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| Course syllabusCourse Title /Code: Medical Parasitology II (MeLS2102)Program/Target Group : BSc Degree in Medical Laboratory SciencesYear: II Semester: IIModule Title : Medical Parasitology (MeLS-M2103)Course EtCTs: 7 EtCTSCourse crhrs : 4 |
| Course Description | * This course describes protozoa of medical importance. Geographical distribution, Morphological features, Life cycles, clinical manifestations, modes of transmission, prevention and control, immunopathological aspects, diagnosis and treatment. The biological and clinical perspectives gained in this course will assist students in the recognition, evaluation and management of public health problems or clinical practice involving medically important protozoa.
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| **Course Objectives**  | 1. **General Objective**
* At the end of this course the students will be able to describe the morphology, classification, clinical features, pathogenesis, laboratory diagnosis and prevention and control measures of protozoa. It is also intended to equip the students with basic practical skills of laboratory techniques (specimen collection, processing, examination and reporting) and apply quality assurance in medical Protozoology.
1. **Instructional Objectives**
* Knowledge
	+ Define terminologies related to protozoa
	+ Describe the general characteristics of protozoa
	+ Explain the classification of protozoa
	+ List the most common medically important protozoa
	+ Describe the life cycle of protozoan parasites
	+ Explain the morphology, epidemiology, pathogenesis and treatment of protozoan parasites
	+ Describe the prevention and control measures of protozoan infections
	+ Compare and contrast the different techniques of protozoan parasites
	+ Apply laboratory quality control in Parasitology laboratory
* Skill
	+ Perform collection, processing, transportation of parasitological specimens (urine, stool, blood, skin slit, body fluids, tissue biopsy, aspirate)
	+ Examine parasitological specimens using parasitological techniques
	+ Prepare permanent smear for the identification of intestinal protozoa
* Attitude
	+ Adhere and promote safety rules in the laboratory
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| Pre-requisite (s)  | Medical Parasitology I |
| Course Status  | Core |
| Mode of Delivery  | Semester based  |
| **Day** | **Contact Hour** | **Topics and Sub Topics** |  |
|  | 1. **Introduction to Medical Protozoology**

Definition, Diversity & Importance General Morphology & Structure Properties, Taxonomy  |  |
| 1. **Sarcodina (Amoebae)**
	1. Taxonomy of Amoeba
	2. Introduction to Sarcodina
		1. Pathogenic Amoeba (Entamoeba histolytica):
			1. Epidemiology, Morphology, Transmission and life cycle
			2. Clinical features, Laboratory diagnosis
			3. Treatment, Prevention& control
 |
| **Laboratory**:* Demonstration of laboratory equipments and supplies used in Parasitology laboratory
* Preparation of reagents, solutions for parasitological examination
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|   |
|  | * + 1. Non – Pathogenic Amoeba (Entamoeba coli, E. hartmanii, E. polescki, E. gingivalis, E. nana, I. bustchili, E. dispar)
			1. Epidemiology, Morphology, Transmission and life cycle
			2. Clinical features, Laboratory diagnosis
			3. Treatment, Prevention& control
 |
| * + 1. Free – living Pathogenic Amoeba (Acanthamoeba spp, Naegleria fowleri)
			1. Epidemiology, Morphology, Transmission and life cycle
			2. Clinical features, Laboratory diagnosis
			3. Treatment, Prevention& control
 |
| 1. **Flagellates (Mastigophora)**
	1. Introduction to Flagellates
	2. Oro-Intestinal Flagellates
		1. General Characteristics
 |
| **Laboratory:*** Direct saline/eosin stool examination
* Thin and tick blood film preparation and staining
