Department of Biology (BioMedical Science)

College of Science

Salahaddin University-Erbil

Subject: Medical Parasitology

First semester: Protozoology(Theory and Practical)

Course Book: 2nd Year

Lecturer names:

Asst. Prof. Rezan Kamal Ahmed (Theory)

Asst.Lecturer Chreska Nooraldin Ahmed (Practical)

Academic Year: 2022/2023

Course Book

1. Course name	**Medical Parasitology (Protozoology and Helminthology)** **Theory & Practical**
2. Lecturer	**Asst. Prof. Rezan Kamal Ahmed** **Asst.Lecturer Chreska Nooraldin Ahmed**
3. Department/ College	**Biology (BioMedical Science) Department** **College of Science**
4. Contact	**e-mail:** **Rezan.ahmed@su.edu.krd** **Tel: (optional)**
5. Time (in hours) per week	**Theory: 2 hrs.** **Practical: 2 hrs./group (3 groups)**
6. Office hours	**6hrs**
7. Course code	**SBM204**
8. Teacher's academic profile	**Rezan K. Ahmed** - She is working as an **Assistant Professor in Parasitology** at Salahaddin University-Erbil, College of Science, Biology Dept. -From 1986-1987 **Bachelor in Biological Science** from Salahaddin University-Erbil/Iraq. -From 1989-1991, she participated in Laboratory Training Course, Pasteur Institute, Medical City Hospital, Baghdad. -From1987-1993, she worked as a Biologist in Central Public Laboratory, Erbil.

-From 1993, She got **MSc. Degree in** Parasitology from Salahaddin University-Erbil/Iraq.

- She has **29 Years of teaching experience** for different Biological Subjects **(Medical Microbiology, Immunology, Bacterial physiology, Human Biology, Parasitology, Invertebrate Zoology)** in College of Science-Department of Biology/University of Salahaddin, Erbil-Iraq and Knowledge University - College of Science-Pathological Analysis Dept.

-She has many published research articles from local and international Journals.

Chreska N. Ahmed

She joined Salahaddin University/ College of Science/ Biology department in **2004**, and obtained **BSc in general biology** in **2008**.

- From **2009-2017**, worked at Salahaddin University/ College of Science/ Biology department, as an **Assistant Biologist.**

- She has **13 years** of teaching experience at **(Biology and Environmental Science Department)** and she taught many different practical biology labs to help students doing experiments with assistant lecturer and professors.

1. Toxicology and Quality Control Lab at (Environmental Science Department)
2. Histology and embryology
3. Food and industrial microbiology
4. Ecology and pollution
5. Microbial genetic
6. Virology
7. Comparative anatomy
8. Entomology
9. Medical entomology
10. Microbial physiology
11. Sewage microbiology
12. Molecular and biotechnology
13. Micro technique
14. Hematology
15. Medical Parasitology
16. Invertebrates

	In **2019**, She got **MSc. Degree in Parasitology** in Salahaddin University/ College of Science/ Biology department-Erbil/Iraq. She is currently, working as an **Assistant Lecturer** at Salahaddin University-College of science-Biology department, her specialist is **Parasitology**. -She has one published Research article in **ZANCO Journal of Pure and Applied Sciences.** (**Chreska Nooraldin Ahmad**, Kareem Khoshnow Hamad and Fikry Ali Qadir, 2019. *Haemonchus contortus* as a model in assessing activity of Citrullus colocynthis fruit extract to control benzimidazole-resistant parasitic nematodes. *ZANCO Journal of Pure and Applied Sciences*, 31 (5); 61-70.
9. Keywords	**Parasitology, protozoa, helminthes, epidemiology, pathogenicity. Life cycle, treatment, prevention.**

10. Course overview and objective:

Parasitic infections remain still now the most serious health problem in the countries worldwide. They affect the morbidity and mortality levels in every nation, affecting the countries with tropical and temperate climates very significantly. Therefore, our course is designed to confirm and provide our students with information about parasites (Helminthes) infecting human specially and some of his domestic and wild animals in generally, including these topics :(geographical distribution, morphology ,general characteristics, life cycle, sign and symptoms, transmission, methods of diagnosis, prevention, and treatment of diseases). The texts are supported by figures and tables.

