SARDAR PATEL UNIVERSITY

Rules/Regulations & Syllabus

[Including all revisions/amendments till June, 2013]

For the course of

B.Sc.- Medical Technology
[Respiratory Care Technology]

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SARDAR PATEL UNIVERSITY

F.Y.B.Sc.- Medical Technology
[Respiratory Care 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 3**5% 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 untill 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 pelves 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:

- Compositin & Fucnction of Blood
- Erythropoesis and Leucopoesis
- Hemostasis
- Action potential and mechanism of Muscle contraction
- Neuromuscular junction

Unit 2. Digeestive System and Excretary System

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

Unit 3. Cardiovascular and Respiratory Sustem

- 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

1. Spermatogenesis and Menstrual cycle
2. Puberty
3. Pregnancy and Lactation
4. Hormones of Pituitary, Thyroid & Parathyroid Glands
5. 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 4. 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 5. 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.
- Histopathlogy – 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 microorgaisms,
- 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 sterlization namely Hot Air oven, Autoclave and serum inspissrator. 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)
    - *Staphyloccci, Streptococci, Pneumococci,*
    - *Gonococci, Menigococci,*
    - *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 sterlization of equipments – Hot Air oven, Autoclave, Bacterial filters.
- Demonstration of commonly used culture media, culture methods
    - Nutrient broth, Nutrient agar, Blood agar, Chacolate 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 Mircrobiology
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 complied 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)
- Conversions 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 Respiratory Care Technology

Curriculum

Sr. No.	Subject	Course No.	Teaching Hours
Main Subjects			
1	Section A -Applied Pathology	BMT-201A	30
	Section B- Applied Microbiology	BMT-201B	30
	Practical-Pathology & Microbiology	BMT-201-(P)	45
2	Introduction to Respiratory Care Technology	BMT-RCT-202	60
	Practical	BMT-RCT-202-(P)	90
3	Applied Pharmacology & Medicine	BMT-RCT-203	60
		Main Subjects- Teaching hours	**315**
Subsidiary subjects			
4	Bio-ethics	BMT-S-201	20
5	Computer Organization & PC Software	BMT-S-202	25
6	Practical - Computer Organization & PC Software	BMT-S-203-(P)	25
		Subsidiary subjects- Teaching hours	**70**
		Teaching hours-Theory/Practicals	385
		Clinical Posting	540
		Total Teaching hours	925

S.Y.B.Sc.- Medical Technology
(in Respiratory Care Technology)

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	Section A: Applied Pathology	BMT-201	2	3	80	20	100	150
	Section B: Applied Microbiology							
	Practical- Pathology & Microbiology	BMT-201-(P)	1	1 day	40	10	50	
2	Introduction to Respiratory Care Technology	BMT-RCT-202	2	3	80	20	100	150
3	Practical- Respiratory Care Technology	BMT-RCT-202-(P)	1	1 day	40	10	50	
3	Applied Pharmacology & Medicine	BMT-RCT-203	2	3	80	20	100	100
4	Bioethics	BMT-S-201	1	2	40	10	50	50
	No practical Exam	-	-	-	-	-	-	
5	Computer Organization & PC Software	BMT-S-202	1	2	40	10	50	80
	Practical- Computer Organization & PC Software	BMT-S--202(P)	1	1 day	25	5	30	
							Total	**530**

Syllabus for Second year
B.Sc- Medical Technology in Respiratory Care Technology

Course code: BMT- 201

SECTION A-APPLIED PATHOLOGY

1. CARDIOVASCULAR SYSTEM

- Atherosclerosis- Definition, risk factors, briefly Pathogenesis & morphology, clinical significance and prevention.
- Hypertension- Definition, types and briefly Pathogenesis and effects of Hypertension.
- Aneurysms – Definition, classification, Pathology and complications.
- Pathophysiology of Heart failure.
- Cardiac hypertrophy – causes, Pathophysiology & Progression to Heart Failure.
- Ischaemic heart diseases- Definition, Types. Briefly Pathophysiology, Pathology & Complications of various types of IHD.
- Valvular Heart diseases- causes, Pathology & complication. Complications of artificial valves.
- Cardiomyopathy – Definition, Types, causes and significance.
- Pericardial effusion- causes, effects and diagnosis.
- Congenital heart diseases – Basic defect and effects of important types of congenital heart diseases.

