SECOND SEMESTER

PAKISTAN STUDIES	
PS 403	**Cr. Hr. 02**

Introduction/Objectives:

- Develop vision of historical perspective, government, politics, contemporary Pakistan, ideological background of Pakistan.
- Study the process of governance, national development, issues arising in the modern age and posing challenges to Pakistan.

1. **HISTORICAL PERSPECTIVE:**
   a. Ideological rationale with special reference to Sir Syed Ahmed Khan, Dr. Allama Muhammad Iqbal and Quaid-i-Azam Muhammad Ali Jinnah.
   b. Factors leading to Muslim separatism
   c. People and Land
      i. Indus Civilization
      ii. Muslim advent
      iii. Location and geo-physical features
2. **GOVERNMENT AND POLITICS IN PAKISTAN:**
   Political and constitutional phases:
   1947-58, 1958-71, 1971-77, 1977-88, 1988-99, 1999-onward
3. **CONTEMPORARY PAKISTAN:**
   a. Economic institutions and issues
   b. Society and social structure
   c. Ethnicity
   d. Foreign policy of Pakistan and challenges
   e. Futuristic outlook of Pakistan

PHARMACEUTICS-IIB (Dosage Forms Science) [Theory]	
PHARM 415	**Cr. Hr. 03**

1. **SUPPOSITORIES AND ENEMAS:** Semi-solid preparations, Suppositories: Bases, preparation, packaging and storage, Solutions/Enemas: preparation, packing & storage.
2. **AEROSOLS, INHALATIONS AND SPRAYS:** Aerosol: Principle, container and valve assembly, propellants, filling, testing, packaging, labelling and storage. Inhalations: Principle, container and valve assembly, propellants, filling, testing, packaging, labelling and storage. Sprays: Principle, container and valve assembly, propellants, filling, testing, packaging, labelling and storage.
3. **POWDERS, CAPSULES, TABLET DOSAGE FORMS:** Preparation of Powders, mixing of powders, uses and packaging of powders, granules, effervescent granulated salts. Hard gelatin capsules: capsule sizes, preparation of filled hard gelatin capsules. Soft gelatin capsules, preparation and its application. Tablets: types, characteristics and methods of preparation.

4. **INTRODUCTION TO PARENTERALS:** Official types of injections, solvents and vehicles for injections, added substances.

5. **A BRIEF INTRODUCTION TO ORAL HYGIENE PRODUCTS:**

PHARMACEUTICS-IIB (Dosage Forms Science) [Practical]
PHARM 415 **Cr. Hr. 01**

NOTE: Practicals of the subject shall be designed from time to time on the basis of the above mentioned theoretical topics and availability of the facilities. (A minimum of 10 practicals will be conducted).

PHARMACEUTICS-IIIB (Pharmaceutical Microbiology & Immunology) [Theory]
PHARM 416 **Cr. Hr.: 03**

1. **INDUSTRIAL MICROBIOLOGY:** Introduction to Sterilization/Disinfection. Fermentation. Pharmaceutical products produced by fermentation process (Penicillins, Cephalosporins, Gentamycin, Erythromycin, Tetracyclines, Rifamycin, Griseofulvin).
2. **IMMUNOLOGY:** Introduction and types of Immunity: Specific and non-specific (Cellular basis of Immune response. Immunity, autoimmunity, tolerance. Antigen. Anti-bodies). Antigen-Antibody reactions and their clinical and diagnostic applications. Hypersensitivity and allergy. Drug allergy mechanism. Vaccination: Introduction and aims. Types of Vaccines. Current vaccine practices.
3. **FACTORY & HOSPITAL HYGIENE including GOOD MANUFACTURING PRACTICES:** Introduction, Control of Microbial contamination during manufacture. Mnaufacture of Sterile products, A Guide to Current Good Pharmaceutical Manufacturing Practices.
4. **INTRODUCTION TO DISEASES:** Dengue fever, Bird flu, SARS, or other prevailing diseases of bacteria and virus.

