CENTRAL COUNCIL OF INDIAN MEDICINE

NISABE TALEEM OF MAHIR-E-TIB
(ILMUL SAIDLA)

SYLLABUS OF
DOCTOR OF MEDICINE (MD-UNANI)
(PHARMACY)

3 YEARS DEGREE COURSE

CENTRAL COUNCIL OF INDIAN MEDICINE
61-65, INSTITUTIONAL AREA,
JANAKPURI
NEW DELHI - 110058

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(December, 2013)
M D Ilmul Saidla  
Scheme of papers

First Year (Exam to be held at the end of one academic year)

Paper I  
Research Methodology and Biostatistics

Paper II  
Qawanine Dawasazi wa Ilmul Taklees (Principles of Pharmacy and Calcinology)

Paper III  
General and Experimental Pharmacology

Final Year (Exam to be held at the end of three years, however teaching / training to be organized in both IIInd & III rd year)

Paper I  
Pharmaceutical Developments & its Applications in Saidla

Paper II  
Cosmetology and Dietetics in Unani Medicine

PAPER III  
Ilm Wasful Aqaqueer (Pharmacognosy of Unani Drugs)

PAPER IV  
Quality Control and Quality Assurance of Unani Drugs  
Thesis Work
First Year

Paper I- Research Methodology and Biostatistics

Research Methodology

- Types of research
  - (a) Literary research
  - (b) Clinical research
  - (c) Experimental research
  - (d) Observation and field studies

- Trends and possibilities of R&D of Unani Drugs

- Research problems
  - (a) Definition
  - (b) Selection and sources of research problems

- Hypothesis
  - Null and alternate hypothesis

- Research designs
  - (a) Types of Research designs

- Controls in research designs
  - (a) Selection criteria
  - (b) Placebo and plain control
  - (c) Randomization
  - (d) Balancing and matching

- Factors effecting research results.

- Tools and techniques in research
  - (a) Interview, questionnaire, inventories, scales
  - (b) Rating scales

- Computer programmes used in research
  - (a) Minitab
  - (b) SPSS
  - (c) Gpad

- Protocols for research and report writing
  - (a) Protocols for experimental, clinical and community based research.
  - (b) Writing research report.
  - (c) References in research report.
    - (i) Books
    - (ii) Journals
    - (iii) Compendia
    - (iv) Bulletins
    - (v) WHO Reports
    - (vi) Internet Sites
• Guidelines for Research
  (a) WHO
  (b) ICMR
  (c) CPCSEA

Bio-Statistics
• Scope and utility of Biostatistics
• Descriptive Statistics
  (a) Analysis of Data
    (i) Data collection, tabulation and presentation of data.
    (ii) Measure of central tendency – Mean, Median and Mode.
    (iii) Measures of dispersion: Range, quartile deviation, standard deviation.
  (b) Probability
    (i) Definition and laws of probability
    (ii) Types of probability distribution
    (iii) NPC and its application size
    (iv) Randomized samples
  (c) Sampling
    (i) Types and sample size
    (ii) Randomized sampling
• Inferential Statistics
  (a) Correlation and linear regression
    (i) Karl Pearson correlation coefficient
    (ii) Linear regression equations.
  (b) Test of significance
    (i) ‘t’ test
    (ii) ‘z’ test.
  (c) Test of variance
    (i) ANOVA one way
    (ii) ANOVA two way
    (iii) $X^2$ test.
  (d) Non-parametric tests
    (i) Median test, Mann Whitney U test.
    (ii) Kruskall Wallis test, Fried test.

• Vital Statistics
  (a) Rate and Ratios
  (b) Standardization of population
  (c) Risk factors
PRELIMINARY EXAMINATION
Paper II
Qawanine Dawasazi wa Ilmul Taklees
(Principles of Pharmacy and Calcinology)

- Scope and chronological evaluation of Unani Pharmacy.
- Technical terminologies and Scientific interpretation of Amaliyate dawasazi (Pharmaceutical Procedures)
  
Irgha, tarveeq, iqla, tashvia, tabkheer, tadhheen, tajfeef, ghasl, tasfia, tasveel, ihraq, taklees, tahmees, tabalvur, Izala Laun, Ifta, Sahaq, tableel, Taqtee, Nakhl, Taseer, Tarsheeh, Tahbeeb, Takhmir wa Taafin.

