**PLANT PROTECTION MSc PROGRAMME**

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| **First Year** | | | | | | |
| **I. Semester** | | | | | | |
| Code | Course Title | ECTS | T+P | Credit | C/E | Language |
| 501011101 | [THE SCIENTIFIC RESEARCH METHODS AND ITS ETHICS](#d00) | 7.5 | 3+0 | 3 | **C** | Turkish |
| 501801501 | [Sampling and Trial Methods in Plant Protection](#d0) | 7.5 | 2+2 | 3 | **C** | Turkish | |
|  | Elective Course-1 | 7.5 | 3+0 | 3 | E | Turkish |
|  | Elective Course-2 | 7.5 | 3+0 | 3 | E | Turkish |
|  | Total of I. Semester | 30 |  | 12 |  |  |
| **II. Semester** | | | | | | |
| Code | Course Title | ECTS | T+P | Credit | C/E | Language |
|  | Elective Course-3 | 7.5 | 3+0 | 3 | E | Turkish |
|  | Elective Course-4 | 7.5 | 3+0 | 3 | E | Turkish |
|  | Elective Course-5 | 7.5 | 3+0 | 3 | E | Turkish |
| 501802001 | Seminar | 7.5 | 0+1 | - | **C** | Turkish |
|  | Total of II. Semester | 30 |  | 9 |  |  |
|  | TOTAL OF FIRST YEAR | 60 |  | 21 |  |  |

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| **Second Year** | | | | | | | | |
| **III. Semester** | | | | | | | | | |
| Code | Course Title | | ECTS | | T+P | Credit | C/E | Language |
| 501801702 | MSc THESIS STUDY | | 25 | | 0+1 | - | **C** | Turkish |
| 501801703 | SPECIALIZATION FIELD COURSE | | 5 | | 3+0 | - | **C** | Turkish |
|  | | Total of III. Semester | 30 |  | |  |  |  | |
| **IV. Semester** | | | | | | | | | |
| Code | | Course Title | ECTS | T+P | | Credit | C/E | Language | |
| 501801702 | | MSc THESIS STUDY | 25 | 0+1 | | - | **C** | Turkish | |
| 501801703 | | SPECIALIZATION FIELD COURSE | 5 | 3+0 | | - | **C** | Turkish | |
|  | | Total of IV. Semester | 30 |  | |  |  |  | |
|  | | TOTAL OF SECOND YEAR | 60 |  | |  |  |  | |

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| **Elective Courses** | | | | | | |
| Code | Course Title | ECTS | T+P | Credit | C/E | Language |
| 501802505 | [Agricultural nematology](#d1) | 7.5 | 2+2 | 3 | E | Turkish |
| 501802504 | [Basic Laboratory Techniques in Mycology](#d2) | 7.5 | 2+2 | 3 | E | Turkish |
| 501801503 | [Biological Control wiht Plant Diseases](#d3) | 7.5 | 3+0 | 3 | E | Turkish |
| 501802502 | [Collecting insects and collection](#d4) | 7.5 | 2+2 | 3 | E | Turkish |
| 501802501 | [Control of Plant Virus Diseases](#d8) | 7.5 | 3+0 | 3 | E | Turkish |
| 501801505 | [English text analysis and article writing techniques](#d5) | 7.5 | 3+0 | 3 | E | Turkish |
| 501802503 | [Entomopathogenic nematodes](#d6) | 7.5 | 3+0 | 3 | E | Turkish |
| 501801502 | [Epidemiology of Plant Virus Diseases](#d9) | 7.5 | 3+0 | 3 | E | Turkish |
| 501801504 | [Methods for Identification of Plant Virus Diseases](#d10) | 7.5 | 3+0 | 3 | E | Turkish |
| 501801506 | [Mycotoxins](#d7) | 7.5 | 3+0 | 3 | E | Turkish |
| 501801507 | [Principles of nematology](#d11) | 7.5 | 3+0 | 3 | E | Turkish |
| 501802506 | [Soil Borne Fungal Pathogens](#d12) | 7.5 | 2+2 | 3 | E | Turkish |

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| --- | --- | --- | --- |
| **DEPARTMENT** | **PLANT PROTECTION (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 501802505 | **TITLE** | Agricultural nematology |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 2 | | 0 | 2 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( x ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
|  | | 0 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | |  | |  |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 40 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | To have taken the Nematology course in the Department of Plant Protection undergraduate program and/or the equivalent course for students applying from other faculties. | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Using the tools and materials found and required in the nematology laboratory  Preparing some media  Taking, storing and preparing nematode soil and plant samples for analysis  Obtaining nematodes from soil and plant samples  Making temporary and permanent preparations  Diagnosis from samples and preparation | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of this course is to use the tools and materials found in the Nematology laboratory, to take nematode soil and plant samples, to preserve them and to prepare them for analysis; obtaining nematodes from soil and plant samples, making their temporary and temporary preparations; To enable them to comprehend the diagnosis from samples and preparations. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | With this course, students will gain gains about the biology, morphological features, ecology, research methods and new developments in the field of nematodes. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | To know the biology and feeding mechanisms of harmful nematodes in cultured plants  To be able to recognize nematode damage, which can be seen frequently in agricultural areas, macroscopically in the field and microscopically in the laboratory.  To be able to decide on the control methods to be applied against economically important plant parasitic nematodes before or during agricultural production, to prepare reports and prescriptions.  To be able to use the theoretical knowledge at the level of expertise, to be able to decide, to prepare suggestions and reports for the solution of the problems related to harmful nematodes in cultivated plants before or during agricultural production. | | | | | | | |
| **TEXTBOOK** | | | | | Hadidi A, Khetarpal RK, Koganezawa H. 1998. Plant Virus Disease Plant Nematology, Roland N. Perry, Maurice Moens, CABI, 2006- 447 pp | | | | | | | |
| **OTHER REFERENCES** | | | | | Plant Parasitic Nematodes in Subtropical and Tropical Agriculture, 2018. 3rd Edition, Richard A Sikora, Danny Coyne, Johannes Hallmann, Patricia Timper. CABI, 898 sayfa.Other online resources on nematology | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | General Information About Plant Parasitic Nematodes (Morphological Structures, Biology) |
| 2 | General Information About Plant Parasitic Nematodes (Ecological Requirements and Spread) |
| 3 | Methods of Working with Nematodes |
| 4 | Parasitic nematodes in vegetable fields and methods of control against them |
