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**Department of plant protection**

**College of Agriculture**

**University of Salahaddin**

**Subject:Insect Taxonomy**

**Course Book (Year 2)**

**Lecturer's name: Nabeel AbdulKhader Mawlood PhD**

**Lecturer's name Hozan Qadir Hamamurad, MSc Lecturer's name GazangTaher Omar, MSc**

**Academic Year: 2018/2019**

**Course Book**

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| **1. Course name** | **Insect Taxonomy** | |
| **2. Lecturer in charge** | **Nabeel Abdulqadir Mawlood**  **Hozan Qadir Hammamurad**  **GazangTaher Omar** | |
| **3. Department/ College** | **plant protection/ Agriculture** | |
| **4. Contact** | **e-mail:nabeel.mawlood@su.edu.Krd**  **Tel: (optional): 07503706215**  **e-mail:**[**hozan.hamamurad@su.edu.krd**](mailto:hozan.hamamurad@su.edu.krd)  **Tel: (optional) 0750 4824927**  **e-mail:**[**gazang.omar@su.edu.krd**](mailto:gazang.omar@su.edu.krd)  **Tel: (optional) 0750 4546799** | |
| **5. Time (in hours) per week** | **For example Theory: 2**  **Practical: 3** | |
| **6. Office hours** | **Availability of the lecturer to the student during the week** | |
| **7. Course code** |  | |
| **8. Teacher's academic profile** | * Date of Birth: 2 / 5 / 1957 * Sex: Male * Nationality: Iraqi * Marital Status: Married   Address:Rasti Q. -Erbil –Kurdistan Region-Iraq  Telephone :07705042177  E-mail: Nabeel\_akm57@yahoo.com  : : nabeel.mawlood.@su.edu.krd  Certifications :   * B.SC :College of Agriculture ,Mosul University/ Iraq (1980) . * M.Sc. : College of Agriculture ,Baghdad University /Iraq (1985)   Taxonomic study of the beetles Family Dermestidae ( Insecta : Coleoptera ) in Baghdad University Iraq(1985) .   * PhD. : College of Agriculture ,Baghdad University/Iraq(2001)   Taxonomic study of the blowflies ( Diptera : Calliphoridae) in middle of Iraq . / Baghdad University (2001).  General Specialty : Agriculture –Plant Protection  Specialty : Entomology ( Insects Taxonomy ) Job Title Professor in Department of Plant protection / College of Agriculture / Salahaddin University Scientific Titles  |  |  | | --- | --- | | Title | Date | | Assistant Lecturer | 1986 | | Lecturer | 1990 | | Assistant Professor | 1994 | | Professor | 2002 |   Description of Main Duties & Responsibilities:   * Head of Community Health Department / Technical Institute - Baquba / Diyala / 1997 * Head of Biology Sciences Dept. / College of Education - University of Diyala /2005 * Chairman of the Scientific Promotion Committee in College of Science/ Diyala University / 2004 – 2007 * Member of the Central Committee of Promotions - University of Diyala , 2003 - 2005 * Secretary Editor of Diyala Journal - College of Education, University of Diyala, 2005-2006 * Editor of Diyala journal - Colleg of Education / University of Diyala / 2006 -2007 * Editor of the Al- Yarmouk University Journal / University of Diyala / 2006 -2007 * Member of the examination Committee for Graduate Studies - College of Agriculture - University of Salahaddin 2008 -2009 * Member of scientific Committee in the College ofAgriculture, University of Salahaddin / 2009 -2019 * Member of scientific committee in the Department of Plant Protection ,College of Agriculture, University of Salahaddin / 2009 -2019 * Chairman of the Quality Assurance Committee in the College of Agriculture -Salahaddin University / 2009 – 2010 * Member of the Joint Committee of Higher Education (Board) - University of Dohuk College of Agriculture from 2010 to 2011 * Member of the Quality AssuranceCommittee in the plant protection department of College of Agriculture - Salahaddin University / 2010 - 2011   MEMBERSHIP OF PROFESSIONAL ASSOCIATION:   * Member of the Syndicate of Agricultural Engineers / Baghdad -1980 * Member of the Association of Agricultural Engineers of Baghdad , 1980 * Member of the Association of Agricultural Engineers of Erbil , 2008 * Member of Teachers Syndicate / Erbil -1986   Number of published researches : More than ( 70 )  Numberof MSc and PHD students : ( 25 )   * Date of Birth: 12 / 6 / 1985 * Sex: Female * Nationality: Iraqi * Marital Status: Single   Address: Salahaddin- Erbil- Kurdistan Region- Iraq.  Phone number: 00964 750 482 4927  E-mail: hozanKadir @yahoo.com;  hozan.hamamurad@su.edu.krd    Certifications :  B.SC : College of Agriculture , Plant Protection Department Salahaddin University/ Erbil/ Iraq   * 2004- 2008 .   