- Specific Unani Pharmaceutical Procedures:
  Methods of distillation and standardization of herbal distillates.
  Methods of preparation of Usara, rub and sat.
  Methods of Oil Extraction.
  Sufoof Sazi :Classification of powder- principles, methods, related equipments and the grades of powder.
  Methods of detoxification and purification of some specific drugs: Afyun, kamoon, azaraqi, shangraf, habbus-salateen, turbud, ghariqoon, saqmunia, khibrit, sammulfar, hartaal, Amale Tasfia (Cleansing Process): shahad, kharateen, simab, sibr, bahroza, mom, abrak etc.
  Methods of preparation of Qiwam used for it and measurement of syrupy consistency.

- Detailed knowledge of Unani Dosage Forms (Solid, Liquid, Semi solid, Gaseous), method of Preparations and need of improvisation.
- Methods of preparation of Qiwam and materials used for it and measurement of consistency.
- Detailed knowledge of ancient and contemporary pharmaceutical instruments used in Unani Pharmacy
  Kharal, Aalae tareeq, Patal jantar, Jaljantar, Sieves, Granulator, Tablet making machine, Coating machine, Grinders, Distillation apparatus, Desiccator, Oven, Crucibles, Lyophilizer (Freeze Dryer).
- Good Manufacturing Practices (GMP) & shelf life.
- Hospital Pharmacy (Definition, functions, objectives, location and management)
- Introduction to Qarabadeen, Unani Pharmacopoeia of India, National Unani Formulary.
- Introduction to Traditional Knowledge Digital Library (TKDL).

Ilmul Taklees (Calcinology)

- Historical background of calcinology, Definition, Aims, objectives and scope of calcinology
- Basics of inorganic Chemistry in context of metals, non-metals and minerals used in Kushtasazi.
- Process of calcinations and their scientific evaluation.
- Calcination, Ignition and temperature standardization.
- Principles of calcination and general methods of preparation of following calx : Faulad, Hartal, Shangraf, Sadaf, Marjan, Qalayee, Gaudanti, Qarnulayyil, Sammulfar, Nuqra, Tila, Jast.
- Evaluation of classical methods of preparation of Kushta and need of modification.
- SOPs for calcination.
- Methods of Identification of kushta :
  a) Classical methods
  b) Recent techniques useful in identification and Analysis of Kushta
- Actions and therapeutic uses of different kushtajat.
- Instruments used in the preparation of Kushta.: Classical and modern instruments
 Determination of Shelf life of a Kushta.

Practicals:
Training in processes mentioned in theory

PAPER III

General and Experimental Pharmacology

General Pharmacology and its various branches: Pharmacokinetics, Pharmacodynamics, Pharmacotherapeutics, Toxicology, Clinical pharmacology, Pharmaceutics, Posology.

- Routes of Administration of Drugs
- Pharmacokinetics: Absorption, Distribution of drugs, Metabolism and Excretion of drugs, Bioavailability and half life of drugs, Dose response curve, LD$_{50}$, ED$_{50}$
- Pharmacodynamics: Receptor theory of drug action, Receptor Families, Receptor – ligand Binding, Factors modifying drug actions
- Pharmacovigilence: Drug interactions, Adverse Drug Reaction, Reporting and monitoring of ADR.
- Principles of Toxicology.

Experimental Pharmacology:
Common laboratory animals, characteristics and experimental uses
Factors affecting drug response
Drug administration (Oral and IV) and withdrawl of blood samples
Dose conversion factors
Vehicles for animal administration
Isolated tissue preparations,
Methods of rendering the animals unconscious, and anaesthetics used.
Physiological salt solutions
Standard drugs and chemicals

Bio assay: Scope, Principles, Designing, Types.

Drugs Screening: Low & High throughput screening.
Low throughput (Simple Blind Programmed Screening)
High put Screening

Toxicity Studies: Acute, Sub acute, Chronic studies.

