugs, medicinal and toilet preparation Act etc. Besides this the new drug policy, professional ethics, DPCO, patent and design Act will be discussed.

2. Objectives of the Subject: Upon completion of the subject student shall be able to (Know, do, and appreciate) –

- a. practice the Professional ethics;
- b. understand the various concepts of the pharmaceutical legislation in India;
- c. know the various parameters in the Drug and Cosmetic Act and rules;
- d. know the Drug policy, DPCO, Patent and design act;

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- e. understand the labeling requirements and packaging guidelines for drugs and cosmetics;
- f. be able to understand the concepts of Dangerous Drugs Act, Pharmacy Act and Excise duties Act; and
- g. other laws as prescribed by the Pharmacy Council of India from time to time including International Laws.

Text books (Theory)

Mithal , B M. Textbook of Forensic Pharmacy. Calcutta :National; 1988.

Reference books (Theory)

- a. Singh, KK, editor. Beotra's the Laws of Drugs, Medicines & cosmetics. Allahabad: Law Book House; 1984.
- b. Jain, NK. A Textbook of forensic pharmacy. Delhi: Vallabh prakashan ; 1995.
- c. Reports of the Pharmaceutical enquiry Committee
- d. I.D.M.A., Mumbai. DPCO 1995
- e. Various reports of Amendments.
- f. Deshapande, S.W. The drugs and magic remedies act 1954 and rules 1955. Mumbai: Susmit Publications; 1998.
- g. Eastern Book Company .The narcotic and psychotropic substances act 1985, Lucknow: Eastern; 1987.

3. Detailed syllabus and lecture wise schedule:

Title of the topic

1 Pharmaceutical Legislations – A brief review.

2 Principle and Significance of professional ethics. Critical study of the code of pharmaceutical ethics drafted by PCI.

3 Drugs and Cosmetics Act, 1940, and its rules 1945.

Objectives, Legal definition, Study of Schedule's with reference to Schedule B, C&C1, D, E1, F&F1, F2, F3, FF, G, H, J, K, M, N, P, R, V, W, X, Y.

Sales, Import, labeling and packaging of Drugs And Cosmetics Provisions Relating to Indigenous Systems.

Constitution and Functions of DTAB, DCC, CDL

Qualification and duties –Govt. analyst and Drugs Inspector.

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4 Pharmacy Act –1948.

Objectives Legal Definitions, General Study, Constitution and Functions of State & Central Council, Registration & Procedure, ER.

5 Medicinal and Toilet Preparation Act –1955.

Objectives, Legal Definitions, Licensing, Bonded and Non Bonded Laboratory, Ware Housing, Manufacture of Ayurvedic, Homeopathic, Patent & Proprietary Preparations.

6 Narcotic Drugs and Psychotropic substances Act-1985 and Rules. Objectives, Legal Definitions, General Study, Constitution and Functions of narcotic & Psychotropic Consultative Committee, National Fund for Controlling the Drug Abuse, Prohibition, Control and regulations, Schedules to the Act.

7 Study of Salient Features of Drugs and magic remedies Act and its rules.

8 Study of essential Commodities Act Relevant to drugs price control Order.

9 Drug Price control Order & National Drug Policy (Current).

10 Prevention Of Cruelty to animals Act-1960.

11 Patents & design Act-1970.

12 Brief study of prescription and Non-prescription Products.

4. Assignments:

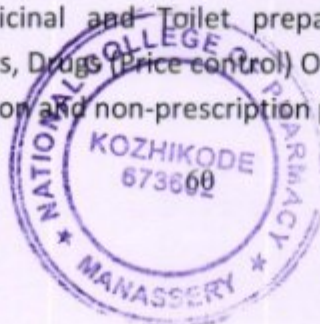
Format of the assignment

1. Minimum & Maximum number of pages
2. It shall be a computer draft copy
3. Reference(s) shall be included at the end.
4. Name and signature of the student
5. Assignment can be a combined presentation at the end of the academic year.
6. Time allocated for presentation may be 8+2 Min

Case studies relating to

- 1 Drugs and Cosmetics Act and rules along with its amendments, Dangerous Drugs Act, Medicinal and Toilet preparation Act, New Drug Policy, Professional Ethics, Drugs (Price control) Order, Patent and Design Act.
- 2 Various prescription and non-prescription products.

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- a. Lipsticks
- b. Cold cream and vanishing cream
- c. Clear liquid shampoo
- d. Tooth paste and tooth powders.

8 Tablet coating (demonstration)

Scheme of Practical Examination :

	Sessionals	Annual
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

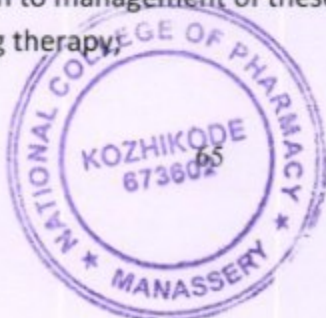
FOURTH YEAR

4.1 - PHARMACOTHERAPEUTICS – III (THEORY)

Theory : 3 Hrs. /Week

- 1 **Scope :** This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.
- 2 **Objectives:** At completion of this subject it is expected that students will be able to understand –
 - a. the pathophysiology of selected disease states and the rationale for drug therapy;
 - b. the therapeutic approach to management of these diseases;
 - c. the controversies in drug therapy.

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- d. the importance of preparation of individualised therapeutic plans based on diagnosis;
- e. needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects);
- f. describe the pathophysiology of selected disease states and explain the rationale for drug therapy;
- g. to summarize the therapeutic approach to management of these diseases including reference to the latest available evidence;
- h. to discuss the controversies in drug therapy;
- i. to discuss the preparation of individualised therapeutic plans based on diagnosis; and
- j. identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).

Text Books

- a. Clinical Pharmacy and Therapeutics - Roger and Walker, Churchill Livingstone publication
- b. Pharmacotherapy: A Pathophysiologic approach - Joseph T. Dipiro et al. Appleton & Lange

Reference Books

- a. Pathologic basis of disease - Robins SL, W.B.Saunders publication
- b. Pathology and therapeutics for Pharmacists: A Basis for Clinical Pharmacy Practice - Green and Harris, Chapman and Hall publication
- c. Clinical Pharmacy and Therapeutics - Eric T. Herfindal, Williams and Wilkins Publication
- d. Applied Therapeutics: The clinical Use of Drugs. Lloyd Young and Koda-Kimble MA
- e. Avery's Drug Treatment, 4th Edn, 1997, Adis International Limited.
- f. Relevant review articles from recent medical and pharmaceutical literature.

3. Detailed syllabus and lecture wise schedule:

Etiopathogenesis and pharmacotherapy of diseases associated with following systems/diseases

Title of the topic

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1. **Gastrointestinal system:** Peptic ulcer disease, Gastro Esophageal Reflux Disease, Inflammatory bowel disease, Liver disorders - Alcoholic liver disease, Viral hepatitis including jaundice, and Drug induced liver disorders.
2. **Haematological system:** Anaemias, Venous thromboembolism, Drug induced blood disorders.
3. **Nervous system:** Epilepsy, Parkinsonism, Stroke, Alzheimer's disease,
4. **Psychiatry disorders:** Schizophrenia, Affective disorders, Anxiety disorders, Sleep disorders, Obsessive Compulsive disorders
5. Pain management including Pain pathways, neuralgias, headaches.
6. Evidence Based Medicine

4.1 - PHARMACOTHERAPEUTICS – III (PRACTICAL)

Practical : 3 Hrs./Week

Practicals:

Hospital postings for a period of at least 50 hours is required to understand the principles and practice involved in ward round participation and clinical discussion on selection of drug therapy. Students are required to maintain a record of 15 cases observed in the ward and the same should be submitted at the end of the course for evaluation. Each student should present at least two medical cases they have observed and followed in the wards.

Assignments:

Students are required to submit written assignments on the topics given to them. Topics allotted should cover recent developments in drug therapy of various diseases. A minimum of THREE assignments [1500 – 2000 words] should be submitted for evaluation.

Format of the assignment:

- 1 Minimum & Maximum number of pages
- 2 Reference(s) shall be included at the end.
- 3 Assignment can be a combined presentation at the end of the academic year
- 4 It shall be computer draft copy
- 5 Name and signature of the student
- 6 Time allocated for presentation may be 8+2 Min.

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Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

4.2 - HOSPITAL PHARMACY (THEORY)

Theory : 2 Hrs. /Week

- 1. Scope:** In the changing scenario of pharmacy practice in India, for successful practice of Hospital Pharmacy, the students are required to learn various skills like drug distribution, drug dispensing, manufacturing of parenteral preparations, drug information, patient counselling, and therapeutic drug monitoring for improved patient care.
- 2. Objectives:** Upon completion of the course, the student shall be able to –
 - know various drug distribution methods;
 - know the professional practice management skills in hospital pharmacies;
 - provide unbiased drug information to the doctors;
 - know the manufacturing practices of various formulations in hospital set up;
 - appreciate the practice based research methods; and
 - appreciate the stores management and inventory control.

Text books: (latest editions)

- Hospital pharmacy by William .E. Hassan
- A text book of Hospital Pharmacy by S.H.Merchant & Dr. J.S. Qadry. Revised by R.K.Goyal & R.K. Parikh

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References:

- a. WHO consultative group report.
- b. R.P.S. Vol.2. Part –B; Pharmacy Practice section.
- c. Handbook of pharmacy – health care. Edt. Robin J Harman. The Pharmaceutical press.

3. Lecture wise programme : Topics

1 Hospital - its Organisation and functions

2 Hospital pharmacy-Organisation and management

- a. Organizational structure-Staff, Infrastructure & work load statistics
- b. Management of materials and finance
- c. Roles & responsibilities of hospital pharmacist

3. The Budget – Preparation and implementation

4 Hospital drug policy

- a. Pharmacy and Therapeutic committee (PTC)
- b. Hospital formulary
- c. Hospital committees
 - Infection committee
 - Research and ethical committee
- d. developing therapeutic guidelines
- e. Hospital pharmacy communication - Newsletter

5. Hospital pharmacy services

- a. Procurement & warehousing of drugs and Pharmaceuticals
- b. Inventory control
 - Definition, various methods of Inventory Control ABC, VED, EOQ, Lead time, safety stock
- c. Drug distribution in the hospital
 - i. Individual prescription method
 - ii. Floor stock method
 - iii. Unit dose drug distribution method
- d. Distribution of Narcotic and other controlled substances
- e. Central sterile supply services – Role of pharmacist

6. Manufacture of Pharmaceutical preparations

- a. Sterile formulations – large and small volume parenterals

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- b. Manufacture of Ointments, Liquids, and creams
 - c. Manufacturing of Tablets, granules, capsules, and powders
 - d. Total parenteral nutrition
7. Continuing professional development programs Education and training
 8. Radio Pharmaceuticals – Handling and packaging
 9. Professional Relations and practices of hospital pharmacist

4.2 - HOSPITAL PHARMACY (PRACTICAL)

Practical : 3 Hrs./Week

- 1 Assessment of drug interactions in the given prescriptions
- 2 Manufacture of parenteral formulations, powders.
- 3 Drug information queries.
- 4 Inventory control

List of Assignments:

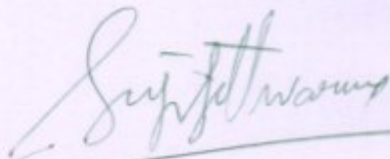
- 1 Design and Management of Hospital pharmacy department for a 300 bedded hospital.
- 2 Pharmacy and Therapeutics committee – Organization, functions, and limitations.
- 3 Development of a hospital formulary for 300 bedded teaching hospital
- 4 Preparation of ABC analysis of drugs sold in one month from the pharmacy.
- 5 Different phases of clinical trials with elements to be evaluated.
- 6 Various sources of drug information and systematic approach to provide unbiased drug information.
- 7 Evaluation of prescriptions generated in hospital for drug interactions and find out the suitable management.

Special requirements:

- 1 Each college should sign MoU with nearby local hospital having minimum 150 beds for providing necessary training to the students' on hospital pharmacy activities.
- 2 Well equipped with various resources of drug information.

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Scheme of Practical Examination:

	Sessionals	Annual
Synopsis	05	15
Major Experiment	10	25
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Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

4.3 - CLINICAL PHARMACY (THEORY)

Theory : 3 Hrs. /Week

1. Objectives of the Subject :

- Upon completion of the subject student shall be able to (Know, do, appreciate) –
- monitor drug therapy of patient through medication chart review and clinical review;
 - obtain medication history interview and counsel the patients;
 - identify and resolve drug related problems;
 - detect, assess and monitor adverse drug reaction;
 - interpret selected laboratory results (as monitoring parameters in therapeutics) of specific disease states; and
 - retrieve, analyse, interpret and formulate drug or medicine information.

Text books (Theory)

- Practice Standards and Definitions - The Society of Hospital Pharmacists of Australia
- Basic skills in interpreting laboratory data - Scott LT, American Society of Health System Pharmacists Inc.
- Biopharmaceutics and Applied Pharmacokinetics - Leon Shargel, Prentice Hall publication.

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- d. A text book of Clinical Pharmacy Practice; Essential concepts and skills, Dr.G.Parthasarathi etal, Orient Orient Langram Pvt.Ltd. ISSN8125026

References

- a Australian drug information -Procedure manual. The Society of Hospital Pharmacists of Australia.
- b Clinical Pharmacokinetics - Rowland and Tozer, Williams and Wilkins Publication.
- c Pharmaceutical statistics. Practical and clinical applications. Sanford Bolton, Marcel Dekker, Inc.

2. Detailed syllabus and lecture wise schedule:

Title of the topic

1. **Definitions, development and scope of clinical pharmacy**
2. **Introduction to daily activities of a clinical pharmacist**
 - a. Drug therapy monitoring (medication chart review, clinical review, pharmacist interventions)
 - b. Ward round participation
 - c. Adverse drug reaction management
 - d. Drug information and poisons information
 - e. Medication history
 - f. Patient counseling
 - g. Drug utilisation evaluation (DUE) and review (DUR)
 - h. Quality assurance of clinical pharmacy services
3. **Patient data analysis**

The patient's case history, its structure and use in evaluation of drug therapy & Understanding common medical abbreviations and terminologies used in clinical practices.
4. **Clinical laboratory tests used in the evaluation of disease states, and interpretation of test results**
 - a. Haematological, Liver function, Renal function, thyroid function tests
 - b. Tests associated with cardiac disorders
 - c. Fluid and electrolyte balance
 - d. Microbiological culture sensitivity tests
 - e. Pulmonary Function Tests

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5. **Drug & Poison information**
 - a. Introduction to drug information resources available
 - b. Systematic approach in answering DI queries
 - c. Critical evaluation of drug information and literature
 - d. Preparation of written and verbal reports
 - e. Establishing a Drug Information Centre
 - f. Poisons information- organization & information resources
6. **Pharmacovigilance**
 - a. Scope, definition and aims of pharmacovigilance
 - b. Adverse drug reactions - Classification, mechanism, predisposing factors, causality assessment [different scales used]
 - c. Reporting, evaluation, monitoring, preventing & management of ADRs
 - d. Role of pharmacist in management of ADR.
7. Communication skills, including patient counselling techniques, medication history interview, presentation of cases.
8. Pharmaceutical care concepts
9. Critical evaluation of biomedical literature
10. Medication errors

4.3 - CLINICAL PHARMACY (PRACTICAL)

Practical : 3 Hrs./Week

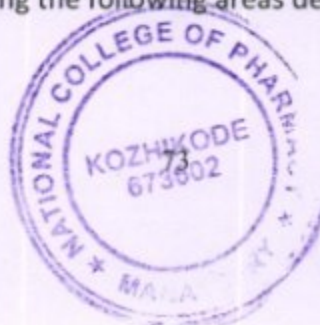
Students are expected to perform 15 practicals in the following areas covering the topics dealt in theory class.