M.Sc. : College of Agriculture, Plant Protection Department , Salahaddin University/ Erbil/ Iraq   * 2014.   Taxonomic study of leaf beetles (Coleoptera: Chrysomelidae) in some Localities of Kurdistan Region-Iraq.    General Specialty : Agriculture –Plant Protection Department  Specialty : Entomology (Plant Protection) ;  Insects Taxonomy . Job Title Lecturer in Department of Plant protection / College of Agriculture / Salahaddin University Scientific Titles  |  |  | | --- | --- | | Title | Date | | Assistant Lecturer | 2014 | | Lecturer | 2018 |   Number of published researches : ( 9 )  Lecturer name: **GazangTaher Omar** , born 1982 , BSc degree in plant protection 2001-2005, 3th -10 had started working as an academic staff (teaching assistant) in 25-10-2005 in the college of Agriculture / plant protection department Salahaddin university, taking post graduate courses for 2 year in college of agriculture plant protection department in Salahaddin university getting MSc. Degree In Entomomlogy (plant protection) working as an assistant lecture also member in agriculture engineering syndicate in Hawler, taking a course on teaching method in 2011,The same University ( Salahaddin).Now PhD student in practical stage.  Giving a pre graduating course of insect taxonomy to students in 2nd class  Working in one researches   1. A New species of comb-clawed beetle *Cteniopus*Solier, 1835 (Coleoptera: Alleculiidae) from Erbil Governorate Kurdistan Region-Iraq.   Description of dark beetle, OpatroidespunctulatusBrullé, 1832 (Coleoptera: Tenebrionidae: Opatrinae) from Iraq , Erbil province. | |
| **9. Keywords** | **Morphology , character , orders , differences, Anatomy** | |
| 10. Course overview:  This course is an exploratory, first course in insect identification, recognition and naming  designed primarily for students in biological sciences. However, it also meets the need of  students in other fields such as crop protection and soil sciences. It provides information history of insect evolutions, systems involved in naming insects, identification and classification of different insects as well as collection and preservation of such insects. It involves practical periods aimed at exposing the students to different species of insect to enable them identifies them to families level. Topics to be covered include insect systematic and evolution, successes of insects, use of identication keys, methods of collection and preservation of insects.Insect classification, and thereby entomological nomenclature and more particularly insect scientific names have undergone many reorganisations and modifications over the last decades. The general public is not familiar with scientific nomenclature, whether zoological or botanical. Moreover, their notion of what a species is or represents is quite vague. o name an animal or a plant species, people generally use the words « a kind of », a sort of », « a variety », « a race ».  Such approximate and therefore imprecise language highlights how difficult it is for the public to name or apprehend some “thing”, whether animal or plant, that more or less looks like some “thing” else. For scientists, the word “species” has a well-defined meaning: it is the basic unit (also called taxon) of systematic classification. Although the concept of “species” is currently interpreted in different ways by the scientific community, its main feature is inter-fecundity, i.e. the capacity for individuals belonging to a same population to interbreed and give birth to viable, fecund offspring in natural conditions. | | |
| **11. Course objective:**  The goal of this course is to provide you with a sound theoretical and practical  understanding of both insect diversity and the practice of classifying organisms. Lectures  discuss the general principles of systematics, history of insect classification, construction  and use of identification tools, nomenclature, and biology and evolutionary history of the  hexapod orders. We also explore why competing classifications exist in taxonomy, and  what existing classifications imply about broad patterns of evolutionary change and  diversification within insects. Laboratory work focuses on the means of recognition of  the major groups of insects (order and family); in-class exercises illustrate concepts  discussed in lecture. A collection is required that will further refine your ability to  identify insects to the level of order, family and in many cases species. Accumulating the  required numbers of taxa will be possible only by employing a variety of collecting  techniques. Building an insect collection, with correctly identified and curated specimens  is an excellent way to learn, understand and employ the methods used by professionals to  classify not only insects, but living organisms in general.  