SEMESTER - V

Elective I: MEDICAL LABORATORY TECHNOLOGY – Paper I

Instructional Hours: 60 Hrs **Code: 16ZOUE501**

Max.Marks : CIA-25;ESE-75 **Credits: 4**

Objectives: To understand the principles and applications of clinical instruments.

Unit I **12 Hrs**

Introduction to clinical laboratory technology: Scope of clinical laboratory techniques. Basic needs of a clinical laboratory. Cleaning and maintenance of glasswares. Sterilization – Physical and Chemical methods. Disposal of specimens and infected materials. Safety precautions and first aid in clinical laboratory.

Unit II **12 Hrs**

Clinical lab instruments and apparatus: Light microscope, Centrifuge, Spectrophotometer, Autoclave, Incubator, Colony Counter, Serological water bath, Physical balance, Hot air oven, Sphygmomanometer and Stethoscope**.**

Unit III **12 Hrs**

Haematology : Specimen collection – Anticoagulants - Preparation of serum – Total RBC count – Total WBC count – Differential leucocyte count – Haemoglobin estimation (Sahli's method) – Erythrocyte Sedimentation Rate (ESR) (Wintrobe method and Westergren method).

Unit IV **12 Hrs**

Heamatology: Determination of bleeding time – Determination of Clotting time – Calculation of Red Blood Cell indices – Haematocrit (Wintrobe method), MCV, MCH and MCHC. ABO blood grouping and Rh factor (Slide method). Cross matching of blood (Coomb's test).

Unit V **12 Hrs**

Urine Analysis: Composition of normal urine. Urine sample - Collection, types and preservation. Physical examination of urine. Microscopic examination of urine sediments. Chemical examination of urine – Detection of glucose (Benedict's test), Protein (Heat test), Blood (Benzidine test), Bilirubin (Fauchet test), Urobilinogen (Ehrlich's test) and Bile salt.

TEXT BOOKS

1. Kanai L. Mukherjee. Medical Laboratory Technology, vol I, II, III. 2nd edition Tata McGraw-Hill Education, New Delhi, 2010.

2. Sach Dev.K.N. Clinical pathology and Bacteriology**,** 9th edition. Jaypee Brothers Medical Publishers, New Delhi, 2000.

REFERENCE BOOKS

1. Talib V.H. Hand Book of Medical Laboratory Technology**,** 2nd edition CBS Publishing company, New Delhi, 2012.

2. Ramnik Sood. Haematology, 6th edition Jaypee brothers Medical Publishers, New Delhi, 2010.

3. Samuel. Notes on Clinical laboratory Techniques, M.K.G. Iyer & Sons, Madras.

SEMESTER - VI

Elective II – MEDICAL LABORATORY TECHNOLOGY - Paper II

Instructional Hrs: 60 **Sub.Code :16ZOUE602**

Max. Marks : CIA- 25; ESE-75 **Credits : 4**

Objective: Describing the practical applications of clinical laboratory technology.

UNIT I 1**2Hrs.**

Faecal Examination: Physical and microscopic examination of faeces. Testing faeces for occult blood (Benzidine test). Laboratory diagnosis of helminthes - Direct smear examination and Sodium chloride. Examination of ova, cyst and adult helminth worms (Ascaris lumbricoides and Taenia solium).

Liver Function Test: Serum Bilirubin (Total and Direct), Serum Protein and Serum Cholesterol (Total).

UNIT II **12 Hrs.**

Gastric Function Test: Collection of gastric content and determination of gastric acidity. **Pancreatic Function Test:** Collection and physical examination of duodenal content. Determination of Pancreatic enzyme – Trypsin.

UNIT III **12 Hrs.**

Sputum Examination: Collection of sputum. Physical and microscopic examination of sputum.

Cerebrospinal Fluid Examination: Collection and processing of CSF. Physical, Chemical and Microscopic examination of CSF.

Seminal Fluid Examination: Collection and Microscopic examination of seminal fluid – Sperm motility and Sperm count.

UNIT IV **12 Hrs.**

Endocrine Function Test: Determination of blood sugar (Folin Wu method) – HbA_{1C} Test. Test for Thyroid Hormones (TSH, T3 and T4). Test for Female Hormones (FSH, Progesterone and HCG).

UNIT V **12 Hrs.**

Microbiological Tests: Collection of Microbiological specimens and precautionary measures for investigation. Hanging drop preparation – Wet preparation – Examination of Throat Swab. Preparation of smears - Gram's staining. Indigenous body flora – Significance in health and diseases of man.

Routine Mycological methods – Superficial mycosis and Dermatophytes, Intermediate mycosis, Superficial deep mycosis, Deep or Systemic mycosis.