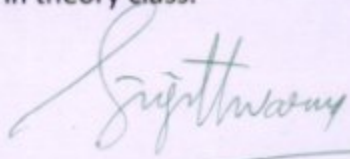
- a. Answering drug information questions (4 Nos)
- b. Patient medication counselling (4 Nos)
- c. Case studies related to laboratory investigations (4 Nos)
- d. Patient medication history interview (3 Nos)

Assignment:

Students are expected to submit THREE written assignments (1500 – 2000 words) on the topics given to them covering the following areas dealt in theory class.

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Drug information, Patient medication history interview, Patient medication counselling, Critical appraisal of recently published articles in the biomedical literature which deals with a drug or therapeutic issue.

Format of the assignment:

- 1 Minimum & Maximum number of pages.
- 2 Reference(s) shall be included at the end.
- 3 Assignment can be a combined presentation at the end of the academic year.
- 4 It shall be computer draft copy.
- 5 Name and signature of the student.
- 6 Time allocated for presentation may be 8+2 Min.

4.4 - BIOSTATISTICS AND RESEARCH METHODOLOGY (THEORY)

Theory : 2 Hrs. /Week

1. Detailed syllabus and lecture wise schedule

1. Research Methodology

- a. Types of clinical study designs:
Case studies, observational studies, interventional studies,
- b. Designing the methodology
- c. Sample size determination and Power of a study
Determination of sample size for simple comparative experiments, determination of sample size to obtain a confidence interval of specified width, power of a study
- d. Report writing and presentation of data

2. Biostatistics

- 2.1
 - a) Introduction
 - b) Types of data distribution
 - c) Measures describing the central tendency distributions- average, median, mode
 - d) Measurement of the spread of data-range, variation of mean, standard deviation, variance, coefficient of variation, standard error of mean.

2.2 Data graphics

Construction and labeling of graphs, histogram, piecharts, scatter plots, semilogarithmic plots

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FIFTH YEAR

5.1 - CLINICAL RESEARCH (THEORY)

Theory : 3 Hrs. /Week

1. Drug development process: Introduction

Various Approaches to drug discovery

- 1 Pharmacological
- 2 Toxicological
- 3 IND Application
- 4 Drug characterization
- 5 Dosage form

2. Clinical development of drug:

- 1 Introduction to Clinical trials
- 2 Various phases of clinical trial.
- 3 Methods of post marketing surveillance
- 4 Abbreviated New Drug Application submission.
- 5 Good Clinical Practice – ICH, GCP, Central drug standard control organisation (CDSCO) guidelines
- 6 Challenges in the implementation of guidelines
- 7 Ethical guidelines in Clinical Research
- 8 Composition, responsibilities, procedures of IRB / IEC
- 9 Overview of regulatory environment in USA, Europe and India.
- 10 Role and responsibilities of clinical trial personnel as per ICH GCP
 - a. Sponsor
 - b. Investigators
 - c. Clinical research associate
 - d. Auditors
 - e. Contract research coordinators
 - f. Regulatory authority
- 11 Designing of clinical study documents (protocol, CRF, ICF, PIC with assignment)
- 12 Informed consent Process
- 13 Data management and its components
- 14 Safety monitoring in clinical trials.

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References :

- a. Central Drugs Standard Control Organization. Good Clinical Practices-Guidelines for Clinical Trials on Pharmaceutical Products in India. New Delhi: Ministry of Health; 2001.
- b. International Conference on Harmonisation of Technical requirements for registration of Pharmaceuticals for human use. ICH Harmonised Tripartite Guideline. Guideline for Good Clinical Practice.E6; May 1996.
- c. Ethical Guidelines for Biomedical Research on Human Subjects 2000. Indian Council of Medical Research, New Delhi.
- d. Textbook of Clinical Trials edited by David Machin, Simon Day and Sylvan Green, March 2005, John Wiley and Sons.
- e. Principles of Clinical Research edited by Giovanna di Ignazio, Di Giovanna and Haynes.
- f. Clinical Data Management edited by R K Rondels, S A Varley, C F Webbs. Second Edition, Jan 2000, Wiley Publications.
- g. Goodman & Gilman: JG Hardman, LE Limbard, 10th Edn. McGraw Hill Publications, 2001.

5.2 - PHARMACOEPIDEMOLOGY AND PHARMACOECONOMICS (THEORY)

Theory : 3 Hrs. /Week

1 Pharmacoepidemiology :

Definition and scope:

Origin and evaluation of pharmacoepidemiology need for pharmacoepidemiology, aims and applications.

Measurement of outcomes in pharmacoepidemiology Outcome measure and drug use measures

Prevalence, incidence and incidence rate. Monetary units, number of prescriptions, units of drugs dispensed, defined daily doses and prescribed daily doses, medication adherence measurement

Concept of risk in pharmacoepidemiology

Measurement of risk, attributable risk and relative risk, time-risk relationship and odds ratio

Pharmacoepidemiological methods

Includes theoretical aspects of various methods and practical study of various methods with the help of case studies for individual methods

Drug utilization review, case reports, case series, surveys of drug use, cross-sectional studies, cohort studies, case control studies, case-cohort studies, meta

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First Year

1.1 - PHARMACOTHERAPEUTICS I & II (THEORY)

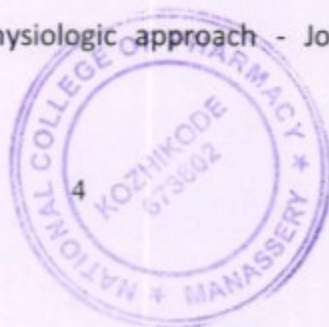
Theory: 3 Hrs. /Week

1. **Scope of the Subject:** This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.
2. **Objectives:** At completion of this subject it is expected that students will be able to understand –
 - a. the pathophysiology of selected disease states and the rationale for drug therapy;
 - b. the therapeutic approach to management of these diseases;
 - c. the controversies in drug therapy;
 - d. the importance of preparation of individualised therapeutic plans based on diagnosis;
 - e. needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects);
 - f. describe the pathophysiology of selected disease states and explain the rationale for drug therapy;
 - g. summarize the therapeutic approach to management of these diseases including reference to the latest available evidence;
 - h. discuss the controversies in drug therapy;
 - i. discuss the preparation of individualized therapeutic plans based on diagnosis; and
 - j. identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).

Text Books

- a. Clinical Pharmacy and Therapeutics - Roger and Walker, Churchill Livingstone publication.
- b. Pharmacotherapy: A Pathophysiologic approach - Joseph T. DiPiro et al. Appleton & Lange.

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Reference Books

- a. Pathologic basis of disease - Robins SL, W.B.Saunders publication.
- b. Pathology and therapeutics for Pharmacists: A Basis for Clinical Pharmacy Practice - Green and Harris, Chapman and Hall publication.
- c. Clinical Pharmacy and Therapeutics - Eric T. Herfindal, Williams and Wilkins Publication.
- d. Applied Therapeutics: The clinical Use of Drugs. Lloyd Young and Koda-Kimble MA
- e. Avery's Drug Treatment, 4th Edn, 1997, Adis International Limited.
- f. Relevant review articles from recent medical and pharmaceutical literature.

3. Detailed syllabus and lecture wise schedule :

Etiopathogenesis and pharmacotherapy of diseases associated with following systems/ diseases

Title of the topic

1. **Cardiovascular system:** Hypertension, Congestive cardiac failure, Angina Pectoris, Myocardial infarction, , Hyperlipidaemias , Electrophysiology of heart and Arrhythmias
2. **Respiratory system :** Introduction to Pulmonary function test, Asthma, Chronic obstructive airways disease, Drug induced pulmonary diseases Endocrine system : Diabetes, Thyroid diseases, Oral contraceptives, Hormone replacement therapy, Osteoporosis
3. **General prescribing guidelines for**
 - a) Paediatric patients
 - b) Geriatric patients
 - c) Pregnancy and breast feeding
4. **Ophthalmology:** Glaucoma, Conjunctivitis- viral & bacterial
5. **Introduction to rational drug use**
Definition, Role of pharmacist Essential drug concept Rational drug formulations
6. **Infectious disease:** Guidelines for the rational use of antibiotics and surgical Prophylaxis, Tuberculosis, Meningitis, Respiratory tract infections, Gastroenteritis, Endocarditis, Septicemia, Urinary tract infections, Protozoal

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infection- Malaria, HIV & Opportunistic infections, Fungal infections, Viral infections, Gonorrhoea and Syphilis

7. Musculoskeletal disorders

Rheumatoid arthritis, Osteoarthritis, Gout, Spondylitis, Systemic lupus erythematosus.

8. Renal system

Acute Renal Failure, Chronic Renal Failure, Renal Dialysis, Drug induced renal disorders

9. Oncology: Basic principles of Cancer therapy, General introduction to cancer chemotherapeutic agents, Chemotherapy of breast cancer, leukemia. Management of chemotherapy nausea and emesis

10. Dermatology: Psoriasis, Scabies, Eczema, Impetigo

1.1 - PHARMACOTHERAPEUTICS - I & II (PRACTICAL)

Practical : 3 Hrs./Week

Practicals : Hospital postings in various departments designed to complement the lectures by providing practical clinical discussion; attending ward rounds; follow up the progress and changes made in drug therapy in allotted patients; case presentation upon discharge. Students are required to maintain a record of cases presented and the same should be submitted at the end of the course for evaluation. A minimum of 20 cases should be presented and recorded covering most common diseases.

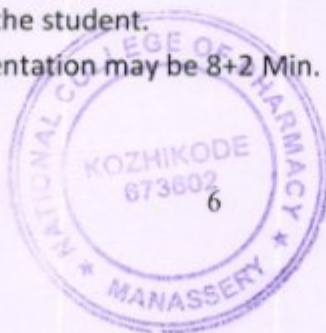
Assignments :

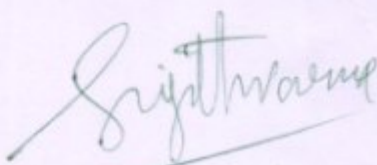
Students are required to submit written assignments on the topics given to them. Topics allotted should cover recent developments in drug therapy of various diseases. A minimum of THREE assignments [1500 – 2000 words] should be submitted for evaluation.

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Max Marks	20	70
Duration	03hrs	04hrs

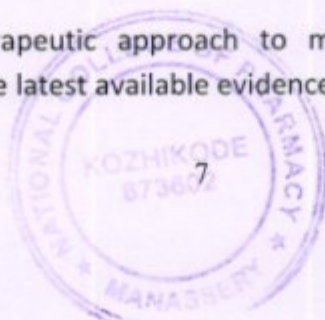
Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

1.2 - PHARMACOTHERAPEUTICS – III (THEORY)

Theory : 3 Hrs. /Week

- 1 Scope :** This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.
- 2 Objectives:** At completion of this subject it is expected that students will be able to understand –
 - a. the pathophysiology of selected disease states and the rationale for drug therapy;
 - b. the therapeutic approach to management of these diseases;
 - c. the controversies in drug therapy;
 - d. the importance of preparation of individualised therapeutic plans based on diagnosis;
 - e. needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects);
 - f. describe the pathophysiology of selected disease states and explain the rationale for drug therapy;
 - g. to summarize the therapeutic approach to management of these diseases including reference to the latest available evidence;

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- h. to discuss the controversies in drug therapy;
- i. to discuss the preparation of individualised therapeutic plans based on diagnosis; and
- j. identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).

Text Books

- a. Clinical Pharmacy and Therapeutics - Roger and Walker, Churchill Livingstone publication
- b. Pharmacotherapy: A Pathophysiologic approach - Joseph T. Dipiro et al. Appleton & Lange

Reference Books

- a. Pathologic basis of disease - Robins SL, W.B.Saunders publication
- b. Pathology and therapeutics for Pharmacists: A Basis for Clinical Pharmacy Practice - Green and Harris, Chapman and Hall publication
- c. Clinical Pharmacy and Therapeutics - Eric T. Herfindal, Williams and Wilkins Publication
- d. Applied Therapeutics: The clinical Use of Drugs. Lloyd Young and Koda-Kimble MA
- e. Avery's Drug Treatment, 4th Edn, 1997, Adis International Limited.
- f. Relevant review articles from recent medical and pharmaceutical literature.

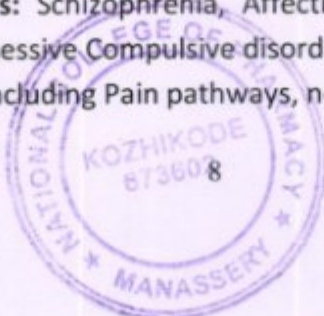
3. Detailed syllabus and lecture wise schedule:

Etiopathogenesis and pharmacotherapy of diseases associated with following systems/diseases

Title of the topic

1. **Gastrointestinal system:** Peptic ulcer disease, Gastro Esophageal Reflux Disease, Inflammatory bowel disease, Liver disorders - Alcoholic liver disease, Viral hepatitis including jaundice, and Drug induced liver disorders.
2. **Haematological system:** Anaemias, Venous thromboembolism, Drug induced blood disorders.
3. **Nervous system:** Epilepsy, Parkinsonism, Stroke, Alzheimer's disease,
4. **Psychiatry disorders:** Schizophrenia, Affective disorders, Anxiety disorders, Sleep disorders, Obsessive Compulsive disorders
5. Pain management including Pain pathways, neuralgias, headaches.

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6. Evidence Based Medicine

1.2 - PHARMACOTHERAPEUTICS – III (PRACTICAL)

Practical : 3 Hrs./Week

Practicals:

Hospital postings for a period of at least 50 hours is required to understand the principles and practice involved in ward round participation and clinical discussion on selection of drug therapy. Students are required to maintain a record of 15 cases observed in the ward and the same should be submitted at the end of the course for evaluation. Each student should present at least two medical cases they have observed and followed in the wards.

Assignments:

Students are required to submit written assignments on the topics given to them. Topics allotted should cover recent developments in drug therapy of various diseases. A minimum of THREE assignments [1500 – 2000 words] should be submitted for evaluation.

Format of the assignment:

- 1 Minimum & Maximum number of pages
- 2 Reference(s) shall be included at the end.
- 3 Assignment can be a combined presentation at the end of the academic year
- 4 It shall be computer draft copy
- 5 Name and signature of the student
- 6 Time allocated for presentation may be 8+2 Min.

Scheme of Practical Examination:

	Sessionals	Annual
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

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Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

1.3 - HOSPITAL PHARMACY (THEORY)

Theory : 2 Hrs. /Week

1. **Scope:** In the changing scenario of pharmacy practice in India, for successful practice of Hospital Pharmacy, the students are required to learn various skills like drug distribution, drug dispensing, manufacturing of parenteral preparations, drug information, patient counselling, and therapeutic drug monitoring for improved patient care.
2. **Objectives:** Upon completion of the course, the student shall be able to –
 - a. know various drug distribution methods;
 - b. know the professional practice management skills in hospital pharmacies;
 - c. provide unbiased drug information to the doctors;
 - d. know the manufacturing practices of various formulations in hospital set up;
 - e. appreciate the practice based research methods; and
 - f. appreciate the stores management and inventory control.