The main objectives of this course are to:  introduce students to collection, identification and naming of different insect species  provide students with opportunities to prepare insect boxes and identify all the insects  collected to family level and also preserve some of the insects collected for future use. | | |
| **12. Student's obligation**  In this part the role of students is as follow :  Student Attendance in lecture and examination , preparing reports about some important course subjects , writing an assignment on any field visiting , doing daily quiz , giving samples | | |
| **13. Forms of teaching**  Teaching methods are , using data show ways , power point , white board , giving hand note | | |
| **14. Assessment scheme**  Breakdown of overall assessment and examination  25 marks for theoretical part  The marks is divided as follow :  10 marks for 1st monthly exam and 10 marks for 2nd, 1st exam : / 3/ 2019;2nd /4/2019  2 marks for daily quiz  2 for reports  1for class conversation  Final examination 20 practical part , 40 for theoretical par  Breakdown of overall assessment and examination  20 marks for practical part  The marks is divided as follow :  10 marks for 1st monthly exam.  3 marks for daily quiz  5 for sample collecting  2 for reports | | |
| **15. Student learning outcome:**  Upon successful completion of this course, the student will be able to:  (Knowledge based)  explain what insect systematic is all about;  classify insects into different families based on similarities and differences that exist  among them;  explain the function of the identification key;  explain the different techniques used in insect collection and how these insects can be  preserved;  know the different features peculiar to each insect family.  (Skills)  prepare good insect box which will include the names and families of all insect collected  and  preserve some insects collected in specimen bottles using appropriate chemicals  Upon completion of this course you will be able to:  - Sight identify all hexapods to order and the majority of common insects to family  - Describe key innovations in life history, growth, development and behavior for each  insect order.  - Draw a phylogenetic tree depicting the relationships among hexapod orders  - Collect insects and record field data in any habitat using a variety of different  methods, and list the strengths and weaknesses of each technique  - Preserve insects by pinning, point mounting, slide mounting and preservation in  ethanol.  - Prepare specimens for deposition into a museum collection, including labeling,  packing and shipping.  - Describe the taxonomic process: how species are described, named and classified.  - Explain the importance of insects to global biodiversity and conservation.  Due to our given topic to students they will learn how to describe external , internal and classifying insects and recognized all body parts. This course is a general introduction to entomology with an emphasis on insect diversity. We will provide an evolutionary perspective on the basic taxonomy, habits, morphology, habitats, and life history strategies of insects. Students will be expected to attain some fluency in the language of entomology, showing an understanding of basic insect structure and the overall diversity of the Insect. They will learn to extrapolate from general patterns of life history and behaviour to specific predictions about the biology of most of the animals encountered in terrestrial and freshwater environments. The laboratories will work synergistically with the lectures to reinforce recognition of large and important taxa (orders, families) and to identify other taxa using dichotomous keys. In both the lecture and the laboratory the emphasis will be on the attainment of practical skills needed by teachers, naturalists, and field biologists in a variety of related disciplines. This handbook provide information on exactly what excepted learning outcomes and what methods can be used to assess them. | | |
