COURSES OF STUDY FOR B.Sc.:

Third Year

First Semester									
No	Course	Weekly hours		Examination degree					Examination time
		Lec.	Lab.	periodical	Practical	written	oral	Total	
1	Pharmaceutics (2)	3	3	15	45	70	20	150	3
2	Chemistry of natural products (1)	3	3	15	45	70	20	150	3
3	Pharmaceutical Medicinal Chemistry (1)	2	3	15	45	70	20	150	2
4	Pharmacology (1)	3	2	15	45	70	20	150	3
5	Biochemistry (1)	3	2	15	45	70	20	150	3
6	Public health	2	-	20	-	80	-	100	2
	Total	16	13					850	

Second Semester									
No.	Course	Weekly hours		Examination degree					Examination time
		Lec.	Lab.	periodical	Practical	written	oral	Total	
1	Biopharmacy and pharmacokinetics	2	2	15	45	70	20	150	2
2	Chemistry of natural products (2)	3	3	15	45	70	20	150	3
3	Pharmaceutical Medicinal Chemistry (2)	2	3	15	45	70	20	150	2
4	Pharmacology (2)	3	2	15	45	70	20	150	3
5	Biochemistry (2)	3	2	15	45	70	20	150	3
6	Drug Marketing	2	-	-	-	100	-	100	2
	Total	**15**	**12**					**850**	

THIRD YEAR

First term:

1.Pharmaceutics-2 (3 hrs lect. + 3 hrs pract.):

Parenteral products: parenteral containers and closures. Ophthalmic products.Controlled drug-delivery systems. Aerosol & inhalation dosage forms.

2.Chemistry of natural products-1 (3 hrs lect. + 3 hrs pract.):

I- Volatile Oils: (16 hrs)

Introduction, Preparation, Chemistry, Classification:
Hydrocarbons, Unsaturated acyclic, alicyclic, Aromatics and sesquiterpenes, Oxygenated terpene compounds e.g. Terpene alcohols, Phenols and phenolic ethers, Aldehydes, Ketones, Oxides and peroxides, Terpene esters, Nitrogen and sulpur containing compounds, body actions and application of volatile oils.

II- Carbohydrates: (8 hrs)

Physical and chemical properties, Classification:
Monosaccharides, Oligosaccharides, Polysaccharides, Derived
carbohydrates, Polysaccharides from seaweeds

III- Glycosides: (18 hrs).

Properties, Extraction and isolation, Estimation, Classification:
Phenolic e.g. Simple phenolic, Anthracene, Flavonoids, Coumarins, Cyanophore, Glycosides, Thioglycosides, Cardic glycosides, Irodoids, Lignans
Saponins glycosides.
Tannius (Defination, Ocurrence, Function, Properties, Classification, Identification, Estimation).

3 Pharmaceutical Medicinal Chemistry-1 (2 hrs lect. + 3 hrs pract.):

Introduction, limit tests, diagnostic agents, GIT, pharmaceutical necessities, analgesics and NSAIs, antihistaminics (H1-antagonists and diuretics.

Practical: Pharmacopoeia and general instructions. Limit test for chloride; Limit test for sulphate; Limit test for iron; Limit test for lead and heavy metals. Purity of lactic, phosphoric, hydrochloric acids and potassium permanganate.

4. Pharmacology-1 (3 hrs lect. + 2hrs pract.):

General pharmacology:

Pharmacokinetics, pharmacodynamics, pharmaco-genetics and principles of therapeutics.

Drugs acting autonomic nervous system:

Introduction, neurotransmissions, parasympatho-mimetics agents, antimuscarinic drugs, ganglionic blocking agents, neuromuscular blockers, sympathomimetic drugs and adrenergic blocking drugs.

Autocoids:

Histamine and its antagonists, 5-hydroxytryptamine agonists and antagonists, angiotensim, angiotensim converting enzyme inhibitors, Kinns, Eicosanoids, leukotrines and platelet activitang factor.

Drugs acting CNS:

Central neurotransmitters, general anaesthetics, anxloiytic and hypnotics, psychotropic drugs (antipsychotic + antidepressants), pharmaco-therapy of epilepsy, treatment of degenerative disorders, opoid analgesics, analgestic-antipyretic and anti-inflammatory drugs, treatment of gout, rheumatic arithritis and rheumatoid and drug therapy of migraine.

Diuretics:

Renal tabular transport, loop diuretics, thiazide diuretics and related drugs, potassium spairing diuretics and osmotic diuretics.

Drugs acting on the cardiovascular system:
Drug therapy of angina pectoris, drug treatment of hypertension, cardiac glycosides, antidysehythmic drugs and drug therapy of hyper liprotenemia.

Drugs acting on the blood:
Anticoagulants, thrombolytic drugs, antiplatelet drugs, hematopoietic agents, treatment of iron deficiency and megaplastic anemias.

5. Biochemistry-1 (3 hrs lect. + 2 hrs pract.):
Molecular biology, enzymes, vitamins, free radicals, antioxidants, xenobiotics, minerals, and biological oxidation.