Neuro-pharmacological Studies: Irwin’s profile, Smith’s profile.
Anticonvulsant activity
Analgesic, Antipyretic, Anti-inflammatory, and Anti-ulcer activities
Hepatoprotective, Nephroprotective Activities
Hypoglycemic and Hypolipidemic Activities
Action of drugs on cardiovascular system

Practicals

In-vivo Experiments
- To study the general pharmacology and gross behaviour in mice/ rats.
- To study the effects of pentobarbital Induced hypnosis in mice.
- To study the effects of chlorpromazine on the locomotor activity using photoactometer in rats.
- To study the analgesic activity of morphine using tail flick method by analgesiometer in mice.
• To study the analgesic activity of morphine using hot plate method in mice.
• To study the analgesic activity of aspirin using acetic acid induced writhing test in rats.
• To study the anti-inflammatory activity of aspirin / indomethacin against carrageenin induced paw edema in mice.
• To study the anticonvulsant activity of phenytoin using convulsiometer in rats.
• To study the antisecretory and ulcer protective effect of \( H_2 \)-Blockers in rats.

**In-vitro Experiments (on isolated preparations)**

• To record a concentration response curve (CRC) of acetylcholine using ileum preparation in rats.
• To record the effect of physostigmine (Eserine) on the CRC of acetylcholine using ileum preparation in rats.
• To record the blocking effect of atropine sulphate on the CRC of acetylcholine using ileum preparation in rats.

**FINAL YEAR EXAMINATION**

**Paper I**

Pharmaceutical Developments & its Applications in Saidla

• **Pharmaceutical Dosage Forms and their methods of preparations:**
  - **Oral Solid Dosage Forms:** Powder, Tablets, Capsules, Sustained release dosage forms, Suppositories and Pessaries.
  - **Oral Liquid Dosage Forms:** Solution, Suspension and Emulsion.
  - **Topical Semisolids:** Ointments, Pastes, Creams, Gels and Poultices
  - **Topical Liquids:** lotions, liniments, topical solutions, gargles, mouthwashes, ear drops and nasal preparations.

• **Principles of Pharmaceutical Processing, designing and application in Unani Pharmacy:**
  Cutting, Milling and Mixing: Pulverizer, Grinders, Sieving shakers, Mixers, Impellor Mixer (for liquids), Ribbon Blender, Mixer (for solids), Triple rolling mills, Ball mill, Edge runner.
  Incineration: Furnaces and ovens.
  Drying of crude drugs and methods of drying: Type of Dryers (Oven, Spray dryer, Freeze dryer, Tray Dryer)
  Granulation: Granulators
  Tablet making machine
  Pills making machine
  Tablet Coating & Polishing machine
  Capsule filling machine
  Emulsions: Emulsifier, Homogenizer, Surfactants, emulsifying agents,
  Ointment, pastes, gels and creams filling machine
  Extracts and tinctures: various methods of Extraction.
  Centrifugation: Centrifuge (Filter Centrifuge)
  Pharmaceutical Aerosols: Various actuators and applicators.
  Suppositories: Manufacturing and bases of suppositories.
  Filtration: Different types of Filter equipments and Filter Aids
  Evaporation and crystallization: Spray drying
  Evaporation and Different types of Evaporators

• **Humidifier and Dehumidifier**
Application of computer in pharmacy.
Packaging material science.
Lyphylyser

- **Bases and Vehicles**
- **Permitted Pharmaceutical Excipients used in Unani and Modern Preparations:** Colorants, Preservatives, Flavoring Agents, Alternate Sweeteners, Surfactants and emulsifying agent.
- **Production Management.**
- **Factory and Pharmacy Act**

**Practicals**
- Practical classes will be conducted covering all the methods of preparation of dosage forms.
- Educational visits to atleast five GMP approved Unani pharmaceutical houses and R&D laboratories.

**PAPER II**
**Cosmetology and Dietetics in Unani Medicine**

**Cosmetology:**
- Applied anatomy and physiology of skin
- Relevant and regulatory provisions of Unani drugs in Drug and Cosmetic Act
- Concept of cosmetology in Unani Medicine
- Common skin diseases leading to cosmetic problems

**Important products used as cosmetics in Unani medicine**
- Preparation used on face: Ghaza, Ghalia, Ubtana etc
- Preparation used on skin: Marham Cream, Lotion, Ubtana, Aabiyat, Zimad, Tila, Adhaan, Ghasool.
- Preparation used on hair: Khizab, Camouflage
- Preparation used in eye: Kohl, Kajal, Surma, Lamelle
- Preparation used on nails: Sibgha, Mehndi
- Preparation used on teeth, gums and oral cavity: Sunoon, Gargara (Gargle), Mazmaza (Mouth wash)
- Atriyat (Perfumes and Deodorants)
- Preparation of cosmetic products using classical and recent techniques. Common diluents and excipients used in cosmetics.
- Diets and Drugs used to improve the beauty
- Side effects of Cosmetics

**Dietetics:**
- Concept of Ghiza in Unani Medicine
- Concept of Neutraceuticals in Unani, Pharma food, Probiotics, Phytochemicals, Anti-oxidants
- Clinical dietetics
- Ghiza that cause specific disorders in the body
- Ghiza that are useful in different diseases conditions
- Ghiza useful for people of different age and different temperament
- Ghiza and life style Diseases
- Malnutrition and special diets prescribed in Unani Medicine
- Preparation and standard of special diets.
Practicals

- Practical training of the processes mentioned in the Theory.

