

SARDAR PATEL UNIVERSITY

Rules/Regulations & Syllabus

[Including all revisions/amendments till June, 2013]

For the course of

B.Sc.- Medical Technology
[Renal Dialysis Technology]

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SARDAR PATEL UNIVERSITY

F.Y.B.Sc.- Medical Technology
[Renal Dialysis Technology]
Proposed Revision in the Curriculum

Sr. No.	Subject	Course No.	Teaching Hours
Main Subjects			
1	Human Anatomy	BMT-101	60
	Practical – Anatomy	BMT-101(P)	30
2	Human Physiology	BMT-102	60
	Practical – Physiology	BMT-102(P)	30
3	Pathology	BMT-103	60
	Practical-Pathology	BMT-103(P)	30
4	Microbiology	BMT-104	60
	Practical- Microbiology	BMT-104(P)	30
5	Biochemistry	BMT-105	60
	Practical- Biochemistry	BMT-105(P)	30
Main Subjects- Teaching hours			450
Subsidiary subjects			
6	English	E-101	60
	Practical-English	E-102(P)	30
7	Health-Care	BMT-S-101	30
Subsidiary subjects- Teaching hours			120
Teaching hours-Theory/Practicals			570
Hospital Posting			360
Total Teaching hours			930

SARDAR PATEL UNIVERSITY

B.Sc.- Medical Technology (First Year)

Table 1. Subjects, Credits and Scheme of Examination

Sr. No.	Subject	Course No.	No. Credits per week	Duration of Uni. Exam	External Marks	Internal Marks	Total	Grand Total
1	Human Anatomy	BMT-101	2	3	80	20	100	100
	Practical – Anatomy	BMT-101(P)	1	-	-	-	-	
2	Human Physiology	BMT-102	2	3	80	20	100	100
	Practical – Physiology	BMT-102(P)	1	-	-	-	-	
3	Pathology	BMT-103	2	3	80	20	100	100
	Practical-Pathology	BMT-103(P)	1	-	-	-	-	
4	Microbiology	BMT-104	2	3	80	20	100	100
	Practical- Microbiology	BMT-104(P)	1	-	-	-	-	
5	Biochemistry	BMT-105	2	3	80	20	100	100
	Practical- Biochemistry	BMT-105(P)	1	-	-	-	-	
6	English	E-101	2	3	80	20	100	100
	Practical-English	E-102(P)	1	-	-	-	-	
7	Health-Care	BMT-S-101	1	2	40	10	50	50
							Total	650

Rules & Regulations for the course of F.Y.B.Sc.- Medical Technology

B.Sc.- Medical Technology (First Year)

With the increasing use of advanced diagnostic and therapeutic technologies in medicine; there has been a challenging career for well-trained Medical technologists in different specialties of **Medical Technology**.

Proposed course of First Year of **B.Sc. – Medical Technology** offers a sound foundation to pursue further, in second and third year of B.Sc. MT, any of the several specialties of Medical; Technology; some of them have been mentioned hereunder:

- a. Clinical Laboratory Technology
- b. Operation Theatre & Anaesthesia Technology
- c. Respiratory Care Technology
- d. Imaging Technology
- e. Cardiac Care Technology
- f. Perfusion Technology
- g. Neuro Science Technology
- h. Renal Dialysis Technology
- i. Radiotherapy Technology

R. BMT. 1: Eligibility for the admission:

Candidates who have passed 10+2 examination conducted by any recognized School Certification Board or Equivalent Examination; with principal subjects Physics, Chemistry, Biology/Maths and English (A or B or AB group student).

R. BMT. 2: Duration of the course:

Duration shall be for a period of **three years** for the course of B.Sc.- Medical Technology in *Clinical Laboratory Technology*.

All other courses will be of **four years** duration; having a compulsory stipendiary Internship during the fourth year.

R. BMT. 3: Medium of instruction:

The medium of instruction and examination shall be in English.

R. BMT. 4: Attendance

Candidate shall be required to attend at least 75% of the Lectures and Practical separately in each year.

R. BMT. 5: Subjects, Credits and Scheme of examination

Main and Subsidiary subjects are common in first year for all the courses of Medical Technology. The subject-wise details of examination for the first year have been given in Table 1.

There shall be three examinations one each at the end of 1st, 2nd and 3rd year.

There shall be no University Practical Exam in the First Year.

It is however necessary that candidates score at least 35% internal marks in all main as well as subsidiary subjects - theory and practical - to become eligible to appear in the University examination.

R. BMT. 6: Eligible candidate desirous for appearing in the University examination of any/all theory papers must forward his/her application in the prescribed form from the respective college to the University on or before the date prescribed for the purpose under the relevant ordinance.

R. BMT.7: **Standard of passing:**

The standard of passing the F.Y.B.Sc. degree examination will be as under:

- (a) To pass the B.Sc. Degree examination, a candidate must obtain at least **35% marks** (aggregate of external and internal) in each of the main and subsidiary subjects **separately**.
- (b) Award of class will be as per the other degree examinations of faculty of Medicine, S.P. University.