| 5 | Parasitic nematodes in potato and tuberous plants and methods of control against them |
| 6 | Parasitic nematodes in ornamental plants and methods of control against them |
| 7 | Midterm |
| 8 | Parasitic nematodes in wheat and other cereal fields and methods of control against them |
| 9 | Parasitic nematodes in cotton fields and methods of control against them |
| 10 | Parasitic nematodes in vineyards and methods of control against them |
| 11 | Parasitic nematodes in orchards and methods of struggle against them |
| 12 | Parasitic nematodes in strawberry fields and methods of control against them |
| 13 | Parasitic nematodes in citrus plants and methods of control against them |
| 14 | Parasitic nematodes in subtropical plants and methods of control against them |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PLANT PROTECTION MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | To be open to development under the guidance of science and to gain the ability to think analytically. |  |  |  |
| **LO 2** | Gaining the ability to follow and interpret literature by using knowledge and technology effectively in the field of plant protection. |  |  |  |
| **LO 3** | Gaining the ability to think up scientific hypotheses and to use research opportunities effectively. |  |  |  |
| **LO 4** | Gaining the ability to plan a scientific research project, analyse data and interpret findings. |  |  |  |
| **LO 5** | Gaining the ability to convert research results into output by scientific methods and to produce scientific publications. |  |  |  |
| **LO 6** | Gaining the ability to use the information related to the field of expert by combining the information from different disciplines and to transfer this information to different groups. |  |  |  |
| **LO 7** | Gaining the ability to evaluate the environmentally friendly alternatives of the methods used against plant protection problems within the scope of sustainable agriculture. |  |  |  |
| **LO 8** | To be able to carry out a work or project that requires expertise independently and as a team member, to develop new approaches for solving possible problems and to find solutions by taking responsibility. |  |  |  |
| **LO 9** | Gaining the ability to perform a research related to the field within considering scientific ethics. |  |  |  |
| **LO 10** | Gaining the ability to use knowledge about biosecurity and bioethics in the field of plant protection. |  |  |  |

**Prepared by:** Doç Dr. Refik Bozbuğa **Date:** 18.05.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| --- | --- | --- | --- |
| **DEPARTMENT** | **PLANT PROTECTION (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 501802504 | **TITLE** | Basic Laboratory Techniques in Mycology |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 2 | | 0 | 2 | | | 3 | 7,5 | COMPULSORY  ( x ) | | ELECTIVE  (   ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
| 0 | | 0 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Introducing the existing tools and equipment in the phytopathology laboratory, their intended use and practical use, isolation of fungal pathogens from the plant under laboratory conditions, culturing, introduction of fungi genus and species with microscope studies. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Teaching basic laboratory tools, equipment and techniques in mycology | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | To have information about the studies to be carried out in laboratory conditions for the diagnosis and control of plant fungal diseases. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | -Knows the current tools and equipment in the mycology laboratory, their purpose of use and how they are used,  - Knows the isolation, culturing and purification of fungal pathogens from plants under laboratory conditions | | | | | | | |
| **TEXTBOOK** | | | | | - Y. Zekai Katırcıoğlu, Salih Maden 2015. Plant Mycology, Ankara University. Faculty of Agriculture Publications.Y. Zekai Katırcıoğlu 1992. Laboratory Techniques in Phytopathology, Ankara University. Faculty of Agriculture Publications | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Points to be considered in the laboratory, introduction of tools and equipment, intended use and their using |
| 2 | Microscope and its using, preparation and examination |
| 3 | Some definitions and concepts, solution preparation and chemical calculations (molarity, normality, ppm etc.) |
| 4 | Sterilization methods |
| 5 | Specific media used for culturing microorganisms and their preparation |
| 6 | Koch's postulates, isolation methods of pathogenic microorganisms from plant tissues and culturing |
| 7 | Preparation of fungal spore suspensions and spore counting, preparation of inoculum |
| 8 | Soil sampling and isolation of microorganisms from soil |
| 9 | Techniques for working with seed-borne fungi |
| 10 | Identification of some saprophytic and plant pathogenic fungi, microscopic studies, examination of hyphae and spore structures, diagnostic criteria and diagnosis in different groups of microorganisms. |
| 11 | Pathogen inoculation techniques into plants |
| 12 | Pathogenicity tests and evaluation methods |
| 13 | Bioactivity studies |
| 14 | Preservation of cultures and culture collections |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PLANT PROTECTION MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | To be open to development under the guidance of science and to gain the ability to think analytically. |  |  |  |
| **LO 2** | Gaining the ability to follow and interpret literature by using knowledge and technology effectively in the field of plant protection. |  |  |  |
| **LO 3** | Gaining the ability to think up scientific hypotheses and to use research opportunities effectively. |  |  |  |
| **LO 4** | Gaining the ability to plan a scientific research project, analyse data and interpret findings. |  |  |  |
| **LO 5** | Gaining the ability to convert research results into output by scientific methods and to produce scientific publications. |  |  |  |
| **LO 6** | Gaining the ability to use the information related to the field of expert by combining the information from different disciplines and to transfer this information to different groups. |  |  |  |
