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MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES  
(Common to all Branches)  
HCPT-1.1

Unit-I  
A detailed study of separations and determination involved in the following chromatographic techniques.  
b. This layer chromatography: Theory, preparation, procedures, detection of compounds  
c. Paper Chromatography: Theory, different techniques employed, filter papers used, quantitative and quantitative detections.  
d. Counter, current extraction, solid phase extraction techniques.

Unit-II  
a. Gas chromatography: fundamentals, Instrumentation, columns preparation and operations, detection, derivatisation, LC-MS, GC-MS.  
b. HPLC: Principles and Instrumentations.

Unit-III  
a. UV-Visible Spectroscopy: Principle, Beer Lambert’s law, study and working principle of instrumentation, applications in pharmaceutical analysis and derivatives spectroscopy.  
b. IR Spectroscopy: Theory, different types of molecular vibrations, sampling techniques, instrumentation and applications in pharmaceutical analysis, FTIR  
c. Fluorimetry: Theory, fluorescence and chemical structure, factors affecting the fluorescence, study of working principles of the instrument and applications in pharmaceutical analysis.

Unit-IV  
a. NMR: theory, Chemical-shift, spin-spin coupling, shielding, working principle of instrumentations and applications in pharmaceutical analysis, HNMR, and cosy $^{13}$CNMR.  
b. Mass: principle, different methods of production of ions metastable ions, working principle of mass spectrometer and applications in pharmaceutical analysis.

Unit-V  
a. Differential thermal analysis, partial thermal analysis.  
b. Radiometric techniques, Radio immunoassay, Elisha test.  
c. X-ray diffraction, polarimetry.
ADVANCED BIOSTATISTICS & RESEARCH METHODS
HCPT-1.2

Unit-I:
Developing a research question, Resources for research question,
Literature Review: Traditional Qualitative Review
Meta-Analysis—A Quantitative Review
Preparation of Research Proposal

Variables—Definition of Variable, Types of variables—Dependent and
Independent variables, Confounded variables, Measurement of variables, Types
of measurement scales and their comparison. Reliability and Validity of
Measurements.

Unit-II:
Validity, Types of validity—Internal validity, Construct validity, External
validity, Threats to validity.
Control: Subject as own control (Within Subject control), Statistical control.

Unit-III:
Non-experimental Research:
Part 1—Observational, Archival and Case-Study Research: The Hermeneutic
Approach.
Observational Research: Naturalistic Observation, Participant-Observer Research.
Archival Research: Archival Data Collection and Compilation.
Case Studies: Characteristic of Case Studies.
Non-experimental Research: Survey Research—Designing of Questionnaire,
Methods of Administration, Response Rates. Types of Samples—Haphazard
Samples, Purposive Samples, Convenience Samples and Probability Samples.

Unit-IV:
True Experiments: Single-Factor Designs, Factors, Levels, Conditions, and
Treatments. Within-Subject Designs.
True Experiments Part-2—Factorial Designs—Main Effects, Interactions, A
Mixed Factorial Design.

Unit V:
Single-Subject Experiments: Advantages and Disadvantages.
Quasi Experiments: The differences between Quasi and True Experiments.
Design without Control Groups—Interrupted Time Series Designs and Repeated
Treatment Designs.

Text Books
1. Donald H. McBurney -Theresa L. White “Research Methods” (Cengage
learning India Pvt. Ltd)
Business books
3. Biostatistics & Computer applications by GN Rao and NK Tiwari

Reference Books
1. Remingtons pharmaceutical Sciences
2. Theory & Practice of Industrial Pharmacy by Lachman
PATHOPHYSIOLOGY AND APPLIED PHARMACOTHERAPEUTICS – I
HCPT-1.3

Pathophysiology and applied Pharmacotherapeutics of diseases associated with following system/diseases with of special reference to the drug of choice.