Text books: (latest editions)

- a. Hospital pharmacy by William .E. Hassan
- b. A text book of Hospital Pharmacy by S.H.Merchant & Dr. J.S. Qadry. Revised by R.K.Goyal & R.K. Parikh

References:

- a. WHO consultative group report.
- b. R.P.S. Vol.2. Part –B; Pharmacy Practice section.
- c. Handbook of pharmacy – health care. Edt. Robin J Harman. The Pharmaceutical press.

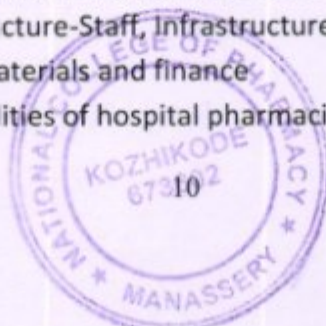
3. Lecture wise programme : Topics

1 Hospital - its Organisation and functions

2 Hospital pharmacy-Organisation and management

- a. Organizational structure-Staff, Infrastructure & work load statistics
- b. Management of materials and finance
- c. Roles & responsibilities of hospital pharmacist

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3. The Budget – Preparation and implementation

4 Hospital drug policy

- a. Pharmacy and Therapeutic committee (PTC)
- b. Hospital formulary
- c. Hospital committees
 - Infection committee
 - Research and ethical committee
- d. developing therapeutic guidelines
- e. Hospital pharmacy communication - Newsletter

5. Hospital pharmacy services

- a. Procurement & warehousing of drugs and Pharmaceuticals
- b. Inventory control
Definition, various methods of Inventory Control ABC, VED, EOQ, Lead time, safety stock
- c. Drug distribution in the hospital
 - i. Individual prescription method
 - ii. Floor stock method
 - iii. Unit dose drug distribution method
- d. Distribution of Narcotic and other controlled substances
- e. Central sterile supply services – Role of pharmacist

6. Manufacture of Pharmaceutical preparations

- a. Sterile formulations – large and small volume parenterals
- b. Manufacture of Ointments, Liquids, and creams
- c. Manufacturing of Tablets, granules, capsules, and powders
- d. Total parenteral nutrition

7. Continuing professional development programs

Education and training

8. Radio Pharmaceuticals – Handling and packaging

9. Professional Relations and practices of hospital pharmacist



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1.3 - HOSPITAL PHARMACY (PRACTICAL)

Practical : 3 Hrs./Week

- 1 Assessment of drug interactions in the given prescriptions
- 2 Manufacture of parenteral formulations, powders.
- 3 Drug information queries.
- 4 Inventory control

List of Assignments:

- 1 Design and Management of Hospital pharmacy department for a 300 bedded hospital.
- 2 Pharmacy and Therapeutics committee – Organization, functions, and limitations.
- 3 Development of a hospital formulary for 300 bedded teaching hospital
- 4 Preparation of ABC analysis of drugs sold in one month from the pharmacy.
- 5 Different phases of clinical trials with elements to be evaluated.
- 6 Various sources of drug information and systematic approach to provide unbiased drug information.
- 7 Evaluation of prescriptions generated in hospital for drug interactions and find out the suitable management.

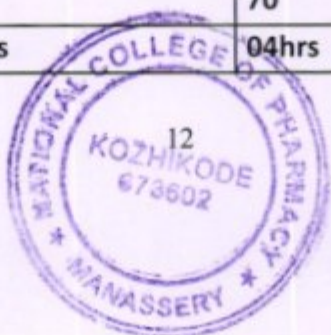
Special requirements:

- 1 Each college should sign MoU with nearby local hospital having minimum 150 beds for providing necessary training to the students' on hospital pharmacy activities.
- 2 Well equipped with various resources of drug information.

Scheme of Practical Examination:

	Sessionals	Annual
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

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CLINICAL PHARMACY PRACTICE (MPP 101T)

Scope

This course is designed to impart the basic knowledge and skills that are required to practice pharmacy including the provision of pharmaceutical care services to both healthcare professionals and patients in clinical settings.

Objectives

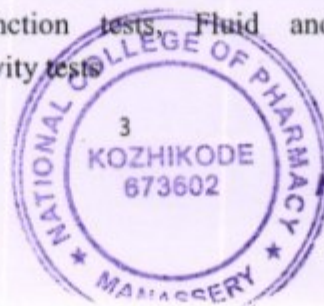
Upon completion of this course it is expected that students shall be able to:

- Understand the elements of pharmaceutical care and provide comprehensive patient care services
- Interpret the laboratory results to aid the clinical diagnosis of various disorders
- Provide integrated, critically analyzed medicine and poison information to enable healthcare professionals in the efficient patient management

THEORY

60Hrs

1. Introduction to Clinical Pharmacy: Definition, evolution and scope of clinical pharmacy, International and national scenario of clinical pharmacy practice, Pharmaceutical care
Clinical Pharmacy Services: Ward round participation, Drug therapy review (Drug therapy monitoring including medication order review, chart endorsement, clinical review and pharmacist interventions) 12Hrs
2. Clinical Pharmacy Services: Patient medication history interview, Basic concept of medicine and poison information services, Basic concept of pharmacovigilance, Hemovigilance, Materiovigilance and AEFI, Patient medication counselling, Drug utilisation evaluation, Documentation of clinical pharmacy services, Quality assurance of clinical pharmacy services. 12Hrs
3. Patient Data Analysis: 12Hrs
Patient Data & Practice Skills: Patient's case history - its structure and significances in drug therapy management, Common medical abbreviations and terminologies used in clinical practice, Communication skills: verbal and non-Verbal communications, its applications in patient care services.
Lab Data Interpretation: Hematological tests, Renal function tests
Liver function tests
4. Lab Data Interpretation: Tests associated with cardiac disorders, Pulmonary function tests, Thyroid function tests, Fluid and electrolyte balance, Microbiological culture sensitivity tests 12Hrs



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5. Medicines & Poison Information Services Medicine Information Service: 12Hrs
Definition and need for medicine information service, Medicine information resources, Systematic approach in answering medicine information queries, Preparation of verbal and written response, Establishing a drug information centre.
Poison Information Service: Definition, need, organization and functions of poison information centre.

REFERENCES

1. A Textbook of Clinical Pharmacy Practice – Essential concepts and skills – Parthasarathi G, Karin Nyfort-Hansen and Milap Nahata
2. Practice Standards and Definitions - The Society of Hospital Pharmacists of Australia
3. Basic skills in interpreting laboratory data - Scott LT, American Society of Health System Pharmacists Inc
4. Relevant review articles from recent medical and pharmaceutical literature.

PHARMACOTHERAPEUTICS-I (MPP 102T)

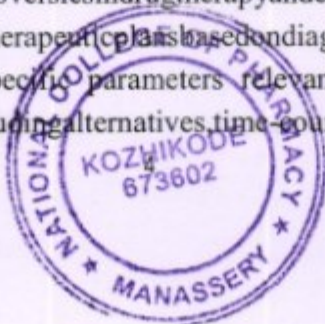
Scope

This course aims to enable the students to understand the different treatment approaches in managing various disease conditions. Also, it imparts knowledge and skills in optimizing drug therapy of a patient by individualizing the treatment plan through evidence-based medicines.

Objectives

Upon completion of this course it is expected that students shall be able to:

- Describe and explain the rationale for drug therapy
- Summarize the therapeutic approach for management of various disease conditions including reference to the latest available evidence
- Discuss the clinical controversies in drug therapy and evidence based medicine
- Prepare individualized therapeutic plans based on diagnosis
- Identify the patient specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory



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indices of therapeutic response and adverse effect/s)

THEORY

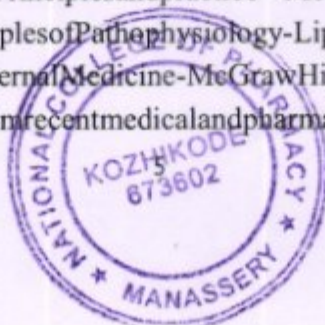
60Hrs

Etiopathogenesis and pharmacotherapy of diseases associated with following systems

1. Cardiovascular system: Hypertension, Congestive cardiac failure, Acute coronary syndrome, Arrhythmias, Hyperlipidemias. 12Hrs
2. Respiratory system: Asthma, Chronic obstructive airways disease, Drug induced pulmonary diseases 12Hrs
Endocrine system: Diabetes, Thyroid diseases
3. Gastrointestinal system: Peptic ulcer diseases, Reflux esophagitis, Inflammatory bowel diseases, Jaundice & hepatitis 12Hrs
4. Gastrointestinal system: Cirrhosis, Diarrhea and Constipation, Drug-induced liver disease 12Hrs
Hematological diseases: Anemia, Deep vein thrombosis, Drug induced hematological disorders
5. Bone and joint disorders: Rheumatoid arthritis, Osteoarthritis, Gout, Osteoporosis 12Hrs
Dermatological Diseases: Psoriasis, Eczema and scabies, impetigo, drug induced skin disorders
Ophthalmology: Conjunctivitis, Glaucoma

REFERENCES

1. Roger and Walker. Clinical Pharmacy and Therapeutics – Churchill Livingstone publication
2. Joseph T. Dipiro et al. Pharmacotherapy: A Pathophysiologic Approach- Appleton & Lange
3. Robins SL. Pathologic basis of disease-W.B. Saunders publication
4. Eric T. Herfindal. Clinical Pharmacy and Therapeutics-Williams and Wilkins Publication
5. Lloyd Young and Koda-Kimble MA Applied Therapeutics: The clinical Use of Drugs- Lippincott Williams and Wilkins
6. Chisholm- Burns Wells Schwinghammer Malone and Joseph P Dipiro. Pharmacotherapy Principles and practice—McGraw Hill Publication
7. Carol Mattson Porth. Principles of Pathophysiology-Lippincott Williams and Wilkins
8. Harrison's. Principles of Internal Medicine-McGraw Hill
9. Relevant review articles from recent medical and pharmaceutical literature



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HOSPITAL & COMMUNITY PHARMACY (MPP 103T)

Scope

This course is designed to impart basic knowledge and skills that are required to practice pharmacy in both hospital and community settings.

Objectives

Upon completion of this course it is expected that students shall be able to:

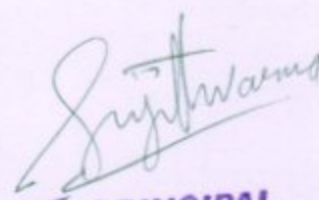
- Understand the organizational structure of hospital pharmacy
- Understand drug policy and drug committees
- Know about procurement & drug distribution practices
- Know the admixtures of radiopharmaceuticals
- Understand the community pharmacy management
- Know about value added services in community pharmacies

THEORY

60Hrs

1. Introduction to Hospitals – Definition, classification, organizational structure 12Hrs
Hospital Pharmacy: Definition, Relationship of hospital pharmacy department with other departments, Organizational structure, legal requirements, work load statistics, Infrastructural requirements, Hospital Pharmacy Budget and Hospital Pharmacy management
Hospital Drug Policy: Pharmacy & Therapeutics Committee, Infection Control committee, Research & Ethics Committee, Management of Medicines as per NABH
2. Hospital Formulary Guidelines and its development, Developing Therapeutic guidelines, Drug procurement process, and methods of Inventory control, Methods of Drug distribution, Intravenous admixtures, Hospital Waste Management 12Hrs
3. Education and training: Training of technical staff, training and continuing education for pharmacists, Pharmacy students, Medical staff and students, Nursing staff and students, Formal and informal meetings and lectures, Drug and therapeutics newsletter. 12Hrs
Community Pharmacy Practice: Definition, roles & responsibilities of community




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pharmacists, and their relationship with other health care providers.


Community Pharmacy management: Legal requirements to start community pharmacy, site selection, layout & design, drug display, superdrug store model, accounts and audits, Good dispensing practices, Different softwares & databases used in community pharmacies. Entrepreneurship in community pharmacy.

4. Prescription – Legal requirements & interpretation, prescription related problems 12Hrs
Responding to symptoms of minor ailments: Head ache, pyrexia, menstrual pains, food and drug allergy,
OTC medication: Rational use of over the counter medications Medication counseling and use of patient information leaflets Medication adherence– Definition, factors influencing adherence behavior, strategies to improve medication adherence Patient referral to the doctors
ADR monitoring in community pharmacies
5. Health Promotion– Definition and health promotion activities, family planning, 12Hrs
Health screening services, first aid, prevention of communicable and non-communicable diseases, smoking cessation, Child & mother care
National Health Programs- Role of Community Pharmacist in Malaria and TB control programs
Home Medicines review program – Definition, objectives, Guidelines, method and outcomes
Research in community pharmacy Practice

REFERENCES

1. Hospital Pharmacy- Hassan WE. Lea and Febiger publication.
2. Textbook of hospital pharmacy- Allwood MC and Blackwell.
3. Avery's Drug Treatment, Adis International Limited.
4. Community Pharmacy Practice– Ramesh A depu, BS Publishers, Hyderabad
5. Remington Pharmaceutical Sciences.
6. Relevant review articles from recent medical and pharmaceutical literature




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CLINICAL RESEARCH (MPP 104T)

Scope

This course aims to provide the students an opportunity to learn drug development process especially the phases of clinical trials and also the ethical issues involved in the conduct of clinical research. Also, it aims to impart knowledge and develop skills on conceptualizing, designing, conducting and managing clinical trials.

Objectives

Upon completion of this course it is expected that students shall be able to:

- Know the new drug development process.
- Understand the regulatory and ethical requirements.
- Appreciate and conduct the clinical trials activities
- Know safety monitoring and reporting in clinical trials
- Manage the trial coordination process

THEORY

60Hrs

1. Drug development process: Introduction, various approaches to drug discovery, Investigational new drug application submission Ethics in Biomedical Research: Ethical Issues in Biomedical Research – Principles of ethics in biomedical research, Ethical committee [institutional review board] - its constitution and functions, Challenges in implementation of ethical guidelines, ICH GCP guidelines and ICMR guidelines in conduct of Clinical trials, Drug Safety Reporting. 12Hrs
2. Types and Designs used in Clinical Research: Planning and execution of clinical trials, Various Phases of clinical trials, Bioavailability and Bioequivalence studies, Randomization techniques (Simple randomization, restricted randomization, blocking method and stratification), Types of research designs based on Controlling Method (Experimental, Quasi experimental, and Observational methods) Time Sequences (Prospective and Retrospective), Sampling methods (Cohort study, case Control study and cross sectional study), Health outcome measures (Clinical & Physiological, Humanistic and economic) 12Hrs

Clinical Trial Study team: Roles and responsibilities of Investigator, Study Coordinator, Sponsor, Monitor, Contract Research Organization.



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3. Clinical trial Documents: Guidelines to the preparation of following documents: 12Hrs
Protocols, Investigator's Brochure, Informed Consent Form, Case report forms,
Contracts and agreements, Dairy Cards

Clinical Trial Start up activities: Site Feasibility Studies, Site/Investigator selection, Pre-study visit, Investigator meeting, Clinical trial agreement execution, Ethics committee document preparation and submission

4. Investigational Product: Procurement and Storage of investigation product 12Hrs

Filing procedures: Essential documents for clinical trial, Trial Master File preparation and maintenance, Investigator Site File, Pharmacy File, Site initiation visit, Conduct, Report and Follow up Clinical Trial Monitoring and Closeout:

Preparation and conduct of monitoring visit: Review of sourced documents, CRF, ICF, IP storage, accountability and reconciliation, Study Procedure, EC communications, Safety reporting, Monitoring visit reporting and follow-up

Close-Out visit: Study related documents collection, Archival requirement, Investigational Product reconciliation and destruction, Close-Out visit report.

