Gandhinagar Institute of Pharmacy

Bachelor of Pharmacy (Undergraduate)

Semester 3

SCHEME OF TEACHING

Course Code	Name of the Course	No. of Hours	Tutorial	Credit Points
BP301T	Pharmaceutical Organic Chemistry-II (Theory)	3	1	4
BP303T	Physical Pharmaceutics-I (Theory)	3	1	4
BP304T	Pharmaceutical Microbiology (Theory)	3	1	4
BP305T	Pathophysiology (Theory)	3	1	4
BP306T	Computer Applications in Pharmacy (Theory)	3	-	3
BP301P	Pharmaceutical Organic Chemistry-II (Practical)	4	-	2
BP303P	Physical Pharmaceutics-I (Practical)	4	-	2
BP304P	Pharmaceutical Microbiology (Practical)	4	-	2
BP306P	Computer Applications in Pharmacy (Practical)	2	-	1
	Total	**29**	**4**	**26**

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SCHEME OF EVALUATION

Course Code	Name of the Course	Marks Distribution			
		University (End Semester Exam)	Institute		Total
			Sessional Exams	Continuous Mode	
BP301T	Pharmaceutical Organic Chemistry-II (Theory)	75	15	10	100
BP303T	Physical Pharmaceutics-I (Theory)	75	15	10	100
BP304T	Pharmaceutical Microbiology (Theory)	75	15	10	100
BP305T	Pathophysiology (Theory)	75	15	10	100
BP306T	Computer Applications in Pharmacy (Theory)	50	15	10	75
BP301P	Pharmaceutical Organic Chemistry-II (Practical)	35	10	5	50
BP303P	Physical Pharmaceutics-I (Practical)	35	10	5	50
BP304P	Pharmaceutical Microbiology (Practical)	35	10	5	50
BP306P	Computer Applications in Pharmacy (Practical)	15	5	5	25
Total		**470**	**110**	**70**	**650**

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Semester 3

Subject Code: BP301T	**Subject Title: Pharmaceutical Organic Chemistry-II (Theory)**
Pre-requisite: --	

Scope: This subject deals with general methods of preparation and reactions of some organic compounds. Reactivity of organic compounds are also studied here. The syllabus emphasizes on mechanisms and orientation of reactions. Chemistry of fats and oils are also included in the syllabus.

Course Objective: Upon completion of this course the students would be able to

1. Write the structure, name and type of isomerism of the organic compound
2. Write the reaction, name the reaction and orientation of reactions
3. Account for reactivity/stability of compounds,
4. Prepare organic compounds

Teaching Scheme (Hours per week)			**Evaluation Scheme (Marks)**			
			Theory			**Total**
Lecture	**Tutorial**	**Credit**	**University Assessment**	**Continuous Assessment**	**Internal Assessment**	
3	1	4	75	10	15	100

Course Content:

General methods of preparation and reactions of compounds superscripted with asterisk (*) to be explained

To emphasize on definition, types, classification, principles/mechanisms, applications, examples and differences

Detailed Syllabus:

Sr. No.	**UNIT**	**Hours**	**Weightage (%)**
1.	**Benzene and its derivatives** A. Analytical, synthetic and other evidence in the derivation of structure of benzene, Orbital picture, resonance in benzene, aromatic characters, Huckel's rule B. Reactions of benzene - nitration, sulphonation, halogenationreactivity, Friedelcrafts alkylation- reactivity, limitations, Friedelcrafts acylation. C. Substituents, effect of substituents on reactivity and orientation of mono substituted benzene compounds towards electrophilic substitution reaction D. Structure and uses of DDT, Saccharin, BHC and Chloramine	**10 Hours**	**22.22%**
2.	• **Phenols*** - Acidity of phenols, effect of substituents on acidity, qualitative tests, Structure and uses of phenol, cresols, resorcinol, naphthols	**10 Hours**	**22.22%**