PHARMACEUTICS-IIIB (Pharmaceutical Microbiology & Immunology) [Practical]
PHARM 416 **Cr. Hr.: 01**

NOTE: Practical of the subject shall be designed from time to time on the basis of the above mentioned theoretical topics and availability of the facilities, e.g. Sterilization of glassware and pharmaceutical products by various methods. Microbiological assays of: Anti-biotics and vitamins. Preparation of general and selective media and culturing of microorganisms. Total and viable counts of micro-organism. Morphological and selective biochemical characterization of some specimen. Staining of Bacteria: Gram method, Acid fast, Giemasas staining, Capsule staining, Flagella staining and Spore staining. Microbiological analysis of air, water and soil (Note: A minimum of 10 practicals will be conducted).

PHARMACOLOGY & THERAPEUTICS-IB [Theory]

PHARM 417 **Cr. Hr. 03**

1. **AUTACOIDS AND THEIR ANTAGONISTS:** Histamine and anti-histamines, serotonin and serotonin antagonist, prostaglandins and their antagonists.
2. **DRUGS ACTING ON RESPIRATORY SYSTEM:**
   a. Drugs used in cough (Anti-tussives, Expectorants and Mucolytic agents).
   b. Drugs used in Bronchial Asthma. Bronchodilators: Sympathomimetic, Xanthine derivatives, Leukotriene receptor antagonists and synthesis inhibitors, Muscarinic receptor antagonists, Cromoglycate, Nedocromil, Cortecosteroids & other Anti-inflammatory drugs.
3. **DRUGS ACTING ON CARDIO-VASCULAR SYSTEM:**
   a. Angina pectoris and its drug treatment
   b. Congestive heart failure & its treatment.
   c. Anti-arrhythmic drugs
   d. Anti-hyperlipidemic.
   e. Coagulants and Anti-coagulants
   f. Anti-hypertensive
   g. Diuretics
4. **DRUGS ACTING ON GENITOURINARY SYSTEM:** Oxytocin, Ergot alkaloids and uterine relaxants.
5. **ANTI-ANAEMIC DRUGS.**
6. **HORMONES, ANTAGONISTS AND OTHER AGENTS AFFECTING ENDOCRINE FUNCTION:** Endocrine function and dysfunctions. Drug used for therapy of Diabetes Mellitus: Insulin and Oral Hypoglycemic agents, Corticosteroids, Thyroid hormone and anti-thyroid drugs.

NOTE:

1. Only an introduction will be given of the banned and obsolete drug products.
2. While dealing with Pharmacology stress should be laid to the group actions of related drugs and only important differences should be discussed of the individual drugs placed in same group.
3. Newly introduced drugs should be included in the syllabus while drugs with no clinical and therapeutic values ought to be excluded from syllabus at any time.
4. The prototype drugs in each group from the latest edition of the recommended books.

PHARMACOLOGY & THERAPEUTICS-IB [Practical]

PHARM 417 **Cr. Hr. 01**

NOTE: Practical of the subject shall be designed from time to time on the basis of the above mentioned theoretical topics and availability of the facilities, e.g.

1. Preparation of standard solution. Ringer solution. Tyrode solution. Kreb solution. Normal saline.

2. To demonstrate the effects of sympathomimetic (Adrenaline) &sympatholytic drugs (Propranolol) on Frog's heart.
3. To demonstrate the effects of parasympathomimetic (Acetylcholine) and parasympatholytic (Atropine) drugs on Frog's heart.
4. To demonstrate the effects of an unknown drug on Frog's heart.
5. Routes of Administration of drugs.
6. To demonstate the effects of vasconstrictor drugs on Frog's blood vessels.
7. To demonstrate the effects of stimulant drugs on Rabbit's intestine (Acetyl choline, Barium chloride).
8. To demonstrate the effects of depressant drugs on Rabbit's intestine (Atropine).
9. To differentiate the effects of an unknown drug on Rabbit's intestine and identify the (unknown) drug.
10. To study the effects of Adrenaline on Rabbit's Eyes.
11. To study the effects of Homatropine on Rabbit's Eyes.
12. To study the effects of Pilocarpine on Rabbit's Eyes.
13. To study the effects of Local Anaesthetic drug (e.g Cocaine) on Rabbit's Eyes.
14. To identify the unknown drug & differentiate its effects on Rabbit's Eyes

(Note: A minimum of 10 practicals will be conducted).