5. Quality Assurance and Quality Control in Clinical Trials: Types of audits, Audit criteria, Audit process, Responsibilities of stakeholders in audit process, Audit follow-up and documentation, Audit resolution and Preparing for FDA inspections, Fraud and misconduct management 12Hrs

Data Management

Infrastructure and System Requirement for Data Management: Electronic data capture systems, Selection and implementation of new systems, System validation and test procedures, Coding dictionaries, Data migration and archival

Clinical Trial Data Management: Standard Operating Procedures, Data management plan, CRF & Database design considerations, Study set-up, Data entry, CRF tracking and corrections, Data cleaning, Managing laboratory and ADR data, Data transfer and database lock, Quality Control and Quality Assurance in CDM, Data mining and warehousing.

REFERENCES

1. Principles and practice of pharmaceutical medicine, Second edition. Authors: Lionel D. Edward, Andrew J. Flether, Anthony W. Fos, Peter D. Sloaier. Publisher: Wiley;
2. Handbook of clinical research. Julia Lloyd and Ann Raven Ed. Churchill Livingstone
3. Principles of Clinical Research edited by Giovanni di Ignazio, Di Giovanna and Haynes.



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4. Central Drugs Standard Control Organization. Good Clinical Practices- Guidelines for Clinical Trials on Pharmaceutical Products in India. New Delhi: Ministry of Health.
5. International Conference on Harmonisation of Technical Requirements for Registration of Pharmaceuticals for human use. ICH Harmonised Tripartite Guideline. Guideline for Good Clinical Practice. E6; May 1996.
6. Ethical Guidelines for Biomedical Research on Human Subjects. Indian Council of Medical Research, New Delhi.
7. Textbook of Clinical Trials edited by David Machin, Simon Day and Sylvan Green, John Wiley and Sons.
8. Clinical Data Management edited by RKR Rondels, SA Varley, CF Webbs. Second Edition, Jan 2000, Wiley Publications.
9. Goodman & Gilman: JG Hardman, LE Limbard, McGraw Hill Publications. 10. Relevant review articles from recent medical and pharmaceutical literature.

PHARMACY PRACTICE PRACTICAL – I (MPP 105P)

Pharmacy Practice practical component includes experiments covering important topics of the courses Clinical Pharmacy Practice, Pharmacotherapeutics-I, Hospital & Community Pharmacy and Clinical Research.

List of Experiments (24)

1. Treatment Chart Review (one)
2. Medication History Interview (one)
3. Patient Medication Counseling (two)
4. Drug Information Query (two)
5. Poison Information Query (one)
6. Lab Data Interpretation (two)
7. Presentation of clinical cases of various disease conditions adopting Pharmaceutical Care Plan Model (eight)
8. ABC Analysis of a given list of medications (one)
9. Preparation of content of a medicine, with proper justification, for the inclusion in the hospital formulary (one)
10. Formulation and dispensing of a given IV admixtures (one)
11. Preparation of a patient information leaflet (two)
12. Preparation of Study Protocol (one)
13. Preparation of Informed Consent Form (one)



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PHARMACOTHERAPEUTICS II (MPP 202T)

Scope

This course aims to enable the students to understand the different treatment approaches in managing various disease conditions. Also, it imparts knowledge and skills in optimizing drug therapy of a patient by individualizing the treatment plan through evidence-based medicines.

Objectives

Upon completion of this course it is expected that students shall be able to:

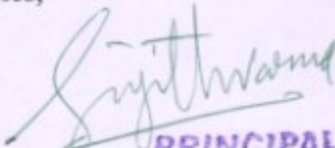
- Describe and explain the rationale for drug therapy
- Summarize the therapeutic approach for management of various disease conditions including reference to the latest available evidence
- Discuss the clinical controversies in drug therapy and evidence-based medicine
- Prepare individualized therapeutic plans based on diagnosis
- Identify the patient specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effect/s)

THEORY

60Hrs

1. Nervous system: Epilepsy, Parkinson's disease, Stroke, Headache, Alzheimer's disease, Neuralgias and Pain pathways and Pain management. 12Hrs
2. Psychiatric disorders: Schizophrenia, Depression, Anxiety disorders, Sleep disorders, Drug induced psychiatric disorders 12Hrs
Renal system: Acute renal failure, Chronic renal failure, Renal dialysis, Drug induced renal disease
3. Infectious diseases: General guidelines for the rational use of antibiotics and surgical prophylaxis, Urinary tract infections, Respiratory tract infections, Gastroenteritis, Tuberculosis, Malaria, Bacterial endocarditis, Septicemia. 12Hrs
4. Infectious diseases: Meningitis, HIV and opportunistic infections, Rheumatic fever, Dengue fever, H1N1, Helmentiasis, Fungal infections 12Hrs
Gynecological disorders: Dysmenorrhea, Hormone replacement therapy.
5. Oncology: General principles of cancer chemotherapy, pharmacotherapy of breast cancer, lung cancer, head & neck cancer, hematological malignancies, Management of nausea and vomiting, Palliative care 12Hrs




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London.


5. George EMackinnon III. Understanding health outcomes and pharmacoeconomics.
6. Graker, Dennis. Pharmacoeconomics and outcomes.
7. Walley, Pharmacoeconomics.
8. Pharmacoeconomic—ed. by Nowakowska—University of Medical Sciences, Poznan.
9. Relevant review articles from recent medical and pharmaceutical literature

PHARMACY PRACTICE PRACTICAL - II (MPP 205P)

Pharmacy Practice practical component includes experiments covering important topics of the courses Principles of Quality Use of Medicines, Pharmacotherapeutics-II, Clinical Pharmacokinetics & Therapeutic Drug Monitoring and Pharmacoepidemiology and Pharmacoeconomics.

List of Experiments (24)

1. Causality assessment of adverse drug reactions (three)
2. Detection and management of medication errors (three)
3. Rational use of medicines in special population (three)
4. Presentation of clinical cases of various disease conditions adopting Pharmaceutical Care Plan Model (eight)
5. Calculation of Bioavailability and Bioequivalence from the given data (two)
6. Interpretation of Therapeutic Drug Monitoring reports of a given patient (three)
7. Calculation of various Pharmacoeconomic outcome analysis for the given data (two)


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6. Chromatographic Analysis of Pharmaceuticals – John A Adamovics, 2nd Edition, Marcel Dekker, New York, USA. 1997.
7. Chromatographic methods in clinical chemistry & Toxicology – Roger L Bertholf, Ruth E Winecker, John Wiley & Sons, New Jersey, USA. 2007.
8. Good Laboratory Practice Regulations, 2nd Edition, Sandy Weinberg Vol. 69, Marcel Dekker Series, 1995.
9. Good laboratory Practice Regulations – Allen F. Hirsch, Volume 38, Marcel Dekker Series, 1989.
10. ICH, USFDA & CDSCO Guidelines.
11. Journal Publications in Spectroscopy, Maria Palmer et. al.

QUALITY CONTROL AND QUALITY ASSURANCE (MPA 203T)

Scope

This course deals with the various aspects of quality control and quality assurance aspects of pharmaceutical industries. It covers the important aspects like cGMP, QC tests, documentation, quality certifications, GLP and regulatory affairs. Objectives

At the completion of this subject it is expected that the student shall be able to know

- the cGMP aspects in a pharmaceutical industry
- to appreciate the importance of documentation
- to understand the scope of quality certifications applicable to Pharmaceutical industries
- to understand the responsibilities of QA & QC departments

THEORY

60 Hrs

1. Concept and Evolution of Quality Control and Quality Assurance

12 Hrs

Good Laboratory Practice, GMP, Overview of ICH Guidelines - QSEM, with special emphasis on Q-series guidelines.

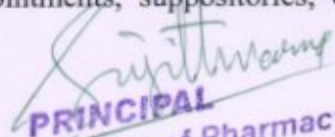
Good Laboratory Practices: Scope of GLP, Definitions, Quality assurance unit, protocol for conduct of nonclinical testing, control on animal house, report preparation and documentation

2. cGMP guidelines according to schedule M, USFDA (inclusive of CDER and CBER): 12 Hrs Pharmaceutical Inspection Convention (PIC), WHO and EMEA covering: Organization and personnel responsibilities, training, hygiene and personal records, drug industry location, design, construction and plant lay out, maintenance, sanitation, environmental control, utilities and maintenance of sterile areas, control of contamination and Good Warehousing Practice. CPCSEA guidelines.

3. Analysis of raw materials, finished products, packaging materials,

12 Hrs

In process quality control (IPQC), Developing specification (ICH Q6 and Q3) Purchase specifications and maintenance of stores for raw materials. In process quality control and finished products quality control for following formulation in Pharma industry according to Indian, US and British pharmacopoeias: tablets, capsules, ointments, suppositories, creams,


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- Modern Pharmaceutics; By Gillbert and S. Banker.
- Remington's Pharmaceutical Sciences.
- Advances in Pharmaceutical Sciences Vol. 1-5; By H.S. Bean & A.H. Beckett.
- Physical Pharmacy; By Alfred Martin
- Bentley's Textbook of Pharmaceutics – by Rawlins.
- Good manufacturing practices for Pharmaceuticals: A plan for total quality control, Second edition; By Sidney H. Willig.
- Quality Assurance Guide; By Organization of Pharmaceutical producers of India.
- Drug formulation manual; By D.P.S. Kohli and D.H. Shah. Eastern publishers, New Delhi.
- How to practice GMPs; By P.P. Sharma. Vandhana Publications, Agra.
- Pharmaceutical Process Validation; By Fra. R. Berry and Robert A. Nash.
- Pharmaceutical Preformulations; By J.J. Wells.
- Applied production and operations management; By Evans, Anderson, Sweeney and Williams.
- Encyclopaedia of Pharmaceutical technology, Vol I – III.

REGULATORY AFFAIRS (MPH 104T)

SCOPE

Course designed to impart advanced knowledge and skills required to learn the concept of generic drug and their development, various regulatory filings in different countries, different phases of clinical trials and submitting regulatory documents: filing process of IND, NDA and ANDA

- To know the approval process of
- To know the chemistry, manufacturing controls and their regulatory importance
- To learn the documentation requirements for
- To learn the importance and

OBJECTIVES:

Upon completion of the course, it is expected that the students will be able to understand

- The Concepts of innovator and generic drugs, drug development process
- The Regulatory guidance's and guidelines for filing and approval process
- Preparation of Dossiers and their submission to regulatory agencies in different countries.
- Post approval regulatory requirements for actives and drug products
- Submission of global documents in CTD/ eCTD formats
- Clinical trials requirements for approvals for conducting clinical trials
- Pharmacovigilence and process of monitoring in clinical trials.

THEORY 60 Hrs

1. Documentation in Pharmaceutical industry: Master formula record, DMF (Drug Master File), distribution records. Generic drugs product development Introduction, Hatch-Waxman act and amendments, CFR (Code of Federal Regulation), drug product performance, in-vitro, regulatory approval



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process, NDA approval process, BE and drug product assessment, in-vivo, scale up process approval changes, post marketing surveillance, outsourcing BA and BE to CRO. Regulatory requirement for product approval: API, biologics, novel, therapies obtaining NDA, ANDA for generic drugs ways and means of US registration for foreign drugs 12 Hrs

2. CMC, post approval regulatory affairs. Regulation for combination products and Medical devices. CTD and eCTD format, industry and FDA liaison. ICH-Guidelines of ICH-Q, S, E, M. Regulatory requirements of EU, MHRA, TGA and ROW countries. 12 Hrs

3. Non clinical drug development: Global submission of IND, NDA, ANDA. Investigational medicinal products dossier (IMPD) and investigator brochure (IB). 12 Hrs

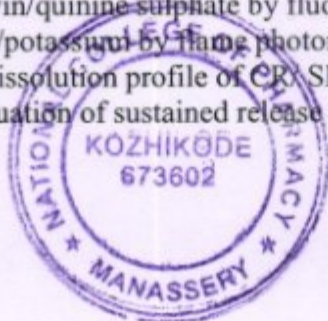
4. Clinical trials: Developing clinical trial protocols. Institutional review board/independent ethics committee. Formulation and working procedures informed Consent process and procedures. HIPAA-new, requirement to clinical study process, pharmacovigilance safety monitoring in clinical trials 12 Hrs

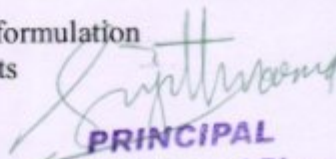
REFERENCES

- Generic Drug Product Development, Solid Oral Dosage forms, Leon Shargel and IsaderKaufer, Marcel Dekker series, Vol.143
- The Pharmaceutical Regulatory Process, Second Edition Edited by Ira R. Berry and Robert P. Martin, Drugs and the Pharmaceutical Sciences, Vol.185, Informa Health care Publishers.
- New Drug Approval Process: Accelerating Global Registrations By Richard A Guarino, MD, 5th edition, Drugs and the Pharmaceutical Sciences, Vol.190.
- Guidebook for drug regulatory submissions / Sandy Weinberg. By John Wiley & Sons. Inc.
- FDA regulatory affairs: a guide for prescription drugs, medical devices, and biologics/edited By Douglas J. Pisano, David Mantus.
- Clinical Trials and Human Research: A Practical Guide to Regulatory Compliance By Fay A. Rozovsky and Rodney K. Adams
- www.ich.org/
- www.fda.gov/
- europa.eu/index_en.htm
- <https://www.tga.gov.au/tga-basics>

PHARMACEUTICS PRACTICALS - I (MPH 105P)

- Analysis of pharmacopoeial compounds and their formulations by UV Vis spectrophotometer
- Simultaneous estimation of multi component containing formulations by UV spectrophotometry.
- Experiments based on HPLC
- Experiments based on Gas Chromatography
- Estimation of riboflavin/quinine sulphate by fluorimetry
- Estimation of sodium/potassium by flame photometry
- To perform In-vitro dissolution profile of CR, SR marketed formulation
- Formulation and evaluation of sustained release matrix tablets




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BP110P. PHARMACEUTICAL INORGANIC CHEMISTRY (Practical) 4Hours / Week

I Limit tests for following ions

- Limit test for Chlorides and Sulphates
- Modified limit test for Chlorides and Sulphates
- Limit test for Iron
- Limit test for Heavy metals
- Limit test for Lead
- Limit test for Arsenic

II Identification test

Magnesium hydroxide Ferrous sulphate Sodium bicarbonate Calcium gluconate Copper sulphate

III Test for purity

- Swelling power of Bentonite
- Neutralizing capacity of aluminum hydroxide gel
- Determination of potassium iodate and iodine in potassium Iodide

IV Preparation of inorganic pharmaceuticals

Boric acid Potashalum Ferrous sulphate

Recommended Books (Latest Editions)

1. A.H. Beckett & J.B. Stenlake's, Practical Pharmaceutical Chemistry Vol I & II, Stahlone Press of University of London, 4th edition.
2. A.I. Vogel, Text Book of Quantitative Inorganic analysis
3. P. Gundu Rao, Inorganic Pharmaceutical Chemistry, 3rd Edition
4. M.L. Schroff, Inorganic Pharmaceutical Chemistry
5. Bentley and Driver's Textbook of Pharmaceutical Chemistry
6. Anand & Chatwal, Inorganic Pharmaceutical Chemistry
7. Indian Pharmacopoeia

BP105T.COMMUNICATION SKILLS (Theory)

30 Hours

Scope: This course will prepare the young pharmacy student to interact effectively with doctors, nurses, dentists, physiotherapists and other health workers. At the end of this course the student will get the soft skills set to work cohesively with the team as a team player and will add value to the pharmaceutical business.