Title of the topic
Unit-I Cardiology:
- Acute Coronary Syndrome
- Hypertension
- Congestive Cardiac Failure
- Ischaemic Heart Disease (Angina Pectoris, Myocardial Infarction)
- Arrhythmias
- Hyperlipidarmia
- Cardiopulmonary Arrest
- Shock

Unit-II Respiratory System
- Introduction to pulmonary function tests
- Asthma
- Chronic Obstructive Pulmonary Disease
- Drug Induced Pulmonary Diseases

Unit-III Haematological Diseases & Nephrology
- Anaemia’s
- Drug Induced Haematological Diseases
- Venous Thromboembolism

- Acute Renal Failure / Chronic Renal Failure
- Renal Dialysis and Transplantation
- Drug Dosing In Renal Failure / Impairment
- Drug Induced Renal Diseases
- End-Stage Renal Disease
- Diuretic Therapy
- Potassium Depletion
- Hyperkaelemia
- Alakalosis

Unit-IV Gastroentrology & Rheumatology
- Gastro – Oesophageal Reflux Disease
- Peptic Ulcer Disease
- Inflammatory Bowel Disease
- Hepatitis, Viral
- Jaundice & Cirrhosis
- Diarrhoea & Constipation
- Drug Induced Liver Disease
- Gout & Hyperuricemia
- Rheumatoid Arthritis
- Osteoarthritis
- Spondylitis

Unit-V Endocrinology &Dermatology
Adrenal Gland Disorders

Diabetic Mellitus

Thyroid Disorders

Osteoporosis

Acne Vulgaris

Psoriasis

Scabies

Eczema

Drug Induced Skin Disorders

Vetiligo

Text Books

Reference Books
4. Pathologic basis of diseases – Robins SL, W. B. Saunders Publication
5. Pathology and Therapeutics for pharmacists: a basis for clinical pharmacy practice – Green and Harris, Chapman and Hall Publication
11. Relevant review articles from recent medical and pharmaHCPtical Journals.
ADVANCED CLINICAL PHARMACY
HCPT-1.4

Unit-I  Introduction to clinical pharmacy
- Definition, Scope, History and Development of clinical pharmacy

Unit-II  Professional Activities of a Clinical Pharmacist
- Ward Round Participation
- Medication History Interview
- Drug Therapy Monitoring (Medication Chart Review, Clinical Review, Therapeutic Drug Monitoring & Pharmacist Interventions)
- Adverse Drug Reaction Management
- Drug Information & Poison Information
- Patient Counseling
- PharmaHCPTical Care
- Drug Utilization evaluation (DUE) & Review (DUR)
- Quality Assurance of Clinical Pharmacy Services

Unit-III  A) Patient Data Analysis
- The patient’s case history, its structure & use in evaluation of drug therapy, presentation of cases.
- Communication skills, including patient counseling techniques, medication history interview, teaching skills.
- Understanding common medical abbreviations & terminologies used in clinical practices.

B) Clinical Laboratory Tests used in the evaluation of diseases states & interpretation of test results.
- Haemotological, Liver function, Renal function, Thyroid function tests.
- Tests associated with cardiac disorders
- Fluid & Electrolyte balance
- Common tests in urine, sputum, faeces, CSF.
- Sensitivity screening for common pathogenic microorganisms, its significance, resistance in disease states & selection of appropriate anti-microbial regimens.
- Pulmonary function tests.

Unit-IV  A) Drug & Poison Information
- Introduction to Drug information, resources available,
- Systematic approach in answering drug information serve queries
- Critical evaluation of drug information and literature
- Preparation of written and verbal reports
- Establishing a drug information center
- Poisons information-organisation and information resources
- Poisons management in drug dependence and drug abuses (opiates, cocaine, amphetamines, alcohols, benzodiazepines, barbiturates, tobacco). Role of emetics, anti-emetics and respiratory stimulants.