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Sr. No.	UNIT	Hours	Weightage (%)
	• **Aromatic Amines*** - Basicity of amines, effect of substituents on basicity, and synthetic uses of aryl diazonium salts • **Aromatic Acids*** –Acidity, effect of substituents on acidity and important reactions of benzoic acid.		
3.	• **Fats and Oils** a. Fatty acids – reactions. b. Hydrolysis, Hydrogenation, Saponification and Rancidity of oils, Drying oils. c. Analytical constants – Acid value, Saponification value, Ester value, Iodine value, Acetyl value, Reichert Meiss (RM) value – significance and principle involved in their determination.	**10 Hours**	**22.22%**
4.	• **Polynuclear hydrocarbons:** a. Synthesis, reactions b. Structure and medicinal uses of Naphthalene, Phenanthrene, Anthracene, Diphenylmethane, Triphenylmethane and their derivatives	**08 Hours**	**17.77%**
5.	• **Cyclo alkanes*** Stabilities – Baeyer's strain theory, limitation of Baeyer's strain theory, Coulson and Moffitt's modification, Sachse Mohr's theory (Theory of strainless rings), reactions of cyclopropane and cyclobutane only	**07 Hours**	**15.55%**

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Semester 3

Subject Code: BP 301P	**Subject Title: Pharmaceutical Organic Chemistry-II (Practical)**
Pre-requisite: --	

Teaching Scheme (Hours per week)		**Evaluation Scheme (Marks)**			
		Theory			
Practical	**Credit**	**University Assessment**	**Continuous Assessment**	**Internal Assessment**	**Total**
4	2	35	5	10	50

List of practical:

Sr. No.	**Title of the Experiments**
1	Experiments involving laboratory techniques • Recrystallization • Steam distillation
2	Determination of following oil values (including standardization of reagents) • Acid value • Saponification value • Iodine value
3	**Preparation of compounds** • Benzanilide/Phenyl benzoate/Acetanilide from Aniline/ Phenol /Aniline by acylation reaction. • 2,4,6-Tribromo aniline/Para bromo acetanilide from Aniline/ • Acetanilide by halogenation (Bromination) reaction. • 5-Nitro salicylic acid/Meta di nitro benzene from Salicylic acid / Nitro benzene by nitration reaction. • Benzoic acid from Benzyl chloride by oxidation reaction. • Benzoic acid/ Salicylic acid from alkyl benzoate/ alkyl salicylate by hydrolysis reaction. • 1-Phenyl azo-2-napthol from Aniline by diazotization and coupling reactions. • Benzil from Benzoin by oxidation reaction. • Dibenzal acetone from Benzaldehyde by Claison Schmidt reaction • Cinnammic acid from Benzaldehyde by Perkin reaction • P-Iodo benzoic acid from P-amino benzoic acid

Recommended Books (Latest Editions)

1. Organic Chemistry by Morrison and Boyd
2. Organic Chemistry by I.L. Finar , Volume-I
3. Textbook of Organic Chemistry by B.S. Bahl & Arun Bahl.
4. Organic Chemistry by P.L.Soni
5. Practical Organic Chemistry byMann and Saunders.
6. Vogel's text book of Practical Organic Chemistry
7. Advanced Practical organic chemistry by N.K.Vishnoi.
8. Introduction to Organic Laboratory techniques by Pavia, Lampman and Kriz

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Semester 3

Subject Code: BP303T	**Subject Title: Physical Pharmaceutics-I (Theory)**
Pre-requisite: --	

Scope: The course deals with the various physical and physicochemical properties, and principles involved in dosage forms/formulations. Theory and practical components of the subject help the student to get a better insight into various areas of formulation research and development, and stability studies of pharmaceutical dosage forms.

Course Objective: Upon completion of this course, the students would be able to

1. Understand various physicochemical properties of drug molecules in the designing the dosage forms
2. Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations
3. Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.