 |
|  | * + 1. Giardia lamblia
			1. Epidemiology, Morphology, Transmission and life cycle
			2. Clinical features, Laboratory diagnosis
			3. Treatment, Prevention& control
 |
| * + 1. Dientamoeba fragilis, Chilomastix mesnili ,Enteromonas hominis, Retortamonas intestinalis, Trichomonas hominis, T. tenax
			1. General Characteristics, Epidemiology, Morphology
			2. Transmission and life cycle
			3. Clinical features laboratory diagnosis
			4. Treatment, Prevention& control
 |
| * + 1. Urogenital Flagellates (Trichomonas vaginalis)
			1. Epidemiology, Morphology, Transmission and life cycle
			2. Clinical features, Laboratory diagnosis
			3. Treatment, Prevention& control
 |
| **Laboratory:*** Formal ether concentration technique
* Direct saline/eosin stool examination
 |
| * 1. Blood and tissue flagellates
		1. General Characteristics
		2. Leishmania Species
			1. General Characteristics
			2. Classification
 |
| * + - 1. Leishmania tropica complex
				1. Epidemiology, Morphology, Transmission and life cycle
				2. Clinical features, Laboratory diagnosis
				3. Treatment, Prevention& control
 |
| Laboratory: * Wet mount urine examination
* Thin and tick blood film preparation, staining and examination
 |
|  | * + - 1. Leishmania donovani complex
				1. Epidemiology, Morphology, Transmission and life cycle
				2. Clinical features, Laboratory diagnosis
				3. Treatment, Prevention& control
 |
| * + - 1. Leishmania Mexicana complex
				1. Epidemiology, Morphology, Transmission and life cycle
				2. Clinical features, Laboratory diagnosis
				3. Treatment, Prevention& control
 |
| * + - 1. Leishmania braziliensis complex
				1. Epidemiology, Morphology, Transmission and life cycle
				2. Clinical features, Laboratory diagnosis
				3. Treatment, Prevention& control
 |
| * + - 1. Leishmania guyanensis complex
				1. Epidemiology, Morphology, Transmission and life cycle
				2. Clinical features, Laboratory diagnosis
				3. Treatment, Prevention& control
 |
| **Laboratory:*** Permanent smear for the identification of intestinal protozoa Examination of prepared slides
 |
|  | * + 1. Trypanosome species
			1. General Characteristics
			2. Classification
 |
| * + - 1. African trypanosomiasis
				1. Epidemiology, Classification, Morphology, Transmission and life cycle
				2. Clinical features, Laboratory diagnosis
				3. Treatment, Prevention& control
 |
| **Laboratory:*** Examination of prepared slides
* Quantitative Buffy Coat examination
 |
|  | * + - 1. American trypanosomiasis
				1. Epidemiology, Morphology, Transmission and life cycle
				2. Clinical features, Laboratory diagnosis
				3. Treatment, Prevention& control
 |
| 1. **Ciliates (Balantidium coli)**
	1. Epidemiology, Morphology, Transmission and life cycle
	2. Clinical features, Laboratory diagnosis
	3. Treatment, Prevention& control
 |
|  | 1. **Apicomplexa (Sporozoa)**
	1. Classification
	2. General features
	3. Intestinal Sporozoa
		1. General features
 |
| * + 1. Cryptosporidium species
			1. Epidemiology, Morphology, Transmission and life cycle
			2. Clinical features, Laboratory diagnosis
			3. Treatment, Prevention& control
 |
| * + 1. Isospora belli
			1. Epidemiology, Morphology, Transmission and life cycle
			2. Clinical features, Laboratory diagnosis
			3. Treatment, Prevention& control
 |
| * + 1. Cyclospora cayetanensis
			1. Epidemiology, Morphology, Transmission and life cycle
			2. Clinical features, Laboratory diagnosis
			3. Treatment, Prevention& control
 |
| **Laboratory:*** Modified acid fast staining
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|
|  | * + 1. Sarcocystis species
			1. Epidemiology, Morphology, Transmission and life cycle
			2. Clinical features, Laboratory diagnosis
			3. Treatment, Prevention& control
 |  |
| * 1. Blood and tissue sporozoa
