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| --- | --- | --- |
| EXC-01-02-02A | **Form Number** | **Form:****Course Syllabus** |
| 2963/2022/24/3/2 5/12/2022 | **Issue Number and Date** |
| 2/(10/12/2023) | **Number and Date of Revision or Modification** |
| 50/2023 | **Deans Council Approval Decision Number** |
| 26/12/2023 | **The Date of the Deans Council Approval Decision** |
| 06 | **Number of Pages** |

|  |  |  |
| --- | --- | --- |
| **1.** | **Course Title** | **Beekeeping**  |
| **2.** | **Course Number** | **(0606242)** |
| **3.** | **Credit Hours (Theory, Practical)** | 3 |
| **Contact Hours (Theory, Practical)** | 3 |
| **4.** | **Prerequisites/ Corequisites** | **606212** |
| **5.** | **Program Title** | BSc in Plant Protection |
| **6.** | **Program Code** |  |
| **7.** | **School/ Center** | The University of Jordan |
| **8.** | **Department** | Agriculture |
| **9.** | **Course Level**  | Plant Protection |
| **10.** | **Year of Study and Semester (s)** | BACHLER |
| **11.** | **Other Department(s) Involved in Teaching the Course** | / |
| **12.** | **Main Learning Language** | English |
| **13.** | **Learning Types** | ☐Face to face learning ☐Blended [x]  Fully online |
| **14.** | **Online Platforms(s)** | [x]  Moodle [x]  Microsoft Teams |
| **15.** | **Issuing Date** |  |
| **16.** | **Revision Date** |  |

**17. Course Coordinator:**

|  |
| --- |
| Name: Prof. Salah Araj Contact hours:Office number: Phone number: +962 6 5355000 Ext. 22520Email: s.alaraj@ju.edu.jo |

**18. Other Instructors:**

|  |
| --- |
| Name: Office number:Phone number:Email:Contact hours:Name: Office number:Phone number:Email:Contact hours: |

**19. Course Description:**

|  |
| --- |
| This course covers Beekeeping past and present. Honeybees relatives and social life. Honeybees colony, casts, morphology, anatomy. Intra and extra colony activities and communication. Colony nutrition, diseases and pests. Hive products. Beekeeping equipments. Manipulation during the different seasons of the year. |

**20. Program Intended Learning Outcomes:** (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1. Demonstrate a depth in understanding of the fundamental knowledge and skills required in the field of Plant Protection sciences, which include weeds, insects, mites, fungi, bacteria, viruses and nematodes. |  |  |  |  |  |  |  |  |  |  |  |  |
| 2. Identify and distinguish harmful and beneficial weeds, insects, mites, fungi, bacteria, and nematodes. |  |  |  |  |  |  |  |  |  |  |  |  |
| 3. Predict the outbreaks of pests and determine the level of infection based on skills gained in the field of Plant Protection Sciences. |  |  |  |  |  |  |  |  |  |  |  |  |
| 4. Recognize different techniques (biological, chemical, cultural, and physical) in pest control.  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5. Design and develop appropriate management strategies of pests in an environmentally friendly manner.  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6. Participate efficiently in agricultural projects in the field of pest management in various public and private sectors in Jordan and worldwide. |  |  |  |  |  |  |  |  |  |  |  |  |
| 7. Communicate effectively in written, oral, and graphical forms.  |  |  |  |  |  |  |  |  |  |  |  |  |
| 8. Employ the gained skills in communication and serving different communities. |  |  |  |  |  |  |  |  |  |  |  |  |
| 9. Commit to ethics and compliance responsibilities for being an agricultural engineer, especially with regard to agricultural sector, environment and society.  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |

**21. Course Intended Learning Outcomes:** (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

1. Stimulate the interest in the biology and behaviour of honeybees.
2. Demonstrate the importance of honeybees in agriculture and its utilization.
3. Introduce beekeeping as an economic and recreational resource.
4. Learn to manipulate bee colonies properly.
5. Learn the bees and pollination

**22. The matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Program ILOs | ILO (1) | ILO (2) | ILO (3) | ILO (4) | ILO (5) |
| Course ILOs |
| 1 | √ |  |  |  |  |
| 2 | √ |  |  |  |  |
| 3 | √ |  |  |  |  |
| 4 |  |  |  | √ |  |
| 5 |  | √ |  |  |  |
| 6 |  |  |  |  | √ |
| 7 |  | √ |  |  |  |
| 8 |  |  |  |  | √ |
| 9 |  |  | √ |  |  |

**23. Topic Outline and Schedule:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Week** | **Lecture** | **Topic** | **ILO/s Linked to the Topic** | **Learning Types****(Face to Face/ Blended/ Fully Online)** | **Platform Used** | **Synchronous / Asynchronous Lecturing** | **Evaluation Methods** | **Learning Resources** |
| 1 | 1.1 | Introduction to course content. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 1.2 | The world of beekeeping: Past. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 1.3 | The world of beekeeping: Present. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 2 | 2.1 | Honey bees of the world. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 2.2 | Honey bees of the world. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 2.3 | The honey bee colony: Life History. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 3 | 3.1 | The honeybee colony: The nest. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 3.2 | Life cycle of the Q, D, W |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 3.3 | Activities and behavior of honey bees. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 4 | 4.1 | Internal and external factors. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 4.2 | Communication: The dance..  |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 4.3 | Intra-colony activities. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 5 | 5.1 | Intra-colony activities. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 5.2 |  Extra-colony activities. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 5.3 |  Manipulation of bees |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 6 | 6.1 |  Manipulation of bees |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 6.2 |  Honey bee plants |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 6.3 |  Honey bee plants |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 7 | 7.1 | Pollination and bees. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 9,17 |
| 7.2 | Pollination and bees. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 9,17 |
| 7.3 | Hive products. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 8 | 8.1 | Hive products. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 8.2 |  Honey. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 8.3 | Honey. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 9 | 9.1 | Hive products: Wax, Pollen. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 9.2 | Hive products: Wax, Pollen. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 9.3 |  Royal jelly, Propolis etc. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 10 | 10.1 |  Royal jelly, Propolis etc. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 10.2 | Honey bee insect pests. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 10.3 | Honey bee insect pests. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 11 | 11.1 | Honey bee Arthropodal pests. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 11.2 | Honey bee Arthropodal pests. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 14,5 |
| 11.3 | Birds, pesticides and poisonous plants. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 12 | 12.1 | Birds, pesticides and poisonous plants. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 12.2 |  Adult diseases. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 14,5 |
| 12.3 |  Adult diseases |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 14,5 |
| 13 | 13.1 | Brood diseases. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 14,5 |
| 13.2 | Bee venom. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15, 16 |
| 13.3 | Africanized honey bees. |  | Fully Online | MS Teams | Synchronous | Homework, Quiz, Presentations | 1 |