Teaching Scheme (Hours per week)			**Evaluation Scheme (Marks)**			
			Theory			**Total**
Lecture	**Tutorial**	**Credit**	**University Assessment**	**Continuous Assessment**	**Internal Assessment**	
3	1	4	75	10	15	100

Detailed Syllabus:

Sr. No.	**UNIT**	**Hours**	**Weightage (%)**
1.	**Solubility of drugs:** Solubility expressions, mechanisms of solute solvent interactions, ideal solubility parameters, solvation & association, quantitative approach to the factors influencing solubility of drugs, diffusion principles in biological systems. Solubility of gas in liquids, solubility of liquids in liquids, (Binary solutions, ideal solutions) Raoult's law, real solutions. Partially miscible liquids, Critical solution temperature and applications. Distribution law, its limitations and applications	**10 Hours**	**22.22%**
2.	**States of Matter and properties of matter:** State of matter, changes in the state of matter, latent heats, vapour pressure, sublimation critical point, eutectic mixtures, gases, aerosols – inhalers, relative humidity, liquid complexes, liquid crystals, glassy states, solid crystalline, amorphous & polymorphism. **Physicochemical properties of drug molecules:** Refractive index, optical rotation, dielectric constant, dipole moment, dissociation constant, determinations and applications	**10 Hours**	**22.22%**
3.	**Surface and interfacial phenomenon:** Liquid interface, surface & interfacial tensions, surface free energy, measurement of surface & interfacial tensions, spreading coefficient, adsorption	**10 Hours**	**22.22 %**

Sr. No.	UNIT	Hours	Weightage (%)
	at liquid interfaces, surface active agents, HLB Scale, solubilization, detergency, adsorption at solid interface.		
4.	**Complexation and protein binding:** Introduction, Classification of Complexation, Applications, methods of analysis, protein binding, Complexation and Drug Action, crystalline structures of complexes and thermodynamic treatment of stability constants.	**8 Hours**	**17.77 %**
5.	**pH, buffers and Isotonic solutions:** Sorensen's pH scale, pH determination (electrometric and calorimetric), applications of buffer equation, buffer capacity, buffers in pharmaceutical and biological systems, buffered isotonic solutions.	**07 Hours**	**15.55%**

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Semester 3

Subject Code: BP303P	Subject Title: Physical Pharmaceutics-I (Practical)
Pre-requisite: --	

Teaching Scheme (Hours per week)		Evaluation Scheme (Marks)			
		Theory			
Practical	Credit	University Assessment	Continuous Assessment	Internal Assessment	Total
4	2	35	5	10	50

List of Practical:

Sr. No.	Title of the Experiments
1	Determination the solubility of drug at room temperature
2	Determination of pKa value by Half Neutralization/ Henderson Hasselbalch equation.
3	Determination of Partition co- efficient of benzoic acid in benzene and water
4	Determination of Partition co- efficient of Iodine in CCl_4 and water
5	Determination of % composition of NaCl in a solution using phenol-water system by CST method
6	Determination of surface tension of given liquids by drop count and drop weight method
7	Determination of HLB number of a surfactant by saponification method
8	Determination of Freundlich and Langmuir constants using activated charcoal
9	Determination of critical micellar concentration of surfactants
10	Determination of stability constant and donor acceptor ratio of PABA-Caffeine complex by solubility method
11	Determination of stability constant and donor acceptor ratio of Cupric-Glycine complex by pH titration method

Recommended Books: (Latest Editions)

1. Physical Pharmacy by Alfred Martin
2. Experimental Pharmaceutics by Eugene, Parott.
3. Tutorial Pharmacy by Cooper and Gunn.
4. Stocklosam J. Pharmaceutical Calculations, Lea &Febiger, Philadelphia.
5. Liberman H.A, Lachman C., Pharmaceutical Dosage forms, Tablets, Volume-1 to 3, MarcelDekkar Inc.
6. Liberman H.A, Lachman C, Pharmaceutical Dosage forms. Disperse systems, volume 1, 2, 3. Marcel Dekkar Inc.
7. Physical Pharmaceutics by Ramasamy C and ManavalanR.
8. LaboratoryManual of Physical Pharmaceutics, C.V.S. Subramanyam, J. Thimma settee
9. Physical Pharmaceutics by C.V.S. Subramanyam
10. Test book of Physical Phramacy, by Gaurav Jain & Roop K. Khar

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Bachelor of Pharmacy (Undergraduate)

Semester 3

Subject Code: BP304T	**Subject Title: Pharmaceutical Microbiology (Theory)**
Pre-requisite: --	

Scope: Study of all categories of microorganisms especially for the production of alcohol antibiotics, vaccines, vitamins enzymes etc.

