COURSE SPECIFICATION

Medical Parasitology

Faculty of Medicine– Mansoura University

(A) Administrative information

(1) Program offering the course:	**Postgraduate Doctorate degree of Medical Parasitology**
(2) Department offering the program:	**Department of Medical Parasitology**
(3) Department responsible for teaching the course:	**Department of Medical Parasitology**
(4) Part of the program:	Second part compulsory course
(5) Date of approval by the Department`s council	9-5-2016
(6) Date of last approval of Program specification by Faculty council	9-8-2016
(7) Course title:	**Medical Parasitology**
(8) Course code:	**(PAR 608)**
(9) Credit hours	**21 lectures-15 practical**
(10) Total teaching hours:	315 hours lectures-450 practical

(B) Professional information

(1) Course aims:

The aims of the program are as follows:

1. Provide the students with knowledge about the recent issues of Medical Parasitology and diagnosis of parasitic diseases.
2. Enable the students to update their scientific information in parasite biology, life cycles, host–parasite relationship, environmental and host factors regulating parasitic diseases.
3. Help the student to recognize the latest epidemiology and transmission patterns of parasites as an essential prerequisite for the development of effective control programs.
4. Enable the student to recognize the general outlines of parasite treatment and control and their impact on health, welfare and productivity of human being.
5. Provide the student with updated information and researches concerned with parasitic diseases, as well as their laboratory diagnosis.
6. Enable the student to master different diagnostic techniques.

(2) Intended Learning Outcomes (ILOs):

A. Knowledge and Understanding

a 1 Point out the latest update on morphological characteristics and classification of medically important parasites.

a 2 Identify morphological characteristics of medical mollusks, their modernized classification, biology and medical importance.

a 3 Recognize the updated geographical distribution of important medical parasites.

a 4 Describe the recently published data on life cycles, methods of transmission, habitat, infective and diagnostic stages of parasites.

a 5 Demonstrate ultra-structure and molecular biology of different parasitic stages.

a 6 Describe biology and metabolism of different parasites.

a 7 Explain new update on host-parasite interaction, and the pathological factors mastering the parasitic harm to their hosts.

a 8 Explain-host parasite interaction in opportunistic, nosocomial and zoonotic infections.

a 9 Recognize clinical picture related to parasitic infection and the progress in diagnostic techniques used for detecting parasites.

a 10 Develop and maintain basic knowledge for efficient consultation in diagnostic parasitology.

a 11 Discuss the major groups of antiparasitic drugs, their method of application and what is new in this field.

B. Intellectual skills

The postgraduate degree provides opportunities for candidates to achieve and demonstrate the following intellectual qualities:

b1 Interpret the clinical and laboratory findings to develop the problem solving skills and reach the proper diagnosis.

b2 Recommend methods for proper diagnosis of different parasitic problems and choose the optimal cost-effective test.

b3 Compare between different lines of prevention of parasitic infection.

b4 Design guidelines for a control program for a particular parasitic disease.

b5 Stratify self-learning skills in data collection and group discussion.

C. Professional/practical skills

The postgraduate degree provides opportunities for candidates to demonstrate the following professional/practical skills:

c1 Identify the laboratory hazards and biosafety measures in Parasitology Laboratory and safety requirements for waste disposal.

c2 Identify nosocomial and laboratory-acquired infection in Parasitology laboratory.

c3 Apply quality assurance measures during examination of different samples e.g. blood, stool, soil, urine, etc…..

c4 Demonstrate and perform methods for collection and preservation of different specimens.

c5 Stratify and control the principles of examination of laboratory specimens (body fluids, excreta or infected tissues) using different preservatives and a range of appropriate techniques in the Parasitology laboratory (concentration and staining).

c6 Demonstrate and perform methods for microscopic examination of stool specimens

6.1. Wet mount.
6.2. Iodine/Eosin stained slides.
6.3. Sedimentation methods.
6.4. Floatation methods.

c7 Demonstrate and conduct methods for microscopic examination of stool specimens using different stains:

7.1. Trichrome stain.
7.2. Modified Kinyoun's Acid-fast stain.
7.3. Modified trichrome stain (Weber stain).
7.4. Safranin stain.
7.5. Chromotrope stain.
7.6. Calcofluor white staining.

c8 Demonstrate and perform techniques used in stool culture:

10.1. Harada-Mori filter paper culture.
10.2 Filter paper/slant culture technique (petri dish).
10.3 Charcoal culture.

10.4. Bearman technique.
10.5. Agar plate culture.

c9 Demonstrate and perform techniques used for stool ova count:
11.1 Stoll technique.
11.2. Kato technique.

c10 Diagnose and quantify different parasitic stages that may be recovered from stool, soil and urine samples, etc…..

c11 Demonstrate and perform thin and thick blood film using different stains:

11.1. Geimsa stain.
11.2. Leishman stain.
11.3. Wright stain.

c12 Demonstrate and perform techniques used in culture of protozoa**.**

c13 Prepare and examine mounted slides and identify different parasites & mollusks, their different stages and body parts using microscope.