| **LO 7** | Gaining the ability to evaluate the environmentally friendly alternatives of the methods used against plant protection problems within the scope of sustainable agriculture. |  |  |  |
| **LO 8** | To be able to carry out a work or project that requires expertise independently and as a team member, to develop new approaches for solving possible problems and to find solutions by taking responsibility. |  |  |  |
| **LO 9** | Gaining the ability to perform a research related to the field within considering scientific ethics. |  |  |  |
| **LO 10** | Gaining the ability to use knowledge about biosecurity and bioethics in the field of plant protection. |  |  |  |

**Prepared by:** Doç. Dr. Filiz ÜNAL **Date:** 18.05.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **PLANT PROTECTION (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 501801503 | **TITLE** | Biological Control with Plant Diseases |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( x ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
|  | | 0 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | |  | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Importance and methods of biological control with plant diseases, relations between plant diseases and their natural enemies, useful organisms used in biological control, biopesticides and up-to-date information on their importance, how biological control studies begin and end, basic laboratory techniques in biological control studies | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Recognizing the importance and methods of biological control with plant diseases, explaining the relationship between plant diseases and their natural enemies, recognizing beneficial organisms used in biological control, biopesticides and their importance are the basic and current issues of plant protection. To learn basic laboratory techniques for how biological control studies start, carry out and end and gain laboratory skills in studies to be carried out with plant pathogenic fungi. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Knows biological control and has information about field and laboratory studies on biological control. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | -Knows the importance and methods of biological control against plant diseases,  -Knows the relationships between plant diseases and their natural enemies, -Has up-to-date information on beneficial organisms, biopesticides and their importance used in biological control,  -Knows how biological control studies are carried out and evaluated,  -Knows basic laboratory techniques in biological control studies. | | | | | | | |
| **TEXTBOOK** | | | | | Bora T. and Özaktan H. 2000. Biological Control. Ege UniversityFaculty of Agriculture. Publications (Textbook) | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction to biological control in plant diseases |
| 2 | Mechanism of biological control |
| 3 | Effects of biological control agents on plant growth and disease resistance |
| 4 | Isolation and reproduction of biocontrol agents used in biological control |
| 5 | Definition and diagnosis of biological control microorganisms |
| 6 | Plant resistance and biological control |
| 7 | Biopreparates used in biological control and the plant diseases they affect |
| 8 | Midterm Exams |
| 9 | Biopreparates used in biological warfare and the plant diseases they affect |
| 10 | Biological control of soil pathogens |
| 11 | Biological control of leaf diseases |
| 12 | Biological control with storage diseases |
| 13 | Biological control of seed and seedling diseases |
| 14 | Biocontrol and integrated Pest Management (IPM) |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PLANT PROTECTION MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | To be open to development under the guidance of science and to gain the ability to think analytically. |  |  |  |
| **LO 2** | Gaining the ability to follow and interpret literature by using knowledge and technology effectively in the field of plant protection. |  |  |  |
| **LO 3** | Gaining the ability to think up scientific hypotheses and to use research opportunities effectively. |  |  |  |
| **LO 4** | Gaining the ability to plan a scientific research project, analyse data and interpret findings. |  |  |  |
| **LO 5** | Gaining the ability to convert research results into output by scientific methods and to produce scientific publications. |  |  |  |
| **LO 6** | Gaining the ability to use the information related to the field of expert by combining the information from different disciplines and to transfer this information to different groups. |  |  |  |
| **LO 7** | Gaining the ability to evaluate the environmentally friendly alternatives of the methods used against plant protection problems within the scope of sustainable agriculture. |  |  |  |
| **LO 8** | To be able to carry out a work or project that requires expertise independently and as a team member, to develop new approaches for solving possible problems and to find solutions by taking responsibility. |  |  |  |
| **LO 9** | Gaining the ability to perform a research related to the field within considering scientific ethics. |  |  |  |
| **LO 10** | Gaining the ability to use knowledge about biosecurity and bioethics in the field of plant protection. |  |  |  |