**24. Evaluation Methods:**

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Evaluation Activity** | **Mark** | **Topic(s)** | **ILO/s Linked to the Evaluation activity** | **Period (Week)** | **Platform** |
| First midterm exam | 35 |  According to lecturing schedule | 1 to 5 | To be agreed upon | Face to Face |
| Lab midterm exam | 15 |  According to lecturing schedule | 1 to 5 | To be agreed upon | Face to Face |
| Lab final exam | 15 |  According to lecturing schedule | 1 to 5 | To be agreed upon |  MS Teams |
| Final Exam  | 35 |  According to lecturing schedule | 1 to 5 | To be agreed upon | Face to Face |

**25. Course Requirements:**

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| Students should have a computer, internet connection, webcam, account on a specific software/platform MS Teams) |

**26. Course Policies:**

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| --- |
| A- Attendance policies:B- Absences from exams and submitting assignments on time:C- Health and safety procedures:D- Honesty policy regarding cheating, plagiarism, misbehavior:E- Grading policy:F- Available university services that support achievement in the course: |

**27. References:**

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| --- |
| A- Required book(s), assigned reading and audio-visuals:B- Recommended books, materials, and media:1. Apimondia, 2014, Proceeding of the first apimondia symposium on African bees and beekeeping. Arasha, Tanzania, 2014
2. Apimondia, 2014, Proceeding of the 5th Apimondia Apimedica and Apimondia Apiquality, Erzuram, Turkey 2014.
3. Anonymous , Apimedica and Apiquality-Second International Forum , Rome, Italy ,June ,2008 .
4. Anonymous, The International Congress of Apiculture. 1999, Vancouver, Canada.
5. Burke, P. W. Bee diseases and Pests of the Apiary. University of Guelph. Canada. Booklet 24 pp. (No date)
6. Crane, E. (ed.) Bees and Beekeeping: Science, Practice and World Resources. 1990. . Heinemann News, U.K
7. Graham, J.M. (ed.). 1992. The Hive and the Honey Bee. Dadant and Sons U.S.A.
8. Greenleaf, S., Williams, N., Winfree, R. and Kremen, C. 2007: Bee foraging ranges and their relationship to body size. Oecolgia, 153, 589 – 596.
9. Klein, A. M., Vaissiere, B., Cane, J. H., Steffan-Dewenter, I., Cunninhan, S. A., etal 2007: Importance of crop pollinators in changing landscapes for world crops. Proceedings of the Royal Society of London: series B. Biological sciences, 247, 303 – 313.
10. Krell, R. 1996. Value- Added Products From Beekeeping. FAO Agriculture

Services Bulletin No. 124. 1. O’toole, C. and Raw, A. 1991. Bees of the World. Blandford Puplishing, U.K.

12. Articles from the following journals: A. Journal of Apicultural Research. B. American Bee Journal. C. Bee World D. Journal of Apicultural abstracts. E. Others. F. WebsitesG. Proceeding of Congresses. المراجع العربية:1. ابو شاور ،أحمد -2003

 موسوعة تربية نحل العسل – دار اسامة للنشر والتوزيع عمان –الاردن .1. الانصاري ،اسامة محمد نجيب 2007

 الجديد في امراض و أعداء نحل العسل – منشأ ة المعارف /الاسكندرية ج. م.ع.1. الصايغ ، مزاحم أيوب ومصطفى عبد الرحيم عمر -2003

 المدخل الى تربية النحل –منظمة الاغذية والزراعة التابعة للامم المتحدة.1. حداد، نزار جمال -2009

نحل العسل المعجزة- الدار العربية للعلوم ناشرون،ش.م.ل- ابو ظبي – الامارات1. ترجمة: الغامدي, احمد الحازم و العتالو يحيى زكي.

التلقيح بالنحل 2012, منشورات جامعة الملك سعود – الرياض - المملكة العربية السعودية. |

**28. Additional information:**

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| --- | --- | --- |
| Name of the Instructor or the Course Coordinator:………………………………………………… | Signature: …………...……………… | Date: ……..………… |
| Name of the Head of Quality Assurance Committee/ Department…………………………………………………. | Signature: …………...……………… | Date: ……..………… |
| Name of the Head of Department…………………………………………………. | Signature: …………...……………… | Date: ……..………… |
| Name of the Head of Quality Assurance Committee/ School or Center…………………………………………………. | Signature: …………...……………… | Date: ……..………… |
| Name of the Dean or the Director…………………………………………………. | Signature: …………...……………… | Date: ……..………… |