Paper III

*Ilm Wasful Aqaqeer (Pharmacognosy of Unani Drugs)*

- **Introduction to Pharmacognosy and Plant Nomenclature.**
- **Classification of Plant Kingdom.**
- **Factors affecting the quality of drugs.**
- **Collection, drying and storage of drugs.**
- **Deterioration of stored drugs.**
- **Identification of crude drugs**
  - Morphology of Root, leaf, stem, fruit, seeds, flowers and its types.
  - Anatomical Studies: Microtomy, Powder study.
  - Quantitative Microscopy: Stomatal number, Stomatal index, Pallisade ratio, Vein islet no.
- **Alkaloids and alkaloid containing drugs:** Kuchla, Ergot, Suranjaj, Afyon, Afsanteen, Asrol
- **Glycosides and glycoside containing drugs:** Revand, Senna, Sibr, Squill, Digitalis
- **Volatile oil & Resin containing drugs:** Ustokhuddus, Eucalyptus, Zeera, Darchini, Anisoon
- **Fixed oil, fats and waxes.**
- **Fixed oil containing drugs:** Badam, Zaitoon, Kunjad, Baidinjeer, Katan.
- **Tannin containing drugs:** Halela, Balela, Ashok chhal, Katha, Sandal Surkh, Arjun chhal
- **Phenols and Phenolic Glycosides containing drugs:** Kamela, Badranjboya, Bedmushk, Revand Chini, Senna, Ghekwar.
- **Gums and Resins containing drugs:** Kateera, Babool, Chuniya gond, Sanobar, Heeng, Kundur, Mastagi, Murrh.
- **Saponins containing drugs:** Hulba, Qust, Aslussoos, Brahmi, Asgandh.
- **Characteristic features of medicinally important plant families:**
  - Solanaceae, Apocynaceae, Papaveraceae, Liliaceae, Leguminosae, Umbellifercae
  - Malvaceae, Euphorbiaceae, Compositeae, Asclepiadaceae

Practicals

- Organoleptic identification of ten medicinal plants
- Morphological identification of any five families mentioned in the theory.
- Anatomical characteristics and dissection of root and stem of two medicinal plants
- Floral formula and floral diagram of five medicinal plants
Aims and Objectives of Standardization

Standardization of Herbal, Mineral, and Animal origin drugs:
(a) Physical standardization
(b) Chemical standardization

Analytical methods in drug analysis:

- Sublimation.
- Distillation.
- Methods of separation and isolation.
- Chromatography: Aims and objectives and various types of Chromatography
  - Thin layer chromatography
  - Paper Chromatography
  - Column Chromatography
  - Gas Chromatography, HPLC and HPTLC
- General description of electrophoresis.
- Spectroscopy: UV and flame photometry, Atomic Absorption Spectroscopy.

Quality Assurance of single drugs of Unani Medicine:
- Adulteration of drugs, Factors affecting quality of drugs, Aflatoxin contamination, Microbial contamination.
- Determination of pesticides and Heavy metals.

Quality Assurance of compound formulations:
- Arq, Majoon, Safoof, Qurs, Kushta and other dosage forms:
- Chemical analysis, Particle size Distribution, Powder XRD studies, Infra red Studies, Thermal Analysis, pH measurement, Carbon Analysis of Kushtajat.
- Detailed knowledge of Standard operating Procedures (SOPs).
- Standardization of Raw materials, Finished Product standardization and storage.
- Stability studies, Shelf life, GLP.
- Weight variation of tablets/ pills, Hardness testing, disintegration test, dissolution rate study.
- Viscosity/ Rheological studies of liquid formulations.

