

Ministry of Higher Education and Scientific research



**Department of Biology**

**College of Science**

**University of Salahaddin/Erbil**

**Subject: Invertebrate Zoology (Theoretical)**

**Course Book – 1<sup>st</sup> semester**

**Lecturer's name: Assist.Prof.Dr.Sherwan T. Ahmed**

**Academic Year: 2023/2024**

## Course Book

1. Course name	Invertebrate Zoology
2. Lecturer in charge	Assist.Proff.Dr.Sherwan T. Ahmed
3. Department/ College	Biology/Science
4. Contact	e-mail: sherwan.ahmed@su.edu.krd Tel: (optional)
5. Time (in hours) per week	Theory: 2 Practical: 2
6. Office hours	6hrs
7. Course code	SBIO 201
8. Teacher's academic profile	<p><b>*Dr.Sherwan T. Ahmed ....</b></p> <p>- 1978-1979 Bachelor in Biological Science from university of Sulaimanya/Iraq</p> <p>-1993-1994 MSc.degree in Medical Microbiology from university of Salahaddin/Iraq</p> <p>-2009-2010 PhD. In Invertebrate Zoology from university of Salahaddin/Iraq</p> <p>-2002 submitting of Duhok University Confrence/College of Medicine</p> <p>-2011 submitting of Kerkuk University Confrence/College of Science – Department of Biology</p> <p>-2011 submitting of 1<sup>st</sup> international Confrence in Applied Science/Malaysia</p> <p>-2015 Quality Assurance committee/College of Science-Department of Biology</p> <p>- During 1995-2017 Teaching ( Medical Microbiology,General Microbiology,Human Biology,Parasitology,Invertebrate Zoology) in College of Pharmacy &amp; College of Science-Department of Biology/University of Salahaddin/Kurdistan Region-Iraq</p> <p>-2011-2015 Supervising of Postgraduate students(Diploma &amp; Master degree)</p> <p>-2017-2018 Supervising of Postgraduate student( PhD. Student)</p> <p>2019-2024 Supervising of Postgraduate student( PhD. Student-MSc Students)</p>

<b>9. Keywords</b>	<b>Invertebrates, Protozoa, Porifera, Platyhelminthes, Annelida, Arthropoda</b>
<b>10. Course overview:</b> This object of this course is to survey the major invertebrate phyla, classes and orders.  We begin with the simplest, single celled organisms, and finish with the most complex. For each group we will explore internal and external anatomy, feeding, and reproduction, and relate these anatomical and morphological features to the invertebrate's mode of life.	
Laboratory work involves examining live and prepared specimens and field trips to local habitats. It is hoped that by the end of the course you will be familiar with the common taxa and understand the relationship between the form and function for each.	
<b>11. Course objective:</b> Most of the animal species on planet Earth are invertebrates! In this course, we study the taxonomy, anatomy, physiology, feeding habits, ecology, behaviour, and reproductive strategies of major invertebrate groups, with the exception of insects. We emphasize the evolutionary relationships between the different invertebrates.	
<b>12. Student's obligation</b> In the performance of all work in this course each student is expected to adhere to the standards of ethical behavior as stated in the University Undergraduate Catalog. The following are expected: 1. students neither give nor receive assistance on exams 2. each report is the students own work 3. students avoid plagiarism in their written work 4. students deal forthrightly and honestly when consulting with faculty If there is any reason to suspect that you have violated the University honor code, you will automatically receive a zero for the work in question. Your violation will be reported to the Office of the Dean of Students and will probably result in an Honor Council hearing. Any student found guilty and sanctioned by the Honor Council is entitled to an appeal.	
<b>13. Forms of teaching</b> A- Lecture B. Demonstration C. Laboratory Practice D. Audio-Visual programs	

#### 14. Assessment scheme

1<sup>st</sup> exam .....5marks  
2<sup>nd</sup> exam .....5marks  
Practical exam .....35 marks  
Quizzes .....5marks  
Final exam  
(Theoretical).....50 marks Final exam  
Total.....100 marks

#### 15. Student learning outcome:

Students should be able to:

- appreciate the importance, value, and diversity of the invertebrates.
- understand the diversity, evolution and relationships between major groups of invertebrates

- knowledge of concepts in animal taxonomy
- study the anatomy and physiology of different invertebrate groups
- understand structure/function relationships
- find out where different animals live and how their body designs evolved to adapt to new environments (marine, fresh water, land)
- identify the major phyla and classes of invertebrates (in the laboratory)
- study the different reproductive strategies of invertebrates
- learn about interesting behaviour of the higher invertebrates

#### 16. Course Reading List and References:

1. "Biology of the Invertebrates" by J.A. Pechenik, 6th Edition, William C. Brown Publishers, 2009
- 2-Invertebrate Zoology.2004. Ruppert, Fox, and Barnes, 7th edition.