2. HAEMATOLOGY

- Anaemia – Definition, morphological types and diagnosis of anaemia.
  Brief concept about Haemolytic anaemia and polycythaemia.
- Leukocyte disorders- Briefly leukaemia, leukocytosis, agranulocytosis etc.,
- Bleeding disorders- Definition, classification, causes & effects of important types of bleeding disorders. Briefly various laboratory tests used to diagnose bleeding disorders.

3. RESPIRATORY SYSTEM

- Chronic obstructive airway diseases – Definition and types. Briefly causes, Pathology and complications of each type of COPD.
- Briefly concept about obstructive versus restrictive pulmonary disease.
- Pneumoconiosis- Definition, types, Pathology and effects in brief.
- Pulmonary congestion and edema.
- Pleural effusion – causes, effects and diagnosis.

4. RENAL SYSTEM

- Clinical manifestations of renal diseases. Briefly causes, mechanism, effects and laboratory diagnosis of ARF & CRS. Briefly Glomerulonephritis and Pyelonephritis.
- End stage renal disease – Definition, causes, effects and role of dialysis and renal transplantation in its management.
- Brief concept about obstructive uropathy.

5. Central Nervous System

- Increased Intracranial tension
- Head Injury

PRACTICALS

1. Description & diagnosis of the following gross specimens.
    a. Atherosclerosis.
    b. Aortic aneurysm.
    c. Myocardial infraction.
    d. Emphysema
    e. Chronic glomerulonephritis.
    f. Chronic pyelonephritis.
2. Interpretation & diagnosis of the following charts.
    a. hematology Chart - AML, CML, Hemophilia, neutrophilia, eosinophilia.
    b. Urine Chart - ARF, CRF, Acute glomerulonephritis.
3. Estimation of Hemoglobin.
4. Estimation Bleeding & Clotting time.

PRACTICAL EXAMINATION

There will be a Combined Practical examination for Applied Pathology & Applied Microbiology.

Course code: BMT- 201

SECTION B-APPLIED MICROBIOLOGY

1. Health care associated infections and Antimicrobial resistance: Infections that patients acquire during the course of receiving treatment for other conditions within a healthcare setting like Methicillin Resistant Staphylococcus aureus infections, Infections caused by Clostriduium difficle, Vancomycin resistant enterococci etc. Catheter related blood stream infections, Ventilator associated pneumonia, Catheter Related urinary tract infections, Surveillance of emerging resistance and changing flora. The impact and cost attributed to Hospital Associated infection. 6 Hours

2. Disease communicable to Healthcare workers in hospital set up and its preventive measure: Occupationally acquired infections in healthcare professionals by respiratory route (tuberculosis, varicella-zoster, respiratory synctial virus etc), blood borne transmission (HIV, Hepatitis B, Hepatitis C, Cytomegalovirus, Ebola virus etc), oro faecal route (Salmonella, Hepatitis A etc), direct contact (Herpes Simplex Virus etc). Preventive measures to combat the spread of these infections by monitoring and control. 6 Hours

3. Microbiological surveillance and sampling: Required to determine the frequency of potential bacterial pathogens including Streptococcus pneumoniae, Haemophilus influenzae, and Moraxella catarrhalis and also to assess the antimicrobial resistance. Sampling: rinse technique, direct surface agar plating technique. 6 Hours

4. Importance of sterilization:

a. Disinfection of instruments used in patient care: Classification, different methods,advantages and disadvantages of the various methods.

b. Disinfection of the patient care unit

c. Infection control measures for ICU's

5. Sterilization:

a. Rooms: Gaseous sterilization,

b. Equipments: classification of the instruments and appropriate methods of sterilization.

c. Central supply department: the four areas and the floor plan for instrument cleaning, high-level disinfecting and sterilizing areas.