PHARMACOGNOSY-IB (Basic) [Theory]

PHARM 418 **Cr. Hr. 03**

1. **DRUGS OF ANIMAL ORIGIN:** General introduction and discussion about honey, gelatin, shellac, musk, civet, ambergris, cod liver oil, cantharides and spermaceti.
2. **BIOLOGICS:** Sources, structure, preparation, description and uses of vaccines, toxins, antitoxins, venoms, antivenoms, antiserums.
3. **SURGICAL DRESSINGS:** Classification of fibers as vegetable, animals and synthetic fibers. Evaluation of fibers in surgical dressings, BPC standards for dressings and sutures. Discussion on cotton, wool, cellulose, rayon, catgut and nylon.
4. **PESTICIDES:** Introduction, methods and control of pests with special reference to pyrethrum, tobacco, and other natural pesticides.
5. **GROWTH REGULATORS:** General account with special reference to plant hormones; Auxins, Gibberellins, Abscisic acid and Cytokinins.
6. **POISONOUS PLANTS INCLUDING ALLERGENS AND ALLERGENIC PREPARATIONS:** General introduction, case history, skin test, treatment of allergy, inhalant, ingestant, injectant, contactant, infectant and infestant allergens. Mechanism of allergy.
7. **ENZYMES:** Enzymes obtained from plant source. (Phytoenzymes). Papain, Bromelain and Malt Extract. Enzymes obtained from Animal source. Rennin, pepsin, Pancreatin and Pancrealipase.

PHARMACOGNOSY-IB [Practical]

PHARM 418 **Cr. Hr. 01**

NOTE: Practicals of the subject shall be designed from time to time on the basis of the above mentioned theoretical topics and availability of the facilities, e.g. Introduction of the entire and broken parts of the plant drugs (Macro and organoleptic characters), Microscopic examination of powders and sections of plant drugs.

(Note: A minimum of 10 practicals will be conducted).

NOTE: A Study Tour will be an integral part of the syllabus and will be arranged at the end of the session for collection of medicinal plants from the country.

PHARMACY PRACTICE-IB (Bio-Statistics)

PHARM 419 **Cr. Hr. 03**

1. **DESCRIPTION OF STATISTICS:** Descriptive Statistics: What is Statistics? Importance of Statistics. What is Biostatistics? Application of Statistics in Biological and Pharmaceutical Sciences. How samples are selected?
2. **ORGANIZING and DISPLAYING DATA:** Vriables, Quantitative and Qualitative Variables, Univariate Data, Bivariate Data, Random Variables, Frequency Table, Diagrams, Pictograms, Simple Bar Charts, Multiple Bar Charts, Histograms.
3. **SUMMARIZING DATA and VARIATION:** The Mean, the Median, the Mode, the Mean Deviation, the Variance and Standard Deviation, Coefficient of Variation.
4. **CURVE FITTING:** Fitting a Straight Line. Fitting of Parabolic or High Degree Curve.
5. **PROBABILITY:** Definitions, Probability Rules, Probability Distributions (Binomial & Normal Distributions).
6. **SIMPLE REGRESSION AND CORRELATION:** Introduction. Simple Linear Regression Model. Correlation co-efficient.
7. **TEST OF HYPOTHESIS AND SIGNIFICANCE:** Statistical Hypothesis. Level of Significance. Test of Significance. Confidence Intervals, Test involving Binomial and Normal Distributions.
8. **STUDENT "t", "F" and Chi-Square Distributions:** Test of Significance based on "t", "F" and Chi-Square distributions.
9. **ANALYSIS OF VARIANCE:** One-way Classification, Two-way Classification, Partitioning of Sum of Squares and Degrees of Freedom, Multiple Compression Tests such as LSD, The analysis of Variance Models.
10. **STATISTICAL PACKAGE:** An understanding of data analysis by using different statistical tests using various statistical software's like SPSS, Minitab, Statistica etc.