

Syllabi
New / 15/1

SYLLABI OF M. PHIL. PHARMACEUTICAL CHEMISTRY

FACULTY OF PHARMACY, BAHAUDDIN ZAKARIYA UNIVERSITY, MULTAN

M. Phil. Pharmaceutical Chemistry comprises of four semesters (50 Credit hours) i. e two years programme. The first two semesters (25 credit hours) i. e one year consist of a course work whereas the 3rd and 4th semesters (25 credit hours) i. e one year is devoted for research work. The syllabi / courses of reading during the first two semesters are outlined below:

1st SEMESTER (12 Credit hours)

Course No.	Title of Course	Credit Hours
✓ PHC-701	Drug Design	3
✓ PHC-702	Drug Stability & Pharmaceutica. Analysis	3
✓ PHC-703	Advanced Pharmaceutical Analysis	3
✓ PHC-704	Natural Product Chemistry	3

2nd SEMESTER (13 Credit hours)

Course No.	Title of Course	Credit Hours
✓ PHC-751	Advanced Medicinal Chemistry	3
✓ PHC-752	Therapeutical Chemistry	3
✓ PHC-753	Phytochemistry	3
✓ PHC-754	Seminar in Pharmaceutical Chemistry	1
✓ PHB-755	Biostatistics	3

3rd and 4th SEMESTERS (25 Credit hours)

Course No.	Title of Course	Credit Hours
✓ PHC-801	Thesis	25

Syllabi / Courses of Reading for M. Phil. Pharmaceutical Chemistry 1st Semester

✓ **PHC-701**

DRUG DESIGN

M. Phil. 1st semester

(Credit hours 3)

- 1 History of Medicinal chemistry
- 2 Systematic drug development and rational research methods.
- 3 General and theoretical aspects of drug design
- 4 Development of new drugs
 - a) Source of drugs.
 - b) Random screening.
 - c) Extraction from natural sources.
 - d) Molecular modification.
 - e) Evaluation of intermediate products.
 - f) Pro-drugs.
 - g) Planned rational synthesis.
 - h) Cost of development of new drugs.
- 5 Selected examples of drug design (Antidepressants, Neuroleptic agents, Antibiotics, Antiinflammatory agents, Anticholinergics and histamine-1 receptor antagonists, Analgetics, antiprotozoal agents, Antiviral and antineoplastic agents)

✓ **PHC-702**

DRUG STABILITY AND PHARMACEUTICAL ANALYSIS

M. Phil. 1st semester

(Credit hours 3)

- 1 Quantitative analysis of Carbon, Hydrogen, Oxygen, Nitrogen, Halogens, Sulphur and Phosphorous
- 2 Theoretical aspects of pharmaceutical analysis with special reference to acidimetry-alkalimetry, Oxidation - reduction, Argentimetric, Non-aqueous, Sodium nitrite and Complexometric titrations
- 3 Radiopharmaceuticals and Radioimmunoassays
- 4 Stability Studies of drugs
 - a) Stability prediction and calculations.
 - b) Modes of pharmaceutical degradation.
 - c) Accelerated stability testing and stability protocol.

✓ PHC-703

ADVANCED PHARMACEUTICAL ANALYSIS

M. Phil. 1st semester

(Credit hours 3)

- 1 *Spectroscopy*: Applications of spectroscopic techniques such as UV and IR spectroscopy, Fluorescence spectrophotometry, nuclear magnetic resonance (NMR), Mass spectrometry and atomic absorption spectroscopy for the analysis and for structural determination of medicinally active natural and synthetic compounds.
- 2 *Chromatographic Techniques*: theory and applications of thin-layer, Gas-liquid and High Pressure Liquid Chromatography to the identification and quantitative analysis of drugs and drug metabolites.
- 3 *Electrochemical techniques*: Theory and applications of various electrochemical techniques such as polarography, amperometry, conductometry, polarimetry and potentiometry for the analysis of official compounds.