6. Preparation of materials for autoclaving: Packing of different types of materials, loading, holding time and unloading.

7. Biomedical waste Management: Biomedical waste handling and disposal

PRACTICALS-

1. Principles of autoclaving & quality control of Sterilization.
2. Collection of specimen from outpatient units, inpatient units, minor operation theater and major operation theater for sterility testing.
3. The various methods employed for sterility testing.
4. Interpretation of results of sterility testing.
5. Disinfection of wards, OT and Laboratory.

PRACTICAL EXAMINATION

There will be a Combined Practical examination for Applied Pathology & Applied Microbiology.

Course code: BMT-RCT- 202

INTRODUCTION TO RESPIRATORY CARE TECHNOLOGY

Theory

Patient contact techniques

Nonverbal Communication
- ¬ʌ Aspects of nonverbal communication
- ¬ʌ Definitions
- ¬ʌ Characteristic

Universal Precautions
- ¬ʌ Handwashing/ Hand hygiene
- ¬ʌ Insolation procedures

Assessment of vital signs
- ¬ʌ General appearance
- ¬ʌ Sensorium
- ¬ʌ Pulsation
- ¬ʌ Blood pressure
- ¬ʌ Respiration

Chest topography
- ¬ʌ Identification of imaginary lines
- ¬ʌ Topographical landmarks of thorax ,Lungs & Pleura

Assessment of respiratory system
- ¬ʌ Inspection Palpation, percussion and auscultation of respiratory system
- ¬ʌ Definition and significance of the presence alteraed resonadge abnormal death sounds and advections sound

Assessment of cardiovascular system
- ¬ʌ Topography of the heart
- ¬ʌ Examination of the procardium
- ¬ʌ Overall cardiovascular functions
- ¬ʌ Symptoms of cardiovascular disease
- ¬ʌ Radiovascular paid

Segment of other body System
- ¬ʌ Skin and extermination
- ¬ʌ Neurological system
- ¬ʌ Abdomen

Chest physical therapy
- ¬ʌ Definition, indication / Contraindication
- ¬ʌ techniques of chest physical therapy

Gas Physics

- State of matter
- Temperature conversion
- Humidity
- pressure measurement
- Gas flows and diffusion
- Gas laws
- Discellaneous concepts such as density and specific gravity

Medical Gas supply

- Compressed gas cylinders
- Colour coding
- Cylinders and Cylinders valves
- Cylinder storage
- Diameter index safety system
- Medical gas pipeline system and station outlets
- Air components
- Oxygen concentrators
- Alarms and safety revises

Gas Administration devices (Reducing valves, flow meters and regulators).

- Simple oxygen administration devices
- Methods of controlling gas flow
- Reducing valve
- Flow meters
- Regulators
- Flow restrictors

Oxygen therapy (rationale for oxygen therapy, precautions assessment of need and adequacy and therapy and the relevant devices)

- Definition
- Humidity therapy Definition
- Aerosol therapy definition
- Small volume nebuliser therapy – definition, physiological rationale

ECG – basic principles, normal ECG, interpretation in disease –

Introduction, value and limitation of chest X-ray, conventional and special radiological views

Pulmonary function testing – Definition
PFT - in disease and their significance
Provocative tests and postbronchodilator tests of lung function

Course code: BMT- 203

(A) APPLIED PHARMACOLOGY

- General concepts about pharmacodynamic and Pharmacokinetic Principles involved in drug activity.

I. Autonomic nerves system.

- Anatomy & functional organisation.
- List of drugs acting an ANS including dose, route of administration, indications, contra indications and adverse effects.

