UNIVERSITI TEKNOLOGI MARA

BIO564: PARASITOLOGY

Course Name (English)	PARASITOLOGY APPROVED
Course Code	BIO564
MQF Credit	3
Course Description	This course is designed to give a broad overview of general human and animal parasitology, with respect to the types of parasites, nature of parasitism, advantages and disadvantages of parasitism. It will cover the biology, parasitism and pathogenesis of the parasitic protozoans, helminths and arthropod parasites that cause significant human and animal disease. This course covers on how each parasite establishes infection in their hosts, how it spreads between hosts, and the pathogenesis of disease. Current approaches to control and to treat parasitic disease will be addressed. Parasitology is a subject that requires a good deal of memorization and specialized terminologies. The outcomes shall be assessed through a variety of tools which include the traditional final examination, tests, quizzes and assignments.
Transferable Skills	This course provides opportunity to work in multidisciplinary care team to solve community parasitic problems and involve in the national campaigns conducted to combat parasitic diseases.
Teaching Methodologies	Lectures, Blended Learning, Discussion
CLO	CLO1 Apply knowledge of parasitology on humans and animals. CLO2 Demonstrate communication skills in written/verbal related to current topics of human and animal parasites. CLO3 Demonstrate information management skills in parasitology through a literature search and laboratory technique videos
Pre-Requisite Courses	No course recommendations

Topics
1. 1.0 Introduction to parasitology 1.1) • Briefing session: Introduction, expectations and assessment. 1.2) • Explain what parasitology is all about and its relevance to Biology students.
2. 2.0 Basic concepts in parasitism 2.1) • Principle of host-parasite relationship – outcome of infection. 2.2) • Parasitic classifications. 2.3) • Parasite form and function.
3. 3.0 Introduction to Extracellular and Intracellular Protozoans 3.1) • Introduction to protozoans 3.2) • Amoeba (Sarcodina) - Intestinal amoeba (Entamoeba histolytica, Entamoeba coli, Entamoeba gingivalis, Iodamoeba buetschlii and Endolimax nana) and free living amoeba (Naegleria fowleri and Acanthamoeba spp.) 3.3) • Ciliates (Ciliospora) - Intestinal ciliates protozoa (Balantidium coli) and parasitic ciliates of fish (Ichthyophthirius marinus and Ichthyophthirius multifiliis) 3.4) • Flagellates (Mastigophora) - Intestinal flagellates (Giardia lamblia, Dientamoeba fragilis, Trichomonas hominis, Chilomastix mesnili, and Retortamonas intestinalis), blood and tissue hemoflagellates (Trypanosoma brucei brucei, Trypanosoma brucei gambiense, Trypanosoma brucei rhodesiense, Trypanosoma cruzi and Leishmania spp.) 3.5) • Sporozoan (Apicomplexa) - Intestinal Sporozoan (Cryptosporidium spp., Cyclospora cayetanensis and Isospora); Blood and tissue sporozoan (Plasmodium spp. and Toxoplasma gondii). 3.6) • Microspora (Microsporidia) and Myxozoa - Nosema spp. and Myxobolus cerebralis.

4. 4.0 Phylum Platyhelminthes (Flatworms) – Trematodes (Flukes)
4.1) • Introduction to trematodes
4.2) • Digeneans - Strigeiformes – Alaria americana and Schistosoma spp.
4.3) • Digeneans – Echinostomatiformes – Echinostoma spp., Fasciola hepatica, Fasciola gigantica and Fasciolopsis buski.
4.4) • Digeneans - Plagiochiformes & Opisthorchiformes – Dicrocoelium dendriticum, Paragonimus westermani, Clonorchis sinensis, Opisthorchis felineus, Opisthorchis viverrini and Heterophyes heterophyes.

5. 5.0 Phylum Platyhelminthes (Flatworms) - Cestodes
5.1) • Introduction to cestodes
5.2) • Intestinal cestodes - Taenia spp., Hymenolepis spp., Diphyllobothrium latum and Dipylidium caninum.
5.3) • Tissue cestodes - Echinococcus spp.

6. 6.0 Phylum Nematoda (Roundworms), Nematomorpha and Acanthocephala
6.1) • Introduction to nematodes
6.2) • Intestinal nematodes - Trichuris trichiura, Enterobius vermicularis, human hookworms (Ancylostoma doudenale, Necator americanus),animal hookworms (Ancylostoma braziliense, Ancylostoma caninum), Ascaris spp., Anisakis simplex, Strongyloides stercoralis and Angiostrongylus (Parastrongylus) costaricensis.
6.3) • Blood/ Body fluid/ Tissue nematodes - Trichinella spiralis, Dracunculus medinensis, Dirofilaria immitis, Toxocara canis and filarial worms (Wuchereria bancrofti, Brugia malayi, Oncocherca volvulus, Loa loa, Mansonella ozzardi and Dirofilaria immitis)
6.4) • CNS nematodes - Angiostrongylus cantonensis.
6.5) • Parasitic nematodes of ruminants - Strongylus vulgaris, Haemonchus contortus, Trichostrongylus sp. and Ostertagia sp.

7. 7.0 Phylum Arthropoda
7.1) • spp., morphology, origin, life-cycle, pathogenesis, clinical signs, treatment, control and prevention.
7.2) • Parasitic Crustacean and Pentastomida (tongue worm) – Linguatula serrata and Armillifer armillatus.
7.3) • Parasitic Insects – head (Pediculus humanus capitis), body (Pediculus humanus humanus) and pubic lice (Phthirus pubis), bed bug (Cimex lectularius), kissing bug and fleas (Pulex irritans, Ctenocephalides felis, Xenopsylla cheopis and Tunga penetrans), Flies (Simulium damnosum, Phlebotomus spp., Lutzomyia spp. and Dermatobia hominis), Mosquitoes (Culex, Anopheles, Mansonia and Aedes).
7.4) • Parasitic Arachnids – Ticks (hard and soft ticks) and mites (Demodex spp., Sarcoptes scabei and Dermatophagoides sp.).

Assessment Breakdown	%
Continuous Assessment	50.00%
Final Assessment	50.00%

Details of Continuous Assessment

Assessment Type	Assessment Description	% of Total Mark	CLO
Assignment	Cumulative of the same one assignment	10%	CLO2
Assignment	Cumulative of the same one assignment	10%	CLO3
Test	Cumulative of two tests	30%	CLO1

Reading List

Recommended Text

- **M. A. Taylor,R. L. Coop,R. L. Wall 2015, *Veterinary Parasitology*, John Wiley & Sons [ISBN: 9780470671627]**
- **Dennis Jacobs,Mark Fox,Lynda Gibbons,Carlos Hermosilla 2015, *Principles of Veterinary Parasitology*, John Wiley & Sons [ISBN: 9780470670422]**
- **Sankar Apurba Sastry,Sandhya Bhat 2014, *Essentials of Medical Parasitology*, JP Medical Ltd [ISBN: 9789351523291]**
- **Anne M. Zajac,Gary A. Conboy 2012, *Veterinary Clinical Parasitology*, John Wiley & Sons [ISBN: 9780813820538]**

Reference Book Resources

- **Larry S. Roberts,Gerald D. Schmidt,John Janovy,Steve Nadler 2013, *Foundations of Parasitology*, 9th Ed., McGraw-Hill Europe [ISBN: 9780071326414]**

Article/Paper List: This Course does not have any article/paper resources

Other References: This Course does not have any other resources