TEXT BOOKS

1. Kanai L. Mukherjee. Medical Laboratory Technology I, II, III.2nd edition Tata McGraw-Hill Education, New Delhi, 2010.

2. Sach Dev. K.N. Clinical pathology 9th edition Jaypee Brothers Medical Publishers**,** New Delhi. 2000.

REFERENCE BOOKS

1. Arora.D.R. Medical Mycology, 1st edition CBS Publishers & Distributors, New Delhi. 2014.
2. Dubey R.C. and Maheswari.R. Text Book of Microbiology. 3rd edition S. Chand Publishers New Delhi. 2013.
3. Anandha Narayanan. R. and Panicker C.K. Text Book of Microbiology. 9th edition, edited by Arti Kapil Universities Press Private Ltd. 2014.

SEMESTER - V & VI

Elective Practical – MEDICAL LABORATORY TECHNOLOGY

(Based on Elective I&II)

Instructional Hrs. 60 **Sub. Code: 16ZOUEP01**

Max. Marks: CIA- 40; ESE-60 **Credits : 3**

Experiments:

1. ABO and Rh Grouping
2. RBC Total Count
3. WBC Total Count
4. Differential Leucocyte Count
5. Haemoglobin estimation
6. Bleeding time of Blood
7. Clotting time of Blood
8. Estimation of ESR
9. Specific gravity of Urine
10. Albumin in Urine
11. Glucose in urine
12. Bile salts in urine
13. Detection of Urobilinogen
14. Estimation of Glucose in blood
15. Hanging drop preparation
16. Gram's staining

Spotters:

Light Microscope, Autoclave, Incubator, Colony counter, Sphymomanometer, Stethoscope, Haemometer, Haemocytometer, ESR apparatus, Urinometer, Folin Wu sugar tube, Ryle's tube, Saccharometer, Glucometer, Streptococcus pyogenes, Corynebacterium diphtheriae, Mycobacterium tuberculosis, Haemophilus influenza, Diplococcus pneumoniae, Candida albicans.

Internship Programme:

Each student must undergo an internship programme in a Medical/Clinical laboratory for ten days. The certificate and report should be submitted along with the record.

SEMESTER -V

SKILL BASED SUBJECT III- ANIMAL FARMING

Instructional Hours : 45 Hrs **Code: 16ZOUS503**

Max.Marks : CIA-25;ESE-75 **Credits:3**

Objectives: To acquire basic knowledge on Traditional farming and to study the nutritive value of by-products of animal farming.

Unit I **9 Hrs**

Cattle farming: Cattle breeds of India - Kangeyam,Gir, Red Sindhi, Jersey, Ongole, Murrah, Jamunapari, Malapari and Thalacherry. Dairy products- Milk, Curd, Butter, Ghee, Cheese, Khoa and Paneer.

Unit II **9 Hrs**

Poultry farming: Types of poultry birds- Layers- White Leghorn, Plymouth rock, Australop and Desi. Broilers- Sussex and Doking. Principles for the construction of poultry house- Deep litter House and Cage house. Poultry products- Egg, Meat and by- products. Nutritive value of egg.

Unit III **9 Hrs**

Fish farming: Types of culturable fishes- Catla catla, Labeo rohita, Cirrhinus mrigala, Cyprinus carpio, Tilapia mossambica and Mugil oeur. Rearing methods- Finculture and Mariculture, Fishery by- products.

Unit IV **9 Hrs**

Rabbitry: Importance and scope of Rabbit production. Breeds of Rabbit- Angora, White Giant and Chinchilla. Housing and sanitation of rabbits. By- products of Rabbit farming.

Piggery: Breeds of Pig- Desi, Hampshire and Large White Yorkshire. Management of Piggery.

Unit V **9 Hrs**

Present and future of Animal farming in India. Development of Artificial Insemination Programmes. Veterinary public health in India.

REFERENCE BOOKS

1. Banerjee. C., A text book of Animal Husbandry, Oxford & IBH Publication, New Delhi., 2010.

2. ICAR., New Delhi- Hand book of Animal Husbandry., 2008.

3. Schmidt G.H and Van Vleck T.D. Principles of Dairy Science, Surgeet Pvt Ltd.,

4. C.B.L.Srivastava- Fishery Science and Indian Fisheries, Kitab Mahal Publication, Allahabad. 2008.

5. **Pandey and Shukla-** Fish and Fisheries, Rastogi Publications, Meerut, 2011-2012.

6. **NPCS Board & Consultant-** The complete technology book on Meat, Poultry and Fish processing, 2013.

7. **M.E.Ensminger-** Poultry Science, CBS Publishers and Distributers, 2015.