II. Cardiovascular drugs- Enumerate the mode of action, side effects And therapeutic uses of the following drugs.

a. Antihypertensives

- Beta Adrenergic antagonists
- Alpha Adrenergic antagonists
- Peripheral Vasodilators
- Calcium channel blockers

b. Antiarrhythmic drugs
c. Cardiac glycosides
d. Sympathetic and nonsympathetic inotropic agents.
e. Coronary vasodilators.
f. Antianginal and anti failure agents
g. Lipid lowering & anti atherosclerotic drugs.
h. Drugs used in Haemostais – anticoagulants Thrombolytics and antithrombolytics.
i. Cardioplegic drugs- History, Principles and types of cardioplagia.
j. Primary solutions – History, principles & types.
k. Drugs used in the treatment of shock.

III. Anaesthetic agents.

- Definition of general and local anaesthetics.
- Classification of general anaesthetics.
- Pharmacokinetics and Pharmacodynamics of inhaled anaesthetic agents.
- Intravenous general anaesthetic agents.
- Local anaesthetics – classification mechanism of action, duration of action and methods to prolong the duration of action. Preparation, dose and routes of administration.

IV Analgessics

- Definition and classification
- Routes of administration, dose, frequency of administration, Side effects and management of non opioid and opiod analgesics

V. Antihistamines and antiemetics-

Classification, Mechanism of action, adverse effects, Preparations, dose and routes and administration.

VI. CNS stimulants and depressants

- Alcohol
- Sedatives, hypnotics and narcotics
- CNS stimulants
- Neuromuscular blocking agents and muscle relaxants.

VII. Pharmacological protection of organs during CPB

VIII. Inhalational gases and emergency drugs.

IX. Pharmacotherapy of respiratory disorders

- Introduction – Modulators of bronchial smooth muscle tone and pulmonary vascular smooth muscle tone
    - Pharmacotherapy of bronchial asthma
    - Pharmacotherapy of cough
    - Mucokinetic and mucolytic agents
    - Use of bland aerosols in respiratory care.

X. Corticosteroids – Classification, mechanism of action, adverse effects and complications. Preparation, dose and routes of administration.

XI Diuretics

- Renal physiology
- Side of action of diuretics
- Adverse effects
- Preparations, dose and routes of administrion.

XII. Chemotherapy of infections

- Definition
- Classification and mechanism of action of antimicrobial agents
- Combination of antimicrobial agents
- Chemoperophylaxis.
- Classification, spectrum of activity, dose, routes of administration and adverse effects of penicillin, cephalosporins, aminoglycosides, tetracyclines, chloramphenicol, antitubercular drugs.

XIII. Miscellaneous.

- IV fluids- various preparations and their usage.
- Electrolyte supplements
- Immunosuppressive agents
- New drugs included in perfusion technology.
- Drugs used in metabolic and electrolyte imbalance.

(B) MEDICINE RELEVANT TO RESPIRATORY CARE TECHNOLOGY

- Brief mention about common diseases such as DM. hypertension, IHD
- Obesity, Elderly, Patient Pregnancy
- Respiratory failure (type, Signs, causes, assessment & management)
- Bronchial asthma and status asthmaticus
- Chronic bronchitis, emphysema & COPD
- Adult respiratory distress syndrome
- AIDS
- Poliomyelitis & Gullian - Barre Syndrome
- Myasthenia gravis
- Status epilepticus
- Respiratory problems in children
- Sepsis & septic shock
- Poisoning
- Pneumonia-community acquired hospital acquired
- In immuno-compromised patient
- Lung abscess
- Atypical pneumonia
- Common viral and fungal infections
- Pulmonary tuberculosis
- Tropical eosinophilia
- Pulmonary oedema
- Acute lung injury
- Toxic inhalation
- Occupational lung
- Diseases of the pleura, mediastinum and chest wall
- Pulmonary thrombo embolism
- Fat embolism

PRACTICALS:

1. Preparation and prescription of drugs of relevance.
2. Experimental pharmacology directed to show the effects of commonly used drugs of relevance and interpretation of few charts.

NO PRACTICAL EXAMINATION

Recommended Books.