✓ PHC-704

NATURAL PRODUCT CHEMISTRY

M. Phil. 1st semester

(Credit hours 3)

- 1 Modification of natural substances in the modern drug synthesis.
- 2 New approaches to the discovery of antitumor agents.
- 3 Recent developments in the chemistry of plant derived anticancer agents.
- 4 Recent developments in chemistry, distribution and biology of the cyanogenetic glycosides.
- 5 Natural products for liver diseases.
- 6 Chemistry and biological activity of Saponins.
- 7 Non-steroid, cardioactive plant constituents.
- 8 Immunostimulants from higher plants
- 9 Potential fertility regulating agents from plants.

Syllabi / Courses of Reading for M. Phil. Pharmaceutical Chemistry 2nd Semester

✓ PHC-751

ADVANCED MEDICINAL CHEMISTRY

M. Phil. 2nd semester

(Credit hours 3)

- 1 Medicinals of plant origin: historical development.
- 2 Metabolic changes of drugs and related organic compounds.
- 3 Biopharmaceutical properties of drug substances.
- 4 Approaches to Anti-AIDS agent.
- 5 Pharmaceutical biotechnology.
- 6 Natural fungitoxins

✓ PHC-752

THERAPEUTICAL CHEMISTRY

M. Phil. 2nd semester

(Credit hours 3)

- 1 Structure-activity relationships of organic medicinal compounds including antimalarials, sedatives, hypnotics antipyretic analgesics, cardiac steroids, diuretics, Morphine and related compounds, sulphonamides.
- 2 Physicochemical properties in relation to biological action.
- 3 Stereochemistry and drug action.
- 4 Receptor theories.
- 5 Antihyperlipidemic drugs, drugs affecting sugar metabolism and Non-Steroidal anti-inflammatory drugs
- 5 Radiosensitizers
- 6 Antiamoebic agents, Antiviral agents and agents affecting immune response

✓ PHC-753

PHYTOCHEMISTRY

M. Phil. 2nd semester

(Credit hours 3)

- 1 Cell culture as sources of drugs.
- 2 Special testing methods for carcinogenicity, mutagenicity, teratogenicity, irritancy, allergenicity.
- 3 Prostaglandin synthetase inhibitors: A new approach for insect control.
- 4 Basic metabolic pathways and origin of secondary metabolites
- 5 Antifungal, Mulluscidal and Cytotoxic compounds from plants used in traditional medicine.
- 6 Natural polypeptides, polysaccharides and beta-lactum antibiotics.

✓ PHC-754

SEMINAR IN PHARMACEUTICAL CHEMISTRY

M. Phil. 2nd Semester

(Credit Hours 1)

Faculty and student participation in discussion of current research and developments in instrumentation, biosynthesis and structure elucidation of natural products, pharmaceutical analysis, synthetic methods and medicinal chemistry.

✓ PHB-755

BIO-STATISTICS

M. Phil. 2nd semester

(Credit hours 3)

Various definitions of Biostatistics. Application of statistics in biological and pharmaceutical sciences. Statistical data collection, presentation and tabulation of data. Frequency Distribution and its formation, types of frequency curves.

Measures of Central Tendency: Such as Mean, Mode, Median quantities decides of grouped and undgrouped Pharmaceutical data

Measures of Dispersion: Such as Range, mean deviation, Standard deviation and Variance. Standard error, Co-efficient of variation, Skewness and Kurtosis of pharmaceutical data.

Test of hypothesis and Significance

Experimental Designs

Correlations and probability.

PHC-801

THESIS

M. Phil. 3rd and 4th Semesters

(Credit Hours 25)

The research work will be carried out in any branch of Pharmaceutical Chemistry. The thesis shall embody the results of research, which may either be continuation to the existing knowledge of the subject, or application of known methods of research to some technical problems. This will also include seminar and viva voce examination concerning research topic. Five copies of research thesis printed or type written shall be submitted for examination at the end of the academic year.

Note: An industrial study tour will be an integral part of the courses of study in Pharmaceutical Chemistry.