B) Evidence Based Medicine
- Formulating Clinical Questions
- Searching for the best evidence
Critical Appraisal of the evidence

Applying evidence to patients

Evaluation

Unit-V  A) Medication Error and Medication Adherence

- Categories and causes of medication error
- Performance indicators of the medication use process
- Categories of medication non-adherence
- Role of pharmacists at medication error and medication adherence

B) Pharmacovigilance

- Scope, Definition and Aims of Pharmacovigilance
- Adverse Drug Reactions – Classification, Mechanism, Predisposing Factors, Causality Assessment [different scaled used].
- Reporting, evaluation, monitoring, preventing & management of ADR’s
- Role of pharmacist in management of ADR’s

Text books

3. Remington Pharmaceutical Sciences

Reference Books

1. Basic skills in interpreting laboratory data – Scott LT . American Society of Health System Pharmacists Inc.
5. Relevant review articles from recent medical and pharmaceutical literature.
COMMUNITY PATIENT CARE/COMMUNITY PHARMACY
HCPT-1.5

**Unit-I**  Introduction to the concept of community pharmacy – its activities and professional responsibilities
a) The role of community pharmacy and its relationships to other local health care providers
   b) Prescribed medication order- Interpretation and legal requirements
   c) Over the counter (OTC) sales

**Unit-II**  Health Education and Community Pharmacy: Family planning, first aid, communicable disease prevention, smoking cessation, screening programs.

**Unit-III**  
   a) Services to nursing homes/clinics.
   b) Community Pharmacy Management: Financial, material and staff management, infrastructure requirements, drug information resources, computers in community pharmacy.
   c) Code of ethics for community pharmacy

   d) Poly pharmacy and its implications

**Unit-IV**  
   A) Communication skills – Principles and elements of communication skills, non-verbal communication in pharmacy, barriers in communication, listening skills, questioning skills, explaining skills. Patient counseling in community pharmacy
   B) Education and training staff, training and continuing education for pharmacists, pharmacy students, Medical staff and students, nursing skills, explaining skills and ethics in communication

**Unit-V**  
   A) Public Health Policy and Health Care System – National & International
   B) Concept of Rational Use of Drugs – Importance of rational drug use, pharmacists role, drug use indication, guidelines for rational prescribing.

Text Books (Latest Edition)
1. Hospital Pharmacy – Hassan WE. Lec and Febiger Publication

Reference books:
3. Remington Pharmaceutical Sciences
4. Relevant review articles from recent medical and pharmaceutics literature.
The students are required to be posted to various clinical wards for their exposure with therapeutic management and other clinical aspects. They are expected to have experience and do a tutorial as well as case presentation in the following clinical conditions. The students have to make at least 10 case presentations covering most common diseases found in the hospital to which the college is attached. The student should also submit a record of the cases presented. The list of clinical cases presented should include follow-up of the clinical cases mentioned below from the day of admission till discharge and presented in the SOAP (Subjective, Objective, Assessment and Plan) format. The cases may be selected from the following departments:

1. Cardiology
2. Respiratory System
3. Haematological Diseases & Nephrology
4. Gastroentrology & Rheumatology
5. Endocrinology & Dermatology

**Assignments**

The students are required to submit a minimum of three written assignments (1500 to 2000 words) selected from the topics on different disease conditions given to them. The students are required to discuss both the clinical and therapeutic aspects in the same.
ADVANCED CLINICAL PHARMACY – LAB
HCPL-1.7

Patient medication history interview, answering drug information questions, patient medication counseling, participation in ward rounds. Case studies related to laboratory investigations covering the topics dealt in theory class.

1. Answering drug information questions (4)
   (Queries related to Dosage, administration, contraindications, adverse drug reactions, drug use in pregnancy and lactation, drug profile, efficacy and safety)
2. Patient medication counseling – (3) Common diseases like Diabetes, Hypertension, Asthma, COPD, Acute Renal Failure, chronic Renal Failure.
3. Case studies related to laboratory investigations (4) – LFT, Hematology, Thyroid, Renal, Cardiac Enzymes.
4. Patient medication history interview (2)
5. Medication order review (2)
6. Detection and assessment of adverse drug reaction and their documentation (3)

Assignments
Drug information,
Patient medication history interview
Patient medication counseling
Problem solving in clinical Pharmacokinetics
Literature evaluation pertaining to therapeutic range used in therapeutic monitoring of any two drugs frequently subjected for TDM.
Critical appraisal of two recently published articles in the biomedical literature, which deals with a drug or therapeutic issue.