1. R. S. Satoskar, S.D. Bhandarkar, S. S. Ainapure, Pharmacology and Pharmacotherapeutics, 18th Edition, single Volume, M/S Popular Prakashan, 350, Madan Mohan Marg, Tardeo, Bombay – 400 034.
2. K.D. Tripathi, Essentials of Medical Pharmacology, V. Edition, M/s. Jaypee Brothers, Post Box, 7193, G-16, EMCA House, 23/23, Bansari Road, Daryaganj, New Delhi.
3. Laurence and Bennet, Clinical Pharmacology, ELBS Edition, 9th Edition.

SARDAR PATEL UNIVERSITY

S.Y.B.Sc. - Medical Technology

Bioethics

(Common to all specializations of Medical Technology)

Course Code: BMT-S-201

Goals

1. Provide a sense of responsibility and professionalism when interacting with patients, peers, fellow employees, and other health care providers.
2. Communicate effectively and professionally.
3. Instill the importance of honesty and professionalism in the workplace.

By the end of this module, the student should be able to:

1. Exhibit behavior consistent with the ethical practice of Medical Technologist.
2. Maintain confidentiality of all patients and test results.
3. Demonstrate an appreciation for the special knowledge and talent of other members of the health care team.
4. Explain the transmission of the AIDS/HIV and state how the virus affects the Immune system.

Methods of Presentation

Lecture, Discussion, Audio-Visual materials

Duration : 20 hours

COURSE CONTENT

1. Values of life (Philosophy)/in clinical practice & Definition of medical ethics. **1 hour**
2. History of Medical Ethics: **2 hour**
   - ◆ Indian perspectives : Charaka,Susruta
   - ◆ The Hippocratic Oath
   - ◆ Declaration of Helsinki
   - ◆ WHO Declaration of Geneva
   - ◆ International code of Medical Ethics
3. Ethical problems of life **2 hour**
   - Right to life, prenatal screening / sex selection
   - Abortion, feticide
   - Assisted reproductive technologies
   - Genetic testing
   - Genetic engineering, cloning
   - Care of terminally ill
   - Death and dying
   - Euthanasia
4. Family and society in medical ethics : **2 hour**
   - Children : Age to consent for treatment parent- Child – clinician conflict

- Mental Disorders and disabilities
- HIV / AIDs

5. Etiquette and mannerism **2 hour**
6. Good communication skill **2 hour**
    - Truthfulness, Building trust, Honesty with patients
    - Communication with colleagues, seniors and subordinates

7. Confidentiality **1 hour**
    - Malpractice, negligence
    - Medical ethics and law

8. Code of ethics: (Please refer Annexure for elaborations)
    - Duties to Patients **1 hour**
    - Duties to Colleagues and other Professionals: **1 hour**
    - Duties to Yourself: **1 hour**
    - Duties to Society: **1 hour**
    - Duties to your Profession: **1 hour**
    - Specific issues: **1 hour**

Internal Evaluation:
(Problem based questions, Short notes, MCQ, Viva) **2 hour**

EVALUATION : TOTAL: 50 marks

Internal evaluation: 10 marks
External Exam (One paper of 2 hours): 40 marks

- Problem oriented question
- Short notes
- Short answer questions

There will no Practical Exam for this course.

SUGGESTED BOOKS/LITERATURE:

1. MEDICAL ETHICS, by C.M.Francis, Jaypee Brothers
2. Current Problems in Medical ethics, by George V. Lobo, St. Paul's Society, Allahabad.
3. Ethics for Doctors, Nurses & Patients by H.P. Dunn, St. Pauls Bandar, Mumbai.

ANNEXURE

CODE OF ETHICS: Medical Technology

Code of Ethics, under different categories, has been elaborated hereunder as applied to the profession of Medical Technician/Technologist. It is however suggested that these elaborations are only indicative and not exclusive. There could be many more situations/ events, depending on the nature of work involved in different types of specialization of Medical Technology; which would also be deemed to be a part of the curriculum as and when identified.