c14 Demonstrate methods used in production of polyclonal antibodies in mammals.

c13 Practice the currently used techniques in immuno-parasitological diagnosis:

- Immunodiffusion
- Complement fixation test
- ELISA
- Gel electrophoresis
- Western blotting
- Immunoprecipitation
- Haemagglutination
- Immunochromato-graphic card tests
- Immunofluorescence

c14 Understand the rationale and the principals of:
14.1. Electron microscopy.
14.2. Polymerase chain reaction (PCR)

c15 Interpret on the results of different parasitological diagnostic methods.

c16 Apply the principles of diagnosis, treatment and control of parasitic diseases.

c17 Utilize suitable statistics and apply quality control and quality assurance procedures as demanded in research.

D. Communication & Transferable skills

The Postgraduate Degree provides the opportunity to demonstrate the following transferable skills:

d1 Retrieve recent data from web sites and review the scientific literature on a research topic.

d2 Manage time efficiently.

d3 Work in a multidisciplinary care team to solve community parasitic problems.

d4 Communicate effectively and respectively with colleagues, supervisors and staff members

d5 Able to react positively with health care professionals, national campaigns and health authorities as regards newly emergent parasitic diseases or outbreaks caused by parasites.

d6 Apply presentation skills to present their performance.

d7 Establish a concise scientific activity according to standard scientific thinking and integrity.

(3) Curriculum structure and contents:

a. Lectures (315 hours)

Subjects	Lectures Hours	Total Teaching Hours
I. Medical Parasitology-Module1		**105**
Helminthology:		
a. Trematode infections:		
-Introduction & General morphology of trematodes	**3**	
-Biology & metabolism	**3**	
-Fasciolidae	**4**	
-Schistomatidae	**6**	
-Heterophyidae & Opisthorchioidae	**6**	
-Paramphistomatoidae & Clinostomatoides & Diplostomatidae	**6**	
-Strigeiformes	**3**	
-Echinostomatiformes	**3**	
-Plagiorchiformes	**3**	
b. Cestode infections:		
-Introduction to cestodes	**3**	
-Biology & metabolism	**3**	
-Bothriocephaloidea & Taeniidae	**5**	
-Hymenolepididae & Dilepididae	**5**	
-Davaineidae & Anoplocephalidae	**5**	
-Mesocestoididae & Dioecocestidae & Proteocephalata &Tetraphyllidea & Trypanorhyncha	**4**	
c. Nematde infections:		
-Phylum Nematoda: Form, Function, and Classification	**3**	
-Biology & metabolism	**3**	
-Enoplida	**3**	
- Oxyrida	**3**	
-Ascaridida	**4**	
- Rhabditida	**4**	
- Ancylostomatidea & Strongylidea	**4**	
- Trichostrongylidea & Metastrongyloidea	**4**	
- Dracunculoidea & Filaroidea	**4**	
- Spirurina	**2**	
-Larva migrans	**2**	
-Nematomorpha &Acanthocephala	**2**	
-Pentastomida: Tongue Worms & Pentastomiasis	**2**	

II. Medical Parasitology-Module 2 **Protozoa:** -Parasitic Protozoa: Form, Function, and Classification -Biology & metabolism -Types of Reproduction& division -Amebida -Schizopyrenida -Kinetoplasta: Trypanosomes and other Flagellated Protozoa -Apicomplexa: Gregarines, Coccidia, Malaria Organisms and Piroplasms -Ciliophora -Microsporidia & Myxozoa -Endosymbionts	 3 3 4 18 14 22 22 6 8 5	105
III. Medical Parasitology-Module 3 **a. Entomology:** - Arthropod**:** Classification & General Form -Arthropod External Morphology -Development Host Specificity -Biology -Diptera, Flies (Suborder: Nematocera & Brachycera) -Muscomorpha -Myiasis -Siphonaptera -Hemiptera -Phthiraptera -Dermaptera -Neuroptera -Lepidoptera -Coleoptera -Strepsiptera - Hymenoptera -Parasitic Arachnids -Parasitic Crustaceans -*Wolbachia* Bacteria& Parasitoid Insects -Leeches - Control of Arthtopods -Genetic Control of Arthtopods **b. Malacology** -General morphology & anatomy -Biology -Prosobranchia spp. -Pulmonata spp. -Land snails -Slugs -Control of mollusks	 2 2 2 2 6 6 4 4 4 4 4 4 4 3 3 3 3 3 2 2 4 4 2 1 3 3 2 2 2	105

c. Nosocomial &zoonotic infections -Nosocomial &opportunistic infections - Zoonotic infections	**6 9**	

b. Practical (450 hours)