Course Objectives: Upon completion of the subject student shall be able to

1. Understand methods of identification, cultivation and preservation of various microorganisms
2. To understand the importance and implementation of sterilization in pharmaceutical processing and industry
3. Learn sterility testing of pharmaceutical products.
4. Carried out microbiological standardization of Pharmaceuticals.
5. Understand the cell culture technology and its applications in pharmaceutical industries

Teaching Scheme (Hours per week)			**Evaluation Scheme (Marks)**			
			Theory			
Lectures	**Tutorial**	**Credit**	**University Assessment**	**Continuous Assessment**	**Internal Assessment**	**Total**
3	1	4	75	10	15	100

Detailed Syllabus:

Sr. No.	**UNIT**	**Hours**	**Weightage (%)**
1.	Introduction, history of microbiology, its branches, scope and its importance. Introduction to Prokaryotes and Eukaryotes Study of ultra-structure and morphological classification of bacteria, nutritional requirements, raw materials used for culture media and physical parameters for growth, growth curve, isolation and preservation methods for pure cultures, cultivation of anaerobes, quantitative measurement of bacterial growth (total & viable count). Study of different types of phase contrast microscopy, dark field microscopy and electron microscopy.	**10 Hours**	**22.22%**
2.	Identification of bacteria using staining techniques (simple, Gram's & Acid-fast staining) and biochemical tests (IMViC). Study of principle, procedure, merits, demerits and applications of physical, chemical gaseous, radiation and mechanical method of sterilization. Evaluation of the efficiency of sterilization methods. Equipments employed in large scale sterilization. Sterility indicators.	**10 Hours**	**22.22%**
3.	Study of morphology, classification, reproduction/replication	**10**	**22.22%**

Sr. No.	UNIT	Hours	Weightage (%)
	and cultivation of Fungi and Viruses. Classification and mode of action of disinfectants Factors influencing disinfection, antiseptics and their evaluation. For bacteriostatic and bactericidal actions Evaluation of bactericidal & Bacteriostatic. Sterility testing of products (solids, liquids, ophthalmic and other sterile products) according to IP, BP and USP.	**Hours**	
4.	Designing of aseptic area, laminar flow equipments; study of different sources of contamination in an aseptic area and methods of prevention, clean area classification. Principles and methods of different microbiological assay. Methods for standardization of antibiotics, vitamins and amino acids. Assessment of a new antibiotic.	**8 Hours**	**17.77%**
5.	Types of spoilage, factors affecting the microbial spoilage of pharmaceutical products, sources and types of microbial contaminants, assessment of microbial contamination and spoilage. Preservation of pharmaceutical products using antimicrobial agents, evaluation of microbial stability of formulations. Growth of animal cells in culture, general procedure for cell culture, Primary, established and transformed cell cultures. Application of cell cultures in pharmaceutical industry and research.	**7 Hours**	**15.55%**

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Semester 3

Subject Code: BP304P	Subject Title: Pharmaceutical Microbiology (Practical)
Pre-requisite: --	

Teaching Scheme (Hours per week)		Evaluation Scheme (Marks)			
		Theory			
Practical	Credit	University Assessment	Continuous Assessment	Internal Assessment	Total
4	2	35	5	10	50

List of Practical:

Sr. No.	Title of the Experiments
1.	Introduction and study of different equipments and processing, e.g., B.O.D. incubator, laminar flow, aseptic hood, autoclave, hot air sterilizer, deep freezer, refrigerator, microscopes used in experimental microbiology.
2.	Sterilization of glassware, preparation and sterilization of media.
3.	Sub culturing of bacteria and fungus. Nutrient stabs and slants preparations.
4.	Staining methods- Simple, Gram staining and acid-fast staining (Demonstration with practical).
5.	Isolation of pure culture of micro-organisms by multiple streak plate techniques and other techniques
6.	Microbiological assay of antibiotics by cup plate method and other methods
7.	Motility determination by Hanging drop method.
8.	Sterility testing of pharmaceuticals.
9.	Bacteriological analysis of water
10.	Biochemical test.

