



बिरसा मुंडा ट्रायबल युनिवर्सिटी Birsa Munda Tribal University

राजपिपला, जि० नर्मदा Rajpipla, Dist. Narmda

Established by Tribal Development Department, Govt. of Gujarat

School of Science

M.Sc. (Zoology) Programme

Subject Code& Name: - MS01EZOO02 – Medical Parasitology

Teaching and Evaluation Scheme:

Teaching Scheme				Examination Scheme			
Credits				Component Weightage			
				Internal		External	
L	T	P	Total	TH	PWE	TH	PWE
2	--	2	4	25%	25%	25%	25 %

Programme Name	M.Sc. Zoology
Semester	I
Course Code	MS01EZOO02
Course Title	Medical Parasitology
Course Content Type (Th./Pr.)	Theory + Practical
Course Credit	4
Sessions+ Lab. Per Week	2 + 2
Total Teaching/Lab. Hours	60 Hours
* 2 Laboratory = 1 Session	

Learning Objectives

- This course is aimed to provide the students with an introduction to the field of medical parasitology.
- It focuses on the parasitological terms, types of parasites, habitats, hosts and different life cycles.
- It also includes the sources of infection, pathogenesis, clinical manifestations, methods of diagnosis, prevention and control.

Prerequisites (if any)

- Students should have basic laboratory skills (microscopy, wet mount preparation, staining, slide handling) before starting the practical component.

Learning Outcomes

On the Completion of this course, students will able to:

- Understand parasite diversity and host-parasite relationships, including types of parasites and hosts, modes of transmission, and factors influencing parasitic infections.
- Explain the classification, distribution, morphology, life cycles, pathogenicity, diagnosis, treatment, and prevention of major parasitic groups.
- Discuss the immunological, genetic and molecular aspects of parasitism, with emphasis on important parasites such as Trypanosoma, Plasmodium, platyhelminths, and nematodes.



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Detailed Contents		
UNIT	TOPIC/SUB-TOPIC	TEACHING HOURS
I	Introduction to Parasitology: • Introduction to parasites of man, scope and definition of parasitology • Animal associations, types of parasites and hosts • Interrelationship between host and parasite; host responses to parasitic infection • Mode of transmission, host specificity and parasitic adaptations Protozoa and Cestoda: • Classification of parasitic protozoans and cestodes. • Detailed study (Classification, Geographical distribution, Morphology, Life-cycle, Transmission, Pathogenicity, Treatment & Prophylaxis) of • Protozoa: <i>Entamoeba</i> sp., <i>Trypanosoma</i> sp., <i>Leishmania</i> sp., <i>Giardia</i> sp., <i>Trichomonas</i> sp. • Cestodes: <i>Taenia</i> sp., <i>Diphyllobothrium</i> sp. • Biodiversity and taxonomic overview of major helminth parasites (brief)	15
II	Trematoda, Nematoda and Advanced Topics Classification, Geographical distribution, Morphology, Life-cycle, Transmission, Pathogenicity, Treatment & Prophylaxis of: • Trematodes: <i>Schistosoma</i> sp., <i>Fasciola</i> sp., <i>Echinococcus</i> sp. • Nematodes: <i>Wuchereria</i> sp., <i>Ancylostoma</i> sp., <i>Dracunculus</i> sp. • Brief on plant/soil nematodes (Cyst nematode, Citrus nematode). Immunology, Genetics & Molecular Biology (overview level): • <i>Trypanosoma</i>: VSG and antigenic variation. • <i>Plasmodium</i>: Surface antigen diversity and drug resistance mechanisms. • Brief on sex determination in Schistosomes and chromatin diminution in <i>Ascaris</i>	15



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Practicals

List of Practical (Practical are demonstrated using charts, models and multimedia videos)