11. Student's obligation

In the performance of all work in this course, each student is expected to adhere to the standards of ethical behaviour as stated in the University Undergraduate Catalogue. The following are expected:

1. Students neither give nor receive assistance on exams and the exams once set will not be postponed. You will be reminded with a note on the students' note-board several days before the exam.
2. each report is the student's own work.
3. students avoid plagiarism in their written work
4. Students deal forthrightly and honestly when consulting with faculty.

Lab obligations:

Student Should take two exams during the course; There will be no make-up exams for absences students without medical reports.

Quizzes: Students are quizzed every week.

Seminar: during the course, a student is expected to present a seminar.

Extra Activity: Taking medical samples from the public and private laboratories.

12. Forms of teaching

Several types of teaching will be used:

1. Giving an abstract of the former lecture, teacher notes including all information on the studied parasites and also labelled morphological and life cycle line diagrams on the board.
2. Power point lectures to:
    a. Acquiring information on parasites (Helminthes) morphology and their hosts.
    b. For illustrating clinical photos of patients infecting with parasites and the damages which caused by them in or outside the host tissues.
    c. To get best knowledge on the parasite life cycle.
3. Classroom discussion will done about the studied parasite including life cycle, transmission, information on its pathogenesis, and pathology, clinical manifestation diagnosis which including clinical diagnosis and laboratory diagnosis, treatment, prevention, and control

13. Assessment scheme

1st Theoretical exam …….7.5 marks
2nd Theoretical exam ……7.5 marks
Practical exam …… ….30 marks
Quizzes ……....5 marks

Final Theoretical exam……....50 marks
Total……100 marks

14. Student learning outcome:

Students should be able to:

1. Give the names of the taxonomic group (common and scientific) and that of the genera and species covered in the course. Taxonomic group can refer to Phylum, Subphylum, Class,

Order, Family, Genus and Species. Correct spelling will be used.
2. Recognize significant morphological characteristics for identification of parasites to taxonomic group and the life history stage.
3. Present the life history of the parasitic group as well as that of genera or species including:
a. The infective agent for each host and their means of invasion.
b. Each host in the life cycle and type of development, multiplication, etc., which occurs in each host.
c. Movement routes and sites of development within hosts.
d. Free living stages.
4. Understand the treatment, prevention, and control of the parasitic genera and species presented.
5. Understand the evolution of parasitic groups as well as other aspects of the parasites discussed.

15. Course Reading List and References:

1. Text Book of Medical Parasitology (Protozoology and Helminthology), Text and color atlas, (2004) by Parija, s.c. 2nd edition, medical books publishers, Chennai, New delhi.

2. Text book of parasitology, (1965), by Belding,D.L., 3rd edition, appleton century crofts, New York.

3. 3.Parasitology and Vector Biology ,(2000),by Marquardt,w.C.,Demaree,R.S.

and Grieve, R.B. 2nd edition, Harcourt Academic Press, New York.

4.Foundation Of Parasitology,(2000), by Roberts,L.S. and John Janovy,Jr.

6th edition, McGraw-Hill higher education, New York.

5. Diagnosing Medical Parasites: A Public Health Officers Guide to Assisting Laboratory and Medical Officers(2010) by Cuomo, M.J., Noel, L.B. and White, D.B. Capt.
6. Foundations of Parasitology (2009), by Roberts, L.S. and John Janovy, Jr., 8th ed. McGraw- Hill higher education, New York
7.Human parasitology (2013)by Burton J. Bogitsh, Clint E. Carter and Thomas N. Oeltmann , 4th ed. Academic press in an imprint of Elsevier/ New York.