**Prepared by:** Doç Dr. Filiz Ünal **Date:** 18.05.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **PLANT PROTECTION (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 501802502 | **TITLE** | Collecting insects and collection |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 2 | | 0 | 2 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( x ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
|  | | 0 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | |  | |  |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 40 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | To have taken the Entomology course in the Department of Plant Protection undergraduate program and/or the equivalent course for students applying from other faculties. | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | This course teaches information about collecting insects and creating collections, maintaining collections, and keeping insects. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | In this course, it is aimed to collect insects, bring them to the laboratory, pinning, sampling, preservation, and preparations. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | With this course, students will contribute to learning information about the collection, preparation, and preservation of insects. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | Sampling methods to be used in insect collection,  Gaining the ability to decide and apply the right pest control method in agricultural production  Planning, conducting, concluding, analyzing laboratory and field trials related to the field  Reaching the resources related to pests, presenting them in written and oral form, gaining academic research skills  Reaching the level of responsibility and awareness brought by graduate education  Learning the collecting techniques of insects.  To know the technical information for the creation of insect collections | | | | | | | |
| **TEXTBOOK** | | | | | General Entomology,2000. İ. Akif Kansu, Ankara, 430p.Böceklerin Toplanma-Preparasyon Muhafaza ve Teşhisi, Çanakçıoğlu, T., 1993. İstanbul Üniversitesi Orman Fakültesi Yayını, 616s. | | | | | | | |
| **OTHER REFERENCES** | | | | | -Online insects related resources | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | General definitions of insects and the importance of collecting insects |
| 2 | Tools and equipment used for collecting insects |
| 3 | Insect pinning |
| 4 | Methods used to collect insects |
| 5 | Methods used to collect insects |
| 6 | Collecting insect samples |
| 7 | Midterm exam |
| 8 | Collecting insect samples |
| 9 | Methods used in stinging insects |
| 10 | Cultivation of some insects under laboratory conditions |
| 11 | Monitoring their biology in laboratory conditions |
| 12 | Preparation of collected insects for identification, |
| 13 | Preparation of insects for identification |
| 14 | Labelling, collection, and preservation methods of collected insects and General assessment |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PLANT PROTECTION MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | To be open to development under the guidance of science and to gain the ability to think analytically. |  |  |  |
| **LO 2** | Gaining the ability to follow and interpret literature by using knowledge and technology effectively in the field of plant protection. |  |  |  |
| **LO 3** | Gaining the ability to think up scientific hypotheses and to use research opportunities effectively. |  |  |  |
| **LO 4** | Gaining the ability to plan a scientific research project, analyse data and interpret findings. |  |  |  |
| **LO 5** | Gaining the ability to convert research results into output by scientific methods and to produce scientific publications. |  |  |  |
| **LO 6** | Gaining the ability to use the information related to the field of expert by combining the information from different disciplines and to transfer this information to different groups. |  |  |  |
| **LO 7** | Gaining the ability to evaluate the environmentally friendly alternatives of the methods used against plant protection problems within the scope of sustainable agriculture. |  |  |  |
| **LO 8** | To be able to carry out a work or project that requires expertise independently and as a team member, to develop new approaches for solving possible problems and to find solutions by taking responsibility. |  |  |  |
| **LO 9** | Gaining the ability to perform a research related to the field within considering scientific ethics. |  |  |  |
| **LO 10** | Gaining the ability to use knowledge about biosecurity and bioethics in the field of plant protection. |  |  |  |

**Prepared by:** Doç Dr. Refik Bozbuğa       **Date:** 18.05.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **PLANT PROTECTION (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 501801505 | **TITLE** | English text analysis and article writing techniques |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( x ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
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| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | |  | |  |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 40 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | None | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Study of related topics in order to increase general grammar, reading and comprehension skills in the English language | | | | | | | |
| **COURSE OBJECTIVES** | | | | | It aims to enable them to read and understand academic publications and express themselves. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Student language skills will increase and their ability to understand English literature will increase in their master's degree. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | Students' language skills will increase,  Increasing their ability to research and understand academic articles,  Increasing the activities to understand the literature in postgraduate courses | | | | | | | |
| **TEXTBOOK** | | | | | Exploring English and Reader At Work 2 | | | | | | | |
| **OTHER REFERENCES** | | | | | English Dictionary and Different Reading MaterialsOnline materials | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Tenses-1 |
| 2 | Tenses-2 |
| 3 | Gerund, infinitives |
| 4 | Vocabularies |
| 5 | Passive voices |
| 6 | Adjective and adverbs |
| 7 | Noun clauses |
| 8 | Midterm exam |
| 9 | Quantifiers |
| 10 | Conjuctions |
| 11 | Conditionals |
| 12 | Turkish- English translations |
| 13 | English- Turkish translations |
| 14 | Academic paragraphs |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PLANT PROTECTION MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | To be open to development under the guidance of science and to gain the ability to think analytically. |  |  |  |
| **LO 2** | Gaining the ability to follow and interpret literature by using knowledge and technology effectively in the field of plant protection. |  |  |  |
