VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT-7

Syllabus

of

B.Sc. Medical Technology

(As per CBCS)

2011 – 12

F.Y. B.Sc. Semester – I

MT 01 : Introduction to Medical Technology.

Unit 1 : Organization of clinical laboratory.

- 1.1 Functional Components.
- 1.2 Associated branches .
- 1.3 Basis of diagnosis.
- 1.4 Ethics & Code of Conduct.

Unit 2 : Basic Laboratory Operations.

- 2.1 Laboratory Reagents – Storage & Maintenance.
- 2.2 Laboratory Glassware & Cleaning Procedure.
- 2.3 Calibration of Glassware.

Unit 3 : Introduction to Lab equipments.

- 3.1 Microscope.
- 3.2 Centrifuge.
- 3.3 Balance.
- 3.4 Colorimeter and Spectrophotometer.
- 3.5 pH meter.
- 3.6 Oven and Incubator.
- 3.7 Autoclave.
- 3.8 Distillation equipments.

Unit 4 : Safety regulations and First Aid.

- 4.1 Psychology of safety.
- 4.2 Basic causes of accidents.
- 4.3 Common types of Laboratory accidents.
- 4.4 Biological hazards.
- 4.5 First Aid in Laboratory Accidents.

References :

1. Mukherjee,K.L., *Medical Laboratory Technology-A procedure manual for routine diagnostic tests*-Volume 1,2,3, Tata McGraw Hill Publishing Company ltd.
2. Godkar,P B.(2006). *Textbook of Medical Laboratory Technology*,2 Ed.,Bhalani Publishing House.
3. John Bernard Henry,(2001) *Clinical Diagnosis and Management by Laboratory Methods*,20Ed.,Saunders.

MT 02 : Introduction to Microbiology.

Unit 1 : History & Scope of Microbiology.

- 1.1 Microbial world & its discovery.
- 1.2 Biogenesis V/s Abiogenesis.
- 1.3 Branches of Microbiology.
- 1.4 Contribution of Scientist in Medical Microbiology.

Unit 2 : Fundamentals of Microscopy.

- 2.1 Resolution & Magnification.
- 2.2 Light Microscopy.
- 2.3 Election Microscopy.
- 2.4 Newer techniques in Microscopy.

Unit 3 : Dyes & Stains.

- 3.1 Introduction / Principle of staining.
- 3.2 Types of dyes.
- 3.3 Chromophore & Auxochrome groups.
- 3.4 Staining Techniques.

Unit 4 : Control of Microorganisms.

- 4.1 Principle of Microbial Control.
- 4.2 Use of Physical methods.
- 4.3 Use of Chemical methods.
- 4.4 Other methods.

References :

1. Pelczar,J.,(2001).*Microbiology,5Ed*.,McGraw-Hill Publishing company limited.
2. Wiley,J.,and Sherwood,L.(2007). *Prescott,Harley and Kleini Microbiology*,7Ed.,McGraw-Hill Science/Engineering/Math.
3. Salle,A.J.(1984).*Fundamental Principles of Bacteriology*,7Ed.,Tata-McGraw-Hill.

F.Y. B.Sc. Semester – II

MT 03 : Fundamentals of Medical Technology.

Unit 1 : Units of Measurements and Calculation.

- 1.1 The Metric System.
- 1.2 Laboratory Calculations.
- 1.3 Types of Reagents solutions.
- 1.4 Preparation of standard solutions of Acid and Base.

Unit 2 : Specimen Collection Processing and Transport.

- 2.1 General considerations.
- 2.2 Types of specimens.
- 2.3 Specimen collection and processing in
  - i. Hematology.
  - ii. biochemical analysis.
  - iii. Pathological analysis.
  - iv. Microbiological analysis.
- 2.4 Preservation and Transport.

Unit 3 : Basics of Quality Control.

- 3.1 General approaches.
- 3.2 Common errors in Laboratory Procedure.
- 3.3 Common terms used in quality control.
- 3.4 Quality control in individual laboratories.
- 3.5 Quality control of Quantitative data.
- 3.6 Preparation of Quality control charts.

Unit 4 : Biomedical Waste Disposal.