Objectives:

Upon completion of the course the student shall be able to

1. Understand the behavioral needs for a Pharmacist to function effectively in the areas of pharmaceutical operation
2. Communicate effectively (Verbal and Non Verbal)
3. Effectively manage the team as a team player
4. Develop interview skills
5. Develop Leadership qualities and essentials



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Course content:

UNIT – I

07 Hours

Communication Skills: Introduction, Definition, The Importance of Communication, The Communication Process – Source, Message, Encoding, Channel, Decoding, Receiver, Feedback, Context

- **Barriers to communication:** Physiological Barriers, Physical Barriers, Cultural Barriers, Language Barriers, Gender Barriers, Interpersonal Barriers, Psychological Barriers, Emotional barriers
- **Perspectives in Communication:** Introduction, Visual Perception, Language, Other factors affecting our perspective – Past Experiences, Prejudices, Feelings, Environment

UNIT – II

07 Hours

- **Elements of Communication:** Introduction, Face to Face Communication – Tone of Voice, Body Language (Non-verbal communication), Verbal Communication, Physical Communication
- **Communication Styles:** Introduction, The Communication Styles Matrix with example for each – Direct Communication Style, Spirited Communication Style, Systematic Communication Style, Considerate Communication Style

UNIT – III

07 Hours

- **Basic Listening Skills:** Introduction, Self-Awareness, Active Listening, Becoming an Active Listener, Listening in Difficult Situations
- **Effective Written Communication:** Introduction, When and When Not to Use Written Communication – Complexity of the Topic, Amount of Discussion Required, Shades of Meaning, Formal Communication
- **Writing Effectively:** Subject Lines, Put the Main Point First, Know Your Audience, Organization of the Message

UNIT – IV

05 Hours

- **Interview Skills:** Purpose of an interview, Do's and Dont's of an interview
- **Giving Presentations:** Dealing with Fears, Planning your Presentation, Structuring Your Presentation, Delivering Your Presentation, Techniques of Delivery

UNIT – V

04 Hours

- **Group Discussion:** Introduction, Communication skills in group discussion, Do's and Dont's of group discussion

BP111P. COMMUNICATION SKILLS (Practical)

2 Hours / week

The following learning modules are to be conducted using wordsworth® English language lab software

Basic communication covering the following topics Meeting People Asking Questions Making Friends What did you do? Do's and Dont's



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Pronunciations covering the following topics

Pronunciation (Consonant Sounds) Pronunciation and Nouns

Pronunciation (Vowel Sounds)

Advanced Learning

Listening Comprehension / Direct and Indirect Speech

Figures of Speech Effective Communication Writing Skills

Effective Writing Interview Handling Skills E-Mail etiquette Presentation Skills

Recommended Books: (Latest Edition)

1. Basic communication skills for Technology, Andreja. J. Ruther Ford, 2nd Edition, Pearson Education, 2011
2. Communication skills, Sanjay Kumar, Pushpalata, 1st Edition, Oxford Press, 2011
3. Organizational Behaviour, Stephen .P. Robbins, 1st Edition, Pearson, 2013
4. Brilliant- Communication skills, Gill Hasson, 1st Edition, Pearson Life, 2011
5. The Ace of Soft Skills: Attitude, Communication and Etiquette for success, Gopala Swamy Ramesh, 5th Edition, Pearson, 2013
6. Developing your influencing skills, Deborah Dalley, Lois Burton, Margaret, Green hall, 1st Edition Universe of Learning LTD, 2010
7. Communication skills for professionals, Konar nira, 2nd Edition, New arrivals – PHI, 2011
8. Personality development and soft skills, Barun K Mitra, 1st Edition, Oxford Press, 2011
9. Soft skill for everyone, Butter Field, 1st Edition, Cengage Learning india pvt.ltd, 2011
10. Soft skills and professional communication, Francis Peters SJ, 1st Edition, Mc Graw Hill Education, 2011
11. Effective communication, John Adair, 4th Edition, Pan Mac Millan, 2009
12. Bringing out the best in people, Aubrey Daniels, 2nd Edition, Mc Graw Hill, 1999

BP 106RBT.REMEDIAL BIOLOGY (Theory)

30 Hours

Scope: To learn and understand the components of living world, structure and functional system of plant and animal kingdom.

Objectives: Upon completion of the course, the student shall be able to

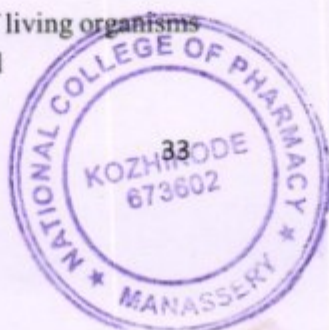
1. know the classification and salient features of five kingdoms of life
2. understand the basic components of anatomy & physiology of plant
3. know understand the basic components of anatomy & physiology animal with special reference to human

UNIT I

07 Hours

Living world:

- Definition and characters of living organisms
- Diversity in the living world
- Binomial nomenclature



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- Five kingdoms of life and basis of classification. Salient features of Monera, Protista, Fungi, Animalia and Plantae, Virus,

Morphology of Flowering plants

- Morphology of different parts of flowering plants – Root, stem, inflorescence, flower, leaf, fruit, seed.
- General Anatomy of Root, stem, leaf of monocotyledons & Dicotyledones.

UNIT II

07 Hours

Body fluids and circulation

- Composition of blood, blood groups, coagulation of blood
- Composition and functions of lymph
- Human circulatory system
- Structure of human heart and blood vessels
- Cardiac cycle, cardiac output and ECG

Digestion and Absorption

- Human alimentary canal and digestive glands
- Role of digestive enzymes
- Digestion, absorption and assimilation of digested food

Breathing and respiration

- Human respiratory system
- Mechanism of breathing and its regulation
- Exchange of gases, transport of gases and regulation of respiration
- Respiratory volumes

UNIT III

07 Hours

Excretory products and their elimination

- Modes of excretion
- Human excretory system— structure and function
- Urine formation
- Renin angiotensin system

Neural control and coordination

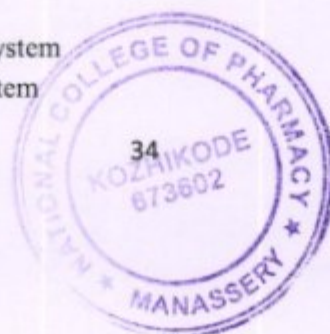
- Definition and classification of nervous system
- Structure of a neuron
- Generation and conduction of nerve impulse
- Structure of brain and spinal cord
- Functions of cerebrum, cerebellum, hypothalamus and medulla oblongata

Chemical coordination and regulation

- Endocrine glands and their secretions
- Functions of hormones secreted by endocrine glands

Human reproduction

- Parts of female reproductive system
- Parts of male reproductive system



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- Spermatogenesis and Oogenesis
- Menstrual cycle

UNIT IV

05 Hours

Plants and mineral nutrition:

- Essential mineral, macro and micronutrients
- Nitrogen metabolism, Nitrogen cycle, biological nitrogen fixation

Photosynthesis

- Autotrophic nutrition, photosynthesis, Photosynthetic pigments, Factors affecting photosynthesis.

UNIT V

04 Hours

Plant respiration: Respiration, glycolysis, fermentation (anaerobic).

Plant growth and development

- Phases and rate of plant growth, Condition of growth, Introduction to plant growth regulators

Cell - The unit of life

- Structure and functions of cell and cell organelles. Cell division

Tissues

- Definition, types of tissues, location and functions.

Text Books

- Text book of Biology by S. B. Gokhale
- A Text book of Biology by Dr. Thulajappa and Dr. Sectaram.

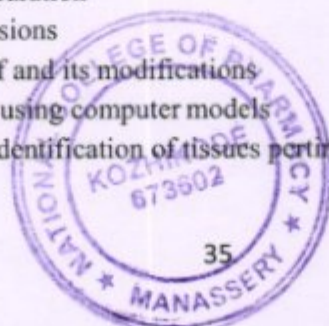
Reference Books

- A Text book of Biology by B.V. Sreenivasa Naidu
- A Text book of Biology by Naidu and Murthy
- Botany for Degree students By A.C.Dutta.
- Outlines of Zoology by M. Ekambaranatha ayyer and T. N. Ananthkrishnan.
- A manual for pharmaceutical biology practical by S.B. Gokhale and C. K. Kokate

BP112RBP.REMEDIAL BIOLOGY (Practical)

30 Hours

- Introduction to experiments in biology
 - Study of Microscope
 - Section cutting techniques
 - Mounting and staining
 - Permanent slide preparation
- Study of cell and its inclusions
- Study of Stem, Root, Leaf and its modifications
- Detailed study of frog by using computer models
- Microscopic study and identification of tissues pertinent to stem, root, leaf, seed, fruit and flower.



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6. Identification of bones
7. Determination of blood group
8. Determination of blood pressure
9. Determination of tidal volume

Reference Books

1. Practical human anatomy and physiology. by S.R.Kale and R.R.Kale.
2. A Manual of pharmaceutical biology practical by S.B.Gokhale, C.K.Kokate and S.P.Shriwastava.
3. Biology practical manual according to National core curriculum .Biology forum of Karnataka. Prof .M.J.H.Shafi

BP 106RMT.REMEDIAL MATHEMATICS (Theory)

30 Hours

Scope: This is an introductory course in mathematics. This subject deals with the introduction to Partial fraction, Logarithm, matrices and Determinant, Analytical geometry, Calculus, differential equation and Laplace transform.

Objectives: Upon completion of the course the student shall be able to:-

1. Know the theory and their application in Pharmacy
2. Solve the different types of problems by applying theory
3. Appreciate the important application of mathematics in Pharmacy

Course Content:

UNIT – I

06 Hours

• **Partial fraction**

Introduction, Polynomial, Rational fractions, Proper and Improper-fractions, Partial fraction , Resolving into Partial fraction, Application of Partial Fraction in Chemical Kinetics and Pharmacokinetics

• **Logarithms**

Introduction, Definition, Theorems/Properties of logarithms, Common logarithms, Characteristic and Mantissa, worked examples, application of logarithm to solve pharmaceutical problems.

• **Function:**

Real Valued function, Classification of real valued functions,

• **Limits and continuity:**

Introduction , Limit of a function, Definition of limit of a function (-definition) ,

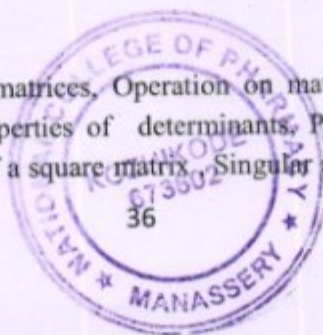
$$\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a} = na^{n-1}, \lim_{\theta \rightarrow 0} \frac{\sin \theta}{\theta} = 1$$

UNIT –II

06 hours

• **Matrices and Determinant:**

Introduction matrices, Types of matrices, Operation on matrices, Transpose of a matrix, Matrix Multiplication, Determinants, Properties of determinants, Product of determinants, Minors and co-Factors, Adjoint or adjugate of a square matrix, Singular and non-singular matrices, Inverse of



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4. Microsoft office Access - 2003, Application Development Using VBA, SQL Server, DAP and Infopath – Cary N.Prague – Wiley Dreamtech India (P) Ltd., 4435/7, Ansari Road, Daryagani, New Delhi – 110002

BP 206 T. ENVIRONMENTAL SCIENCES (Theory)

30 hours

Scope: Environmental Sciences is the scientific study of the environmental system and the status of its inherent or induced changes on organisms. It includes not only the study of physical and biological characters of the environment but also the social and cultural factors and the impact of man on environment.

Objectives: Upon completion of the course the student shall be able to:

1. Create the awareness about environmental problems among learners.
2. Impart basic knowledge about the environment and its allied problems.
3. Develop an attitude of concern for the environment.
4. Motivate learner to participate in environment protection and environment improvement.
5. Acquire skills to help the concerned individuals in identifying and solving environmental problems.
6. Strive to attain harmony with Nature.

Course content:

Unit-I

10 hours

The Multidisciplinary nature of environmental studies

Natural Resources

Renewable and non-renewable resources: Natural resources and associated problems

- a) Forest resources; b) Water resources; c) Mineral resources; d) Food resources; e) Energy resources; f) Land resources; Role of an individual in conservation of natural resources.

Unit-II

10 hours

- Ecosystems
- Concept of an ecosystem.
- Structure and function of an ecosystem.

Introduction, types, characteristic features, structure and function of the ecosystems: Forest ecosystem; Grassland ecosystem; Desert ecosystem; Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

Unit- III

10 hours

Environmental Pollution: Air pollution; Water pollution; Soil pollution

Recommended Books (Latest edition):

1. Y.K. Sing, Environmental Science, New Age International Pvt, Publishers, Bangalore
2. Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
3. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 013, India,
4. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p

5. Clark R.S., Marine Pollution, Clarendon Press Oxford
Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001,
6. Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p
7. De A.K., Environmental Chemistry, Wiley Eastern Ltd.
8. Down of Earth, Centre for Science and Environment

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9. Determination of acute oral toxicity (LD50) of a drug from a given data
10. Determination of acute skin irritation / corrosion of a test substance
11. Determination of acute eye irritation / corrosion of a test substance
12. Calculation of pharmacokinetic parameters from a given data

Note: **Wherever wet laboratory experiments are not feasible**, simulated experiments by software /videos may be used.

Recommended Books (Latest Editions)

1. Rang H. P., Dale M.M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchill Livingstone Elsevier
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata McGraw-Hill
3. Goodman and Gilman's, The Pharmacological Basis of Therapeutics
4. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs, The Point Lippincott Williams & Wilkins
5. Mycek M.J, Gelnet S.B and Perper M.M. Lippincott's Illustrated Reviews-Pharmacology
6. K.D.Tripathi. Essentials of Medical Pharmacology, JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.
7. Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher
8. Modern Pharmacology with clinical Applications, by Charles R.Craig & Robert,
9. Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata.
10. Kulkarni SK. Handbook of experimental pharmacology. VallabhPrakashan,

BP 405 T.PHARMACOGNOSY AND PHYTOCHEMISTRY I (Theory)

45 Hours

Scope: The subject involves the fundamentals of Pharmacognosy like scope, classification of crude drugs, their identification and evaluation, phytochemicals present in them and their medicinal properties. To study production of plants and phytochemicals through plant tissue culture.

Objectives: Upon completion of the course, the student shall be able

1. To know the techniques in the cultivation and production of crude drugs
2. To know the crude drugs, their uses and chemical nature
3. To know the evaluation techniques for the herbal drugs
4. To carry out the microscopic and morphological evaluation of crude drugs

Course Content

UNIT-I

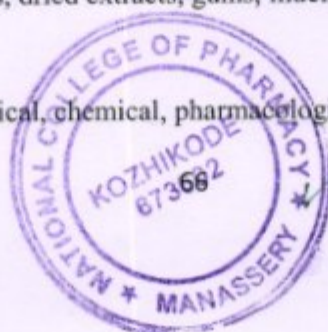
10 Hours

Introduction to Pharmacognosy:

- a. Definition, History, scope and development of Pharmacognosy.
- b. Sources of Drugs – Plants, Animals, Marine & Tissue culture
- c. Organized drugs, (seed, leaf, bark, wood, root, rhizome, flower, fruit and entire drug) unorganized drugs, (dried latex, dried juices, dried extracts, gums, mucilages, oleoresins and oleo- gum -resins).