16.The topics

Week Lecture Topic Readings (Theory)

First semester (Medical Protozoology)

Week 1 and 2 :

Introduction: Definitions, principles , concepts and Terminology

Week3

Parasitic protozoa

Classification of protozoa

1. Phylum Sarcomastigophora *Entamoeba histolytica*,

Week 4:

Non- pathogenic *Amoebae*

Entamoeba dispar

Entamoeba hartmanni

Entamoeba coli

Endolimax nana

Iodamoeba bütschlii

Entamoeba gingivalis

Week 5and6:

Free living Amoebae (Opportunistic Amoebae)

Naegleria fowleri

Acanthamoeba SP.

Balamuthia mandrillaris

Week 7:

PATHOGENIC FLAGELLATES

1- Luminal flagellates

Giardia lamblia ,Chilomastix mesnili ,Trichomonas hominis

Week 8:

Dientamoeba fragilis

2- Urogenital flagellates

Trichomonas vaginalis

Week 9:

3- Hemoflagellates

Leishmania species

Leishmania tropica

Leishmania donovani

Leishmania braziliensis

Week 10

Trypanosoma species
Trypanosoma cruzi
Trypanosomabrucei gambiense/

Week 11

Trypanosoma brucei rhodesiense
The ciliata of man
3. Phylum Ciliophora:
Balantidium coli

Week 12

4. Phylum: Apicomplexa
Toxoplasma gondii

Week 13 and 14

Plasmodium SP.
Plasmodium vivax
Plasmodium ovale
Plasmodium malariae
Plasmodium falciparum
Cryptosporidium parvum

Week 15

Blastocystis hominis
Sarcocystis sp.
Isospora spp.

Week Lecture Topic Readings (Practical)

Week 1: Medical Protozoology

Phylum: Protozoa

1. Super class: Sarcodina
2. Super class: Mastigophora
3. Super class: Ciliphora
4. Super class: Sporozoa

Week 2: Amoebic Dysentery

1. Super class: Sarcodina

Entamoeba coli
Entamoeba histolytica

Week 3: Intestinal Flagellated Protozoa

2. Super class: Mastigophora

Giardia lamblia
Chilomastix mesnili

Week 4: Tissue Flagellated Protozoa

Leishmania tropica
Leishmania donovani
Leishmania braziliensis

Week 5: Blood Flagellated Protozoa

Trypanosoma cruzi
Trypanosoma bruci gambiense
Trypanosoma bruci rhodesiense

Week 6: Intestinal Ciliated Protozoa

3. Super class: Ciliphora

Balantidium coli

Week 7 and 8: Sporozoan Protozoa

4. Super class: Sporozoa

Toxoplasma gondii

Week 9 and 10: Intestinal Sporozoan Parasites

Cryptosporidium parvum
Cryptosporidium hominis

Week 11: Modified Ziehl–Neelsen Technique for Sporozoan Parasites

Week 12: Other intestinal protozoa

Week 13: *Blastocystis hominis*

Week 14: Blood Sporozoan Parasites (Malaria)

Plasmodium vivax
Plasmodium ovale
Plasmodium malariae
Plasmodium falciparum

Week 15: Slides for all stages of *Plasmodium* sp.

17.Examinations(Examples):(Theory)

Q1.Draw and lable the following
a.*Giardia lamblia* trophozoite
b.Amastigote stage of *Leishmania* Sp.
c. Life cycle of *Toxoplasma gondii* in the intermediate host

Q2.Choose the correct answer :
1-The form of *Giardia lamblia* which is responsible for infecting man is----------
A- Sporozoites B-Trophozoite.
C-Cystic stage D-A and C

2- The trophozoite of *Entamoeba histolytica* is differ from *Entamoeba coli* in

A-Location of karyosome B- Cytoplasm

C-Size D- All of the above

3-The habitat of the following parasites is intestine except

A-*Giardia lamblia* B-*Chilomastix mesnili*

C-*Trichomonas hominis* D-*Entamoeba gingivalis*

(Practical)

Examination Samples:

Q1. Diagnose the given sample / or slide.

Q2. Classify *Giardia lamblia*

Q3. Write the position of the following

1. Nucleus of *chilomastix mesnili* Trophozoite.
2. Micro nucleus of *Balantidium coli*

Q4. What are the difference between the cyst of *Entamoeba histolytica* and *Entamoeba coli.*