

**BIOMEDICAL TECHNOLOGY SYLLABUS FOR
CREDIT BASED SEMESTER SYSTEM (BASIC)**

No.	Course Code	Name of the course	Hours	Credits
1	BMT – 401	Instrumentation and Methodology	3+1	04
2	BMT - 402	Clinical Biochemistry and Serology I	3+1	04
3	BMT – 403	Parasitology	3+1	04
4	BMT – 404	Haematology	3+1	04
5	BMT – 405PR	Practical – 1	6	04
6	BMT – 406PR	Practical – 2	6	04
		Total	28	24
1	BMT – 407	Clinical Biochemistry and Serology II	3+1	04
2	BMT - 408	Toxicology	3+1	04
3	BMT – 409	Clinical Pathology	3+1	04
4	BMT – 410	General Microbiology	3+1	04
5	BMT – 411PR	Practical – 3	6	04
6	BMT – 412PR	Practical – 4	6	04
		Total	28	24
1	BMT – 501	Immunology	3+1	04
2	BMT - 502	Clinical Endocrinology	3+1	04
3	BMT – 503	Reproductive technologies and Radiation diagnostics	3+1	04
4	BMT – 504	Clinical Genetics	3+1	04
5	BMT – 505PR	Practical – 5	6	04
6	BMT – 506PR	Practical – 6	6	04
		Total	28	24
1	BMT – 507S	Seminars / Industrial Visits	4	04
2	BMT - 508A	Assignments / Group Discussions	4	04
3	BMT – 509PT	Dissertation and Viva	20	16
		Total	28	24
		Grand Total	112	96

BIO-MEDICAL TECHNOLOGY SEMESTER – I

BMT-401:Instrumentation and Methodology:

UNIT-I : Microscopy: General principles, Light microscopy, Electron microscopy, Phase contrast, Fluorescence, Polarized and Con-focal microscopy.

Histology: Tissue fixation techniques, Processing of tissues; tissue embedding, Sectioning, Microtome types and their uses; histological staining techniques. Study of animal tissues, histology of various organs.

Squash, Smear techniques, Exfoliative techniques.

UNIT – II : Cell Biology & Cytochemical Staining Methods:

Study of Cell and its organelles, Cell cycle and Division

DNA, RNA, Proteins, Lipids, Enzymes, Miscellaneous components.

UNIT – III : Chromatography: Paper, Thin layer, Gas liquid, Column, High performance liquid chromatography (HPLC)& clinical applications. Measurement of pH.

Electrophoresis: Gel Electrophoresis, Isoelectric focussing, 2 Dimensional, Ultra electrophoresis & applications.

UNIT – IV: Photometry: Colorimetry, Visible and UV Spectrophotometry, fluorimetry, Flame photometry & applications, Atomic absorption spectrophotometry.

Centrifugation: Differential, Density gradient, ultra centrifugation, Infracentrifugation & clinical importance,

Autoanalyser: Parts, Sampler, Proportionating Pumps, Dialyser, Constant temp. bath, flow through colorimeter, recorder.

Sonography, Encephalography, Myography, Gas Analyser, etc.

BMT-402: Clinical Biochemistry and Serology I:

UNIT – I : Clinical Biochemistry: Composition of food and diet; Energy metabolism; Variation of diet and disease.

Blood sugar & Reducing substances in urine: Methods of Blood sugar determination- Glucose-Tolerance test. Identification of reducing substances, Diabetes mellitus, Diabetic coma & ketosis.

UNIT – II : Urine Examination: Chemical & microscopical and its implications.

Chemical tests in kidney disease: Sp.gr.tests, urea clearance test, other clearance tests, Determination of plasma and urine Insulin and sodium thiosulphate, P.S.P.tests, serum albumin & globulin, plasma bicarbonates, serum calcium, plasma chlorides. Renal diseases and chemical findings.