Classification of drugs:

Alphabetical, morphological, taxonomical, chemical, pharmacological, chemo and serotaxonomical classification of drugs



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Quality control of Drugs of Natural Origin:

Adulteration of drugs of natural origin. Evaluation by organoleptic, microscopic, physical, chemical and biological methods.

Quantitative microscopy of crude drugs including lycopodium spore method, leaf constants, Camera Lucida, and calibration of eye piece micrometer using stage micrometer.

UNIT-II

10 Hours

Cultivation, Collection, Processing and storage of drugs of natural origin: **General aspects on cultivation and collection, processing and storage of drugs of natural origin. Factors influencing cultivation of medicinal plants. Plant hormones and their applications. Polyploidy, mutation and hybridization with reference to medicinal plants.**

Conservation of medicinal plants: In situ and ex situ conservation of medicinal plants.

UNIT-III

07 Hours

Plant tissue culture: Historical development of plant tissue culture, types of cultures, nutritional requirements, growth and their maintenance. Applications of plant tissue culture in Pharmacognosy. Edible vaccines

UNIT IV

10 Hours

Pharmacognosy in various systems of medicine:

Role of Pharmacognosy in allopathy and traditional systems of medicine namely, Ayurveda, Unani, Siddha, Homeopathy and Chinese systems of medicine.

Introduction to secondary metabolites:

Definition, classification, properties and general tests for identification of Alkaloids, Glycosides, Flavonoids, Tannins, Volatile oil and Resins.

UNIT V

08 Hours

Study of biological source, chemical constituents and uses of drugs of natural origin containing following Plant drugs /Products:

Fibers - Cotton, Jute, Hemp

Hallucinogen- Cannabis,

Teratogens- Tobacco, Colchicum, Veratrum

Natural allergens-Classification, Preparation and standardization of allergenic extract.

Primary metabolites:

General introduction, detailed study with respect to chemical constituents, sources, preparation, evaluation, preservation, storage, therapeutic uses and commercial utility as Pharmaceutical Aids and/or Medicines for the following Primary metabolites:

Carbohydrates: Acacia, Agar, Starch, Tragacanth, Honey.

Proteins and Enzymes: Gelatin, Casein, Proteolytic enzymes (Papain, Bromelain, Serratiopeptidase, Urokinase, Streptokinase, Pepsin).

Lipids (Waxes, fats, fixed oils): Castor oil, Chaulmoogra oil, Wool Fat, Bees wax.

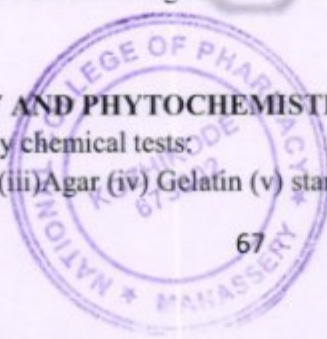
Marine Drugs: Novel medicinal agents from marine sources: Antiviral, Antimicrobial, Anticancer and Cardiovascular agents.

BP409 P. PHARMACOGNOSY AND PHYTOCHEMISTRY I (Practical)

4 Hours/week

1. Analysis of crude drugs by chemical tests:

(i) Tragacanth (ii) Acacia (iii) Agar (iv) Gelatin (v) starch (vi) Honey (vii) Castor oil



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2. Determination of stomatal number and index
 3. Determination of vein islet number, vein termination number and palisade ratio.
 4. Determination of size of starch grains, calcium oxalate crystals by eye piece micrometer
 5. Determination of Fiber length and width by eye piece micrometer.
 6. Determination of number of starch grains by Lycopodium spore method
 7. Determination of Ash values.
 8. Determination of Extractive values of crude drugs.
 9. Determination of moisture content of crude drugs
10. Determination of swelling index and foaming index. Recommended Books: (Latest Editions)
1. W.C.Evans, Trease and Evans Pharmacognosy, 16th edition, W.B. Saunders & Co., London, 2009.
 2. Tyler, V.E., Brady, L.R. and Robbers, J.E., Pharmacognosy, 9th Edition., Lea and Febiger, Philadelphia, 1988.
 3. Text Book of Pharmacognosy by T.E. Wallis
 4. Mohammad Ali. Pharmacognosy and Phytochemistry, CBS Publishers & Distribution, New Delhi.
 5. Text book of Pharmacognosy by C.K. Kokate, Purohit, Gokhlae (2007), 37th Edition, Nirali Prakashan, New Delhi.
 6. Herbal drug industry by R.D. Choudhary (1996), 1st Edn, Eastern Publisher, New Delhi.
 7. Essentials of Pharmacognosy, Dr.SH.Ansari, 11nd edition, Birla publications, New Delhi, 2007
 8. Practical Pharmacognosy: C.K. Kokate, Purohit, Gokhale
 9. Anatomy of Crude Drugs by M.A. Iyengar
 10. Biren Shah ,A.K.Seth,Text Book of Pharmacognosy and phytochemistry, second edition ,Elsevier publications.



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7. Study of effect of hepatic microsomal enzyme inducers on the phenobarbitone sleeping time in mice.
8. Effect of drugs on isolated frog heart.
9. Effect of drugs on blood pressure and heart rate of dog.
10. Study of diuretic activity of drugs using rats/mice.
11. Bioassay of agonist, eg .Acetyl choline on chicken ileum by matching method.
12. Bioassay of agonist, eg.Acetyl choline on chicken ileum by Bracketing method
13. Bioassay of agonist, eg.Acetyl choline on chicken ileum by interpolation method.
14. Bioassay of agonist, eg.Acetyl choline on chicken ileum by three point bioassay.
15. Bioassay of agonist, eg.Acetyl choline on chicken ileum by four point bioassay. (Demonstration only)

Note: **Wherever wet laboratory experiments are not feasible**, simulated experiments by software /videos may be used.

Recommended Books (Latest Editions)

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchill Livingstone Elsevier
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill.
3. Goodman and Gilmans, The Pharmacological Basis of Therapeutics
4. Marry Anne K. K., Lloyd Yee Y., Brian K. A.,⁸⁹ Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs, The Point Lippincott Williams & Wilkins.
5. Mycek M.J, Gelnet S.B and Perper M.M. Lippincotts Illustrated Reviews-Pharmacology.
6. K.D.Tripathi. Essentials of Medical Pharmacology, JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.
7. Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher
8. Modern Pharmacology with clinical Applications, by Charles R.Craig & Robert.
9. Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata.
10. Kulkarni SK. Handbook of experimental pharmacology. Vallabh Prakashan.

BP504 T. PHARMACOGNOSY AND PHYTOCHEMISTRY II (Theory)

45 Hours

Scope: The main purpose of subject is to impart the students the knowledge of how the secondary metabolites are produced in the crude drugs, how to isolate and identify and produce them industrially.

Objectives: Upon completion of the course, the student shall be able

1. to know basic metabolic pathways and formation of different secondary metabolites
2. to know various medicinally important secondary metabolites
3. to know the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
4. to carryout isolation and identification of phytoconstituents

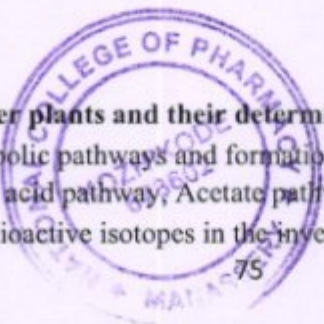
Course Content:

UNIT-I

7 Hours

Metabolic pathways in higher plants and their determination

- a) Brief study of basic metabolic pathways and formation of different secondary metabolites through these pathways- Shikimic acid pathway, Acetate pathways and Amino acid pathway.
- b) Study of utilization of radioactive isotopes in the investigation of Biogenetic studies.



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 Manipal, Karnataka

UNIT-II**20 Hours**

Study of the biological source, cultivation (*marked only), commercial varieties, chemical constituents, chemistry & chemical classes, substitutes, adulterants, Diagnostic, macroscopic and microscopic (# marked only) features, specific chemical tests, general methods of extraction & analysis, therapeutic uses and commercial applications of following secondary metabolites:

Alkaloids: Vinca, Rauwolfia*#, Belladonna, Opium*, Ephedra, Cinchona#

Phenylpropanoids and Flavonoids: Lignans, Tea, Ruta

Steroids, Cardiac Glycosides & Triterpenoids: Liquorice*#, Dioscorea, Digitalis*#

Volatile oils: Mentha, Clove*#, Cinnamon*#, Fennel#, Coriander#.

Tannins: Catechu, Pterocarpus

Resins: Benzoin, Guggul, Ginger*#, Asafoetida, Myrrh, Colophony

Glycosides: Senna*#, Aloes*, Bitter Almond

Iridoids, Other terpenoids & Naphthaquinones: Gentian, Artemisia, Taxus, Carotenoids

UNIT-III**10 Hours**

Industrial production, estimation and utilization of the following phytoconstituents:

Forskolin, Sennoside, Artemisinin, Diosgenin, Digoxin, Atropine, Podophyllotoxin, Caffeine, Taxol, Vincristine and Vinblastine

UNIT IV**8 Hours**

Basics of Phytochemistry Modern methods of extraction, application of latest techniques

Like Spectroscopy, chromatography and electrophoresis in the isolation, purification and identification Of crude drugs.

BP 508 P. PHARMACOGNOSY AND PHYTOCHEMISTRY II (Practical)**4 Hours/Week**

1. Morphology, histology and powder characteristics : Cinchona, Cinnamon, Senna, Clove, Ephedra, Fennel and Coriander
2. Exercise involving isolation & detection of active principles
 - a. Caffeine - from tea dust.
 - b. Starch from Potato
 - c. Calcium citrate from lemon juice
 - d. Pectin from lemon peel
 - e. Casein from milk
 - f. Lawsone from Henna
 - g. Curcumin from turmeric
3. Separation of sugars by Paper chromatography
4. TLC of herbal extract
5. Distillation of volatile oils and detection of phytoconstituents by TLC
6. Analysis of crude drugs by chemical tests: (i) Asafoetida (ii) Benzoin (iii) Colophony (iv) Aloes (v) Myrrh



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Recommended Books: (Latest Editions)

1. W.C.Evans, Trease and Evans Pharmacognosy, 16th edition, W.B. Saunders & Co., London, 2009.
2. Mohammad Ali. Pharmacognosy and Phytochemistry, CBS Publishers & Distribution, New Delhi.
3. Text book of Pharmacognosy by C.K. Kokate, Purohit, Gokhale (2007), 37th Edition, Nirali Prakashan, New Delhi.
4. Herbal drug industry by R.D. Choudhary (1996), 1st Edn, Eastern Publisher, New Delhi.
5. Essentials of Pharmacognosy, Dr.SH.Ansari, IInd edition, Birla publications, New Delhi, 2007
6. Herbal Cosmetics by H.Pande, Asia Pacific Business press, Inc, New Delhi.
7. A.N. Kalia, Textbook of Industrial Pharmacognosy, CBS Publishers, New Delhi, 2005.
8. R Endress, Plant cell Biotechnology, Springer-Verlag, Berlin, 1994.
9. Pharmacognosy & Pharmacobiotechnology. James Bobbers, Marilyn KS, VETylor.
10. Louis Appell, The formulation and preparation of cosmetic, fragrances and flavours, Micelle Press 1994.
11. Remington's Pharmaceutical sciences.
12. Text Book of Biotechnology by Vyas and Dixit.
13. Text Book of Biotechnology by R.C. Dubey.

BP 505 T. PHARMACEUTICAL JURISPRUDENCE (Theory)

45 Hours

Scope: This course is designed to impart basic knowledge on several important legislations related to the profession of pharmacy in India.

Objectives: Upon completion of the course, the student shall be able to understand:

1. The Pharmaceutical legislations and their implications in the development and marketing
2. Various Indian pharmaceutical Acts and Laws
3. The regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
4. The code of ethics during the pharmaceutical practice

Course Content:

UNIT-I

10 Hours

Drugs and Cosmetics Act, 1940 and its rules 1945:

Objectives, Definitions, Legal definitions of schedules to the act and rules

Import of drugs Classes of drugs and cosmetics prohibited from import, Import under license or permit.

Offences and penalties.

Manufacture of drugs Prohibition of manufacture and sale of certain drugs, Conditions for grant of license and conditions of license for manufacture of drugs,

Manufacture of drugs for test, examination and analysis, manufacture of new drug, loan license and repacking license.

UNIT-II

10 Hours

Drugs and Cosmetics Act, 1940 and its rules 1945.

Detailed study of Schedule G, H, M, N, P, T, U, V, X, Y, Part XII B, Sch F & DMR (OA) Sale of Drugs



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Wholesale, Retail sale and Restricted license. Offences and penalties Labeling & Packing of drugs- General labeling requirements and specimen labels for drugs and cosmetics, List of permitted colors. Offences and penalties.

Administration of the act and rules Drugs Technical Advisory Board, Central drugs Laboratory, Drugs Consultative Committee, Government drug analysts, licensing authorities, controlling authorities, Drugs Inspectors

UNIT-III

10 Hours

Pharmacy Act 1948: Objectives, Definitions, Pharmacy Council of India; its constitution and functions, Education Regulations, State and Joint state pharmacy councils; its constitution and functions, Registration of Pharmacists, Offences and Penalties

- **Medicinal and Toilet Preparation Act 1955:** Objectives, Definitions, Licensing, Manufacture In bond and Outside bond, Export of alcoholic preparations, Manufacture of Ayurvedic, Homeopathic, Patent & Proprietary Preparations. Offences and Penalties.