R. BMT. 8: **Promotion and A.T.K.T.**

a. Candidates, who have passed separately in theory and practical of all subject heads (course) in F.Y.B.Sc. and S.Y.B.Sc. Shall be promoted to S.Y.B.Sc. And T.Y.B.Sc. Respectively.

b. Candidates, who fail in **any three** of the subject heads (courses) in F.Y.B.Sc. Or S.Y.B.Sc. Shall be granted A.T.K.T. And shall be allowed to attend S.Y.B.Sc. Or T.Y.B.Sc.; as the case may be. Candidate can re-appear in the following subject-heads in the subsequent exam.

c. Candidate would however not be allowed for the promotion from S.Y.B.Sc. to T.Y.B.Sc. unless and until s/he passes all subjects of F.Y.B.Sc.

SYLLABUS FOR F.Y.B.Sc. – Medical Technology

Course code: BMT 101

HUMAN ANATOMY

Theory classes: 60 hours

Practical classes : 30 hours

Unit 1. Introduction: human body as a whole

Theory:

- Definition of anatomy and its divisions
- Terms of location, positions and planes
- Cell and its organelles
- Epithelium-definition, classification, describe with examples, function
- Glands- classification, describe serous & mucous glands with examples
- Basic tissues – classification with examples

Practical:

- Histology of types of epithelium
- Histology of serous, mucous & mixed salivary gland

Unit 2. Locomotion and support

Theory:

- Cartilage – types with example & histology
- Bone – Classification, names of bone cells, parts of long bone, microscopy of compact bone, names of all bones, vertebral column, intervertebral disc, fontanelles of fetal skull
- Joints – Classification of joints with examples, synovial joint (in detail for radiology)
- Muscular system: Classification of muscular tissue & histology
- Names of muscles of the body

Practical:

- Histology of the 3 types of cartilage
- Demo of all bones showing parts, radiographs of normal bones & joints
- Histology of compact bone (TS & LS)
- Demonstration of muscles of the body (as functional groups)
- Histology of skeletal (TS & LS), smooth & cardiac muscle

Unit 3. Cardiovascular system

Theory:

- Heart-size, location, chambers, exterior & interior
- Blood supply of heart
- Systemic & pulmonary circulation
- Branches of aorta, common carotid artery, subclavian artery, axillary artery, brachial artery, superficial palmar arch, femoral artery, internal iliac artery
- Peripheral pulse
- Inferior venacava, portal vein, portosystemic anastomosis
- Great saphenous vein
- Dural venous sinuses
- Lymphatic system- cisterna chyli & thoracic duct
- Histology of lymphatic tissues
- Names of regional lymphatics, axillary and inguinal lymph nodes in brief

Practical:

- Demonstration of heart and vessels in the body
- Histology of large artery, medium sized artery & vein, large vein
- Microscopic appearance of large artery, medium sized artery & vein, large vein
- pericardium
- Histology of lymph node, spleen, tonsil & thymus
- Normal chest radiograph showing heart shadows
- Normal angiograms

Unit 4. Gastro-intestinal system**Theory:**

- Parts of GIT, Oral cavity (lip, tongue (with histology), tonsil, dentition, pharynx, salivary glands, Waldeyer's ring)
- Oesophagus, stomach, small and large intestine, liver, gall bladder, pancreas
- Radiographs of abdomen

Unit 5. Respiratory system**Theory:**

- Parts of RS, nose, nasal cavity, larynx, trachea, lungs, bronchopulmonary segments
- Histology of trachea, lung and pleura
- Names of paranasal air sinuses

Practical:

- Demonstration of parts of respiratory system.
- Normal radiographs of chest
- Histology of lung and trachea

Unit 6. Urinary system**Theory:**

- Kidney, ureter, urinary bladder, male and female urethra
- Histology of kidney, ureter and urinary bladder

Practical:

- Demonstration of parts of urinary system
- Histology of kidney, ureter, urinary bladder
- Radiographs of abdomen-IVP, retrograde cystogram

Unit 7. Reproductive system**Theory:**

- Parts of male reproductive system, testis, vas deferens, epididymis, prostate (gross & histology)
- Parts of female reproductive system, uterus, fallopian tubes, ovary (gross & histology)
- Mammary gland – gross

Practical:

- Demonstration of section of male and female pelvis with organs *in situ*
- Histology of testis, vas deferens, epididymis, prostate, uterus, fallopian tubes, ovary
- Radiographs of pelvis – hysterosalpingogram

Unit 8. Endocrine glands**Theory:**

- Names of all endocrine glands in detail on pituitary gland, thyroid gland, parathyroid gland, suprarenal glad – (gross & histology)

Practical:

- Demonstration of the glands
- Histology of pituitary, thyroid, parathyroid, suprarenal glands

Unit 9. Nervous system

Theory:

- Neuron
- Classification of NS
- Cerebrum, cerebellum, midbrain, pons, medulla oblongata, spinal cord with spinal nerve (Gross Anatomy)
- Histology of Cerebrum, cerebellum and spinal cord
- Meninges, Ventricles & cerebrospinal fluid
- Blood supply of brain (In Brief)
- Cranial nerves (Only Names)

Practical:

- ◆ Histology of peripheral nerve & optic nerve
- ◆ Demonstration of all plexuses and nerves in the body
- ◆ Demonstration of all part of brain
- ◆ Histology of cerebrum, cerebellum, spinal cord

Unit 10.Sensory organs:

Theory:

- Skin: Skin-histology
- Appendages of skin
- Eye: Parts of eye & lacrimal apparatus
- Extra-ocular muscles & nerve supply
- Ear:parts of ear- external, middle and inner ear and contents

Practical:

- Histology of thin and thick skin
- Demonstration and histology of eyeball
- Histology of cornea & retina

Unit 11.Embryology:

Theory:

- Spermatogenesis & oogenesis
- Ovulation, fertilization
- Fetal circulation
- Placenta

There shall be no University Practical Examination.

REFERENCE BOOKS

1 William Davis (P) understanding Human Anatomy and Physiology MC Graw Hill

2. Human Anatomy for Nursing & Allied Sciences - 1st edition
Dr. M.K.Anand, Dr. Meena Verma, The Arora Medical Publishers Pvt.Ltd

3. Fattana, Human anatomy
(Description and applied)
Saunder's & C P Prism Publishers, Bangalore – 1991

4. ESTER . M. Grishcimer,
Physiology & Anatomy with Practical Considerations, J.P. Lippin Cott. Philadelphia

Course code: BMT 102
HUMAN PHYSIOLOGY

Theory classes: 60 hours

Practical classes : 30 hours

Theory:

Unit 1. Blood and Muscle Physiology:

- Composition & Function of Blood
- Erythropoiesis and Leucopoiesis
- Hemostasis
- Action potential and mechanism of Muscle contraction
- Neuromuscular junction

Unit 2. Digestive System and Excretory System

- Movement and Alimentary tract
- Deglutition and Mechanism of Vomiting
- Digestive juices
- Micturition
- Mechanism of Urine formation
- Regulation of acid-base balance

Unit 3. Cardiovascular and Respiratory System

- Heart rate and sound
- Blood pressure
- Cardiac cycle and output
- Mechanism of breathing
- Oxygen and Carbon dioxide Transport
- Pulmonary volume and capacity

Unit 4. Endocrinology and Reproductive System

- Spermatogenesis and Menstrual cycle
- Puberty
- Pregnancy and Lactation
- Hormones of Pituitary, Thyroid & Parathyroid Glands
- Hormones of Adrenal Gland and Pancreas

Unit 5. Nervous System and Special Senses

- Neuron and Neuroglia
- Properties of nerve fibre
- Reflex mechanism and Receptors
- Mechanism of vision and hearing
- Taste and smell

Practical:

- Estimation of Haemoglobin
- Bleeding time
- Clotting time
- Blood Grouping
- Erythrocyte Sedimentation rate
- Packed Cell Volume
- Arterial Blood Pressure
- Pulse
- Heart rate
- Breathing rate

There shall be no University Practical Examination.

REFERENCE BOOKS

1. Guyton (Arthur) Text Book of Physiology.
Latest Ed. Prism publishers
2. Ganong (William F) Review of Medical Physiology.
Latest Ed . Appleton
3. Jain AK, Concise Physiology, Latest Ed.

Course code: BMT 103

PATHOLOGY

Theory classes: 60 hours

Practical classes : 30 hours

Theory

Unit 1. Histo Pathology

- Introduction to Histo Pathology
- Receiving of Specimen in the laboratory
- Grossing Techniques
- Mounting Techniques – various Mountants
- Maintenance of records and filing of the slides.
- Use & care of Microscope
- Various Fixatives, Mode of action, Preparation and Indication. Section Cutting
- Tissue processing for routine paraffin sections
- Decalcification of Tissues.
- Staining of tissues - H& E Staining
- Bio-Medical waste management

Unit 2. Clinical Pathology

- Introduction to Clinical Pathology
- Collection, Transport, Preservation, and Processing of various clinical Specimens
- Urine Examination – Collection and Preservation of urine. Physical, chemical, Microscopic Examination
- Examination of CSF and other body fluids.
- Sputum Examination.
- Examination of feces

Unit 3. Haematology

- Introduction to Haematology
- Normal constituents of Blood, their structure and function.
- Collection of Blood samples
- Various Anticoagulants used in Haematology
- Various instruments and glassware used in Haematology, Preparation and use of glassware
- Laboratory safety guidelines
- SI units and conventional units in Hospital Laboratory
- Hb, PCV
- ESR
- Normal Haemostasis
- Bleeding Time, Clotting Time, Prothrombin Time, Activated Partial Thromboplastin Time.