Recommended Books: (Latest Editions)

1. W.B. Hugo and A.D. Russel: Pharmaceutical Microbiology, Blackwell Scientific publications, Oxford London.
2. Prescott and Dunn., Industrial Microbiology, 4th edition, CBS Publishers & Distributors, Delhi.
3. Pelczar, Chan Kreig, Microbiology, Tata McGraw Hill edn.
4. Malcolm Harris, Balliere Tindall and Cox: Pharmaceutical Microbiology.
5. Rose: Industrial Microbiology.
6. Probisher, Hinsdill et al: Fundamentals of Microbiology, 9th ed. Japan
7. Cooper and Gunn's: Tutorial Pharmacy, CBS Publisher and Distribution.
8. Peppler: Microbial Technology.
9. I.P., B.P., U.S.P.- latest editions.
10. Ananthnarayan : Textbook of Microbiology, Orient-Longman, Chennai
11. Edward: Fundamentals of Microbiology.
12. N.K.Jain: Pharmaceutical Microbiology, Vallabh Prakashan, Delhi
13. Bergeys manual of systematic bacteriology, Williams and Wilkins- A Waverly company

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Bachelor of Pharmacy (Undergraduate)

Semester 3

Subject Code: BP305T	**Subject Title: Pathophysiology (Theory)**
Pre-requisite: --	

Scope: Pathophysiology is the study of causes of diseases and reactions of the body to such disease producing causes. This course is designed to impart a thorough knowledge of the relevant aspects of pathology of various conditions with reference to its pharmacological applications and understanding of basic pathophysiological mechanisms. Hence it will not only help to study the syllabus of pathology, but also to get baseline knowledge required to practice medicine safely, confidently, rationally and effectively.

Course Objective: Upon completion of the course student shall be able to

1. Describe the etiology and pathogenesis of the selected disease states;
2. Name the signs and symptoms of the diseases; and
3. Mention the complications of the diseases.

Teaching Scheme (Hours per week)			**Evaluation Scheme (Marks)**			
			Theory			**Total**
Lecture	**Tutorial**	**Credit**	**University Assessment**	**Continuous Assessment**	**Internal Assessment**	
3	1	4	75	10	15	100

Detailed Syllabus:

Sr. No.	**UNIT**	**Hours**	**Weightage (%)**
1.	**Basic principles of Cell injury and Adaptation:** Introduction, definitions, Homeostasis, Components and Types of Feedback systems, Causes of cellular injury, Pathogenesis (Cell membrane damage, Mitochondrial damage, Ribosome damage, nuclear damage), Morphology of cell injury – Adaptive changes (Atrophy, Hypertrophy, hyperplasia, Metaplasia, Dysplasia), Cell swelling, Intra cellular accumulation, Calcification, Enzyme leakage and Cell Death Acidosis &Alkalosis, Electrolyte imbalance **Basic mechanism involved in the process of inflammation and repair:** Introduction, Clinical signs of inflammation, Different types of Inflammation, Mechanism of Inflammation – Alteration in vascular permeability and blood flow, migration of WBC's, Mediators of inflammation, Basic principles of wound healing in the skin, Pathophysiology of Atherosclerosis.	**10 Hours**	**22.22%**
2.	**Cardiovascular System:** Hypertension, congestive heart failure, ischemic heart disease (angina, myocardial infarction, atherosclerosis and	**10 Hours**	**22.22%**