<p><b>17. The Topics:</b>  Date Lecture Reading  <b>Week 1</b>  2/2: Orientation/Generalities , Protozoans  <b>Week 2</b>  9/2: Protozoans(2)  <b>Week 3</b>  16/2: Porifera  <b>Week 4</b>  23/2: Hydrostatic Skeleton &amp; Cnidaria  <b>Week 5:</b>  2/3: Platyhelminthes  <b>spring holiday</b>  <b>Week 6: spring holiday</b>  <b>Week 7: spring holiday</b>  23/3: 1<sup>st</sup> EXAM  <b>Week 8</b>  30/4: Rotifera, Nemertea  <b>Week 9</b>  7/5 : Mollusca  <b>Week 10</b>  14/5: Mollusca  <b>Week 11</b>  21/4: Annelids  <b>Week 12</b>  28/4: Arthropoda: chelicerata  <b>Week 13</b>  5/5: Arthropoda: crustacea  <b>Week 14</b>  12/5: 1<sup>st</sup> EXAM  <b>Week 15</b>  17/5: Echinodermata</p>	
<p><b>Week 16</b>  24/5: Hemichordata</p> <p>*This lecture schedule may be modified depending on the pace of the course</p>	

**19. Examinations:**

**1. Compositional:**

Q/Describe the function of each of the following structures/cell types. a.

mastax in rotifers

b. gastrovascular cavity in *Hydra*

c. pinacocytes in poriferans

**2. Multiple choices:**

**Q/1-** A cell type that you would not expect to find in the gastrodermis of a hydrozoan would be a:

a) nematocyst

b) mucus cell

c) photosynthetic cell

d) nutritive-gland cell

**2- Cephalopods are important molluscs that include:**

a. Snails, slugs and limpets

b. Ammonites, squid and nautiloids

c. Cockles, mussels and clams

**20. Extra notes:**

**21. Peer review**



**Department of Biology**

**College of Sciences**

**University of Salahaddin**

**Subject: Practical invertebrates/ 2<sup>nd</sup> Semester**

**Course Book – (Year 2)**

**Lecturer's name: Dr. Fenik Sherzad Husein**

**Academic Year: 2023/2024**

## Course Book

1. Course name	General parasitology
2. Lecturer in charge	Dr. Fenik Sherzad Husein
3. Department/ College	Biology/Sciences
4. Contact	e-mail: <a href="mailto:fenik_aya@yahoo.com">fenik_aya@yahoo.com</a> Tel: 009647504862671
5. Time (in hours) per week	Practical: 3 (3*6=18)
6. Office hours	20-25 hrs.
7. Course code	SBio110
8. Teacher's academic profile	<ul style="list-style-type: none"> <li>• I(Fenik Sherzad Hussen) graduate from Salahaddin University in 2000 (Ranked 8<sup>th</sup> in collage) worked as assistant biology for 2 years and assist in practical microbial physiology lab., practical medical microbiology lab., practical food microbiology lab. In 2006 I finished my MSc degree and start as Assistant Lecturer Teaching Practical parasitology, invertebrate ,zoology and microbial physiology.</li> <li>• In 2011-2015 I go with my husband to Malaysia because he continue the PhD degree in September I came bag and starting again teaching parasitology ,I have 6 published paper</li> </ul>
9. Keywords	Invertebrate ,general phylum ,zoology
<p><b>10. Course overview:</b>  The invertebrates are a medically, economically and ecologically important group of animals. A number of invertebrates act as pathogens or vectors of disease. Malaria is one of the most important diseases in the world and is caused by a protozoan that is transmitted by anopheles mosquitoes. Economically speaking, invertebrates can be detrimental, serving as pests that destroy crops, but can also benefit us by serving as sources of food (eg. shrimp, lobster). Ecologically, invertebrates are an integral part of the food chain and can be utilized as bio indicators. Therefore it is in our best interest to study and understand the unique physiological processes of each phylum. In addition to lectures, students will write a concise 1 page review of an article published in a peer reviewed journal on a physiologically relevant topic and will present the hi-lights of this paper to the class. The laboratories will consist of hands-on experiments which demonstrate physiological mechanisms in the invertebrates. The majority of lab exercises will utilize insects because they are cheap to obtain and make convenient models</p>	



