

## II Semester

<b>Course No.</b>	<b>Theory</b>	<b>Unit</b>	<b>Course No.</b>	<b>Laboratory</b>	<b>Unit</b>
BMT 2001	Human Anatomy & Physiology – II	1.0	BMT 2002	Human Anatomy & Physiology Lab.-II	0.5
BMT 2003	Hematology – I	1.0	BMT 2004	Hematology Lab.-I	0.5
BMT 2005	Clinical Chemistry - I	1.0	BMT 2006	Clinical Pathology	0.5
BMT 2007	Introduction to Computer Science	1.0	BMT 2008	Programming Lab.	0.5
BMT 2009	Histology	1.0	SCA 2001	PT & Games/CA	0.5
		<b>5.0</b>			<b>2.5</b>

## **BMLT 2001 Human Anatomy & Physiology – II**

- (i) Urinary System
- (ii) Nervous System
- (iii) Endocrine and Exocrine glands and their functions
- (iv) Reproductive System
- (v) Lymphatic System
- (vi) Skin - Structure & its functions
- (vii) Eye & Ear
- (viii) Nutrition - Carbohydrate, Protein, Fats

### **Books Recommended:**

1. Best & Taylor: "Best and Taylor's Physiological Basis of Medical Practice," William & Wilkins: Baltimore.
2. Chaurasia: "Human Anatomy – Regional & Applied." Part I, II, III, CBS Publishers & Distributors, New Delhi.
3. C.C. Chatterjee: "Human Physiology," Vols. I & II, Medical Allied Agency, Calcutta.
4. Shalya: "Human Physiology," CBS Publishers & Distributors.
5. Edwards: "Davidson's Principles Practice of Medicine," ELBS/Churchill Livingstone.
6. Ganong: "Review of Medical Physiology," Prentice Hall International.
7. Guyton & Hall: "Textbook of Medical Physiology," WB Saunders Company.
8. Keele et al.: "Samson Wright's Applied Physiology," Oxford University Press.
9. McNaught & Callander: "Illustrated Physiology," Churchill Livingstone.
10. Parmer: "Health Education and Community Pharmacy," CBS Publishers.
11. Tortora & Anaganodokos: "Principles of Anatomy and Physiology," Harper and Row Publishers N.Y.
12. Vander et al.: "Human Physiology," Tata McGraw Hill Publisher Co.,

## **BMLT 2003 : HEMATOLOGY - I**

1. Introduction to hematology.
2. Formation of blood, composition of blood, functions of blood.
3. Various anticoagulants and their uses, mode of action of anticoagulants, merits and demerits.
4. Physiological variations in Hb , PCV, TLC, Platelets
5. Quality assurance in hematology.
6. Haemoglobinometry, various methods of estimation of Hb, errors involved and standardization of instruments for adaptation for Hb estimation.
7. Haemocytometry, procedures of cell counts, visual as well as electronic, red cell, leucocytes and platelets counts, error involved in and means to minimize such error.
8. Morphology of normal blood cells and their identification.
9. Erythrocytes sedimentation rate, factors influencing ESR and various procedures for its estimation with their significance.
10. Routine examination of urine.
11. Examination of biological fluids such as CSF etc.
12. Examination of semen

### **BOOKS:**

1. Baker et al: An introduction to medical laboratory technology.
2. Charles F. Seiverd: Hematology for medical technologists
3. Arthur Simmons: Technical hematology

## **BMLT 2005 : CLINICAL CHEMISTRY – I**

**Introduction to Biochemistry:** Bioconstituents, Enzymes, Metabolism, Clinical Biochemistry, Nutritional Biochemistry

**Biochemistry of Cell Membrane:**

**Enzymes:** Chemical Nature of the Enzymes, Properties of Enzyme, Factors affecting Enzyme Activity, Enzyme Inhibition, Mechanism of Enzyme Action, Nomenclature and Classification of Enzymes, Isoenzymes, Multienzyme Complex, Diagnostic Applications of the Enzymes, Therapeutic uses of Enzymes.

**Bioenergetics and Biological Oxidation:**

Application of Thermodynamics in Biological Reaction, Biological Oxidation Reduction, Substrate Level Phosphorylation, Energy Rich Compounds.

**Chemistry and Metabolism of Carbohydrates:**

Carbohydrate of biological importance, Storage Carbohydrates: Glycogen Synthesis and breakdown, Glycolysis, TCA Cycle, HMP Shunt Pathway, Uronic Acid Pathway, Gluconeogenesis, Glucose Tolerance, Blood Sugar Level, Glycosuria and Diabetes Mellitus, Disorder of Carbohydrate metabolism.