| **16. Course Reading List and References‌:**  ▪https://insects.tamu.edu/students/undergrad/ento305/index.html;  **▪**Snodgrass, R. E. (December 1993). Principles of Insect Morphology. Cornell Univ Press. [*ISBN*](https://en.wikipedia.org/wiki/International_Standard_Book_Number) [*0-8014-8125-2*](https://en.wikipedia.org/wiki/Special:BookSources/0-8014-8125-2).  **▪**Gordh, G. & Headrick, D. (2001).  A Dictionary of Entomology. CABI Publishing, New York.  **▪** [Copyright © 1997-2015 Amateur Entomologists' Society](http://www.amentsoc.org/help/copyright.html)  - John, R.M.(2016). General Entomology. Disclaimer, 1-3p.  - Hoell, H.V.; Doyen, J.T. and Purcell, A.H. (1998). Introduction to insect Biology and Diversity, Ox. Uni., 2nd ed. 320pp.  **-**www.earthlife.net/search.html | | |
| **17. The Topics:** | | **Lecturer's name** |
| Subject Weeks  Taxonomy , its history and function 1  St  Principal kingdom of living organs ,characteristics  and its Phylum , Phylum Arthropoda , Taxonomic  key of Classes  2  nd  The species , Subspecies , and higher  categories ,Taxonomic characters  3  rd  Taxonomic procedure methods of insect collection  , Kind of Types  4  th  Steps of identification , Classification ,  Nomenclature and identification of insects and  their relatives  5  th  Taxonomic discrimination major types of  variation , The international rules of zoological  nomenclature  6  th  Study of insects Order , Subclass : Apterygota,  Order :Collembola , Thysanura , Protura ,  Diplura  7  th  Subclass: Pterygota , Order : Ephemeroptera  ,Orthoptera , Dictyoptera , Phasmida  8  th  Subclass: Order : Odonata , Dermaptera ,  Isoptera  9  th  Order :, Hemiptera , Homoptera10  th  Order : Anoplura , Mallophaga ,  Thysanoptera , Plecoptera  11  th  Order : Neuroptera , Siphonoptera , Mecoptera ,  Zoraptera  12  th  Order : Diptera , Coleoptera , Psocoptera13  th  Order : Lepidoptera , Trichoptera,14  th  Order Embioptera , Hymenoptera, 15  th  College of Prof. Dr. Nabeel AdulKadir Mawlood / Lecturer  College of Agriculture  Department of Plant Protection 2  nd  class  bject : Insect Taxonomy Year : 2015 - 2016  Marks of Spring Semester / 40%  Marks Monthly Examinations No.  101  st  exam / Theoretical 1  10  2  nd  exam / Theoretical 2  3  Daily exam (quiz ) 3  2 Students reports 4  25Total / Theoretical 5  51  st  exam / practical 6  52  nd  exam / practical 7  5daily exams ++Reports  Activity  8  15Total practical 9  40Grand tot  Subject Weeks  Taxonomy , its history and function 1  St  Principal kingdom of living organs ,characteristics  and its Phylum , Phylum Arthropoda , Taxonomic  key of Classes  2  nd  The species , Subspecies , and higher  categories ,Taxonomic characters  3  rd  Taxonomic procedure methods of insect collection  , Kind of Types  4  th  Steps of identification , Classification ,  Nomenclature and identification of insects and  their relatives  5  th  Taxonomic discrimination major types of  variation , The international rules of zoological  nomenclature  6  th  Study of insects Order , Subclass : Apterygota,  Order :Collembola , Thysanura , Protura ,  Diplura  7  th  Subclass: Pterygota , Order : Ephemeroptera  ,Orthoptera , Dictyoptera , Phasmida  8  th  Subclass: Order : Odonata , Dermaptera ,  Isoptera  9  th  Order :, Hemiptera , Homoptera10  th  Order : Anoplura , Mallophaga ,  Thysanoptera , Plecoptera  11  th  Order : Neuroptera , Siphonoptera , Mecoptera ,  Zoraptera  12  th  Order : Diptera , Coleoptera , Psocoptera13  th  Order : Lepidoptera , Trichoptera,14  th  Order Embioptera , Hymenoptera, 15  th  College of Prof. Dr. Nabeel AdulKadir Mawlood / Lecturer  College of Agriculture  Department of Plant Protection 2  nd  class   |  |  | | --- | --- | | Subject | Weeks | | Taxonomy , its history and function | 1St | | kingdom of living organs ,characteristics and its Phylum , Phylum Arthropoda , Taxonomic key of Classes | 2nd | | The species , subspecies , and higher categories ,Taxonomic characters | 3rd | | Taxonomic procedure methods of insect collection , Kind of Types, learning of key. | 4th | | Steps of identification , Classification , Nomenclature and identification of