UNIT – III : Non-Protein Nitrogen: Urea, Uric acid, Creatinine - Methods of analysis & interpretations, Determination of amino acids in urine, Phenylketonuria - & tests. Screening tests for blood phenyl alanine, tests for 5- Hydroxyindole excretion.

Lipids: Cholesterol and types, Ester cholesterol, Phospholipids, Fatty acids in blood, Esterified fatty acids in blood, Triglycerides, Lipoproteins. Disorders of Lipid Metabolism

UNIT – IV : Gastric juice collection and analysis.

Tests in liver and biliary tract disease, Jaundice, Bilirubin estimation, Bile salts & pigments, Urobilinogen in urine, Flocculation tests, Thymol turbidity tests, Cephalin cholesterol tests, etc. Enzymes. Pancreatic function tests.

BMT-403 – Parasitology:

UNIT – I : General introduction to Medical Parasitology:

1. Divisions of medical parasitology.
2. Classes of parasites.
3. Classes of hosts.
4. Host parasitic interactions.
5. Parasitic adaptations.
6. Sources of infection.
 - a) Soil, b) Water, c) Food, d) insect vectors, e) Animals, f) Other persons.
7. Modes of infection:
 - a) Oral transmission, b) Skin transmission, c) Vector transmission, d) Direct transmission.
8. General pathogenicity.

Diagnostic methods in parasitology:

1. Examination of stools.
2. Examination of blood.
3. Examination of urine.
4. Examination of sputum.
5. Biopsy.
6. Culture methods.
7. Indirect evidences.

UNIT-II: Medical Protozoology:

1. Classification of protozoan parasites.
2. Salient characters of protozoans.
3. Distribution and localization of protozoan parasites in man.
4. Pathogenic effects of various parasites in man.
5. Distribution, Habitat, Life cycle, Pathogenicity, Clinical features, Epidemiology, Laboratory diagnosis and prophylaxis of the following protozoan parasites:
 - a) Entamoeba histolytica
 - b) Trichomonas vaginalis
 - c) Giardia intestinalis
 - d) Trypanosoma gambiense
 - e) Leishmania donovani
 - f) Leishmania tropica
 - i) Plasmodium vivax
 - k) Plasmodium falciparum
 - l) Balantidium coli

UNIT III : Medical Helminthology:

1. Classification of helminthes.
 - a) Platyhelminthes
 - i) Trematodes ii) Cestodes.
 - b) Nematelminthes.
2. Salient characters of helminthes.
3. Distribution and localisation of helminth parasites in man.
4. Pathogenic effects of various parasites in man.
5. Distribution, Habitat, Life cycle, Pathogenicity, Clinical features, Epidemiology, Laboratory diagnosis and prophylaxis of the following platyhelminth parasites:

A: Trematodes:

 - a) Schistosoma mansoni
 - b) Schistosoma haematobium
 - c) Fasciola hepatica
 - d) Paragonimus westermani
 - e) Clonorchis sinensis

- B: Cestodes:
a) Diphyllbothrium latum
b) Taenia solium
c) Taenia saginata
d) Echinococcus granulosus

UNIT-IV : Distribution, Habitat, Life cycle, Pathogenicity, Clinical features, Epidemiology, Laboratory diagnosis and prophylaxis of the following nemathelminth parasites:

- a) Trichuris trichiura
- b) Trichinella spiralis
- c) Strongyloides stercoralis
- d) Ancylostoma duodenale
- e) Ascaris lumbricoides
- f) Wuchereria bancrofti
- g) Loa loa
- h) Onchocerca volvulus
- i) Dracunculus medinensis

Arthropod vectors and their role in parasitology:

1. Mosquito
 - a) Culex
 - b) Anopheles.
2. Sandfly
3. Tsetse fly
4. Bugs
5. Lice
6. Fleas

BMT-404 – Haematology :

UNIT – I : Collection of Blood:

Blood and its formed elements, RBC, WBC, Platelets.

Haemoglobin and its types

Haematocrit, Differential count, ESR, PCV, MCV, MCH, MCHC.