| **LO 3** | Gaining the ability to think up scientific hypotheses and to use research opportunities effectively. |  |  |  |
| **LO 4** | Gaining the ability to plan a scientific research project, analyse data and interpret findings. |  |  |  |
| **LO 5** | Gaining the ability to convert research results into output by scientific methods and to produce scientific publications. |  |  |  |
| **LO 6** | Gaining the ability to use the information related to the field of expert by combining the information from different disciplines and to transfer this information to different groups. |  |  |  |
| **LO 7** | Gaining the ability to evaluate the environmentally friendly alternatives of the methods used against plant protection problems within the scope of sustainable agriculture. |  |  |  |
| **LO 8** | To be able to carry out a work or project that requires expertise independently and as a team member, to develop new approaches for solving possible problems and to find solutions by taking responsibility. |  |  |  |
| **LO 9** | Gaining the ability to perform a research related to the field within considering scientific ethics. |  |  |  |
| **LO 10** | Gaining the ability to use knowledge about biosecurity and bioethics in the field of plant protection. |  |  |  |

**Prepared by:** Doç. Dr. Refik Bozbuğa **Date:** 18.05.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| --- | --- | --- | --- |
| **DEPARTMENT** | **PLANT PROTECTION (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 501802503 | **TITLE** | Entomopathogenic nematodes |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( x ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
|  | | 0 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | |  | |  |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 40 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | To have taken the Nematology course in the Department of Plant Protection undergraduate program and/or the equivalent course for students applying from other faculties. | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | The place and importance of entomopathogenic nematodes in the control of pests, the past, present and future approaches to the use of entomopathogenic nematodes in the control of insects, general characteristics of entomopathogenic nematodes, mass production methods, Rhabditida: Steinernematidae and Heterorhabditidae, general characteristics of Steinernema carterpocaphorsae and Heterorhabditidae. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of this course is to provide gains in the study of the place and importance of entomopathogenic nematodes in pest control. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | With this course, students will gain gains about entomopathogenic nematodes. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | The place and importance of entomopathogenic nematodes  General characteristics of entomopathogenic nematodes.  Identification of entomopathogenic nematodes causing disease in insects  Gains the ability of production, morphology and physiology, laboratory techniques of entomopathogenic nematodes  To learn the techniques related to the use of entomopathogenic nematodes in pest control.  Gains information about the collection of entomopathogenic nematodes | | | | | | | |
| **TEXTBOOK** | | | | | H Khuong Nguyen and David Hunt, 2007. Entomopathogenic Nematodes: Systematics, Phylogeny and Bacterial Symbionts, Nematology Monographs and Perspectives, BRILL, pp 816. | | | | | | | |
| **OTHER REFERENCES** | | | | | -Online insects related resources | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | General characteristics of entomopathogenic nematodes |
| 2 | The importance of entomopathogenic nematodes |
| 3 | Collection of entomopathogenic nematodes |
| 4 | Physiology of entomopathogenic nematodes |
| 5 | Morphometric characteristics of entomopathogenic nematodes |
| 6 | Laboratory production of entomopathogenic nematodes |
| 7 | Long-term preservation of entomopathogenic nematodes |
| 8 | Midterm exam |
| 9 | General characteristics of Steinernematidae and Heterorhabditidae, Steinernema carpocapsae and Heterorhabditis bacteriophora |
| 10 | General characteristics of Steinernematidae and Heterorhabditidae, Steinernema carpocapsae and Heterorhabditis bacteriophora |
| 11 | Approaches to the control of entomopathogenic nematodes and insects |
| 12 | The place and importance of entomopathogenic nematodes in pest control |
| 13 | Use of entomopathogenic nematodes in pest control |
| 14 | Use of entomopathogenic nematodes in pest control and general evaluation |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PLANT PROTECTION MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | To be open to development under the guidance of science and to gain the ability to think analytically. |  |  |  |
| **LO 2** | Gaining the ability to follow and interpret literature by using knowledge and technology effectively in the field of plant protection. |  |  |  |
| **LO 3** | Gaining the ability to think up scientific hypotheses and to use research opportunities effectively. |  |  |  |
| **LO 4** | Gaining the ability to plan a scientific research project, analyse data and interpret findings. |  |  |  |
| **LO 5** | Gaining the ability to convert research results into output by scientific methods and to produce scientific publications. |  |  |  |
| **LO 6** | Gaining the ability to use the information related to the field of expert by combining the information from different disciplines and to transfer this information to different groups. |  |  |  |
| **LO 7** | Gaining the ability to evaluate the environmentally friendly alternatives of the methods used against plant protection problems within the scope of sustainable agriculture. |  |  |  |
| **LO 8** | To be able to carry out a work or project that requires expertise independently and as a team member, to develop new approaches for solving possible problems and to find solutions by taking responsibility. |  |  |  |
| **LO 9** | Gaining the ability to perform a research related to the field within considering scientific ethics. |  |  |  |