**Chemistry and Metabolism of Lipids:**

Lipids of biological importance, Derived lipid, Sterols, Bile acids, Oxidation of Fatty acids, Ketolysis and ketogenesis, Biosynthesis of Fatty acids, Metabolism of Phospholipids, Metabolism of Cholesterol, Disorders of Lipid Metabolism.

**Chemistry and Metabolism of Amino acids and Protein:**

Characteristics of Amino acid and Proteins, Biological Value of Proteins, Metabolism of Amino acids and Proteins, Urea Cycle, Disorders of Protein Metabolism, Chemistry and Metabolism of Nucleic Acids.

**Books Recommended:**

1. Harper's Review in Biochemistry: A.K. Murray, D.K. Granner, P.A. Mayers and V.W. Rodwell: Prentice Hall of India Ltd., New Delhi.
  2. Fundamental of Clinical Chemistry R.W. Tietz (Ed.) W.B. Saunders Co., Philadelphia USA.
  3. Clinical Chemistry (Principles and Techniques): R.J. Henry, D.C. Cannon, J.W. Winkelman: Harper & Row Publishers.
  4. Text Book of Biochemistry by Agarwal's: Goel Publishing House.
  5. A Text Book of Medicinal Biochemistry: R.L. Nath: New Age International Publishers.
  6. Stryer: "Biochemistry," 4<sup>th</sup> ed., W.H Freeman & company, 1995 (Reprint 1999).
  7. Mussay et al.: "Harpers Biochemistry," Prentice Hall International.
  8. Marlin et al.: Harpers Biochemistry," 24<sup>th</sup> ed., Lange Medical Publications, 1996.
  9. Lehninger: "Biochemistry," 3<sup>rd</sup> ed., Worth, CBS Publisher & Distributors 2000.
  10. Conn & Stumpf: "Outline of Biochemistry," 5<sup>th</sup> ed., John Wiley & Sons, 2003.
  11. Harrow & Mazur: "Text book of Biochemistry," W.B. Saunders, Philadelphia.
  12. Jayaraman: "Laboratory Manual in Biochemistry," Wiley Eastern Ltd., New Delhi.
  13. Satyanarayan: "Biochemistry," Book & Allied (P) Ltd., Reprint 2000.
- Singh: "Practical manual of Biochemistry," 4<sup>th</sup> ed., CBS Publishers & Distributors, 2001.

## **BMLT 2007 : INTRODUCTION TO COMPUTER SCIENCE**

### **Module : I**

**COMPUTER ORGANIZATION AND PROCESSING OF DATA** : Introduction, Input Units, The Central Processing Unit, How does CPU work ? Types of CPU Memory, The RAM (Read Only Memory) Chip, CMOS RAM, The Data Flow on the Motherboard, The PC Buses, The I/O Buses, RAM (Random Access Memory).

### **Module : II**

**INPUT AND OUTPUT DEVICES AND STORAGE DEVICES CONCEPTS** : Input Devices, Output Devices, Drives are Storage Media, Hard Disks, The Optic Media, Optic Data Storage, CD-R, CD-RW, The DVD.

**COMPUTER SOFTWARE** : Starting up the Computer : Software Types, Software Creation and Programming Languages, The Operating System, User Interface, System Software, Which operating systems, 32 Bit Drives, File Systems, The Four Disk Areas, Partitioning with FDSK, Loader and Linker, Compiler, Assembler and Interpreter, Types of Operating Systems, Applications Software.

### **Module : III**

**FILE ORGANISATION AND ACCESS CONCEPTS** : Representation of Data, Storage Mapping; A Physical Representation of Data, File Systems, Searching and Sorting Data, Quicksort, Sequential File Processing, Random File Processing, Indexed Sequential Access.

### **Module : VI**

**DATA BASE DESIGN AND MANAGEMENT** : Introduction, Basic Terminology and Concepts, Data Models, Entity Relationship Diagram, Creating Database, Query Languages, Security and Privacy Measures, Application and Trends, Principles of Database Management.

**STRUCTURED QUERY LANGUAGES** : Introduction, Basics of the Select Statement, Conditional Selection, Joins, Miscellaneous SQL Statements, Miscellaneous Topics.

### **Module : V**

**NUMBER SYSTEMS** : Number Representation and Arithmetic, Number System, Decimal System, Binary Numbering System, Octal System, Hexadecimal System. Radix Conversions, Arithmetic Operations of Octal Numbers, Arithmetic Operations of Hexadecimal Numbers, Floating Point Numbers, Encoding Systems.