Sr. No.	UNIT	Hours	Weightage (%)
	arteriosclerosis) **Respiratory system:** Asthma, Chronic obstructive airways diseases. **Renal system:** Acute and chronic renal failure		
3.	**Haematological Diseases:** Iron deficiency, megaloblastic anemia (Vit B12 and folic acid), sickle cell anemia, thalasemia, hereditary acquired anemia, hemophilia **Endocrine system:** Diabetes, thyroid diseases, disorders of sex hormones **Nervous system:** Epilepsy, Parkinson's disease, stroke, psychiatric disorders: depression, schizophrenia and Alzheimer's disease. **Gastrointestinal system:** Peptic Ulcer	**10 Hours**	**22.22%**
4.	Inflammatory bowel diseases, jaundice, hepatitis (A,B,C,D,E,F) alcoholic liver disease. **Disease of bones and joints:** Rheumatoid arthritis, osteoporosis and gout **Principles of cancer:** classification, etiology and pathogenesis of cancer **Diseases of bones and joints:** Rheumatoid Arthritis, Osteoporosis, Gout **Principles of Cancer:** Classification, etiology and pathogenesis of Cancer	**8 Hours**	**17.77%**
5.	**Infectious diseases:** Meningitis, Typhoid, Leprosy, Tuberculosis Urinary tract infections **Sexually transmitted diseases:** AIDS, Syphilis, Gonorrhea Recommended Books (Latest Editions)	**7 Hours**	**15.55%**

Recommended Books (Latest Editions)

1. Vinay Kumar, Abul K. Abas, Jon C. Aster; Robbins & Cotran Pathologic Basis of Disease; South Asia edition; India; Elsevier; 2014.
2. Harsh Mohan; Textbook of Pathology; 6th edition; India; Jaypee Publications; 2010.
3. Laurence B, Bruce C, Bjorn K.; Goodman Gilman's The Pharmacological Basis of Therapeutics; 12th edition; New York; McGraw-Hill; 2011.
4. Best, Charles Herbert 1899-1978; Taylor, Norman Burke 1885-1972; West, John B (John Burnard); Best and Taylor's Physiological basis of medical practice; 12th ed; united states;
5. William and Wilkins, Baltimore;1991 [1990 printing].
6. Nicki R. Colledge, Brian R. Walker, Stuart H. Ralston; Davidson's Principles and Practice of Medicine; 21st edition; London; ELBS/Churchill Livingstone; 2010.
7. Guyton A, John. E Hall; Textbook of Medical Physiology; 12th edition; WB Saunders Company; 2010.

8. Joseph DiPiro, Robert L. Talbert, Gary Yee, Barbara Wells, L. Michael Posey; Pharmacotherapy: A Pathophysiological Approach; 9th edition; London; McGraw-Hill Medical; 2014.
9. V. Kumar, R. S. Cotran and S. L. Robbins; Basic Pathology; 6th edition; Philadelphia; WB Saunders Company; 1997.
10. Roger Walker, Clive Edwards; Clinical Pharmacy and Therapeutics; 3rd edition; London; Churchill Livingstone publication; 2003.

Recommended Journals

1. The Journal of Pathology. ISSN: 1096-9896 (Online)
2. The American Journal of Pathology. ISSN: 0002-9440
3. Pathology. 1465-3931 (Online)
4. International Journal of Physiology, Pathophysiology and Pharmacology. ISSN: 1944-8171 (Online)
5. Indian Journal of Pathology and Microbiology. ISSN-0377-4929.

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Semester 3

Subject Code: BP306T	**Subject Title: Computer Applications in Pharmacy (Theory)**
Pre-requisite: --	

Course Objective: Upon completion of the course student shall be able to

1. Apply knowledge of computer in pharmacy.
2. Classify and explain various types of databases.
3. Enlist and describe various applications of databases in pharmacy.
4. Write advantages and disadvantages of computers in pharmacy management system.
5. Explain various software's of computers used in pharmacy.