| **LO 10** | Gaining the ability to use knowledge about biosecurity and bioethics in the field of plant protection. |  |  |  |

**Prepared by:** Doç Dr. Refik Bozbuğa **Date:** 18.05.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **PLANT PROTECTION (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 501801506 | **TITLE** | Mycotoxins |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( x ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
| 0 | | 0 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Definition of toxin and fungi that can produce toxins in cultivated plants, the toxins they create, the damage of toxins, the control of toxins and the importance of toxins in terms of food industry and domestic and foreign trade. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | To emphasize the toxins and their importance, to learn the harmfulness of toxins and their importance in terms of agricultural product and food safety, to teach practices to prevent toxin production. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | To graduate knowing mycotoxins and their importance for human health | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | Graduates knowing the definition of toxin and the fungi that can produce toxins in cultivated plants, the toxins they create, the harm of toxins, the control methods of toxins and the importance of toxins in terms of food industry and domestic and foreign trade. | | | | | | | |
| **TEXTBOOK** | | | | | Mycotoxins -A. U. Faculty of Agriculture Lecture Notes | | | | | | | |
| **OTHER REFERENCES** | | | | | - Kaushal K. Shinha, Deepak Bhatnagar 1998 Mycotoxins in Agriculture and Food Safety, Taylor anf Francis Group, 520 p.-Google Academic | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Description and development conditions of fungi |
| 2 | Description of mycotoxin producing fungi |
| 3 | Isolation of fungi from plants |
| 4 | Types of mycotoxins produced by fungi |
| 5 | Metabolic activities of fungi |
| 6 | Ecology of mycotoxigenic fungi |
| 7 | Physiology of mycotoxigenic fungi |
| 8 | Fungus forming mycotoxins in cereals and their toxins |
| 9 | Mycotoxin-forming fungi and their toxins in industrial plants |
| 10 | Mycotoxin-forming fungi and their toxins in stored products |
| 11 | Harms of toxins and risk criteria |
| 12 | Inhibition of mycotoxin growth in plants under field conditions |
| 13 | Inhibition of postharvest toxin growth in plants |
| 14 | Mycotoxin analyzes |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PLANT PROTECTION MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | To be open to development under the guidance of science and to gain the ability to think analytically. |  |  |  |
| **LO 2** | Gaining the ability to follow and interpret literature by using knowledge and technology effectively in the field of plant protection. |  |  |  |
| **LO 3** | Gaining the ability to think up scientific hypotheses and to use research opportunities effectively. |  |  |  |
| **LO 4** | Gaining the ability to plan a scientific research project, analyse data and interpret findings. |  |  |  |
| **LO 5** | Gaining the ability to convert research results into output by scientific methods and to produce scientific publications. |  |  |  |
| **LO 6** | Gaining the ability to use the information related to the field of expert by combining the information from different disciplines and to transfer this information to different groups. |  |  |  |
| **LO 7** | Gaining the ability to evaluate the environmentally friendly alternatives of the methods used against plant protection problems within the scope of sustainable agriculture. |  |  |  |
| **LO 8** | To be able to carry out a work or project that requires expertise independently and as a team member, to develop new approaches for solving possible problems and to find solutions by taking responsibility. |  |  |  |
| **LO 9** | Gaining the ability to perform a research related to the field within considering scientific ethics. |  |  |  |
| **LO 10** | Gaining the ability to use knowledge about biosecurity and bioethics in the field of plant protection. |  |  |  |

**Prepared by:** Doç. Dr. Filiz ÜNAL **Date:** 18.05.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **PLANT PROTECTION (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 501802501 | **TITLE** | Control of Plant Virus Diseases |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( X ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
|  | | 0 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | To have taken the Plant Virology (251616001) course in the Department of Plant Protection undergraduate program and/or the equivalent course for students applying from other faculties. | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Economic importance: Economic losses due to plant viruses; Strategies of control: Conventional, biochemical and molecular approaches; Control of vectors; Quarantine and certification; Elimination: Virus elimination by meristem tip culture and tip micro-grafting; Present statues of controlling economically important some plant viruses. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The objective of this course is to give basic knowledge about economic importance of plant virus, control strategies and certification and elimination of plant virus. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | With this course, students will gain gains about the economic importance of viral diseases, control strategies, control of vectors, quarantine and certification, and elimination of viruses. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1-Economic Importance: Economic losses due to plant viruses.  2-Choose and apply the methods using for controlling of plant viral pathogens.  3-Know the biochemical and molecular approaches using for control strategies.  4-Learn the tissue culture techniques and comprehend the importance of the controls of viruses.  5-Read, understand and critic literature on control methods of plant viral pathogens. | | | | | | | |
| **TEXTBOOK** | | | | | Hadidi A, Khetarpal RK, Koganezawa H. 1998. Plant Virus Disease Control, APS Prass, Minnesota, USA, pp 684.Matthews, R. E. F. 2005. Plant Virology. Academic Press. Inc. N.Y. 835 pp. | | | | | | | |