		1. General features
 |
| * + 1. Plasmodium falciparum
			1. Epidemiology, Morphology
			2. Transmission and life cycle, Clinical features
 |
|  | Plasmodium falciparum……* + - 1. Laboratory diagnosis, Treatment
			2. Prevention& control
 |
| **Laboratory:*** Modified acid fast staining
 |
|  | * + 1. Plasmodium vivax
			1. Epidemiology, Morphology, Transmission and life cycle
			2. Clinical features, Laboratory diagnosis
			3. Treatment, Prevention& control
 |
| * + 1. Plasmodium malariae/ovale
			1. Epidemiology, Morphology, Transmission and life cycle
			2. Clinical features, Laboratory diagnosis
			3. Treatment, Prevention& control
 |
| * + 1. Babesia species
			1. Epidemiology, Morphology, Transmission and life cycle
			2. Clinical features, Laboratory diagnosis
			3. Treatment, Prevention& control
 |
| **Laboratory:** * Rapid diagnostic tests for plasmodium species
* Quantitative Buffy Coat examination
* Thin and tick blood film preparation, staining and examination
 |
| **Independent Study:** |
|  | * + 1. Toxoplasma gondii
			1. Epidemiology, Morphology, Transmission and life cycle
			2. Clinical features, Laboratory diagnosis
			3. Treatment, Prevention& control
 |
| 1. **Microsporidium species (Encephalitozoon hellem Enterocytozoon bieneusi Encephalitozoon intestinalis)**
	1. Epidemiology, Morphology, Transmission and life cycle
	2. Clinical features, Laboratory diagnosis
	3. Treatment, Prevention& control
 |
| **Laboratory:*** Rapid diagnostic tests for plasmodium species
 |
|  | **Laboratory:*** Examination of prepared slides and Modified acid fast staining
 |
|  | **Laboratory:*** Thin and tick blood film preparation, staining and examination
 |
| **Teaching Methods** * Interactive Lecture, Brainstorming and Discussion
* Presentation and Group Discussion
* Laboratory Practical and Demonstration
* Individual or Group Tutorial, Home Study
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| **Learning Materials:*** Text Books, Lecture Notes
* Laboratory Manuals and Bench Aids
* Visual Aids (Video cassettes, LCD)
* Chalk and Board, Flip Charts
* Laboratory Equipments, Materials and Supplies
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| **Reference (s)** | **Required texts:** 1. Awole M., Cheneke W. Medical Parasitology for Medical laboratory Technology students. Upgraded lecture Notes Series .2006.
2. P.L. Chiodini, A.H. Moody and D.W. Manser. Atlas of Medical Helminthology and Protozoology 2nd edition; 2003. Churchill Living Stone.
3. Cheesbrough M. District laboratory practice in tropical countries United Kingdom, Cambridge university press, 2009, part I
4. Beaver, P.C. Jung, R.C. and Cupp, E.W. 1984 Clinical Parasitology. 9th Edition Lea and Febiger, Philadelphia.
5. Wilcox, A. Manual for the microscopical diagnosis of malaria in man. U.S. Department of Health, Education and Welfare, Washington, D.C. 1960
6. Basic Malaria Microscopy World Health Organization, Geneva, Switzerland. 1991
7. WHO. Manual of Basic Techniques for a Health Laboratory, 2nd ed; 2003
8. Gillespie S,Pearson R.D. Principles and practice of Clinical Parasitology .John Wiley and Sons Ltd, 2001
9. Garcia LS, Bruckner DA. Diagnostic Medical Parasitology. 3rd Edition. ASM Press, Washington DC. 1997.
10. Neva FA, Brown HW. Basic Clinical Parasitology.6th Edition. Appleton and Lange, Norwalk Connecticut. 1994.

**Recommended study books**1. National Committee for Clinical Laboratory Standards. Use of Blood Film Examination for Parasties. Tenative Guideline M15-T National Committee for Clinical Laboratory Standards, Villanova, PA 1992
2. Ash LR, Oreil TC. Atlas of Human Parsitology. 4th Edition. ASCp Press,

 Chicago.1997.1. Gillespie, S.H. and Hawkey, P.M. Medical Parasitiology: A Practical Approach. IRL Press New York 1994 pp191-208
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