- **Narcotic Drugs and Psychotropic substances Act-1985 and Rules:** Objectives, Definitions, Authorities and Officers, Constitution and Functions of narcotic & Psychotropic Consultative Committee, National Fund for Controlling the Drug Abuse, Prohibition, Control and Regulation, opium poppy cultivation and production of poppy straw, manufacture, sale and export of opium, Offences and Penalties

UNIT-IV

08 Hours

- **Study of Salient Features of Drugs and magic remedies Act and its rules:** Objectives, Definitions, Prohibition of certain advertisements, Classes of Exempted advertisements, Offences and Penalties

- **Prevention of Cruelty to animals Act-1960:** Objectives, Definitions, Institutional Animal Ethics Committee, Breeding and Stocking of Animals, Performance of Experiments, Transfer and acquisition of animals for experiment, Records, Power to suspend or revoke registration, Offences and Penalties

- **National Pharmaceutical Pricing Authority:** Drugs Price Control Order (DPCO)2013. Objectives, Definitions, Sale prices of bulk drugs, Retail price of formulations, Retail price and ceiling price of scheduled formulations, National List of Essential Medicines (NLEM)

UNIT-V

07 Hours

- **Pharmaceutical Legislations** A brief review, Introduction, Study of drugs enquiry committee, Health survey and development committee, Hathi committee and Mudaliar committee

- **Code of Pharmaceutical ethics** Definition, Pharmacist in relation to his job, trade, medical profession and his profession, Pharmacist's oath

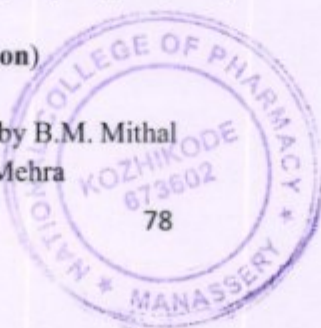
- **Medical Termination of pregnancy act**

- **Right to information Act**

- **Introduction to Intellectual Property Rights (IPR)**

Recommended books: (Latest Edition)

1. Forensic Pharmacy by B. Suresh
2. Text book of Forensic Pharmacy by B.M. Mithal
3. Hand book of drug law-by M.L. Mehra



S. J. Thomas
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4. A text book of Forensic Pharmacy by N.K. Jain
5. Drugs and Cosmetics Act/Rules by Govt. of India publications.
6. Medicinal and Toilet preparations act 1955 by Govt. of India publications.
7. Narcotic drugs and psychotropic substances act by Govt. of India publications
8. Drugs and Magic Remedies act by Govt. of India publication
9. Bare Acts of the said laws published by Government. Reference books (Theory)

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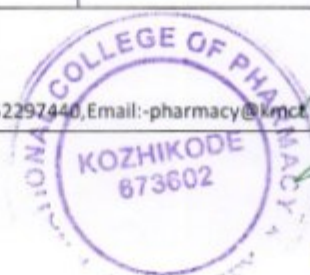


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Events addressing the professional ethics, gender, human values and environment sustainability into the Curriculum

SL No.	Program	Date	No. of Students Participated
1.	workshop on Personality Development, Building Etiquette, Cluster Confidence, General fitness	21.03.2023	60
2.	Poster making competition and street play: international women's day	08.03.2023	12
3.	Webinar on antimicrobial stewardship	04.03.2023	30
4.	MIC's leadership talk with chairman AICTE	30.01.2023	20
5.	Awareness program on Common gynecological disorders in college students	25. 01.2023	50
6.	Entrepreneurship Skill, Attitude and Behavior Development	18.01.2023	50
7.	National energy conservation day	14.12.2022	10
8.	Add on course antimicrobial resistance	02.12.2022	80
9.	National pollution day	02.12.2022	20
10.	Community based awareness campaign on antibiotic awareness week	24.11.2022	30
11.	Children's day Awareness session on Nutrition in girl child	15.11.2022	10
12.	Webinar International girl child day observance- our time is now our right our future	18.10.2022	30
13.	National nutrition week	01&02.09.2022	30
14.	Seminar on trip to healthy life	01&02.09.2022	50
15.	World environment day	06.06.2022	59
16.	Earth day	22.04.2022	20
17.	World Downsyndrome day	21.03.2022	30
18.	webinar on womens health awareness and menstrual hygiene	24.01.2022	50
19.	Webinar on skill, attitude and behavioural development	18.01.2022	50
20.	life skill training programme on the topic communication skills for pharmacy students	18.12.2021	60



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21.	Webinar on road to mental wellbeing exploring stress and coping strategies	10.11.2021	54
22.	One day vaccine surveillance need of the hour	18.09.2021	20
23.	Virtual interactive session on learning experience for clinical pharmacist in clinical trials	27.08.2021	50
24.	World earth day	22.04.2021	15
25.	Training program of swab collection from patients to identify covid 19 +ve	21.04.2021	30
26.	National women's day: gender equality for a sustained tomorrow	08.03.2021	50
27.	Soft skill program on yoga for pharmacy students	10.02.2021	60
28.	National deworming day leaflet distribution	10.02.2021	20
29.	State level webinar(Kozhikode): mental health and premarital counselling	12.01.2021	60
30.	World environment day	05.06.2019	20
31.	World earth day	22.04.2019	20
32.	International women's day	08.03.2019	20
33.	World environment day	05.06.2018	20



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From,
Dr. Venketesh
Professor
Department of Pharmacology
National College of Pharmacy Manassery, Kozhikode

To,
IQAC
National College of Pharmacy
Manassery, Kozhikode

Dear Sir,

Subject: Request for Permission to conduct the cultural programs at Pratheeksha Special School, Mampetta, Mukkum, Kozhikode, Kerala.

I am writing on behalf of the Department of Pharmacology to formally request your esteemed permission to conduct cultural programs at Pratheeksha Special School, Mampetta, Mukkum, Kozhikode, Kerala, on behalf of "World Down Syndrome Day".

The cultural program details are outlined as follows:

- **Title:** cultural program at Prateeksha Special School, Mampetta, Mukkum, Kozhikode
- **Date:** 21.03.2023
- **Time:** 10.30 am
- **Venue:** Prateeksha Special School, Mampetta, Mukkum, Kozhikode

Thank you for considering our request.

Yours sincerely,
Dr. Venketesh
Coordinator,
Department of Pharmacology
National College of Pharmacy
Manassery, Kozhikode

Date: 01.03.2023



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From,
The IQAC,
National College of Pharmacy

To,
The Principal,
National College of Pharmacy
Manassery, Kozhikode

Dear Principal,

I hope this letter finds you well. The Department of Pharmacology, in collaboration with the Internal Quality Assurance Cell (IQAC), seeks permission to conduct cultural programs at Pratheeksha Special School, Mampetta, Mukkam, Kozhikode, Kerala, on behalf of "World Down Syndrome Day". The event is scheduled to take place at 10.30 am.

We kindly request your authorization to proceed with this endeavor.

Thank you for your consideration.


Sincerely,


IQAC Coordinator

National College of Pharmacy, Manassery, Mukkam, Kozhikode
Manassery

Date: 03.03.2023




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CIRCULAR

WORLD DOWN SYNDROME DAY

We are delighted to inform you that the Department of Pharmacology, in collaboration with the Internal Quality Assurance Cell (IQAC), has organized cultural programs at Pratheeksha Special School, Mampetta, Mukkum, Kozhikode, Kerala, on behalf of "World Down Syndrome Day". The details of the event are as follows:

- Date: 21.03.2023
- Time: 10.30 am
- Venue: Pratheeksha Special School, Mampetta, Mukkum, Kozhikode, Kerala

We look forward to your enthusiastic participation and making this programs a resounding success.

Principal

Date: 18.03.2023


[Signature and Seal]

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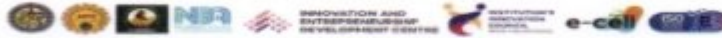


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Cultural Program World Down Syndrome Day

21st March 2023 | 10.30 AM
Venue : Pratheeksha School, Mampetta



Organized by Department of Pharmacology, National College of Pharmacy.

KMCT Medical College Campus, Mukkam, Kozhikode - 673602 | www.nationalcollegeofpharmacy.org



World downsyndrome day

Syithwan

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REPORT

On behalf of "World Down Syndrome Day" on March 21st, 2023, the Department of Pharmacology, National College of Pharmacy, celebrated the cultural programs at Pratheeksha Special School, Mampetta, Mukkum, Kozhikode, Kerala. During the program, 2nd Year Pharm D & 3rd Year Pharm D students eagerly participated and entertained them by singing songs, dancing, mimicry, etc.,

After the cultural programs, the cake-cutting ceremony, sweets and chocolates were distributed to the school students. Coordinators of this program Dr. S. Venkatesh and Mrs. Anargaha Jeyaraj.

DATE: 22.03.2023


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ATTENDANCE SHEET

Name of student	Batch	Signature
Adhila M Sherief	II Pharm D	
Afeedha Ashraf	II Pharm D	
Ameera Jahan	II Pharm D	
Ameesha O	II Pharm D	
Anjana U	II Pharm D	
Arabhi Raj K J	II Pharm D	
Arshad Zaman	II Pharm D	
Neha Binu	II Pharm D	
Niha Nafrain K N	II Pharm D	
Nitha M	II Pharm D	
Nitha Nathila P	II Pharm D	
Radhwan	II Pharm D	
Riyamirsa Kundanchery Ashik	II Pharm D	
Saaniya Saleem	II Pharm D	
Shamja Nasrin A P	II Pharm D	
Sharafa Muhammad Rafeek	II Pharm D	
Shermin Sheheed	II Pharm D	
Yadhu Krishna P	II Pharm D	
Anjana Babu	III Pharm D	
Agna Rino	III Pharm D	
Alida Rifa	III Pharm D	
Alna Joy	III Pharm D	
Liyana Nasrin Thilleri	III Pharm D	
Muhammed Shibil	III Pharm D	
Muhammed Adil	III Pharm D	
Nalina S Kaimal	III Pharm D	
Sona Biju	III Pharm D	
Ziya Mariyam	III Pharm D	
Nandhana T S	III Pharm D	

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From,
Akil Hari
Associate Professor
Department of Pharmaceutics
National College of Pharmacy Manassery, Kozhikode

To,
IQAC
National College of Pharmacy
Manassery, Kozhikode

Dear Sir,


Subject: Request for Permission to conduct seminar and workshop on Personality Development, Building Etiquette, Cluster Confidence, General fitness

I am writing on behalf of the Department of Pharmaceutics to formally request your esteemed permission to conduct a workshop for our students of first year pharm D, First & 8th sem Bpharm and M.pharm. This initiative is in line with our commitment to enhancing the educational experience and fostering academic growth among our students.


The workshop details are outlined as follows:

- **Title:** seminar and workshop on Personality Development, Building Etiquette, Cluster Confidence, General fitness
- **Date:** 01.03.2023
- **Time:** 10.30 am
- **Venue:** Seminar Hall

Thank you for considering our request.

Yours sincerely,
Mr. Akil Hari 
Coordinator,
Department of Pharmaceutics
National College of Pharmacy
Manassery, Kozhikode
Date
08.02.2023




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From,
The IQAC,
National College of Pharmacy

To,
The Principal,
National College of Pharmacy
Manassery, Kozhikode

Dear Principal,

I hope this letter finds you well. The Department of Pharmaceutics, in collaboration with the Internal Quality Assurance Cell (IQAC), seeks permission to organize a workshop and seminar for students of first year pharm D, First & 8th sem Bpharm and M.pharm on the topic "Personality Development, Building Etiquette, Cluster Confidence, General fitness" on 01.03.2023. The event is scheduled to take place at seminar hall.

We kindly request your authorization to proceed with this educational endeavor, which we believe will contribute significantly to the academic growth and development of our students.

Thank you for your consideration.


Sincerely,


IQAC Coordinator

National College of Pharmacy

Manassery

Date: 10.02.2023


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CIRCULAR

Workshop and Seminar on the Topic of Personality Development, Building Etiquette, Cluster Confidence, General Fitness

Dear Students,

We are delighted to inform you that the Department of Pharmaceutical Chemistry, in collaboration with the Internal Quality Assurance Cell (IQAC), has organized a workshop and seminar on the topic of Personality Development, Building Etiquette, Cluster Confidence, General fitness for students of first year pharm D, First & 8th sem Bpharm and M.pharm


The details of the workshop are as follows:


- Date: 01.03.2023
- Time: 10.30 am
- Venue: Seminar Hall

We look forward to your enthusiastic participation and making this workshop a resounding success.

Principal

Date: 28.02.2023


(Signature and Seal)
Principal
National College of Pharmacy
Manassery, Kozhikode


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 KMCT Medical College Campus, Mankam, Kozhikode - 673602 | www.nationalcollegeofpharmacy.org

SEMINAR ON :
**PERSONALITY DEVELOPMENT,
 BUILDING ETIQUETTE,
 CLUSTER CONFIDENCE, GENERAL FITNESS**

01st March, 2023
Wednesday, 10:30 AM to 12:30 PM

Resource Persons


Rebeesh Bhaskaran
Business Strategist &
 Motivational Speaker

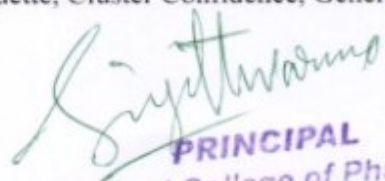

K. Akshay Kumar
General Fitness, Group Training,
 Yoga Class (Y)

ENGLISH

Organized by IQAC, B.C. Dept. of Pharmaceutics, National College of Pharmacy



Workshop on Personality Development, Building Etiquette, Cluster Confidence, General fitness


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REPORT

IQAC in association with IIC and Department of Pharmaceutics conducted an seminar and workshop on Personality Development, Building Etiquette, Cluster Confidence, General fitness On 1st March 2023. Resource persons were Mr Rabeesh Bhaskaran, Business Strategist and motivational speaker and Mr K Akshay kumar, Fitness trainer(body building and Yoga crossfit). Coordinators of this program were Mr. Akhil Hari, Professor, department of pharmaceutics, National College of Pharmacy and Ms Hiba Najeem, IV PharmD student. Welcome speech was delivered by Ms Hiba. Najeem. Dr Sujith Varma K, Principal, National College of Pharmacy, presided the program. Vote of thanks was delivered by Mr Akhil Hari, Dept of Pharmaceutics.

DATE 02.03.2023

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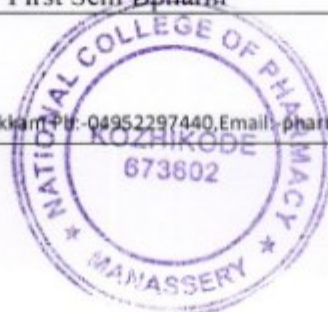


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ATTENDANCE SHEET

Name Of Student	Batch	Signature
Adhila Shareef	1 st Pharm D	
Anjana Babu	1 st Pharm D	
Neha Binu	1 st Pharm D	
Arabhi Raj	1 st Pharm D	
Ameera Jahan	1 st Pharm D	
Shermin Ahammed	1 st Pharm D	
Liyana Parveen	1 st Pharm D	
Meera Raj	Mpharm	
Vajid	Mpharm	
Nahana	Mpharm	
Aiswaraya Babu	First Sem Bpharm	
Afra	First Sem Bpharm	
Afreen	First Sem Bpharm	
Ayisha T M	First Sem Bpharm	
Badhiya Parveen K B	First Sem Bpharm	
Diya Jayachandran	First Sem Bpharm	
Mohammed Ashiq K	First Sem Bpharm	
Mohammed Shemal K	First Sem Bpharm	
Muhammad Ashhad K P	First Sem Bpharm	
Muhammed Fayiz V C	First Sem Bpharm	
Muhammed Shebin	First Sem Bpharm	
Reja Fathima P K	First Sem Bpharm	
Ridha Rouf	First Sem Bpharm	
Rinsha Nasrin	First Sem Bpharm	
Risha	First Sem Bpharm	
Risvana E T K	First Sem Bpharm	
Riya Ferin Ezhunilath	First Sem Bpharm	
Riya Sofna A V	First Sem Bpharm	
Ruby Fathima P	First Sem Bpharm	
Safa	First Sem Bpharm	
Sahmila Sharin A P	First Sem Bpharm	
Sajida P P	First Sem Bpharm	
Sanaha O	First Sem Bpharm	
Shabeeb Ahamed	First Sem Bpharm	
Shabeeb P	First Sem Bpharm	
Shabna Sheri	First Sem Bpharm	
Shaharshada K C	First Sem Bpharm	





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Ayisha Nidha	First Sem Bpharm	
Ayisha N K	First Sem Bpharm	
Fathima Binth Jaleel	First Sem Bpharm	
Fathimath Minsha P	First Sem Bpharm	
Fathimathu Fidha T V	First Sem Bpharm	
Ansila Shaju	8 th Sem Bpharm	
Adil Farhan	8 th Sem Bpharm	
Muhammed Irfan	8 th Sem Bpharm	
Muhammed Harshad	8 th Sem Bpharm	
Muhammed Suhail	8 th Sem Bpharm	
Arshad Saman	First Pharm D	
Muhammed Kanz	First Pharm D	
Yadhu Krishna	First Pharm D	
Nawal	8 th Sem Bpharm	
Naja P	8 th Sem Bpharm	
Safna Yasmin	8 th Sem Bpharm	
Sana P M	8 th Sem Bpharm	
Marjana Parveen	8 th Sem Bpharm	
Naheeda	8 th Sem Bpharm	
Rasmina	8 th Sem Bpharm	
Kavya V	First Pharm D	
Radwan	First Pharm D	
Ameera Jahan	First Pharm D	

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Manassery, Kozhikode





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Feedback Report

	excellent	Very good	good	average	poor
Male	3	11	-	-	-
Female	30	17	-	-	-

PRINCIPAL
National College of Pharmacy
Manassery, Kozhikode





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From
Dhanya.K.P
Associate Professor
Department of Pharmaceutics
National College of Pharmacy Manassery, Kozhikode

To,
IQAC
National College of Pharmacy
Manassery, Kozhikode

Dear Sir,

Subject: Request for Permission to conduct a street play and poster presentation

I am writing on behalf of the Department of Pharmaceutics to formally request your esteemed permission to conduct a street play and poster presentation for our students (B Pharm, M .pharm and Pharm D). This initiative is in line with our commitment to spread awareness about women empowerment among our students.