UNIT – II : Blood cell abnormalities.

Blood coagulation, Haemopoiesis and study of Bone marrow, enrichment of stem cells & clinical application, C.T, Anticoagulants.

Blood Groups and sub-groups.

Blood related disorders.

UNIT – III : Anaemias, Haemolytic anaemia (Thalassemia), Haemophilia, Aplastic anaemia, Polycythemia, sickle cell anaemia, Thrombosis, Leukemia, Importance of blood sugar, Calcium, Acetone.

UNIT - IV : Blood Donation.

Blood transfusion.

Transfusion of RBC, Platelets, WBC, Haemopoietic Cells, Plasma components, Adverse effects of blood transfusion; Transfusion for the newborn.

Blood Banks and their functioning, Blood storage.

Haemin crystals, Spectroscopic examination of blood, Determination of HbF, Osmotic fragility of blood cells, Preparation of lupus erythematosus (LE) cells; Preparation of Heinz bodies; Electrophoresis of Hb.

BMT-405PR : Practical I : Based on topics covered in BMT 401 and 402

BMT-406PR : Practical II : Based on topics covered in BMT 403 and 404

Reference Books for BMT Semester I:

1. Biomedical Electron Microscopy – Maunsbach, Afrilits
2. Basic Medical Laboratory Technology – Reynolds Walter
3. Lab. Practice in tropical countries (I) – Chess Brough
4. Biosensors – Cooper & Cass
5. Medical Instrumentation and their applications & design – Webster.
6. Theory and practice in Histological Techniques by Bancroft and Stevens.
7. Histological and Histochemical methods, IVth Edition by Kierman, Scion, 1999.
8. Techniques in Cell Biology by P.S. Yadav.
9. Chromosome, Sharma et al., 3rd Edition, 1995.
10. Molecular Biology of Cell (Part I, II, III) – Bruce Alberts
11. Stem cell biology and gene therapy (ii) – Peter J. Querenberry & Gery s. stein
12. Mitochondria – Alexander Tzagoloff
13. GENES VIII by B. Lewin, 2004, Pearson Publications.
14. Principles and techniques of Biochemistry and Molecular Biology, 6th Edition, Wilson and Walker.
15. Textbook of Medical Laboratory techniques by Godkar et al., 2003, Bhalani Publications, Parel, Mumbai.
16. Clinical Biochemistry: Clinical and Metabolic Aspects, 2nd Edition, Marshall and Bangert, Churchill, 2008.
17. Medical Biochemistry by Baynes and Dominiczak, 2nd Edition, 2005.
18. Pre test Biochem – fgrancis J. Chlaspwki
19. Introducing Biochem – E. J. Wood, W. R. Pickering
20. General Parasitology – Thomas. C. Chang
21. Parasitism – Bush, Fernandez & Esch
22. Practical Exercises in Parasitology – David & Jerzey
23. Parasitology(Including Entomology & Acarology) – B. Dasgupta
24. Parasitology (Protozoology & Helmithology) – Chatterjee
25. An Introduction to Helminthes – Bhamrah & Juneja
26. Practical Haematology – Dacie & Lewis
27. Haematology, Atlas and diagnostic guide – N. C. J. Son
28. Haematology (1st edition) – Howard and Hemilton
29. Clinical Haematology - John .E. Pettit
30. Histochemistry: Theoretical and Applied by AGE Pearse Vol. I & II, 1968, IIIrd Edition.
Clinical Biochemistry by Gupta and Salunke, 1995.

BIO-MEDICAL TECHNOLOGY SEMESTER – II

BMT-407: Clinical Biochemistry and Serology II:

UNIT – I : Estimation of inorganic materials.
Na, K, Cl, Fe, Mg, Cu, Zn, Ca, P, Iodine, Sulphur & Interpretations, Iron and iron binding capacity.
Chemical Examination of C.S.F.
Chemical examination of Kidney&Gall bladder stones, examination of puncture fluids.
Methods for study of metabolism.