| **OTHER REFERENCES** | | | | | Campbell, C. L., and Madden, L. V., 1990. Introduction to Plant Disease Epidemiology. John Wiley&Sons, New York. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Economic Importance: Economic losses due to plant viruses. |
| 2 | Strategies of Control: Conventional approaches; breading for resistance to plant viruses. |
| 3 | Strategies of Control: Conventional approaches; control of plant vi-ruses by cross-protection, control of virus infection in crops through breading plants for vector resistance. |
| 4 | Biochemical and molecular approaches; biochemistry of resistance to plant virus, satellite RNA mediated resistance to plant viruses. |
| 5 | Biochemical and molecular approaches; alternative strategies for engineering virus resistance in plants. |
| 6 | Control of Vectors: Forecasting aphid-borne virus diseases, chemical control of insect and nematode vectors of plant viruses. |
| 7 | Control of Vectors: Chemical control fungal vectors of plant viruses. |
| 8 | Midterm exam |
| 9 | Quarantine and certification: Exclusion of plant viruses, seed certification of plant viruses. |
| 10 | Quarantine and certification: Virus certification of grapevine, citrus and strawberries. |
| 11 | Elimination: Heat treatment of perennial plants to eliminate phytoplasmas, viruses and viroids while maintaining plant survival. |
| 12 | Elimination: Virus elimination by meristem tip culture and tip micrografting. |
| 13 | Present Statues of Controlling Economically Important Some Plant Viruses: Present statues of controlling conventional strains of plum pox virus. |
| 14 | Present Statues of Controlling Economically Important Some Plant Viruses: Control strategies for Citrus tristeza virus, Tomato spotted wilt virus and Tomato brown rugose fruit virus. |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PLANT PROTECTION MSc PROGRAM LEARNING OUTCOMES** | | | **CONTRIBUTION LEVEL** | | |
| **NO** | | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | To be open to development under the guidance of science and to gain the ability to think analytically. | |  |  |  |
| **LO 2** | Gaining the ability to follow and interpret literature by using knowledge and technology effectively in the field of plant protection. | |  |  |  |
| **LO 3** | Gaining the ability to think up scientific hypotheses and to use research opportunities effectively. | |  |  |  |
| **LO 4** | Gaining the ability to plan a scientific research project, analyse data and interpret findings. | |  |  |  |
| **LO 5** | Gaining the ability to convert research results into output by scientific methods and to produce scientific publications. | |  |  |  |
| **LO 6** | Gaining the ability to use the information related to the field of expert by combining the information from different disciplines and to transfer this information to different groups. | |  |  |  |
| **LO 7** | Gaining the ability to evaluate the environmentally friendly alternatives of the methods used against plant protection problems within the scope of sustainable agriculture. | |  |  |  |
| **LO 8** | To be able to carry out a work or project that requires expertise independently and as a team member, to develop new approaches for solving possible problems and to find solutions by taking responsibility. | |  |  |  |
| **LO 9** | Gaining the ability to perform a research related to the field within considering scientific ethics. | |  |  |  |
| **LO 10** | Gaining the ability to use knowledge about biosecurity and bioethics in the field of plant protection. | |  |  |  |

**Prepared by:** Assist. Prof. Dr. Serkan ÖNDER **Date:** 13.05.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **PLANT PROTECTION (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | Epidemiology of Plant Virus Diseases |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( X ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
|  | | 0 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | |  | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | To have taken the Plant Virology (251616001) course in the Department of Plant Protection undergraduate program and/or the equivalent course for students applying from other faculties. | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Induction mechanism of viral disease in plants; Transmission mechanism of plant virus diseases; The host range of plant viruses; Histological changes and cytological effects in plant metabolism; Economic importance of viruses and control strategies. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The objective of this course is to give basic knowledge about epidemiology and management of plant virus diseases, host aspects, environmental aspects, factors that influence disease development. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | With this course, students will gain gains about the epidemiology of viral diseases, their transport, the economic importance of viruses and control strategies. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1-Know induction of viral diseases mechanism.  2-Understand the transmission and movement of viruses in plants.  3-Understand the effect of environmental conditions on disease epidemiology.  4-Learn the biological and physical factors in ecology of viruses.  5-Understand the economic importance and control methods of viruses. | | | | | | | |
| **TEXTBOOK** | | | | | Matthews, R.E.F., 2005. Plant Virology. Academic Press. Inc. N.Y. 835 pp. Agrios N.G., 1997. Plant Pathology, Fourt Edition, Academic Pres, USA. 635 pp. | | | | | | | |
| **OTHER REFERENCES** | | | | | J.A. Khan and J. Dijkstra, 2001. Plant Viruses as Molecular Pathogens, 1st Edition, CRC Press, 537pp. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Induction of viral disease in plants |
| 2 | Direct passage in living higher plant material |
| 3 | Transmission by fungi of viruses |
| 4 | Transmission by mechanical inoculation of viruses |
| 5 | Virus movement and final distribution in plants |
| 6 | The host range of viruses |
| 7 | The host range of viruses |
| 8 | Midterm exam |
| 9 | Macroscopic symptoms in plants |
| 10 | Histological changes and cytological effects in plant metabolism |