- 4.1 Introduction.
- 4.2 Categories of waste.
- 4.3 Standard protocol of waste disposal.
- 4.4 Methods of waste disposal.

References :

1. Mukherjee,K.L., *Medical Laboratory Technology-A procedure manual for routine diagnostic tests*-Volume 1,2,3, Tata McGraw Hill Publishing Company ltd.
2. Godkar,P B.(2006). *Textbook of Medical Laboratory Technology*,2 Ed.,Bhalani Publishing House.
3. John Bernard Henry,(2001) *Clinical Diagnosis and Management by Laboratory Methods*,20Ed.,Saunders.

MT 04 : Basics of Microbiology.

Unit 1 : Prokaryotic Organisms.

- 1.1 Prokaryote Vs Eukaryote.
- 1.2 Cell Wall.
- 1.3 Structures external to Cell Wall.
- 1.4 Structures internal to Cell Wall.
- 1.5 Spores.

Units 2 : Eukaryotic Organisms.

- 2.1 Structure of eukaryotes.
- 2.2 Characteristics of eukaryotes.
- 2.3 Isolation and Identification of eukaryotes.
- 2.4 Clinical significance of eukaryotes.

Unit 3 : Identification of Microorganisms.

- 3.1 Concept of pure culture.
- 3.2 Study of cultural characteristics.
- 3.3 Methods of isolation of bacteria.
- 3.4 Maintenance and preservation of pure culture.

Unit 4 : Growth and cultivation of Microorganisms.

- 4.1 Nutritional requirement of microorganisms.
- 4.2 Types of media.
- 4.3 Microbial growth and growth curve.
- 4.4 Cultivation of bacteria and fungi.

References :

1. Pelczar,J.,(2001).*Microbiology,5Ed*.,McGraw-Hill Publishing company limited.
2. Wiley,J.,and Sherwood,L.(2007). *Prescott,Harley and Kleini Microbiology*,7Ed.,McGraw-Hill Science/Engineering/Math.
3. Salle,A.J.(1984).*Fundamental Principles of Bacteriology*,7Ed.,Tata-McGraw-Hill.

Practicals of Sem I – Medical Technology.

01. Study of Laboratory Organization.
02. Study of Laboratory Glassware & Reagents.
03. Study of Laboratory Instruments & Equipments.
04. Study of First Aid measures in Laboratory accidents.
05. Study of Microscope.
06. Study of Bacterial motility.
07. Simple Staining.
08. Gram Staining.
09. Acid – fast Staining.
10. Effect of Sterilization by dry heat & Moist heat.
11. Effect of Disinfectants & Antiseptics.
12. Measurement & Adjustment of pH.
13. Study of Hay Infusion by Wet mount technique.

References

1. Patel,A.H.,(1994). *A Maual of Medical Laboratory Technology*, Navneet Prakashan ltd.
2. Patel, R.J., and Patel,R.K.,(2000).*Experimental Microbiology,Volume 1&2*,Aditya.
3. Cappuccino,J.G.,(2005).*Microbiology: A Laboratory Manual*,6Ed.,Pearson Education Pvt. Ltd.

Practicals of Sem II – Medical Technology.

01. Study of different Specimen Collection, Handling & Transport.
02. Preparation of Standard Solutions.
03. Preparation of Buffers.
04. Preparation of Anticoagulants.
05. Preparation of Quality Control Charts (S.D., C.V., L.J. Chart).
06. Preparation of Nutrient broth & media.
07. Cultivation of Bacteria by broth / Stab / Slant.
08. Study of Cultural characteristics of Microorganism.
09. Special Staining.
10. Micrometry.
11. Preparation of Hypochlorite solution for biomedical waste disposal.
12. Micrometry.

References

1. Patel,A.H.,(1994). *A Maual of Medical Laboratory Technology*, Navneet Prakashan ltd.
2. Patel, R.J., and Patel,R.K.,(2000).*Experimental Microbiology,Volume 1&2*,Aditya.
3. Cappuccino,J.G.,(2005).*Microbiology: A Laboratory Manual*,6Ed.,Pearson Education Pvt. Ltd.