UNIT – II : Enzymes:
Clinical importance of enzymes, quantitative estimation of enzymes, Enzymes in preparation of reagents. SGPT, SGOT, LDH, CPK & Hydroxybutyrate dehydrogenase, Isocitrate dehydrogenase, amylase, glucose-6 phosphate, dehydrogenase, Cholinesterases, Aldolase activity, Phosphatases.

UNIT – III : Plasma Proteins:
A/G Ratio, Determination of gamma globulin, Dye Binding technique, Determination of fibrinogen; Electrophoretic separation and interpretations, Lipoproteins-separation, interpretations, Ultracentrifugation, separation of Immunoglobulins, Determination of mucoproteins.

UNIT – IV : Heart and Circulation
Cardiac function tests.
Cardiovascular diseases (CVDs) – types, mechanisms.
Cardiovascular diseases - treatments and management.
Stem Cell Applications in CVDs.

BMT-408 – Toxicology:

UNIT – I : General principles and terminology, Types of toxicity; Factors affecting toxicity; Acute, Sub acute and chronic toxicity; Classification of toxicants. Estimation of toxicity; LD50; LC50.
Toxicity testing-Route of administration, Absorption, Distribution, excretion, Metabolism, Biotransformation.

UNIT – II : Toxic agents and mode of action:
Pesticides, metals, Solvents & vapours, Radiation and radioactive materials, Xenobiotics and Toxins of animal and plant origin, Teratogens, Food additives and contaminants; Air, Water, Soil pollutants.

UNIT – III : Toxicology of organs and organ systems:
Toxicology of blood, Cutaneous, Development, Endocrine, Reproductive systems, Immune system; Digestive, Respiratory, Excretory and Nervous systems, Sense organs, Cardiovascular system.

UNIT – IV : Genotoxicity:
Toxins and Toxic residues and analysis, Clinical, Occupational toxicology; Reproductive, Industrial Toxicology and importance in Forensic Science.
Human toxicology and Medical Ethics.

BMT-409: Clinical Pathology:

UNIT – I : Clinical Pathology : General background.
Disorders of cells and tissues:
Hypoplasia, hyperplasia, hypertrophy, metaplasia, neoplasia- Cancer-types, characteristics.-Apoptosis.
Disorders of blood cells and heart:
Embolism, heart diseases, hypertension

UNIT – II : Disorders of respiratory tract:
Tonsillitis, Bronchitis, Asthma, Emphysema, Cough, Carbon monoxide (CO)-poisoning; Hypoxia.
Disorders of digestive tract:
Gastritis, ulcers, diseases of pancreas and liver, diarrhoea, dysentery.
Disorders of excretory systems:
Nephritis; Acidosis; Disorders of urination.

UNIT–III : Disorders of nervous system:
Sclerosis, Migraine, Depression, Schizophrenia, Neurosis, Epilepsy, Parkinsonism; Dementia, Alzheimer's Disease.

UNIT – IV : Disorders of other system:
Impotency, Infertility, Abortions, Prostatitis, etc.
Disorders of bones, joints and cartilages.
Disorders of skin, muscles.
Small uterus; blocked tubes, vaginal discharge and infection, cervical, vaginal uterine cancers, PAP test, agalactorrhoea, ultrasound sonography, Mammary gland cancers, Intersex, Pregnancy test.

BMT-410: General Microbiology:

UNIT – I : General principles and classification; Classification of selected bacteria.
Isolation, Cultivation and identification of pathogens;
Preparation of specific culture media for the isolations of pathogens.
Sensitivity of pathogens;
Staining of pathogens.

UNIT – II : Ultrastructure of microbial cell, microbial genetics and physiology. Microbial flora of healthy human host, Host-microbe interaction. Staining techniques for microorganisms, Monochrome staining, Differential staining, Special staining.
Preparation of glassware for microbiological work;
Introduction to few instruments; Incubator, Oven, Autoclave.
Sterilization techniques, Disinfection technique.