Unit 4. Blood Bank

- Introduction
- Blood grouping and Rh Types
- Cross matching

Practical:

- Urine Examination.
- Physical
- Chemical
- Microscopic
- Blood Grouping Rh typing.
- Hb Estimation, Packed Cell Volume[PCV], Erythrocyte Sedimentation rate{ESR}
- Bleeding Time, Clotting Time.
- Histopathology – Section cutting and H &E Staining.[For BSc MLT only]

There shall be no University Practical Examination.

REFERENCE BOOKS

1. Silvertone : Introduction to Medical Lab. Technology
2. Bancroft : Theory and Practical of Histology techniques
3. Textbook of Clinical Blood Banking Science by Zmijewski.
4. Manual for Clinical Pathology by Sabitry Sanyal
5. Practical Pathology by Dr.P.Chakraborty & Gargi Chakraborty
6. Haematology for students and practitioners by Ramnik Sood
7. Histological techniques by K.Laxminarayan
8. Practical Pathology by Dr.K.Uma Chaturvedi & Tejsindersingh

Course code: BMT 104

MICROBIOLOGY

Theory classes: 60 hours

Practical classes : 30 hours

Theory

Unit 1. Morphology

- Classification of microorganisms,
- Size, shape and structure of bacteria.
- Use of microscope in the study of bacteria.

Unit 2. Sterilisation and Disinfection

- Principles and use of equipments of sterilization namely Hot Air oven, Autoclave and serum inspissator. Pasteurization,
- Anti septic and disinfectants

Unit 3. Growth and nutrition

- Nutrition, growth and multiplications of bacteria,
- Use of culture media in diagnostic bacteriology.
- Antimicrobial sensitivity test

Unit 4. Immunology

- Infection & Immunity
- Antigen, Immunoglobuline (in brief)
- Principles and interpretation of commonly done serological tests namely Widal, VDRL, ASO, CRP, RF & ELISA. Rapid tests for HIV and HBsAg (Technical details to be avoided)
- Types of Vaccine and immunization schedule

Unit 5. Systematic Bacteriology

- Morphology, cultivation, diseases caused, laboratory diagnosis including specimen collection of the following bacteria (the classification, antigenic structure and pathogenicity to be avoided)
 - *Staphylococci, Streptococci, Pneumococci,*
 - *Gonococci, Meningococci,*
 - *C. diphtheriae, Clostridia, Bacillus,*
 - *Shigella, Salmonella, Esch coli,*
 - *Klebsiella, Proteus, Pseudomonas*
 - *Mycobacteria*
 - *Vibrio cholerae, &*
 - *Spirochetes-Treponema pallidum & Leptospira*

Unit 6. Parasitology

- Morphology, life cycle, laboratory diagnosis of following parasites
 - Protozoa - *E. histolytica, Plasmodium,*
 - Tape worms –*Taenia*
 - Intestinal nematodes – Round worm, Hookworm,

Unit 7. Mycology

- Morphology, diseases caused and lab diagnosis of following fungi.
 - *Candida, Cryptococcus,*
 - Dermatophytes ,
 - opportunistic fungi.

Unit 8. Virology

- General properties of viruses, diseases caused, lab diagnosis and prevention of following viruses,
 - Herpes,
 - Hepatitis,
 - HIV
 - Rabies and
 - Poliomyelitis.

Unit 9. Hospital infection

- ◆ Causative agents, transmission methods,
- ◆ Prevention and control Hospital infection.

Unit 10. Principles and practice Biomedical waste management

Practical

- Compound Microscope.
- Grams stain
- Acid Fast staining
- Demonstration and sterilization of equipments – Hot Air oven, Autoclave, Bacterial filters.
- Demonstration of commonly used culture media, culture methods

Nutrient broth, Nutrient agar, Blood agar, Chocolate agar, Mac conkey medium, LJ media, Robertson Cooked meat media, Potassium tellurite media with growth, Mac with LF & NLF, NA with staph

- Demonstration of commonly used Biochemical Reactions for identification of bacteria
 - Coagulase test
 - Catalase test
 - IMViC
 - TSI
 - Urease, Oxidase
- Antibiotic susceptibility test
- Anaerobic culture methods.
- Demonstration of common serological tests – Widal, VRDL, ELISA.
- Stool exam for Helminthic ova
- Visit to hospital for demonstration of Biomedical waste management.

There shall be no University Practical Examination.