The details of the program are outlined as follows:

- **Title:** Women's day
- **Date:** 08/03/2023
- **Time:** Poster presentation (1pm),
- **Venue:** M pharm class room (Poster presentation)

Street play

Thank you for considering our request.

Yours sincerely,
Dhanya .K.P, Coordinator,
Department of Pharmaceutics
National College of Pharmacy
Manassery , Kozhikode
Date -17/02/2023



Sujitha
PRINCIPAL
National College of Pharmacy
Manassery, Kozhikode



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From,
The IQAC,
National College of Pharmacy

To,
The Principal,
National College of Pharmacy
Manassery, Kozhikode


Dear Principal,

I hope this letter finds you well. The Department of Pharmaceutics, in collaboration with the Internal Quality Assurance Cell (IQAC), seeks permission to organize a street play and poster presentation for students (B. Pharm, M. pharm and Pharm D) on the topic of women's day on 08/03/2023. The event is scheduled to take place at 1pm.

We kindly request your authorization to proceed with this educational endeavor, which we believe will contribute significantly to the mental growth and development of our students.

Thank you for your consideration.


Sincerely,

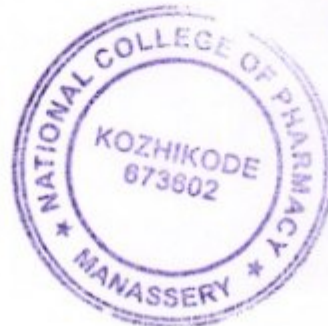

IQAC Coordinator

National College of Pharmacy

Manassery

Date – 15/02/2023


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National College of Pharmacy
Manassery, Kozhikode





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CIRCULAR

INTERNATIONAL WOMEN'S DAY

Dear Students,

We are delighted to inform you that the Department of Pharmaceutics, in collaboration with the Internal Quality Assurance Cell (IQAC), has organized a street play and poster presentation on the topic of women's day for Students (B.Pharm M.pharm and PharmD)

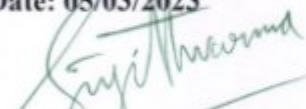
The details of the workshop are as follows:


- Date: 08/03/2023
- Time: 1pm
- Venue: M pharm class room ,Manassery

We look forward to your enthusiastic participation and making this event a resounding success.

Principal

Date: 05/03/2023


[Signature and Seal]
PRINCIPAL
National College of Pharmacy
Manassery, Kozhikode

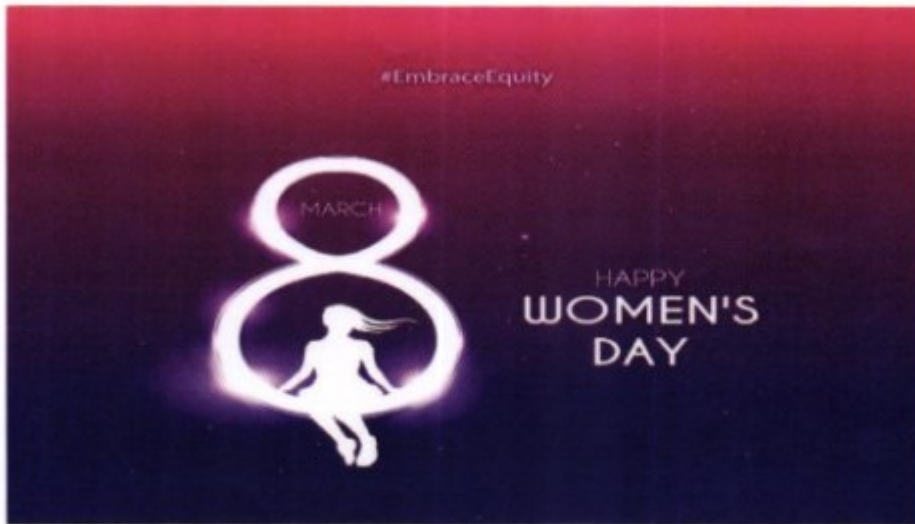

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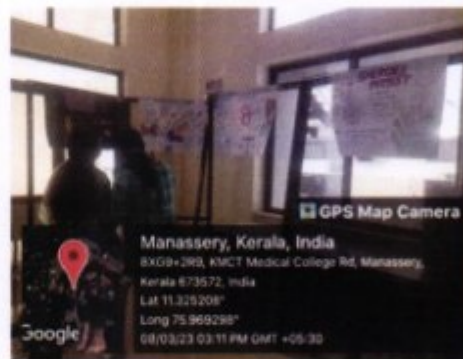


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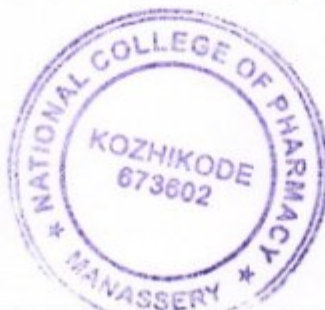


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International women's day celebrations

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REPORT

IQAC and Women empowerment cell of National College of Pharmacy celebrated International Women's day on 8 th March 2023. Poster making competition was conducted among students on the topic "DigitALL: Innovation and technology for gender equality". First year pharm D students performed a street play based on women empowerment. The event was coordinated by Ms. Dhanya K. P and Ms . Anju T. S.

DATE: 09/03/2023


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ATTENDANCE SHEET

Name of the student	Batch	Signature
Fidha thasni	2020 pharm D	
Sakshi S nair	2020 pharm D	
Ruksana A	2020 pharm D	
Jijimol.K.A	2011 Bpharm	
Rinshana Jubin	2022 Bpharm	
Abhaya.C	2022 Bpharm	
Farsana.A.T	2022 Bpharm	
Hisana Serin	2022 Bpharm	
Bashima K.M	2022 BPharm	
Nasma shereen	2022 Bpharm	
Anupam Prahlad	2011 Bpharm	
Aseeba .P.P	2011 Bpharm	

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From,
Mr. Abdurahman & Mr. Anil Kumar
Assistant Professor
Department of pharmacy practice & Department of Pharmaceutical Chemistry
National College of Pharmacy Manassery, Kozhikode

To,
IQAC
National College of Pharmacy
Manassery, Kozhikode

Dear Sir,

Subject: Request for Permission to distribute paper pens containing seeds of different plants to the local people by visiting houses as part of world environment day celebration

I am writing on behalf of the Department of Pharmaceutical Chemistry and pharmacy practice to formally request your esteemed permission to conduct world environment day celebration. This initiative is in line with our commitment to raise awareness of the value of the resources on our planet and the need to protect them.

The program details are outlined as follows:

- **Title:** world environment day celebration
- **Date:** 06.06.2022
- **Time:** 02.00pm
- **Venue:** Manassery town

Thank you for considering our request.

Yours sincerely,
Mr. Abdurahman & Mr. Anil Kumar
Assistant Professor
Department of pharmacy practice & Department of Pharmaceutical Chemistry
Coordinators
National College of Pharmacy
Manassery, Kozhikode
Date: 16.05.2022



Sujithamma

PRINCIPAL
National College of Pharmacy
Manassery, Kozhikode



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From,
The IQAC,
National College of Pharmacy

To,
The Principal,
National College of Pharmacy
Manassery, Kozhikode

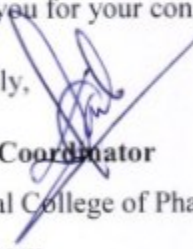
Dear Principal,

I hope this letter finds you well. The Department of Pharmaceutical Chemistry & pharmacy practice, in collaboration with the Internal Quality Assurance Cell (IQAC), seeks permission to organize outreach program (distributing paper pens containing seeds of different plants to the local people by visiting houses) as part of world environment day celebration on 06.06.2022. The event is scheduled to take place at Manassery Town

We kindly request your authorization to proceed with this endeavor, which lies with our commitment to raise awareness of the value of the resources on our planet and the need to protect them.


Thank you for your consideration.

Sincerely,


IQAC Coordinator
National College of Pharmacy
Manassery

Date: 19.05.2022




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National College of Pharmacy
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CIRCULAR

WORLD ENVIRONMENT DAY

Dear Students,

We are delighted to inform you that the Department of Pharmaceutical Chemistry pharmacy practice, in collaboration with the Internal Quality Assurance Cell (IQAC), has organized an outreach program (distributing paper pens containing seeds of different plants to the local people by visiting houses) as part of world environment day celebration.

The details of the program are as follows:

- Date: 06.06.2022
- Time: 2.00pm
- Venue: Manassery town

We look forward to your enthusiastic participation and making this workshop a resounding success.

Principal

Date: 03.06.2022

[Signature and Seal]

PRINCIPAL
National College of Pharmacy
Manassery, Kozhikode



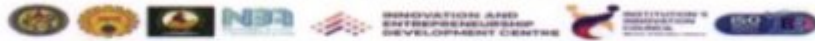


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06 JUNE 2022

WORLD ENVIRONMENT DAY

ORGANISED BY IQAC AND NATURE CLUB

DISTRIBUTING PAPER PENS CONTAINING SEEDS OF DIFFERENT PLANTS TO THE
LOCAL PEOPLE BY VISITING HOUSES



World environment day celebration



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REPORT

World Environment Day was celebrated on 06-06-2022 at the National College of Pharmacy, Manassery, Mukkam, Calicut. It was inaugurated by the Principal, Dr Sujith Varma K. Students conducted an outreach program in the presence of teachers and they distributed paper pens containing seeds of different plants to the local people by visiting houses. It was attended by 59 members, including 5 staff. IIC of National College of Pharmacy organized the event

DATE: 07.06.2022

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Manassery, Kozhikode





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ATTENDANCE SHEET

Name of students	Batch	Signature
Aditya	3 rd sem Bpharm	<i>[Signature]</i>
Ayisha jubin	3 rd sem Bpharm	<i>[Signature]</i>
Rubeena Khaleel	3 rd sem Bpharm	<i>[Signature]</i>
Muhsina Aboobacker	3 rd sem Bpharm	<i>[Signature]</i>
Sona	3 rd sem Bpharm	<i>[Signature]</i>
Lakshmi	3 rd sem Bpharm	<i>[Signature]</i>
Baslana	3 rd sem Bpharm	<i>[Signature]</i>
Muhammed Sinas	3 rd sem Bpharm	<i>[Signature]</i>
Muhammed Junaid	3 rd sem Bpharm	<i>[Signature]</i>
Finu Mariyam	3 rd sem Bpharm	<i>[Signature]</i>
Suha Fthima	3 rd sem Bpharm	<i>[Signature]</i>
Fathimath Shadina	3 rd sem Bpharm	<i>[Signature]</i>
Hisana Sherin	3 rd sem Bpharm	<i>[Signature]</i>
Rinu Hazraj	3 rd sem Bpharm	<i>[Signature]</i>
Fathima Naval	3 rd sem Bpharm	<i>[Signature]</i>
Swaliha Valiyoth	3 rd sem Bpharm	<i>[Signature]</i>
Amal Roshan	3 rd sem Bpharm	<i>[Signature]</i>
MUhammed Fahad	3 rd sem Bpharm	<i>[Signature]</i>
Muhammed Hadi	3 rd sem Bpharm	<i>[Signature]</i>
Nazal Anwer	3 rd sem Bpharm	<i>[Signature]</i>
Abhaya	3 rd sem Bpharm	<i>[Signature]</i>
Junaid	3 rd sem Bpharm	<i>[Signature]</i>
Dikra	3 rd sem Bpharm	<i>[Signature]</i>
Gokul P	3 rd sem Bpharm	<i>[Signature]</i>
Sreelakshmi	3 rd sem Bpharm	<i>[Signature]</i>
Aswathi O	3 rd sem Bpharm	<i>[Signature]</i>
Minnu Sanooba	3 rd sem Bpharm	<i>[Signature]</i>
Noor Fathima	3 rd sem Bpharm	<i>[Signature]</i>
Noor fathima Alavi	3 rd sem Bpharm	<i>[Signature]</i>
Fathima R	3 rd sem Bpharm	<i>[Signature]</i>
Hamid Zaheen	3 rd sem Bpharm	<i>[Signature]</i>
Fathima Sana T K	3 rd sem Bpharm	<i>[Signature]</i>
Shahana Sherin	3 rd sem Bpharm	<i>[Signature]</i>
Nasma	3 rd sem Bpharm	<i>[Signature]</i>
P Fathima Hiba	3 rd sem Bpharm	<i>[Signature]</i>
Minfa Fathima	3 rd sem Bpharm	<i>[Signature]</i>



[Signature]
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Nada Asis	3 rd sem Bpharm	Nada
Afsiya	3 rd sem Bpharm	Afsiya
Nida Nasrin	3 rd sem Bpharm	Nida
Sharin Sha Basheer	3 rd sem Bpharm	Sharin
Shamna Sherin	3 rd sem Bpharm	Shamna
Ayisha Hamza	3 rd sem Bpharm	Ayisha
Shifnu	3 rd sem Bpharm	Shifnu
Balana	3 rd sem Bpharm	Balana
Bashima	3 rd sem Bpharm	Bashima
Rimsha Fathima	3 rd sem Bpharm	Rimsha
Shahma sherin	3 rd sem Bpharm	Shahma
Farsana A T	3 rd sem Bpharm	Farsana
Fathimath Lubana	3 rd sem Bpharm	Fathimath
Aysha Afra	3 rd sem Bpharm	Aysha
Shifnu	3 rd sem Bpharm	Shifnu
Aswathi P	3 rd sem Bpharm	Aswathi
Aswini O	3 rd sem Bpharm	Aswini
Siya E T	3 rd sem Bpharm	Siya
Gopika	3 rd sem Bpharm	Gopika
Fathima Ramsi	3 rd sem Bpharm	Fathima
Sreena	3 rd sem Bpharm	Sreena
Soorya Prabha	3 rd sem Bpharm	Soorya
Hisana Sherin	3 rd sem Bpharm	Hisana



PRINCIPAL

National College of Pharmacy
Manassery, Kozhikode