UNIT – III : Microbial and serological methods of identification and interpretation of some clinically important microbes.
Gram positive pathogenic bacteria; viz. Staphylococci, Streptococci, Diplococci, Gonococci, Meningococci, Coryno- bacteria, etc.

Gram negative bacteria e.g. coliform, Salmonella, Vibrio, Shigella, Pseudomonas, Pasteurella, Haemophilus, Brucella, Bordetella, Clostridium, etc.

Other pathogenic microorganisms eg. Spirochetes, Rickettsia, Mycobacteria.

Microbial serological tests for identification of organisms:
Precipitation test, Agglutination test, Flocculation test, Complement fixation test, Cytotoxic and Fluorescent antibody test.

UNIT – IV : Hemagglutination test.
Immunodiffusion.
Neutralization tests.
Opsonization.
Susceptibility tests:
MIC methods, Kirby- Baner Method, DISC method for sensitivity; antibiotic spectrum, serum level antibiotic test, Biochemical test along with serological tests for identification.

BMT-411PR: Practical III : Based on topics covered in BMT 407 and 408

BMT-412PR: Practical IV : Based on topics covered in BMT 409 and 410

Reference Books for Semester II:

1. Practical Biochem – Keith Wilson and John Walker
2. Textbook Clinical Biochem and human Biochem – G. P. Talwar
3. Biochemistry - Jelemy Berg , John Tymoczko , Lubert stryer
4. Lehninger Principles of Biochem (4th Edition) – Nelson and Gox
5. Toxicology Vol I, II and III.
6. LU's Basic Toxicology – Frank C, L. U
7. Toxicology of the Liver – Hewitt
8. Clinical use of the laboratory data – Dufour
9. Principle of Biochemical Toxicology – John Timbrell
10. Presenting Toxicology results – Gerhard J. N
11. Emergency Toxicology – Bania, Brent et. Al
12. Reproductive and developmental Toxicology – Korach
13. Medical Toxicology – Schonwald
14. Toxicology and Pathology – Haschek R
15. Principles and Methods of Toxicology, 4th Edition, Wallace Hayes, 2001, Taylor & Francis publications.
16. Experimental Toxicology, 2nd Edition, 1993 Aldridge et al.,
17. Microbiology – Pelzar, Chan & Krieg
18. Microbiology Perspective – Wistreich
19. Tools and Techniques of Microbiology – S. Rajan
20. Medical Microbiology – Churchill Livingstone
21. Immunology – basic and clinical immunology – peakman/bergana
22. Immunology – essential immunology – Roatt (10th edition)
23. Immunology – practical immunology – Hay and West Wood
Immunology – The Tao of Immunology – Lappe

BIO-MEDICAL TECHNOLOGY SEMESTER – III

BMT-501 - Immunology

UNIT – I : Principles of immunology; Types of immunity, Cells and tissues of immune system, Antigens, immunoglobulins; Antigen-antibody reactions; Adjuvants, Complements; immune response, Immunity to diseases.

UNIT – II : Hypersensitivity:
Allergy, Immunoglobulin IgE; Importance of histamine and antihistamines.
Immunogenicity:
Complete antigens; incomplete antigens (haptens)

UNIT-III : Immune complex diseases and autoimmune diseases:
General knowledge of classification of antigens and antibodies involved; their interrelationships, immunopathogenic mechanisms; Immunologic tests of diagnostic value and clinical significance of test results with special reference to the following:
a) Systemic lupus erythematosus.
b) Rheumatoid arthritis.
c) Scleroderma.
d) Autoimmune haemolytic anaemia.
e) Pernicious anaemia.
f) Thyroidites.
g) Autoimmune liver diseases-primary biliary cirrhosis and chronic active hepatitis.
h) Glomerunephritis.
j) Skin diseases.
k) AIDS.