Practicals

Practical demonstration:

- Determination of Ash values
- Determination of moisture content.
- Determination of extractive values.
- Determination of Disintegration time
- Determination of Refractive index.
- Determination of Rf value by TLC.
- Determination of viscosity.
- Friability test.
- Bulk Density
- Swelling Index
- Determination of Essential Oil.
Recommended Readings:

Research Methodology and Biostatistics


Qawanine Dawasazi wa Ilmul Taklees (Principles of Pharmacy and Calcinology)

5. Qarabadeen Kabeer (Urdu), Vol. I, M. Md. Husain, Munshi Naval Kishore, Lucknow, 1892 AD.
6. Qarabadeen Qadri, Md. Akbar Arzani, Munshi Naval Kishore Lucknow, 1880 AD.
11. Fune Dawasazi, S.Z.Rehman, Publication Div. AMU.
19. Physico-chemical standardization of Unani Medicine, CCRUM, New Delhi.

**Ilm Wasful Aqaqeer**
**(Pharmacognosy of Unani Drugs)**

1. Bibliography of Pharmacognosy of Medicinal plants; R.Mitra; EBIS, Lucknow.
3. Modern method of plant analysis; Peach & Tracey; Springer Verlag Berlin, Gottengen Heidelberg; 1955.
4. Pharmacognosy; V.E Tyler, L.R.Brady, J.E.Robber; Pharmacognosy Lae Faibiger, Philadelphia; 1976.

**Cosmetology and Dietetics in Unani Medicine**

2. Al Qanoon Fit Tib (5th Volume): Avicenna.
3. Basic Nutrition and Diet Therapy, 10th edition , S R Williams, Mosby publishing House
7. Nutrition for Mother & Child, National Institute of nutrition, Hyderabad
8. Diet and Heart disease, National Institute of nutrition, Hyderabad
9. Nutrient requirements and Dietary allowances for Indians, Indian Council of Medical research
10. Some Therapeutic Diets, National Institute of nutrition
12. Nutritive values of Indian Foods, Gopalan, Shastri , National Institute of nutrition 1996
14. Poucher’s; Perfumes, cosmetics and soaps; W. A. Poucher; vol - 1, 2, 3; 9th edition.
15. Small scale manufacturer of soaps and detergents; D.N. Mathur.
17. Cosmetic science and technology series; Eric Jungerman; vol-1-8.
19. Modern Cosmetics; E.G. Thomssen.
21. Handbook of Synthetic and Herbal Cosmetics; Ankur, Engineer India Research Institute.

Pharmaceutical Sciences and its Application in Saidla

4. Pharmaceutical Practice; IIIrd; Winfield, Richards.
5. Remington (The Science and Practice of Pharmacy); 21st; Beringer, Gupta, Hoover; Lippincot, William and Wilkins; 2005.
6. Analytical Chemistry; VIth; Christian; WSE.
7. Vogel, Drug Discovery and Evaluation; IInd.
8. Theory and Practice of Industrial Pharmacy; IIIrd; Lachman, Lieberman, Kanig; Varghese Publishing House.
10. Modern Pharmaceutics, Basic Principles and Systems , 1 & 2, Alexander T. Florence, Juergen Siepmann
11. Martin’s Physical Pharmacy & Pharmaceutical Sciences, Vth, Patrick J. Sinco
12. Pharmaceutical Product Development, In Vitro and In Vivo Correlation, Dakshina Murthy Chilukri

General and Experimental Pharmacology

2. CRC Desk reference of clinical pharmacology; M.Ebadi; CRC Desk Reference series editor, Gerald Kerkut; 1998.
3. Drug discovery and evolution pharmacological assays; W.H.Vogel; Springer Verlag Publication.
11. Satoshkar, Kale, Bhandarkar’s Pharmacology and Pharmacotherapeutics; R.S Satoshkar and Bhandarkar; Popular prakashan Bombay.

Quality Control and Quality Assurance of Unani Drugs

2. Bibliography of Pharmacognosy of Medicinal plants; R.Mitra; EBIS, Lucknow.
3. Chemistry of Medicinal plants; CCRUM New Delhi; CCRUM New Delhi.
5. Physico-chemical standardization of Unani Medicine; CCRUM, New Delhi; CCRUM, New Delhi.
6. Plant microtechnique; J.D. Alexender; Tata Macgra Hill, Bombay.
7. Standardization of herbal drugs; S.H. Afaq; Publication Division, AMU, Aligarh.
9. Unani Advia Mufrada; Safiuddin, National Council; New Delhi; 1996.

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