



# Course Specifications

|                      |  |
|----------------------|--|
| <b>Course Title:</b> | <b>Economic and Medical Arthropods</b> |
| <b>Course Code:</b>  | <b>423BIO-3</b>                        |
| <b>Program:</b>      | <b>Biology</b>                         |
| <b>Department:</b>   | <b>Biology</b>                         |
| <b>College:</b>      | <b>College of Arts and Sciences</b>    |
| <b>Institution:</b>  | <b>Najran University</b>               |

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## A. Course Identification

|  |
|--|
| <b>1. Credit hours:</b> 3  |
| <b>2. Course type</b>  |
| a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/> |
| b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>  |
| <b>3. Level/year at which this course is offered:</b> II/ 1 <sup>st</sup> year   |
| <b>4. Pre-requisites for this course (if any):</b> 324BIO-3  |
| <b>5. Co-requisites for this course (if any):</b> non  |

### 6. Mode of Instruction (mark all that apply)

| No | Mode of Instruction   | Contact Hours | Percentage |
|----|-----------------------|---------------|------------|
| 1  | Traditional classroom | 45            | 100%       |
| 2  | Blended               | -             |            |
| 3  | E-learning            | -             |            |
| 4  | Correspondence        | -             |            |
| 5  | Other                 |               |            |

### 7. Actual Learning Hours (based on academic semester)

| No                           | Activity                        | Learning Hours |
|------------------------------|---------------------------------|----------------|
| <b>Contact Hours</b>         |                                 |                |
| 1                            | Lecture                         | 45             |
| 2                            | Laboratory/Studio               | -              |
| 3                            | Tutorial                        | -              |
| 4                            | Others (specify) E-learning     | -              |
|                              | <b>Total</b>                    | 45             |
| <b>Other Learning Hours*</b> |                                 |                |
| 1                            | Study                           | 27             |
| 2                            | Assignments                     | 3              |
| 3                            | Library                         | 5              |
| 4                            | Projects/Research Essays/Theses | 5              |
| 5                            | Others (specify): Office hours  | 10             |
|                              | <b>Total</b>                    | 50             |

\* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

## B. Course Objectives and Learning Outcomes

### 1. Course Description

This course is designed to introduce students to the concepts of agricultural and medical entomology and pest management emphasizing theory and practice of pest population management; economic threshold; current research; population modeling; sampling techniques; data analysis; ecological bases for control; control by host resistance and by biological, genetic, physical, behavioral, cultural, and chemical means; integrated systems of pest management.

### 2. Course Main Objective

1. Recognize prominent beneficial and harmful species of the most important arthropod pests injuring fruits, vegetables and crops.
2. Identify types of insecticides and problem associated with their use.
3. Recognize the importance of insect pests as vector transmitters for pathogens and their life cycles
4. Understand the interactions between pest and host plant.
5. Understand the ecological and economic importance insects.
6. Apply specific monitoring programs for sampling, forecasting and management arthropod pests.

### 3. Course Learning Outcomes

| CLOs     |   | Aligned PLOs |
|----------|---|--------------|
| <b>1</b> | <b>Knowledge:</b>   |              |
| 1.1      | Recognize prominent beneficial and harmful species of the most important arthropod pests injuring fruits, vegetables and crops. |              |
| 1.2      | Identify types of insecticides and problem associated with their use.   |              |
| 1.3      | Know the importance of insect pests as vector transmitters for pathogens and their life cycles                                  |              |
| <b>2</b> | <b>Skills :</b>   |              |
| 2.1      | Describe the interactions between pest and host plant.  |              |
| 2.2      | Apply specific monitoring programs for sampling and forecasting the arthropod pests.  |              |
| 2.3      | Explain the ecological and economic importance insects  |              |
| <b>3</b> | <b>Competence:</b>  |              |
| 3.1      | Work independently and as a team work   |              |
| 3.2      | Manage recourses, time and other members of the group   |              |
| 3.3      | Communicate results of work with others   |              |

## C. Course Content:Theoretical Aspect

| No | List of Topics  | Contact Hours |
|----|---|---------------|
| 1  | Welcoming the students and discussion the teaching and marking strategies during the launching this course objectives Introduction and historical view of Medical Entomology. | 3             |
| 2  | Economic insects:<br>1-Commercial products derived from useful insects<br>2-Insect predators and parasites  | 3             |
| 3  | Insects as: pollinizers, soil builders, subjects for scientific study, food of man and animals, and as scavengers.  | 3             |