6. Public Hygiene (3 hrs lect.):
Community medicine. General epidemiology: epidemiology of infectious diseases, epidemiologic cycle, prevention and control of infectious diseases. Some infectious diseases: diphtheria, tetanus, measles, German measles, meningococcal meningitis, diarrheal diseases, cholera, rabies, acquired immunodeficiency syndrome "AIDS". Environmental sanitation. Nutrition and diabetics: food, adequate diet, nutritive value of various food stuffs, nutrient requirements and recommended intake. Breast feeding. Weaning. Family planning.

Second term:

1-Biopharmaceutics and Basic pharmacokinetics (2 hrs lect. + 2 hrs pract.):

1-1-Biopharmaceutics:

Gastrointestinal absorption, biological considerations (membrane physiology, lipid soluble molecules), mechanisms of drug absorption (passive diffusion, active transport and facilated diffusion mechanisms), gastrointestinal physiology (gastrointestinal blood flow, gastrointestinal pH, gastroemptying and GI-mobility, effect of food on drug absorption, malabsorption. Physicochemical consideration (pH partition theory, drug pKa and GIT pH, lipid solubility, absorption of ions, unstirred water layer, dissolution, drug stability and hydrolysis in the GIT, complexation and adsorption). Role of the dosage forms.

1-2-Pharmackokinetics:

Concepts in pharmacokinetics: Definition, basic model for drug absorption and disposition, absorption, distribution, elimination (renal clearance and elimination, biotransformation and biliary excretion).
Deposition and absorption kinetics (I.V. dose, extra-vascular dose, metabolite kinetics, bolus and I.V. infusion, drug level-time relationship, assessment of pharmacokinetics parameters, multiple doses).

2. Chemistry of natural products-2 (3 hrs lect. + 3 hrs pract.):

1- Alkaloid: (22 hrs)

Introduction, Classification:
Phenylalkalylamines, Pyridine, Tropone alkaloids, Ecgonine alkaloids, Quinoline alkaloids, Isoquinoline alkaloids, Opium alkaloids, Indole alkaloids, Carboline alkaloids, Imidazole alkaloids, Purine alkaloids, Steriodal alkaloids, Rropoline alkaloids, Diterpene alkaloids, Miscellaneous.

II- Chromatography: (10 hrs)

Introduction, Classification. Prinsiples of Chromatography separation, Paper chromatography, Thin layer chromatography, Column chromatography, Affinity chromatography, GLC, HPLC, Ion exchange, Sephadex, Application.

III- Resin, resin combination and bitters; (10 hrs)

Resin, resin combination

Introduction, Physical characters, Chemical composition, Classification, Main uses.

IV- Bitters:

Introduction, Classification, Physical and Chemical characters, Main uses

3. Pharmaceutical Medicinal Chemistry-2 (2 hrs lect. + 3 hrs pract.):

Chemotherapy:

Antibiotics, antivirals, antineoplastics, sulphonamides, antitubercular drugs, antiprtozoans, anthelmintics, disinfectants and antifungals.

Drug design and drug metabolism.

Practical: Assay of povidone, iodine topical solution. Assay of frusemid tablets. Assay, identity and purity of aspirin tablets. Assay, identity and purity of paracetamol tablets. Assay and purity of nalidixic acid. Assay of optocetine eye drops, tutorial classes.

4.Pharmacology-2 (3 hrs lect. + 2 hrs pract.):

Chemotherapy:

Introduction, antibacterial agents, antifungal drugs, antiviral drugs, anthelementics, antiprotozoal drugs, cancer chemotherapy and immunosuppressive drugs.

Hormones:

Genral mechanisms, hypothalamic and pituitary hormones, thyroid and anti-thyroid hormones, female sex hormones, estrogens, progestins, contraceptives, inhibitors and antagonist of female sex hormones, male sex hormones, anti-androgens, glucocorticoids,

mineralocorticoids, adrenocorticosteroid antagonist, insulin, oral hypoglycemic agents, agents that affect calcium homoeostasis, vitamin D, calcitonine and bisphosphonate.

Drugs acting on respiratory system.
Drug treatment of bronchial asthma, cough and antitussive drugs.
Drugs acting on gastrointestinal tract.
Drug treatment of acid peptic disorders, laxatives, antidiarreal drugs, drugs promoting GIT motility, drugs used in inflammatory bowel diseases and drugs used in irritable bowel syndrome.

Vitamins:
Water soluble and fat soluble vitamins.
Deramatological pharmacology.
Ocular pharmacology.
Principles of the use of medicinal herbs.

5. Biochemistry-2 (3 hrs lect. + 2 hrs pract.):
Chemistry and metabolism of carbohydrates, Chemistry and metabolism of lipids, Chemistry and metabolism of proteins, hormones.

6- Drug Marketing (2 hrs lect.):
The course includes,
*introduction and partial view of marketing.
*Product-selling,
*Current status- specification of pharmaceuticals.
*tasks of marketing—overall stategy, market targets.
*Evolution of scope- marketing at the portfolio level.
*Market segmentation- advantages- drawbacks bases-targeted market selection.
*Positioning- differential advantage-type- measures.
*alternative strategies.
* competitive analysis- structure- process.
*Research and development and marketing, R & D process-strategy and productivity.

*strategic marketing review, concept- plan- assessment- options.
*Implementation of marketing strategy, marketing mix, pricing, communication, distribution.