1. Code of Ethics: Duties to Patients:
    - accountability for the quality and integrity of the services they provide.
    - respect patients' privacy and dignity
    - treat patients politely and with consideration
    - apply the principle of informed consent as an on-going process
    - recognize the rights of patients to maintain confidentiality of information in the course of professional duties, unless they agree to disclosure or the law demands
    - patients' permission before sharing information with their spouses, partners or relatives.
    - always seek to give priority to the service to be provided to patients solely on the basis of clinical need.

- Code of Ethics: Duties to Colleagues and other Professionals:
    - Should not make a patient doubt a colleagues' knowledge or skills by making comments about them that cannot be fully justified.
    - Work with and respect other health care professionals in pursuit of the best health care possible for all patients.
    - Should not discriminate against colleagues, including professionals applying for posts, because of views of their race, culture, ethnicity, social status, lifestyle, perceived economic worth, age, gender, disability, communicable disease status, sexual orientation, religious or spiritual beliefs, or any condition of vulnerability.
    - Refrain from speaking ill of colleagues or other health care professionals.
    - Actively strive to establish cooperative and respectful working relationships with other health care professionals with the primary objective of ensuring a high standard of care for the patients they serve.
    - Share their knowledge with colleagues and promote learning.

- Code of Ethics: Duties to Yourself :
    - Maintain and improve the standard of your performance by keeping your professional knowledge and skills up to date throughout your working life. In particular, regularly take part in educational activities that relate to medical laboratory science.
    - Acknowledge the limits of your professional knowledge and competence. Do not pretend to know everything.
    - Use equipment and laboratory ware correctly and with care.
    - Refrain from engaging in activities that may affect your health and lead to impairment.

- Aware laws and regulations governing medical laboratory technology and shall apply them in the practice of your profession.
- Not wasting reagents and other laboratory supplies unnecessarily.

Never taking anything from place of work that does not belong to you

- Code of Ethics: Duties to Society
    - Refrain from providing a service that is not needed, whether it provides financial gain or not.
    - Refrain from unnecessary wastage, and from participating in improper financial arrangements, especially those that escalate costs and disadvantage individuals or institutions unfairly.
    - Dedicate to serve the healthcare needs of the public

- Code of Ethics: Duties to your Profession
    - Uphold and maintain the dignity and respect of medical laboratory profession and strive to maintain a reputation of honesty, integrity and reliability.
    - Contribute to the advancement of the profession by improving the body of knowledge, adopting scientific advances that benefit the patient, maintaining high standards of practice and education, and seeking fair socioeconomic working conditions for members of the profession.

- Specific issues: Any other issues specific to a particular specialization of Medical Technology profession not categorized in any of the above.

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SARDAR PATEL UNIVERSITY

S.Y.B.Sc. - Medical Technology

Computer Organization and PC Software

(Common to all specializations of Medical Technology)

Course Code: BMT-S-202

Objective:

At the end of this course, a student would be able to :

- identify various components of computer hardware and
- use some software in order to manage data related to the profession.

Teaching hours: Theory: 25 hours
Practicals: 25 hours

Curriculum:

SECTION A

Unit 1. Computer Organization -I

Generations of a computer, types of a computer, some important terms: hardware, software, program, operating system, interpreter, compiler, assembler, high level languages, bits and bytes.

Introduction to number systems

Unit 2. Computer Organization -II

Processors, CPU organization, primary memory, memory addresses, secondary memory, memory hierarchies, magnetic disks, CDROMs, DVDs, input/output devices: keyboards, monitors, mice, printers, modems

The concept of character codes

SECTION B

Unit 1: PC Software- I

Introduction to spreadsheets, the concept of cells and cell addresses, formulas, some important functions, introduction to charts

Introduction, features and applications of a DBMS

Database objects

Tables – creation, modification, deletion

Working with data – insertion, modification, finding, sorting, grouping, viewing and sharing data

Unit 2. PC Software- II

Forms – creation of forms; modification, viewing and validating data using forms, subforms