REFERENCE BOOKS

1. Anathanarayana & Panikar Medical Microbioloty
2. Roberty Cruckshank – Medical Microbiology – The Practice of Medical Microbiology
3. Chatterjee – Parasitology – Interpretation to Clinical medicine.
4. Rippon – Medical Mycology
5. Monica Cheesebrough,

Course code: BMT 105

BIOCHEMISTRY

Theory classes: 60 hours

Practical classes : 30 hours

Theory

Unit.1 Introduction, specimen collection and Handling

- ◆ Introduction to Bio-chemistry including code of ethics for Medical Lab technicians and Medical Lab Organization.
- ◆ Reception, Registration and Bio-chemical parameters investigated.
- ◆ Types of vials used in blood /specimen collection
- ◆ Anticoagulants
- ◆ Preservatives
- ◆ Blood collection
- ◆ Precautions
- ◆ Safety, first aid, Biological and chemical hazards
- ◆ Processing of samples
- ◆ Preservation
- ◆ Disposal of samples
- ◆ Introduction to laboratory apparatus :
 - Pipettes - different types (Graduated, volumetric, Pasteur, Automatic etc.), Calibration of glass pipettes
 - Burettes, Beakers, Flasks, Funnels, Cuvettes,

Unit 2. Units of measurements and Basics of Instrumentation

- ◆ Conventional and SI units
 - Molecular weight, equivalent weight of elements and compounds, normality, molarity,
 - Preparation of molar solutions, normal solutions, Percent solutions
- I. Colorimetry : Photoelectric methods, instrumentation, principles and laws involved, Operation, maintenance, applications.
- II. Spectrophotometry : Principle, types and applications.
- III. Weighing : Different types of balances used, care and maintenance.
- IV. pH meter-Principle, Use, care and maintenance of pH meter and electrodes
- ◆ Basic lab operations like -Separation of Solids from liquids,
 - a) Centrifugation : Principle, Different types of Centrifuges, care and maintenance, applications
 - b) Filtration using funnel

Unit.3 Carbohydrates :

Definition, biological importance, classification, qualitative tests, Metabolism(brief), Blood glucose.

Unit.4 Lipids :

Definition, biological importance, classification, Acid value, Iodine value, saponification value, Metabolism(brief).

Unit.5 Aminoacids and Proteins :

Definition, biological importance, classification, qualitative tests.

Unit.6 Vitamins and Minerals :

Vitamins : Classification of Vitamins, Sources, Daily requirements, Deficiency diseases. (In Brief)
Minerals (Iron, calcium, Iodine): Sources, Daily requirements, Deficiency diseases .

Unit.7 Enzymes

Nature, Classification and Clinical enzymes.

Unit.8 Nucleic acids- Chemistry and functional aspects

Purine bases, Pyrimidine bases, nucleosides, Nucleotides, DNA & RNA, Their functions
Brief outline of Replication, Transcription, translation.

Unit.9

- ◆ PH, buffers, acid-base balance, disorders.
- ◆ Digestion and absorption of Biomolecules
- ◆ Water, Chemicals and related substances
 - ★ Purity of chemicals
 - ★ Corrosives

Practical:

- ◆ Reception and registration
- ◆ Collection of Capillary blood
- ◆ Collection of Venous blood
- ◆ Separation of Serum from clotted blood
- ◆ Separation of plasma from blood
- ◆ Lab glass ware
 - a) Identification
 - b) Handling
 - c) Care and Maintenance
 - d) Uses
- ◆ Lab instruments
 - a) Centrifuges
 - b) Balances
 - c) Photo Electric colorimeter
 - d) Spectrophotometer
- ◆ Preparation of
 - a) Percentage solutions
 - b) Normal solutions
 - c) Molar solutions
- ◆ Qualitative identification of tests of sugars
- ◆ Qualitative identification of tests of proteins
- ◆ Qualitative identification of tests for amino acids
- ◆ Estimation of Blood glucose
- ◆ Estimation of Blood urea
- ◆ Normal and pathological urine.

There shall be no University Practical Examination.

REFERENCE BOOKS

1. TEITZ – Clinical chemistry
2. Vasudevan (DM) Sreekumari(S) Text book of Biochemistry for Medical students ,Latest Ed
3. Varley – Clinical chemistry
4. 3. Kaplan – Clinical chemistry

Course code: BMT-S-101

HEALTH CARE

Theory classes: 30 hours

Unit 1. Introduction to Health

- ◆ Definition of Health
- ◆ Determinants of Health
- ◆ Health Indicators of India
- ◆ Health Team

Unit 2. Health Policy and Programmes

- Concept.
- National Health Policy
- National Health Programmes (Briefly Objectives and scope)
- Population of India and Family welfare programme in India

Unit 3. Introduction to Nursing

- What is Nursing ? Nursing principles.
- Inter-Personnel relationships.
- **Bandaging** : Basic turns; Bandaging extremities; Triangular Bandages and their application.
- Nursing Position, Bed making, prone, lateral, dorsal, dorsal re-cumbent, Fowler's positions, comfort measures, Aids and rest and sleep.
- **Lifting And Transporting Patients**: Lifting patients up in the bed. Transferring from bed to wheel chair. Transferring from bed to stretcher.