Subjects	**Practical Hours**
-Laboratory hazards and biosafety measures in in Laboratory	**10**
-Quality assurance measures in examination of different samples	**10**
-Collection and preservation of different specimens	**10**
-Concentration of stool by sedimentation and flotation methods	**10**
-Microscopic examination of stool specimens	**10**
- Microscopic examination of stool specimens using different stains	**25**
- Stool culture	**20**
- Perform techniques used for ova count	**15**
-Perform methods used for examination of urine, sputum, and duodenal fluid	**15**
- Preparation of thin and thick blood film using different stains	**15**
- Culture of protozoa	**20**
-Prepare and examine mounted slides of different helminthes/stages and parasitic sections	**40**
-Mounting different stages and parts of medically important arthropods	**20**
-Preparation of polyclonal antibodies	**35**
- Immunodiffusion and immunoprecipitation	**20**
- Complement fixation test and haemagglutination	**20**
-ELISA	**20**
-Immunochromatographic card tests for detection of parasitic antigens	**5**
-Gel-electrophoresis	**30**
- Western blotting	**30**
- Immunofluorescence	**20**
-PCR	**50**

(4)Teaching methods:

4.1. Lectures

4.2. Power point presentation

4.3. Essay discussion

4.4. Seminar one hour/ 4 weeks about the recent advances in the Parasitology field.

(5) Assessment methods:

5.1. Multiple choice questions (MCQ) exam for assessment of knowledge and intellectual ILOS.

5.2. Written exam for assessment of knowledge and intellectual ILOS.

5.3. Objective structure practical exam (OSPE) for assessment of knowledge and intellectual, practical and transferable ILOS.

5.4. Structured oral exam for assessment of knowledge and intellectual, practical and transferable ILOS.

Percentage of each assessment to the total mark:

Tools	Marks	Percentage of the total mark
Continuous assessment (MCQ)	40	11.43%
Written exam	160 (2 written exams each 80 Mark)	45.71%
OSPE	75	21.43%
Structured oral exam	75	21.43%
Total	350	

Other assessment without marks: seminars as described above included in the log book.

(6) References of the course:

Textbooks (available at the library):

- Advances in Parasitology, 2015.
- Parasitology, Chatterjee KD. CBS; New Delhi. 2014.
- Medical Parasitology, Arora DR, Arora BB, 2014.
- Foundations of Parasitology, Larry SR, John J and Steve Nadler. McGraw-Hill; New York. 2013.
- Human Parasitology, Bogitsh BJ and Carter CE. Academic Press; Boston. 2013.
- Panikers Textbook of Medical Parsitology, Paniker CJ. Jaypee; New Delhi, 2013.
- Parsitology for Medical and Clinic and Laboratory Professionals, John WR. Delmar Cengage Learning; Clifton Park; New York. 2012.
- Human Parsitology, Fatik BM. PHI Learning Private Limited; New Delhi, 2011.
- Protozoa and Human Diseases, Mark FW. Garland Science; New York. 2011.

- Text Book of Parasitology, 2010.
- Diagnostic Medical Parasitology, Garcia LS and Bruckner A (Eds). 4th Edition, ASM Press, Washington DC. 2001.
- Principles and Practice of Clinical Parasitology, Gillespie SH and Pearson RD (Eds.). 1st Edition, John Wiley & Sons Ltd., Chichester, New York, Weinheim, Brisbane, Singapore, Toronto, 2001.
- Atlas of Medical Helminthology and Protozoology, Chiodini PL, Moody AH and Manser DW (Eds). 4th Edition, Churchill Livingstone, Edinburg, London, New York, Oxford, Philadelphia, St Louis, Sydney, Toronto, 2003.
- Clinical Parasitology, Beaver PC, Jung RC and Cupp EW (Eds). 9th edition, Lea and Fibiger; Philadelphia. 1984.

Periodicals:

- Advances in Parasitology.
- Trends in Parasitology.
- PLoS Neglected Tropical Diseases.
- International Journal of Parasitology.
- Acta Tropica.
- Parasitology Research.
- Parasitology.
- Experimental Parasitology.
- Journal of Parasitology.
- Journal of Parasitology Research.
- Annals of Tropical Medicine and Parasitology.
- Malaria Journal.
- American Journal of Tropical Medicine and Hygiene.
- Journal of Infectious Diseases.
- Clinical Microbiology Review.
- Journal of Infection and Immunity.
- Clinical Review.

Web sites:

- http://www.who.int/
- http://www.ncbi.nlm.nih.gov/entrez/query.fcgi
- http://www.dpd.cdc.gov/dpdx/html/para-health.htm
- http://www.malaria.org/
- http://biology.unm.edu/biology/coccidia/home.html
- http://www.ksu.edu/parasitology/625tutorials/index.html

(7) Facilities and resources mandatory for course completion:

7.1. Lecture halls and data show.

7.2. Research laboratories: the department has two research laboratories equipped with instruments needed for the course including:

- **Glass ware, and chemical**
- Ultracentrifuge
- Light microscopes

- Fluorescent microscope
- ELISA machine
- Electrophoresis set
- PCR machine
- UV illuminator
- Computers for data analysis.

Course coordinator: Prof. Samar Nagah El-Beshbishi

Head of the department: **Prof.** Hala Ahmed El-Nahas

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