UNIT-IV : Alterations of immune response:
a) Tolerance: i) Factors; ii) Natural vs. acquired.
b) Suppression: i) Drugs; ii) Radiation.
c) Autoimmunity.
Immunogenetics:
Clonal selection-genetics of lymphocytes differentiation.
Genes for antibodies.
ABO system - Blood groups.
Rh system
Other blood groups-
MNSS blood group system.
P blood group system
Kell, Lutheran, Duffy, Kidd.-blood group systems

BMT-502 - Clinical Endocrinology

- UNIT-I** : General principles of Endocrinology. Feedback control mechanisms.
Hormones:
Types, Chemical nature, Synthesis, Metabolism, control and functions
- UNIT – II** : Mechanism of hormone action:

Different signalling molecules and ligands. Signal transduction; mechanism of action of protein hormones; Steroid hormones; Secondary messengers.

Hormones and Receptors:

Types, location, classification. synthesis, metabolism and recycling. Hormones and biotechnology-synthesis of insulin, growth hormone, etc.
- UNIT-III** : Clinical aspects of hormones and endocrine glands, their hypo-and hyper function and related syndromes/diseases.

Hypothalamus and higher brain centres, hypothalamic Lesions.

Pituitary - Cretinism, gigantism, Acromegaly, Diabetes insipidus.

Pineal - Pinealomas.

Thyroid - goitre; exophthalmic goitre.
- UNIT – IV**: Parathyroid and calcium metabolism.
Pancreas - Diabetes mellitus.
Adrenal - Addison Disease, Relation to carbohydrate and mineral metabolism, stress.
Kidney - ADH and diabetes insipidus.
Lung, Liver- Angiotensin system;
Vitamin D3 and its hormonal action.
Atrionatrial hormone and electrolyte balance.
Gut Hormones and its regulation and Pathophysiology.

BMT-503 - Reproductive technologies and Radiation diagnostics:

- UNIT-I** : Testis - Spermatogenesis and its hormonal control, Formation of semen and its diagnostic value, Fertility standards, Ultrastructure of sperm, Sperm maturation, Semen biochemistry, sperm metabolism, sperm acrosome reaction, Capacitation of sperms, functional tests of sperm, Sperm banks. Sertoli cell only Syndrome
Ovary – Structure, Folliculogenesis, ovulation, corpus luteum, atresia, menstrual cycle Polycystic ovary; Ovary from birth to senescence; hypogonadism; Amenorrhoea, Dysmenorrhoea; PCO syndrome/ Hirsutism, Anovulation.
- UNIT – II** : Principles of Radiation Biology, Radioimmunoassays, Radioreceptor assay, IRMA, ELISA, Chemiluminescence assays, ECIL Radiation Diagnostics, Imaging & Scanning techniques- CAT-Scan, Pet-Scan, X-ray, Radiation therapy.
- UNIT – III** : Fertilization, *In-vitro* fertilization, Assisted reproductive technology - IVF, ZIFT, GIFT, SUZI, ICSI, etc. Test tube baby. Sperm preparative techniques, Fertility control in male and female.
- UNIT – IV**: Infertility: Definition. General – types. Factors affecting fertility: male and female sterility. Contraceptive technology in males and females.

BMT-504: Clinical Genetics:

- UNIT – I** : Cell nucleus; nucleic acids, Chromosome structure and organization, Replication, Transcription, Translation, synthesis, DNA damage and repair, DNA isolation, sequencing, splicing.
Replication, Transcription, Translation.
- UNIT – II** : Chromosomes:
Heterochromatin, Euchromatin, Sex chromatin and its importance, Cell, tissue and organ culture, suspension and monolayer cultures, stem cell cultures and its significance, Chromosome banding techniques and its importance. Study of sister chromatid exchange. Human Genome Project.

UNIT – III : Human chromosomal abnormalities - numerical, structural and syndromes.

Identification of chromosomes and karyotyping.

Laws of inheritance beyond basic Mendelian concepts.