Unit 4. Bed Side Management:

- Giving and taking Bed pan, Urinal :
- Observation of stools, urine.Observation of sputum,
- Understand use and care of catheters, enema giving.
- **Methods Of Giving Nourishment**: Feeding, Tube feeding, drips, transfusion
- Recording of body temperature, respiration and pulse,
- **Simple aseptic technique**: Sterlization and disinfection.
- Surgical Dressing: Observation of dressing procedures

Unit 5. First Aid :

- Syllabus as for Certificate Course of Red Cross Society

Course Code: E - 101

ENGLISH

Theory classes: 60 hours

Practical classes: 30 hours

There will be two papers in English at the FYBSc as per the revised syllabus E-101 (Theory) will be taught for two hours a week and E-102 (Practical) will also be taught for two hours a week/per Batch each form the academic year 2009-10

Language Skills like Reading and Writing will be covered in E-101 and Listening and Speaking will be covered in E-102 which will also have Lab Session of two hours per week.

Aim

These two course will aim at helping the course participants develop their communication skills in English by training them in handling all the four language skills effectively. The learners will be able to listen, speak, read and write in English adequately so that they could participate in various activities and perform satisfactory the different tasks listed below.

Overall Objectives

The objectives are to develop abilities

- ◆ To process information using a variety of media
- ◆ To use appropriate phrases for performing language functions
- ◆ To edit, select and present information in a format / perspective
- ◆ To listen and reduce information to a point form
- ◆ To read and to expand from points to paragraph
- ◆ To predict, comprehend, infer and synthesize information
- ◆ To question, probe and arrive at information through discussions, dialogues and interviews
- ◆ To answer questions, choose and provide data etc.

E-101 (Theory) : 2 Credits : 2 hours week

A. Reading

The objectives are to enable the students to

- Read for information news features, articles, newspaper and text
- Read intensively a collection of short stories given in a compiled text (See for the text and the lessons selected from it below)

Book prescribed

- ◆ L.A.Hill (1970), **Contemporary Short Stories**. Chennai: Oxford University Press. The following stories have been selected for use on the course.

- ◆ The happy Prince
- ◆ A Horseman in the sky
- ◆ The Wolves of Cernogratz
- ◆ The half Mile
- ◆ The Mark of Vishnu
- ◆ The Halfyard Ham
- ◆ Locomation 38
- ◆ The Ghost Ship
- ◆ Uneasy Homecoming
- ◆ The Trust Property

B. Writing

The objectives are to enable the students to

- ◆ Form words properly using prefixes / suffixes (See list 4 in the Appendix)
- ◆ Use phrasal verbs (See list 3 in the Appendix)
- ◆ Use appropriate and related registers (See list 5 in the Appendix)
- ◆ Writing paragraphs, developing points / ideas
- ◆ Writing resume, job applications, letters of invitations (inviting / accepting/ declining), letters of complaint to civil authorities
- ◆ Answering questions based on the prescribed text: **Contemporary Short Stories**

Books Recommended

- Champa Tickoo and Jaya Sasikumar (2000). **Writing with a Purpose**, Chennai, OUP
- David Jolly (1988). **Writing Tasks**: An authentic task approach to individual writing needs.

E-102 (Practicals) : 2 hours week

C. Listening

The objectives are to enable the students to listen and understand

- Short lecture, descriptions, and narrations, rapid talks, passages read aloud and/or dictated and identify Language functions (See list 2 in the Appendix)
- Conversations based on familiar situations, and
- Note Making

Books Recommended

- Spoken English-D Sasikumar and PV Dhamija (with Audio Cassette) Tata Mcgraw Hill

D. Speaking

The objectives are to enable the students to

- Use greeting and formula in everyday conversations.
- Use various notions and function of everyday usage (See list 2 in the Appendix)
- Use grammatically correct and appropriately structures to organize thought (See list 1 Containing Syntactic items in the Appendix)
- Give short formal and informal talks, speeches

Books Recommended

- Grant Taylor. English Conversation Practice. New Delhi: Tata McGraw Hill
- R.P.Bhatnagar and R.T.Bell (1999) **Communication in English**, Hyderabad: Orient Longman

Testing: Division of Marks

E – 101 (Theory)

Q.1	Answer in Brief. (In not more than three sentences)	14 marks
Q.2	Short Notes (Any Two)	06 marks
Q.3	Multiple Choice	
	• Content based questions	05 marks
	• Expressions / Idioms / Difficult words	05 marks
	• Connectives	04 marks
	• Concord	04 marks
Q.4	(A) Comprehension (Unseen Passage) OR Paragraph Writing	08 marks
	(B) Letter Writing	08 marks
	• Formal Letters- Letters of complaint, Invitation- Extending/declining, Resume building/ Applications	
Q.5	(A) Phrasal Verbs	04 marks
	(B) Registers	02 marks