Reports – creation, modification, opening, viewing

Creating mailing labels

REFERENCE BOOKS:

1. Tanenbaum A. S., Structured Computer Organization, 4th Edition, Prentice-Hall of India Pvt. Ltd., 2002.
2. Elmasri, Navathe, Somyajulu, Gupta, Fundamentals of Database Systems, Pearson Education, 2006.
3. Progue, Irwin, Roardon, Microsoft Office Access 2007 Bible, Wiley Publishing Inc., 2007.
4. Taxali R. K., P C Software for Windows 98 Made Simple, Tata McGraw-Hill, 2001.
5. Hall D. V., Microprocessors and Interfacing, McGraw-Hill Book Company, 1986.
6. Desai Bipin C., An introduction to Database Systems, 7th Edition, Pearson Education Asia, 2001.

SARDAR PATEL UNIVERSITY
T.Y. B. Sc.- Medical Technology
in
Respiratory Care Technology

Curriculum

Sr. No.	Subject	Course No.	Teaching Hours
Main Subjects			
1	Respiratory Technology – Clinical	BMT-RST-301	60
2	Respiratory Technology – Applied	BMT-RST-302	60
3	Respiratory Technology – Advanced	BMT-RST-303	60
4	Practical – Respiratory Care Technology	BMT-RST-304-P	90
		Main Subjects- Teaching hours	270
		Hospital Posting	750
		Total Hours	1020

R. BMT.RCT.1: *Internship*

With reference of Rule No. R. BMT. 2 (First Year B.Sc. - Medical Technology); the course of B.Sc. - Medical Technology in *Respiratory care 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 & 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 *(Respiratory care 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.

Subjects, code and Scheme of Examination

T.Y. B. Sc.- Medical Technology
in
Respiratory Care Technology

Sr. No.	Subject	Course code No	No. Credits per week	Duration of Uni. Exam	External Marks	Internal Marks	Total
1	Respiratory Technology – Clinical	BMT-RCT-301	2	3 hrs	80	20	100
2	Respiratory Technology – Applied	BMT-RCT-302	2	3 hrs	80	20	100
3	Respiratory Technology – Advanced	BMT-RCT-303	2	3 hrs	80	20	100
4	Practical	BMT-RCT-304-(P)	2	1 day	160	40	200
	Grand total				**400**	**100**	**500**

Syllabus for Third year
B.Sc- Medical Technology in Respiratory Care Technology

Paper – I

Respiratory Care Technology – Clinical
Course code: BMT:RCT:301

Symptoms of respiratory diseases

- Cough, Haemoptysis, dyspnoea, cyanosis Concept of disease, clinical Evaluation and management of the following Respiratory Diseases
- Acute Rhimitis
- Acute sinusits
- Acute pharynagitis
- Larynogo tracheitis
- Epiglotitis

Lower respiratory tract infection

- Bronchietis
- Pneumonia – community acquired, hospital acquired
- Innunocomprmised host
- Lung abscess
- Atypical pnecemia
- Common viral and fungal lower respiratory
- Pulmonary tuborcuiosis
- Tropical consinophelia
- Acute obstructive pulmonary diseases and acute respiratory failure
- Pulmonary oedema
- Acute lung injury
- Toxic inhalation
- Bronchial asthma and other types of chronic obstructive pulmonary disease
- Oxygen therapy (rationale for oxygen therapy, precautions assessment of need and adequacy and therapy and the relevant devices)
- Causes and responses to hypoxemia
- Clinical signs of hypoxemia
- Geals of oxygen therapy
- Oxygen therapy devices
- Hazards of oxygen therapy
- Uses of humidification
- Possible of inadequate humidification
- Possible results if leained airway
- Types of humidifies (including active and passive methods of humidification)
- Goals of aerosol therapy
- Hazards of aerosol therapy
- Assessment of aerosol therapy
- Factors influencing aerosol deposition in the lungs
- Particle deposition
- Aerosol generators