Epistasis, Linkage, multiple allelism, mutation, Hybrid vigour.

Sex determination and sex-linked inheritance, Related diseases.

Colour blindness, haemophilia, muscular dystrophy, Inborn errors of metabolism.

Prenatal diagnostic techniques, amniocentesis, Chorionic biopsy, Torch technique.

UNIT-IV : Molecular biology techniques:

Flow cytometry, Fluorescence in-situ hybridization (FISH), M-FISH technique; Genetic engineering and recombinant DNA technique, Cloning, Southern, Northern, Western blotting and Dot Blot techniques; Polymerase chain reaction (PCR), RFLP analysis;

DNA finger printing and its importance; DNA foot printing; Gene therapy and its applications;

Immunogenetics

Chromosome and Cancer: Chromosomal involvements, Oncogenes.

BMT-505PR: Practical V : Based on topics covered in BMT 501 and 502

BMT-506PR: Practical VI : Based on topics covered in BMT 503 and 504

Reference Books for Semester III:

1. Immunology, 6th Edition by Kuby, Freeman Publications.
2. Cellular and molecular immunology by Abbas et al., 6th Edition, 2007, Elsevier Publications.
3. Elements of Immunology by Khan 2009, Dorling Kindsley, Delhi.
4. Textbook of Assisted Reproductive Technologies by Gardener et al., 2009, 3rd Edition, Informa Health Care.
5. Basic and Clinical Endocrinology by Greenspan et al., 1983, ELBS, Singapore.
6. Endocrinology by De Groot Vol I, II & III, 2nd Edition, Saunders Publications, 1989.
7. Essentials Endocrinology by Laycock and Wise, 2nd Edition, ELBS, Singapore, 1981.
8. Essential reproduction by Johnson and Everitt, 1980, Blackwell Scientific Publications.
9. Principles of Vertebrate reproductive biology by Devraj Sarkar, 1996, Ganapati Publications.
10. Endocrinology Secrets by Michael T. Mc Dernott, 2005, Elsevier, Rajkamal, Delhi.
11. Human Reproduction Contraception and Conception, 2nd Edition, Harper Publications, 1992.
12. The Physiology of Reproduction, Ernest Knobil & Neil, 1988, Vol II, Raven Press.
13. Marshall's Physiology of Reproduction by Ge. E. Lamming, 4th Edition, Vol II, Churchill
14. Elements of Biotechnology by P. K. Gupta., Latest Edition, Rastogi Publications.
15. Human Syndromes by Gupta.
16. Clinical Chemistry and Molecular Diagnostics by Burtis et al., 4th Edition, Saunders, 2006, Elsevier.
17. Molecular Biology and Reproductive Medicine – B. J. M Fauser
18. Genetics Disorders & the fetus – Milunsky
19. Microbial Genetics – S. Sundara Rajan
20. Human Physiology – Silverthorn
21. Genetics (2nd Edition) – Pierce
22. An Atlas of Human Gametes & Conceptuses – Lucinda . L. Vecck
23. Culture of animal cells by Freshney, 2005 Willey publications.
24. An Atlas of Human Gametes & Conceptuses – Lucinda . L. Vecck Genetics (2nd Edition) – Pierce

BIO-MEDICAL TECHNOLOGY SEMESTER – IV

BMT-507S : Seminars and Industrial Visits during the Semester.

BMT-508 : Assignments / Group Discussions.

BMT-509PT: Project Dissertation and Viva-voce

TIME TABLE BIO-MEDICAL TECHNOLOGY (SEMESTER –) YEAR 201 -201 .

BMT-I	TIME	MON	TUE	WED	THUR	FRI	SAT
THEORY (09:00 TO 11:00)	09:00 10:00						
	10:00 11:00						
11:00 11:30	R E C E S S						
PRACTICAL (11:30 TO 02:30)	11:30 12:30						
	12:30 01:30						
	01:30 02:30						
THEORY	02:30 03:30						