E – 102 (Practical)

- Listening 15 marks
- Dictation 05 marks
- Reading A loud 10 marks
- Viva + Journal 10 + 5 marks
- Note Making 10 marks
- Vocabulary 05 marks

60 marks (60/2 = 30)

SARDAR PATEL UNIVERSITY**S.Y. B. Sc.- Medical Technology
in
Renal Dialysis Technology
Curriculum**

Sr. No.	Subject	Course No.	Teaching Hours
Main Subjects			
1	Applied Anatomy, Physiology and Pharmacology	BMT-RDT-201	60
2	Applied Pathology	BMT-RDT-202	60
3	Renal Dialysis Technology-Basics	BMT-RDT-203	60
4	Practical – Renal Dialysis Technology	BMT-RDT-204(P)	90
Subsidiary Subjects			
5	Bio-ethics	BMT-S- 201	20
6	Computer organization & PC software	BMT-S-202	25
	Computer organization & PC software- Practical	BMT-S-202(P)	25
Main Subjects- Teaching hours			270
Subsidiary subjects – Teaching Hours			70
Teaching hours – Theory/Practicals			340
Renal Dialysis Unit Posting			635
Total Teaching hours			975

Subjects, code and Scheme of Examination

Sr. No.	Subject	Course code No	No. Credits per week	Duration of Uni. Exam	External Marks	Internal Marks	Total
1	Applied Anatomy, Physiology and Pharmacology	BMT-RDT-201	2	3 hrs	80	20	100
2	Applied Pathology	BMT-RDT-202	2	3 hrs	80	20	100
3	Renal Dialysis Technology-Basics	BMT-RDT-203	2	3 hrs	80	20	100
4	Practical – Renal Dialysis Technology	BMT-RDT-204(P)	2	1 day	160	40	200
	Grand total				400	100	500

Detailed curriculum
S.Y.B.Sc.- Medical Technology in
Renal Dialysis Technology

Paper I: Applied Anatomy, Physiology and Pharmacology
Course code: BMT-RDT-201

- **ANATOMY:**
- Structure of kidney
- Structure of ureter
- Structure of urinary bladder
- Nephrons
- Juxta-glomerular apparatus (JGA)
- Blood supply to kidney- Renal artery, Renal vein, Sub-clavian vein, Femoral vein, Jugular vein and Radial artery
- Innervations of kidney and urinary bladder
- Peritoneum in general

- **PHYSIOLOGY:**
- Functions of kidney
- Renal function test [RFT]
- Mechanism of urine formation
- Physiology of bladder function
- Micturition and types of bladder dysfunction
- Role in BP regulation in health disease
- Role of peritoneum in PD
- Mechanism of bone formation and regulation
- Role of kidney in bone formation
- Other endocrine functions of kidney
- Body fluids and electrolytes and regulation in health and disease
- Disorders of water metabolism
- Sodium, potassium, calcium and phosphate
- Role of kidney in acid-base balance

- **PHARMACOLOGY RELATED TO DIALYSIS TECHNOLOGY**
- 1. Renal pharmacology- IV fluids in renal patients, common drugs used in renal medicine including diuretics, anti-HTN, steroids, azthioprine, cyclosporin, cyclophosphamide, vitamin-D analogs, erythropoietin, anti-biotics, chemicals used in dialysis room including composition & mechanism of action.
- 2. PD fluids
- 3. Renal replacement fluids and CAVH
- 4. Chemicals used in sterilisation including formaldehyde and mechanism of action
- 5. Hydrogen peroxide
- 6. Vaccines used in dialysis patients
- 7. Hepatitis-B
- 8. Cardio-vascular drugs- Digoxine, β -blockers
- 9. Inotropic drugs- Dopamine, Dobutamine, Adrenaline, Isoprenaline and Noradrenaline
- 10. Vasodilator – Nitroglycerine & Nitroprusside

Paper II: Applied Pathology

Course Code: BMT-RDT-202

- Acute renal failure
- Chronic renal failure
- Renal biopsy
- Acid-base fluid and electrolyte disorder- Hyponatremia & Hypernatremia
- Disorders of potassium metabolism
- Disorders of calcium and phosphorus, homeostasis
- Oedema and clinical use of diuretics
- Metabolic acidosis
- Metabolic alkalosis
- Respirators of acidosis and alkalosis
- Glomerular diseases
- Renal function in congestive heart failure (CHF)
- Renal function in liver disease
- Post infectious glomerular nephritis
- Renal involvement in systemic vasculitis
- Renal manifestation in SLE and rheumatic disorder
- Diabetic Nephropathy
- Amyloidosis
- HUS/TTP
- Renal disease associated with HIV
- Drugs and kidney
- Hereditary renal disorder
- Hyperoxaluria
- Obstructive uropathy
- VUR and reflux nephropathy
- Nephrolithiasis
- UTI
- Kidney disorder in pregnancy
- Renal hypertension