insects and their relatives( Phylum : Arthropoda and classes )  1st exam. | 5th  6th | | Taxonomic discrimination major types of variation , The international rules of zoological nomenclature | 7th | | Classification of Insects; Study of insects Order , Subclass : Apterygota ,Order :Collembola , Thysanura , Protura , Diplura | 8th | | Subclass: Pterygota , Order : Ephemeroptera ,Orthoptera , Dictyoptera , Phasmida | 9th | | Subclass: Order : Odonata , Dermaptera , Isoptera | 10th | | Order :, Hemiptera , Homoptera | 11th  2nd exam | | Order : Anoplura , Mallophaga , Thysanoptera , Plecoptera | 12th | | Order : Neuroptera , Siphonoptera , Mecoptera , Zoraptera | 13th | | Order : Diptera , Coleoptera , Psocoptera | 14th | | Order : Lepidoptera , Trichoptera, | 15th | | Order Embioptera , Hymenoptera , | 16th |   Subject : Insect Taxonomy Year : 2015 - 2016  Marks of Spring Semester / 40%  Marks Monthly Examinations No.  101  st  exam / Theoretical 1  10  2  nd  exam / Theoretical 2  3  Daily exam (quiz ) 3  2 Students reports 4  25Total / Theoretical 5  51  st  exam / practical 6  52  nd  exam / practical 7  5daily exams ++Reports  Activity  8  15Total practical 9  40Grand tot | | Lecturer's name  ex:(2 hrs) |
| **18. Practical Topics (If there is any)** | |  |
| In this course we will given an overview of insect taxonomy  Lecture1: study the classification of living things.  Lecture 2: Study the insect collection and preserving.  Lecture 3: Definitions such as taxonomy, phylum, and each other...  the principles of the classification of insect orders.  Lecture 4 : visit to the field to survey insects.  Lecture 5: study the order orthoptera and scientific classification and characteristics.  Lecture 6: study the pterygota orders.  Lecture 7: 1st practical examination.  Lecture 8: study the order Hemiptera, scientific classification and other orders.  Lecture 9: order Pthiroptera and study the characteristics.  Lecture 10: study the order Coleoptera.  Lecture 11 :study the order Hymenoptera (Wasps, Ants and Bees).  Lecture 12 : visit to the field to survey insects.  Lecture 13: 2nd examination.  Lecture 14: study the order Diptera.  Lecture 15: how to learn key of insect orders.  Lecture 16 :Order Lepidoptera | | Lecturer's name  Hozan Qadir Hamamurad + Gazang Tahir  ex: (9 hrs)  Ex: 5/2/2019 |
| **19. Examinations:**  **1. Multiple choices:**  **Q2 : Choose the correct terms from the brackets of the following sentences .**  **Q 3: Enumerate the following ( Choose only Three ) .**  **Q4:Write the scientific name and the Order of the following .**   |  |  |  | | --- | --- | --- | | **Order** | **Scientific name** | **Common name** | |  |  |  | |  |  |  | |  |  |  | |  |  |  | |  |  |  |   **Q5 : Formulate an appropriate taxonomic key for the identified the following :-**  **Orders of ClassInsecta .**  **Q6: Explain**  **Prof. Dr .NabeelA.Mawlood**  **Examinations:**  **Question sample:**   1. Scientific classified of this order. 2. Write the parts that point. 3. Write the function of this parts. 4. Defined between this suborder. 5. What is the parts and give the examples. 6. Fell the blank.     **2. True or false type of exams:**  **3. Multiple choices:** | | |
| **20. Extra notes:** | | |
| **21. Peer reviewپێداچوونه‌وه‌ی هاوه‌ڵ**  .‌‌ | | |

College of Agriculture –Subject :Insect Taxonomy

Department of Plant Protection 2ndclassInsect Year : 2018 - 2019

2018 -2019 2ndSemester

References

1. Borrer , D.J and Delong , D. ( 1954 ) . An Introduction to the study of insects .Holt , Rinehart andWinston New york.

Chinery , M. ( 1982 ) . A Field guide to the Insect of Britain and Northern Europe . William Collins Sons

and Co. Ltd Glasgow .

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Methuen and Co. LTD London .

Mayer , E. (1969 ) . Priciples of SystemsticsZoology . Tata

McGraw – Hill Publishing Company LTD.

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Ross , H.H. ( 1948 ) . A Textbook of Entomology . John Wiley and Sons , Inc. New York .

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J:\The History of Taxonomy eHow\_com.htm

J:\Systematics , taxonomy, classification.htm

J:\ Phylum Arthropoda mm.htm

J:\ ArthropodaCharacteristics Tutorvista\_com.htm

I:\A Guide To arthropoda.htm

I:\Principles of systamatics.mht

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