|              |  |           |
|--------------|--|-----------|
| 4            | Pests attacking stored grains and their products and vegetables & management.  | 3         |
| 5            | <b>Medical insects:</b><br><b>How insects affect human and animal health?</b><br>1-Insects(Arthropods) as direct causative agents of a disease condition,<br>2- Insects (Arthropods) as vectors of diseases  | 6         |
| 6            | Epidemiology of vector-transmitted (borne) diseases(VTD's)<br>What is epidemiology?<br>What does an epidemiologist need to know?<br>Components of transmission cycles<br>Classification of VTD's<br>According to the involved organisms<br>According to methods (modes) of transmission (vertical, horizontal)   | 6         |
| 7            | Mechanisms or routes of man infection<br>Characteristics of the involved organisms and factors governing the transmission of VTD's<br>Vectors<br>Arthropod-transmitted pathogens<br>Vertebrate hosts, including reservoirs<br>Human habits and disease prevalence<br>Environmental factors<br>How to identify a disease as an arthropod- borne one?  | 6         |
| 8            | <b>1. Insect groups of medical and veterinary importance:</b><br>Cockroaches (Order Blattodea), bed bugs and winged bugs (Order Hemiptera). Systematic; general characteristics; life cycle; habits; blood feeding behavior and blood feeding patterns; mating and oviposition behavior and medical and veterinary Importance of these insect groups will be detailed, Life cycle of pathogen/parasite within insect vectors and vertebrate hosts will be studied as well. | 6         |
| 9            | Biting and chewing lice (Order Phthiraptera), fleas (Order Siphonaptera), Systematic; general characteristics; life cycle; habits; blood feeding behavior and blood feeding patterns; mating and oviposition behavior and medical and veterinary Importance of these insect groups will be detailed, Life cycle of pathogen/parasite within insect vectors and vertebrate hosts will be studied as well.   | 3         |
| 10           | Gnats and flies (Order Diptera). Systematic; general characteristics; life cycle; habits; blood feeding behavior and blood feeding patterns; mating and oviposition behavior and medical and veterinary Importance of these insect groups will be detailed, Life cycle of pathogen/parasite within insect vectors and vertebrate hosts will be studied as well. Use of insects in Forensic science   | 3         |
| 11           | Insect management approaches   | 3         |
| <b>Total</b> |  | <b>45</b> |

## D. Teaching and Assessment

### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

| Code | Course Learning Outcomes  | Teaching Strategies  | Assessment Methods       |
|------|---|----------------------|--------------------------|
| 1.0  | <b>Knowledge:</b>   |                      |                          |
| 1.1  | Recognize prominent beneficial and harmful species of the most important arthropod pests injuring fruits, vegetables and crops. | Lectures             | Final and semester exams |
| 1.2  | Identify types of insecticides and problem associated with their use.   | Lectures             | Final and semester exams |
| 1.3  | Recognize the importance of insect pests as vector transmitters for pathogens and their life cycles                             | Lectures             | Final and semester exams |
| 2.0  | <b>Skills:</b>  |                      |                          |
| 2.1  | Understand the interactions between pest and host plant.  | Student negotiations | Class room activity      |
| 2.2  | Apply specific monitoring programs for sampling and forecasting the arthropod pests.  | Student negotiations | Class room activity      |
| 1.3  | Understand the ecological and economic importance insects   | Student negotiations | Class room activity      |
| 3.0  | <b>Competence:</b>  |                      |                          |
| 3.1  | Work independently and as a team work   | Student negotiations | Class room activity      |
| 3.2  | Manage recourses, time and other members of the group   | Student negotiations | Class room activity      |
| 1.3  | Communicate results of work with others   | Student negotiations | Class room activity      |

### 2. Assessment Tasks for Students

| # | Assessment task*            | Week Due   | Percentage of Total Assessment Score |
|---|-----------------------------|------------|--------------------------------------|
| 1 | Theoretical First Exam      | 6          | 20                                   |
| 2 | Theoretical Second Exam     | 11         | 20                                   |
| 3 | Assays , oral presentations | continuous | 10                                   |
|   | Theoretical Final Exam      | 14         | 50                                   |

\*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

## E. Student Academic Counseling and Support

**Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :**

- 10 hours per week as office hours
- Academic advisor 10 hours per week

## F. Learning Resources and Facilities

### 1. Learning Resources

|                                       |  |
|---------------------------------------|--|
| <b>Required Textbooks</b>             | <ul style="list-style-type: none"> <li>- The economic importance of insects. Dennis S. Hill, Chapman &amp; Hall, London, 1997.</li> <li>- The Biology of Blood-Sucking in Insects by M. J. Lehane (Jul 11, 2005).</li> </ul>   |
| <b>Essential References Materials</b> | <ul style="list-style-type: none"> <li>- Larry P. Pedigo and Marlin E. Rice 2006 Entomology and pest management person Edu. publisher pp749.</li> <li>- Mary Louise Flint and Patricia Gouveia 2001 IPM in practice: Principles and Methods of Integrated Pest Management pp296</li> </ul> |
| <b>Electronic Materials</b>           | Websites   |
| <b>Other Learning Materials</b>       | Films, videos related to the course  |

### 2. Facilities Required

| Item   | Resources   |
|--|---|
| <b>Accommodation</b><br>(Classrooms, laboratories, demonstration rooms/labs, etc.)   | Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)<br>40 seats/ class room<br>Computer access with data show and internet |
| <b>Technology Resources</b><br>(AV, data show, Smart Board, software,  | Data show, Overhead projector   |
| <b>Other Resources</b><br>(Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list) | Models  |

## G. Course Quality Evaluation

| Evaluation Areas/Issues                                       | Evaluators               | Evaluation Methods |
|---|--------------------------|--------------------|
| Course evaluation   | Student                  | direct             |
| Student-faculty meeting                                       | Faculty, Program Leaders | indirect           |
| Departmental council discussions                              | Staff members            | indirect           |
| Discussion with the group of faculty teaching the same course | Peer Reviewer            | indirect           |
| Periodical departmental revisions of each method of teaching  | Peer Reviewer            | indirect           |

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

|                            |  |
|----------------------------|--|
| <b>Council / Committee</b> |  |
| <b>Reference No.</b>       |  |
| <b>Date</b>                |  |