Medical Parasitology (Theory)

Total: 4 hours /week
Lecture: 2 hours/week
Tutorial: 0 hour/week
Practical: 2 hours/week
Lab: 0 hours/week

Course Description:

The course focuses on medical parasites in reference to parasites prevalent in the regions, particularly in Nepal. This course deals especially, with Protozoa, Helminthes and related laboratory procedures including mode of infection, pathogenicity, laboratory diagnosis & preventive measures of important intestinal as well as blood & tissue parasites of man including different kinds of defense mechanisms of a body. This course also deals with the study of different body fluids of a body.

Course Objectives

At the end of the course, the students will be able to:

1. Explain the common parasites found in Nepal.
2. Carry out basic laboratory procedures in order to diagnose the common parasitic diseases.
3. Explain defense mechanism of the body to the medical parasites.
4. Perform different body fluids analysis.

Course Content

Unit 1: Introduction **5 hrs**

- Host: definitive host, intermediate host.
- Parasite; ectoparasite, endoparasite, temporary parasite, permanent parasite, obligatory parasite, facultative parasite.
- Host parasite relationship; commensalism, mutualism, pathogenic. Infection and infestation
- Classify medically important parasites and explain intestinal, urine, blood and tissue parasites.

Unit 2: Protozoa **20 hrs**

- Introduction
    - Rhizopoda-Pathogenic, non-pathogenic and free living
    - Ciliates
    - Flagellates
    - Kinetoplastida
    - Sporozoa
- Introduction, Prevalence, geographical distribution, mode of infection, habitat, life cycle, pathogenesis, laboratory diagnosis, prevention and control of:

- Entamoeba histolytica
- Giardia lamblia
- Trichomonas vaginalis
- Leishmania: L. donovani
- Plasmodium: P. vivax, P. falciparum
- Toxoplasma gondii.
- Cryptosporidium parvum:
- Cyclospora cayetanensis,
- Balantidium coli

Unit 3: Helminthes **30hrs**

- Nematodes
  - Introduction
  - Introduction, Prevalence, geographical distribution, mode of infection, habitat, life cycle, pathogenesis, laboratory diagnosis, prevention and control of:
- Cestodes (Tape worms)
  - Introduction
  - Introduction, Prevalence, geographical distribution, mode of infection, habitat, life cycle, pathogenesis, laboratory diagnosis, prevention and control of:
- Taenia: Taenia solium and Taenia saginata,
- Echinococcus granulosus and
- Hymenolepis nana.
- Trematodes (Flukes, intestinal, hepatic, pulmonary and blood)
  - Introduction
  - Introduction, Prevalence, geographical distribution, mode of infection, habitat, life cycle, pathogenesis, laboratory diagnosis, prevention and control of:
    - Fasciola hepatica
    - Paragonimus westermani
    - Schistosoma hematobium

Unit 4: Laboratory techniques **15 hrs**

- The procedure for clinical specimen collection for parasitic investigations (stool, urine, blood, sputum, exudates, swabs and aspirates).
- Preparation of reagents required for routine diagnostic purposes (iodine solution, brine solution, 33% zinc sulphate solution, normal saline solution, Stoll's reagent, Giemsa and Leishman's stain and benzidine solution).
- Various laboratory technique:
  - Feacal (stool) examination: physical, chemical-reducing substances and occult blood, and microscopic.
  - Blood examination by wet and stained smears preparation for blood parasites.
  - Urine, sputum examination for urinary and respiratory tract parasites.

- Various concentration methods (floatation and sedimentation) to detect the blood and intestinal parasites.

References Books

- Medical Parasitology K.D. Chatterjee MD Medical Laboratory Manual for Tropical Countries Monica Cheesbrough
- Text Book of Medical Laboratory Technology HG Shrestha and M. Nakanishi
- Textbook of Medical Parasitology Paniker, C.K

Unit	**1**	**2**	**3**	**4**	**Total**
Unit Hours	5	20	30	15	70
Marks	3	11	17	9	40

Medical Parasitology (Practical)

Practical 70hrs

- Collect various samples (stool, urine, blood, sputum, CSF and body fluid) by different methods for the detection of parasites.
- Prepare various reagents (iodine solution, brine solution, 33% zinc sulphate solution, normal saline solution, Stoll's reagent, Giemsa and Leishman's stain and benzidine solution).
- Conduct physical, chemical and microscopic examination of stool samples: naked eye examination, preparation of wet mount smear (saline and iodine) and observation of smear under the microscope for parasites.
- Identify Scotch tape technique for ova of pin worm.
- Detect parasites by Concentration Technique present on stool samples
- Brine solution floatation method
- Zinc sulphate and sucrose floatation methods
- Formal-ether sedimentation method.
- Examine reducing sugar and occult blood in the stool.
- Examine and identify malaria parasites by thick and thin smears.
- Examine and identify microfilaria by wet mount.