Nebulisers and metered dose inhaler

- Types of nebulisers
- Aerosol output
- Small volume nebuliser therapy-definition, physiological rationale
- Gas Analysers (Oxygen ,Carbon - Dioxide)
- Gas analysis
- Transcutaneos oxygen monitors
- pulse oximeters
- Capnography

Manual Resuscitators

- Types of resuscitator bags, bruits airway
- Indications
- Hazards

Artificial air way (oral and Nasal Endotracheal tubes tracheostomy tubes)

- Parts of airway and features
- Types sizes and method of insertion
- Face mask – types sizes and its usage

Paper – II

Respiratory Care Technology – Applied
Course code: BMT:RCT:302

- Principles of mechanical ventilation –Airway resistance, lung compliance, dead space Ventilation, ventilatory failure, oxygenation failure, clinical conditions leading to mechanical ventilation. Operating modes of mechanical ventilation.
- Monitoring in mechanical ventilation- concepts of monitoring, vital signs, chest inspection and auscultation, fluid electrolyte balance, arterial blood gases, oxygen and end tidal carbon
  dioxide monitoring
- Management of mechanical ventilation-strategies to improve ventilation, improve oxygenation, acid base electrolyte balance and their correction. Fluid electrolyte nutrition balance and management. Troubleshooting of ventilator alarms and events, care of the ventilation circuit, care of the artificial airway.
- Pharmacotheraphy for mechanical ventilation – This includes drugs for improving ventilation, steroids, MDI medications, neuromuscular blocking agents like nitric oxide, propafol and Anaesthetic gases
- Effect of PEEP- Pulmonary considerations, effects on the cardiovascular system, Haemodynamics, renal neurological considerations.
- Basic ventilator waveform analysis.
- Haemodynamics monitoring; ECG arterial catheter, CVP, pulmonary artery catheter, Cardiac output and vascular resistance calculation, Preload after load contractility assessment, calculation of haemodynamic values, monitoring of mixed venous saturation
- Classification of mechanical ventilators- Ventilator classification, ventilatory work, drive mechanism, control circuits, control variables, phase variables, output waveform, alarm system.
- Airway management in mechanical ventilation-intubation, common artificial airways, intubation procedures, management of endotracheal and tracheostomy tubes, extubation, complications of the above.
- Tracheostomy minitracheostomy Endotracheal intubation
- Humidification

Paper – III

Respiratory Care Technology – Advanced

Course code: BMT:RCT:303

- Initiation of mechanical ventilation- indications, contraindication, initial Ventilator settings, Ventilator alarm settings, hazards and complications
- Weaning from mechanical ventilation- weaning and its failure, weaning criteria and indices, weaning procedure, signs, causes of weaning failure.
- Neonatal mechanical ventilation – intubation and problems inherent to the neonate, surfactant replacement therapy, basic principles of neonatal ventilation, modes, initiation and maintenance, high frequency ventilation, liquid ventilation
- Clinical situations with case studies of mechanical ventilation and management.
- Noninvasive positive pressure ventilation – introduction, terminology, indications, CPAP, bilevel PAP, Home mechanical ventilation-goals, indications, patient selection, equipment selection.
- Miscellaneous – barotraumas, transport during ventilation, hyperbaric therapy, caissons disease and high altitude sickness, sleep apnea and related disorders, drug overdosaging and poisoning requiring ventilation and their therapy, pulmonary edema, drowning, oxygen toxicity.

Respiratory Care Technology – Practical

Course code: BMT:RCT:304 (P)

Practical Exercises:

1. Interpretation and correction of a given arterial blood gas
2. Interpretation and correction of a given electrolyte abnormality
3. Calculation of body surface area, nutritional requirement and fluid electrolyte requirement
4. Setting of ventilator for a given case
5. Managing a simulated ventilatory accident circuit including disconnection, kinking of tubes recognition of various alarms etc.
6. Identification of various respiratory circuit components and their used, method of sterilization and complications related them.
7. identification of drugs and their pharmacology
8. Calculating lung compliance, interpretation of a PFT and management