<b>for studying these processes.</b>
<b>11. Course objective:</b> The course will cover different invertebrates including: Phylum (Protozoa, Porifera, Cnidaria, Platyhelminthes, Nematelminthes, Annelida, Mollusca, Arthropoda and Echinodermata). Including every necessary information on invertebrates, geographical distribution of them, nomenclature, classification, morphology and their life cycle. .
<b>12. Student's obligation</b>  The student's attendance the class, exams and seminars and other activity like collecting samples .
<b>13. Forms of teaching</b>  Several type of teaching will be used: <ol style="list-style-type: none"><li>1. Giving an abstract of the former lab lecture with daily/weekly quizzes.</li><li>2. Teacher notes including all information on the studied invertebrate and also labelled morphological and life cycle line diagrams on the board.</li><li>3. Power point lectures to:<ol style="list-style-type: none"><li>a. Acquiring information on invertebrates morphology and structure...</li><li>b. To get best knowledge on the invertebrate life cycle and their habitat.</li></ol></li><li>4. Classroom discussion will done about the studied invertebrate including structure, morphology, habitat, life cycle, information about the methods of invertebrate diagnosis.</li></ol>
<b>14. Assessment scheme</b> I assessments the student through attendance in the class, course exams, quizzes and seminars or presentation the subjects that have relations with the invertebrate.
<b>15. Student learning outcome:</b> This course is designed to provide students with a basic understanding of biology, evolution, morphology, anatomy and physiology of the more common invertebrate phyla. The taxonomy, distribution, diversityand economical, medical and ecological importance of invertebrates will be presented. After finishing the course students will be able to explain the main principles of the body plan of each major taxon of invertebrates and to explain importance of invertebrates animals.
<b>16. Course Reading List and References:</b>

<p>To prepare the subjects I using Laboratory Studies in Integrated Principles of Zoology, Text Book of invertebrate Practical Animal Biology .....etc.,journals about the subjects by using internet websites.</p> <p>i</p>	
<b>17. The Topics:</b>	<b>Lecturer's name</b>
<ul style="list-style-type: none"> <li>-introduction to the invetebrate phylum :protozoa .</li> <li>-super class:opalinata, ciliophora and sporozoa.</li> <li>-phylum porifera</li> <li>- Phylum: Cnidaria (Coelentrata).</li> <li>- Phylum : Nemathelminthes</li> <li>- Phylum: Annelida (segmented worm ).</li> <li>- Phylum:Mollusca</li> <li>- class: Lamellibranchiata</li> <li>- Phylum: Arthropoda</li> <li>-Sub phylum: Chelicerata</li> <li>-Phylum: Echinodermata</li> <li><i>-Practical methods in invertebrate</i></li> </ul>	<p><b>Dr. Fenik Sherzad Husein</b></p> <p>(2 hrs) for each class (2*6) 12 2nd stage</p>
<b>18. Practical Topics (If there is any)</b>	
<ul style="list-style-type: none"> <li>-Preparing slid for searching invertebrate</li> <li>-identification of land invertebrate and fresh water invertebrate.</li> <li>-using scientific key for classification of invertebrate.</li> </ul>	<p><b>Dr. Fenik S.Husein</b></p> <p>(2 hrs) for each class</p> <p>2nd stage</p>
<p><b>19. Examinations:</b></p> <p>For the exam uses move system, and include different questions as true and false, blanks, define, describe and identify the slides and parasite specimens.</p>	
<p><b>20. Extra notes:</b></p> <p>This subjects need field trips to see some fresh water and land sample and learning identification of the invertebrate and fine the new record of invertebrate especially in our city.</p>	
<p><b>21. Peer review</b></p> <p>This course book has to be reviewed and signed by: <b>Assr.Prof.Dr. SHERWAN T. AHMAD</b></p>	