1. To study the scope of parasitology through demonstration of different types of parasites and host-parasite associations
2. To identify morphological features of *Entamoeba sp.* (trophozoite and cyst) using saline and iodine mounts
3. To study and identify *Giardia sp.* and *Trichomonas sp.* in wet mounts
4. To examine permanent slides of *Trypanosoma sp.* and *Leishmania sp.* (blood smears/culture forms)
5. To study morphology of *Taenia sp.* (scolex, proglottids, and eggs)
6. To study adult, eggs, and larval stages of *Fasciola sp.*
7. To examine adult male/female worms and eggs of *Schistosoma sp.*
8. To study morphology of *Ancylostoma sp.* (adult, eggs, and larvae)
9. To identify microfilaria of *Wuchereria sp.* in blood smear
10. To study adult worm and larvae of *Dracunculus sp.*
11. To examine hydatid cyst, scolices, and hooklets of *Echinococcus sp.*
12. To demonstrate plant/soil nematodes (cyst nematode and citrus nematode)
13. To perform parasite concentration techniques (formalin-ether, floatation methods) and blood smear preparation
14. To study and draw life cycles of major parasites (*Taenia*, *Schistosoma*, *Ancylostoma*, *Plasmodium*)
15. Collection of Parasites from digestive tract of Cockroach/gut / parasites of hen and their identification and preservation

Text Book(s)

1. Paniker's Textbook of Medical Parasitology by C.K. Jayaram Paniker, Jaypee Brothers Medical Publishers.
2. Textbook of Medical Parasitology by Sumeeta Khurana and Abhishek Mewara, Universities Press.
3. Medical Parasitology by Rohela Mahmud, Yvonne Ai Lian Lim and Amirah Amir, Springer.
4. Diagnostic Medical Parasitology by Lynne Shore Garcia, ASM Press.
5. Medical Parasitology by C.K. Baveja, Arya Publications.
6. Essentials of Medical Parasitology by S. Arora and D.R. Arora, Jaypee Brothers Medical Publishers.
7. Parasitology: Protozoology and Helminthology by K.D. Chatterjee, CBS Publishers & Distributors.



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Reference Books

1. General Parasitology by T. C. Cheng, Academic Press.
2. Foundations of Parasitology by Larry S. Roberts, John Janovy Jr. and Steve Nadler, McGraw-Hill Education.
3. Modern Parasitology: A Textbook of Parasitology by F. E. G. Cox, Wiley-Blackwell.
4. Medical Parasitology by K. D. Chatterjee, CBS Publishers & Distributors Pvt. Ltd.
5. Human Parasitology by Burton J. Bogitsh, Clint E. Carter and Thomas N. Oeltmann, Academic Press (Elsevier).
6. Diagnostic Medical Parasitology by Lynne Shore Garcia, ASM Press.
7. Helminths, Arthropods and Protozoa of Domesticated Animals by E. J. L. Soulsby, Baillière Tindall / ELBS.

Web Resources

1. CDC Parasites – <https://www.cdc.gov/parasites/>
2. CDC DPDx: Laboratory Identification of Parasites – <https://www.cdc.gov/dpdx/>
3. World Health Organization (WHO) – Parasitic Diseases – <https://www.who.int/health-topics/parasitic-diseases>
4. Parasites Without Borders – <https://parasiteswithoutborders.com/>
5. National Center for Biotechnology Information (NCBI) – <https://www.ncbi.nlm.nih.gov/>
6. NCBI Bookshelf – <https://www.ncbi.nlm.nih.gov/books/>
7. Microbiology Society – <https://microbiologysociety.org/>
8. NPTEL – <https://nptel.ac.in/>
9. SWAYAM – <https://swayam.gov.in/>
10. MIT OpenCourseWare – <https://ocw.mit.edu/>
11. Khan Academy – <https://www.khanacademy.org/science/health-and-medicine>
12. The Carter Center – Guinea Worm Eradication Program – https://www.cartercenter.org/health/guinea_worm/index.html
13. Biology LibreTexts – <https://bio.libretexts.org/>
14. eMedicine (Medscape) Parasitology – <https://emedicine.medscape.com/>
15. Microbe Notes – <https://microbenotes.com/>

Required Software(s) (if any)

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L:: Lecture, **T::** Tutorial, **P::** Practical

PWE:: Practical Work Examination

(PWE includes Laboratory practical work, project work, viva simulation exercise work etc.)