Paper III: Renal Dialysis Technology - Basics

Course code: BMT-RDT-203

- Dialysis team
- Basic chemistry, body fluids and electrolytes
- History of HD
- Indications of dialysis
- Types of hemodialysis
- Principles of HD
- Initiation of Dialysis Therapy
- Water treatment unit [WTU]
- HD equipment
- Types of dialyzer
- Dialyzer membrane

- Composition of dialysate
- Cannulation of vascular access in HD
- Vascular access and its types and complication
- Vascular access recirculation
- Hemodialysis adequacy
- Anti-coagulation
- Methods and complications of dialyzer re-use
- Infection control and universal precaution
- Psychological aspect of dialysis patients
- Drugs and dialysis
- Anemia and erythropoietin use

Practical- Renal Dialysis technology

Course Code: BMT-RDT-204 (P)

SARDAR PATEL UNIVERSITY

**T.Y. B. Sc.- Medical Technology
in
Renal Dialysis Technology**

Curriculum

Sr. No.	Subject	Course No.	Teaching Hours
Main Subjects			
1	Renal Dialysis Technology-I	BMT-RDT-301	90
2	Renal Dialysis Technology-II	BMT-RDT-302	90
3	Renal Dialysis Technology-III	BMT-RDT-303	90
4	Practical – Renal Dialysis Technology	BMT-RDT-304(P)	90
Teaching hours – Theory/Practicals			360
Renal Dialysis Unit Posting			615
Total Teaching hours			975

Subjects, code and Scheme of Examination

Sr. No	Subject	Course code No	No. Credits per week	Duration of Uni. Exam	External Marks	Internal Marks	Total
1	Renal Dialysis Technology-I	BMT-RDT-301	3	3 hrs	80	20	100
2	Renal Dialysis Technology-II	BMT-RDT-302	3	3 hrs	80	20	100
3	Renal Dialysis Technology-III	BMT-RDT-303	3	3 hrs	80	20	100
4	Practical – Renal Dialysis Technology	BMT-RDT-304(P)	2	1 day	160	40	200
Grand total					400	100	500

R. BMT.RDT.1: Internship (Fourth Year)

The courses of B.Sc.- Medical Technology in *Renal Dialysis Technology* shall be having a compulsory Internship during the fourth year.

(a) Internship shall be commenced only after the candidate is declared pass in all the subjects and practical of T.Y. B.Sc. and/or previous year's A.T.K.T., if any.

(b) The Internship shall be commenced soon after the announcement of result of T.Y.B.Sc.- Medical Technology in *Renal Dialysis Technology* from a date as notified by the Principal of the affiliated Institute and would continue for continuous twelve months; with one leave per month permissible.

(c) The degree of B.Sc. will be awarded by Sardar Patel University only on successful completion of Internship.

Detailed curriculum
T.Y.B.Sc.- Medical Technology in
Renal Dialysis Technology

Paper I: Renal Dialysis Technology - I

Course code: BMT-RDT-301

- Patient assessment
- Acute complication
- MARS
- Plasmapheresis
- Hemoperfusion
- Current research in HD
- Paediatric dialysis
- Slow continuous therapies
- High flux and high efficiency dialysis
- Machine monitoring in dialysis
- Lab data analysis
- Quality assurance in HD
- Dialysis Amyloidosis
- Ascites in dialysis patients
- Pregnancy in dialysis patients

Pape II: Renal Dialysis Technology - II

Course code: BMT-RDT-302

History of peritoneal dialysis
Physiology of PD
Indication and contraindication of chronic PD
PD apparatus
Access for CAPD
Catheter and exit-site care
PD process
Assessment of peritoneal membrane permeability
Adequacy of PD
PD therapies
Non-infectious complications
Infectious complications
Patient education
Types of renal donor and cadaver donor maintenance
Recipient and donor workup
Post-transplant management and follow up
Current research in PD and transplantation

Paper III: Renal Dialysis Technology - III

Course code: BMT-RDT-303

- Nutrition in Dialysis patients
- Diabetes in Dialysis patients
- Serum enzyme level
- Acid-Base homeostasis
- Haematological abnormalities
- Infection in Dialysis patients
- Endocrine disturbances
- Bone disease
- Aluminium toxicity
- Sleep disorder
- Musculoskeletal and rheumatologic disease in CRF patient
- Special problems pertaining to genitor urinary tract and male reproductive organs in CRF patients
- ESWL
- Urosurgical procedure
- Care of the HIV-infected Dialysis Patient
- Cardio-Vascular Disease in chronic dialysis patients
- Neurologic aspects of uremia
- Metabolic abnormalities
- Anemia and erythropoietin use
- Acquired cystic kidney disease
- Gastro-intestinal disease in dialysis patients
- Principles of ICU care

Practicals: Renal Dialysis Technology - I

Course code: BMT-RD-304 (P)