Teaching Scheme (Hours per week)			**Evaluation Scheme (Marks)**			
			Theory			**Total**
Lecture	**Tutorial**	**Credit**	**University Assessment**	**Continuous Assessment**	**Internal Assessment**	
3	-	3	50	10	15	75

Detailed Syllabus:

Sr. No.	**UNIT**	**Hours**	**Weightage (%)**
1.	**Number system, Concept of Information Systems and Software** Binary number system, Decimal number system, Octal number system, Hexadecimal number systems, conversion decimal to binary, binary to decimal, octal to binary etc, binary addition, binary subtraction – One's complement, Two's complement method, binary multiplication, binary division. Information gathering, requirement and feasibility analysis, data flow diagrams, process specifications, input/output design, process life cycle, planning and managing the project.	**6 Hours**	**20%**
2.	**Web technologies**: Introduction to HTML, XML, CSS and Programming languages, introduction to web servers and Server Products Introduction to databases, MYSQL, MS ACCESS, Pharmacy Drug database	**6 Hours**	**20%**

3.	**Application of computers in Pharmacy** Drug information storage and retrieval, Pharmacokinetics, Mathematical model in Drug design, Hospital and Clinical Pharmacy, Electronic Prescribing and discharge (EP) systems, barcode medicine identification and automated dispensing of drugs, mobile technology and adherence monitoring. Diagnostic System, Lab-diagnostic System, Patient Monitoring System, Pharma Information System	**6 Hours**	**20%**
4.	**Bioinformatics** Introduction, Objective of Bioinformatics, Bioinformatics Databases, Concept of Bioinformatics, Impact of Bioinformatics in Vaccine Discovery	**6 Hours**	**20%**
5.	**Computers as data analysis in Preclinical development:** Chromatographic dada analysis(CDS), Laboratory Information management System (LIMS) and Text Information Management System(TIMS)	**6 Hours**	**20%**

Subject Code: BP306P	Subject Title: Computer Applications in Pharmacy (Practical)
Pre-requisite: --	

Course Objective: Upon completion of the course student shall be able to

1. Generate database using various tools.
2. Program to retrieve data from database.
3. Apply MS of access for storage and retrieving drug information
4. Export contents to web and xml pages
5. Analyze the problem, communicate suggested solution and interpret the results.

Teaching Scheme (Hours per week)		Evaluation Scheme (Marks)			
		Theory			
Practical	Credit	University Assessment	Continuous Assessment	Internal Assessment	Total
2	2	15	5	5	25

List of Practical:

Sr. No.	Title
1.	Design a questionnaire using a word processing package to gather information about a particular disease.
2.	Create a HTML web page to show personal information.
3.	Retrieve the information of a drug and its adverse effects using online tools
4.	Creating mailing labels Using Label Wizard, generating label in MS WORD
5.	Create a database in MS Access to store the patient information with the required fields Using access
6.	Design a form in MS Access to view, add, delete and modify the patient record in the database
7.	Generating report and printing the report from patient database
8.	Creating invoice table using – MS Access
9.	Drug information storage and retrieval using MS Access
10.	Creating and working with queries in MS Access
11.	Exporting Tables, Queries, Forms and Reports to web pages
12.	Exporting Tables, Queries, Forms and Reports to XML pages

Recommended Study Material:

1. Computer Application in Pharmacy – William E. Fassett –Lea and Febiger, 600 South Washington Square, USA, (215) 922-1330.
2. Computer Application in Pharmaceutical Research and Development –Sean Ekins – Wiley-Interscience, A John Willey and Sons, INC., Publication, USA
3. Bioinformatics (Concept, Skills and Applications) – S. C. Rastogi-CBS Publishers and Distributors, 4596/1- A, 11 Darya Gani, New Delhi – 110 002(INDIA)
4. Microsoft office Access - 2003, Application Development Using VBA, SQL Server,DAP and Infopath – Cary N. Prague – Wiley Dreamtech India (P) Ltd., 4435/7, Ansari Road, Darya Ganj, New Delhi - 110002