

B. Sc. Zoology Honors 8th Semester

Microbiology & Parasitology

Course code: ZOLC2822M

Credits:4+2

Hours 64+32

Course Objectives:The course aims to:

1. Introduce students to microbiology and parasitology, their **history, pioneers, and scope**.
2. Familiarize students with microorganisms and parasites ' **classification, structure, and characteristics**.
3. Study **microscopy, staining, sterilization, and disinfection** techniques.
4. Explain microbes 'role in **human health, disease, industry, and biotechnology**.
5. Explain parasitology's **origin, evolution, adaptations, and host-parasite relationships**.

Learning Outcomes: By the end of this course, students will be able to:

1. Record the history and classification of microbiology.
2. Examine the use of culture, staining and preservation techniques in microbiology.
3. **Differentiate** between beneficial and pathogenic microbes, and **analyze** their roles in human health, disease, antibiotics, and resistance.
4. Analyze the applications of microbiology in industry, biotechnology, and medicine.
5. **Describe** parasitic adaptations, host–parasite relationships, zoonotic infections, and the biology of important human parasites (protozoa, helminths, nematodes).

Unit 1: Introduction to Microbiology

- 1.1: History and pioneers of microbiology (Pasteur, Koch, etc.). Scope and applications of microbiology.
- 1.2: Classification of microorganisms unto class level (viruses, archaea, bacteria, protozoa, fungi).
- 1.3: Microscopy and staining techniques.(TEM, SEM, & Phase contrast microscopy)
- 1.4: Sterilization & disinfection techniques.

Unit 2: Applied Microbiology

- 2.1: Microbes and Human Health: Pathogens vs. beneficial microbes, Microbiota & Probiotics.
- 2.2: Microbial diseases: AIDS, Dermatophytosis(Ringworm), Tuberculosis.
- 2.3: Antibiotics & Resistance
- 2.4: Industrial Microbiology- fermentation (ethanol, antibiotics, enzymes).

Unit 3: Introduction to Parasitology

- 3.1. Terms & definitions in parasitology
- 3.2. Origin, evolution and distribution of parasites in animal kingdom
- 3.3. Parasitic adaptations in ectoparasites & endoparasites.
- 3.4. Host parasite relationships & zoonosis.

Unit 4: Economically Important Parasites of Humans and Domestic Animals

- 4.1. Parasites of man (Plasmodium) *poultry (Eimeria) & cattle (Babesia)*
- 4.2. Trematode parasites of man (Schistosoma) *fish (Diplozoon) & ruminants (Fasciola)*
- 4.3. Cestode parasites of man (Diphyllobothrium) *fish (Adenoscolex) & ruminants (Moneizia)*

4.4. Nematode parasites of man with emphasis on (*Wucharia*) *aves* (*Heterakis*) & *ruminants*
(*Haemonchus*)

Practicals: 2 credits (32 hours)

1. Gram staining and observation of bacteria
2. Culture technique (streak plate method) and colony morphology
3. Identification of common helminth and protozoan parasites
4. Temporary mount preparation of ectoparasites (lice/ticks)
5. Slide preparation of some parasites.
6. Colony counting.

SUGGESTED READINGS

1. Arora, D. R and Arora, B. (2001) Medical Parasitology. II Edition. CBS Publications and Distributors.
2. E.R. Noble and G.A. Noble (1982) Parasitology: The biology of animal parasites. V Edition, Lea &Febiger
3. Ahmed, N., Dawson, M., Smith, C. and Wood, Ed. (2007) Biology of Disease. Taylor and Francis Group.
4. Parija, S. C. Textbook of medical parasitology, protozoology & helminthology (Text and colour Atlas), II Edition, All India Publishers & Distributers, Medical Books Publishers, Chennai, Delhi.
5. Prescott, L.M. (2002) Microbiology. 5th Edition, McGraw-Hill, New York