### **Module : VI**

**OPERATING SYSTEMS** : Introduction, Custom-Made (Specification) Types of Operating Systems, Computer Processing Techniques, Functions of Operating Systems Processor Management, Memory Management, Virtual Storage, Device Management, Information Management.

### **Module : VII**

**INTERNET, ELECTRONIC – MAIL AND INTERNET** : Information Superhighway, Linking to the Internet, Internet Address, Internet Tools, Domain Name System (DNS), Configuring Networks, Configuring Dial-up Networking, Browsing Internet, Sending & Receiving Mail : MS – Outlook, Intranet, Intranet vs. Groupware, Intranet Services, Communication Systems, Electronic Meeting Systems.

**APPLICATION OF INFORMATION TECHNOLOGY** : Education and Training, Science and Technology, Local Authorities and Public Utilities, Business and Industry.

TEXT BOOKS :

A. Jaiswal – Fundamentals of Computers & Information Technology, Dreamtech Publ., New Delhi, 2003.

## **BMLT 2009:HISTOLOGY**

1. **Introduction** to histology and microtechnique
2. **Fixation:** Physical methods, chemical methods, General properties of fixatives, individual fixative agents, choice of fixative, methods of fixation.
3. **Processing and mounting:** Processing, Keeping sections on slides, mounting media, treatments before staining.
4. **Dyes:** Classification and nomenclature, histological staining, metachromasis and metachromatic dyes.
5. **Histological studies** of circulatory system, alimentary system, digestive system, respiratory system, urinary system, reproductive system, lymphatic and neurosensory system.
6. **Staining** blood and other cell suspension, connective tissue, nucleic acids, organic functional groups and protein histochemistry, Carbohydrate and amyloid special staining procedures and lipid staining.
7. **Principles of metal impregnation** techniques, Demonstration and identification of minerals and pigments.

### **Books:**

1. Kiernan JA: Histological and Histochemical Methods Theory and Practice., 3<sup>rd</sup> edn, Butterworth & Heinemann Publication.

## **BMT2002 Human Anatomy & Physiology Lab.-II**

### **Laboratory based on BMT2001 Human Anatomy & Physiology-II**

#### **Books Recommended:**

1. Principles of Anatomy & Physiology: Tortora & Anagnodokos, Harper & Row publishers, N.Y.
2. Human Anatomy – Regional & Applied, Part-I, II & III: Chaurasia, CBS publisher & Distributors, New Delhi.
3. Illustrated Physiology: McNaught & Callander, Churchill Livingstone.
4. Text book of Practical Physiology: Ranade, Pune Vidyarthi Griha Prakashan, Pune.

## BMLT 2004: HEMATOLOGY LABORATORY I

1. Estimation of Hb by various methods.
2. Standardization of instruments for adaptation for Hb estimation.
3. Estimation of cell counts by both visual as well as electronic method
4. Estimation of leucocytes and platelets counts
5. Experiments based on study of morphology of normal blood cells and their identification
6. Estimation of erythrocytes sedimentation rate (ESR) by various procedures.
7. Experiment based on routine examination of urine.
8. Experiment based on routine examination of biological fluids such as CSF

### **BOOKS:**

1. Baker et al: An introduction to medical laboratory technology.
2. Charles F. Seiverd: Hematology for medical technologists
3. Arthur Simmons: Technical hematology



## **BMLT 2006 CLINICAL PATHOLOGY LABORATORY**

1. Examination of urine analysis:
  1. Physical examination: Volume, color, odor, appearance, specific gravity and pH
  2. Chemical examination:
    - a. Protein: Heat and acetic acid test.
    - b. Sulfosalicylic acid method
    - c. Reducing sugar: Benedict test
    - d. Ketone bodies: Rothera test
    - e. Bile pigments: Fouchet method
    - f. Bile salt: Hays test
    - g. Blood: Benzidine test
    - h. Urobilinogen and Porphobilinogen: Ehrlich aldehyde and Schwartz test
2. Examination of stool:
  1. Physical examination:
  2. Chemical examination:
    - a. Occult blood
    - b. Reducing sugar
  3. Microscopic examination of ova, cysts, crystals and fat globules
3. Examination of semen:
  1. Physical examination:
  2. Chemical examination:
4. Examination of CSF:
  1. Physical examination:
  2. Chemical examination:
5. Examination of Body fluids (pleural, pericardial and peritoneal):
  1. Physical examination:
  2. Chemical examination:
6. Examination of Synovial fluid:
  1. Physical examination:
  2. Chemical examination:
  3. Microscopic examination