| 11 | Ecology: Biological factors; properties of viruses, dispersal, cultural practices |
| 12 | Ecology: physical factors; rainfall, wind, air temperature, soil, seasonal variation in weather |
| 13 | Economic importance of viruses: Measurement of losses, biological and physical factors affecting losses, economic factors |
| 14 | Control measures; removal of sources of infection, control of vectors, protecting the plant from systemic disease, disease forecasting. |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PLANT PROTECTION MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | To be open to development under the guidance of science and to gain the ability to think analytically. |  |  |  |
| **LO 2** | Gaining the ability to follow and interpret literature by using knowledge and technology effectively in the field of plant protection. |  |  |  |
| **LO 3** | Gaining the ability to think up scientific hypotheses and to use research opportunities effectively. |  |  |  |
| **LO 4** | Gaining the ability to plan a scientific research project, analyse data and interpret findings. |  |  |  |
| **LO 5** | Gaining the ability to convert research results into output by scientific methods and to produce scientific publications. |  |  |  |
| **LO 6** | Gaining the ability to use the information related to the field of expert by combining the information from different disciplines and to transfer this information to different groups. |  |  |  |
| **LO 7** | Gaining the ability to evaluate the environmentally friendly alternatives of the methods used against plant protection problems within the scope of sustainable agriculture. |  |  |  |
| **LO 8** | To be able to carry out a work or project that requires expertise independently and as a team member, to develop new approaches for solving possible problems and to find solutions by taking responsibility. |  |  |  |
| **LO 9** | Gaining the ability to perform a research related to the field within considering scientific ethics. |  |  |  |
| **LO 10** | Gaining the ability to use knowledge about biosecurity and bioethics in the field of plant protection. |  |  |  |

**Prepared by:** Assist. Prof. Dr. Serkan ÖNDER **Date:** 13.05.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **PLANT PROTECTION (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 501801504 | **TITLE** | Methods for Identification of Plant Virus Diseases |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( X ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
|  | | 0 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | To have taken the Plant Virology (251616001) course in the Department of Plant Protection undergraduate program and/or the equivalent course for students applying from other faculties. | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | General characteristics and economic importance of viruses that cause diseases in plants, Widely used methods for diagnosing and identifying plant viruses and historical developments in their use, Sample collection techniques for the diagnosis and diagnosis of plant viruses and sample preparation techniques for tests, Classical and advanced virus diagnosis and diagnosis methods and their applications, Comparing the sensitivity and reliability of diagnostic methods, Interpreting the results and preparing reports. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of this course for students are; to learn the methods used in the diagnosis and diagnosis of plant viruses and the diseases they cause, to apply the specified methods and to conduct analyzes and prepare a report for the solution of a problem on this subject. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | They will learn the methods used in the diagnosis of viruses that cause diseases in plants. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1-Learns the symptoms of viruses in cultivated and test plants.  2-Differentiate plant viruses by considering their different characteristics.  3-Can use the diagnosis and identification methods of viruses in plant samples.  4-Learns the principles of methods used to identify viruses in plants.  5-Gains the ability to work with diagnostic and diagnostic methods and use equipment.  6-Gains the ability to organize studies on the subject and report the results. | | | | | | | |
| **TEXTBOOK** | | | | | Matthews REF, 1993. Diagnosis of Plant Virus Diseases, CRC Pres, Florida, USA, pp 373. | | | | | | | |
| **OTHER REFERENCES** | | | | | Matthews, R. E. F. 2005. Plant Virology. Academic Press. Inc. N.Y. 835 pp. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction to Plant Viruses |
| 2 | Host Plant in Diagnosis |
| 3 | Experimental Transmission on Viruses in Diagnosis |
| 4 | Virus Transmission Through Soil and Soil-Inhabiting Organisms in Diagnosis |
| 5 | Inclusions in Diagnosis Plant Virus Diseases |
| 6 | Virus Purifications in Relation to Diagnosis |
| 7 | Serological Procedures: ELISA |
| 8 | Midterm exam |
| 9 | Mechanical inoculation and biological indexing |
| 10 | Serological Procedures: DTBIA and Dot blot |
| 11 | Western Blot Analysis |
| 12 | dsRNA Analysis |
| 13 | Electron Microscope |
| 14 | Nucleic acid Hybridization Procedures, Reverse Transcriptase Polymerase Chain Reaction (RT-PCR). |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PLANT PROTECTION MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | To be open to development under the guidance of science and to gain the ability to think analytically. |  |  |  |
| **LO 2** | Gaining the ability to follow and interpret literature by using knowledge and technology effectively in the field of plant protection. |  |  |  |
| **LO 3** | Gaining the ability to think up scientific hypotheses and to use research opportunities effectively. |  |  |  |
| **LO 4** | Gaining the ability to plan a scientific research project, analyse data and interpret findings. |  |  |  |
| **LO 5** | Gaining the ability to convert research results into output by scientific methods and to produce scientific publications. |  |  |  |
| **LO 6** | Gaining the ability to use the information related to the field of expert by combining the information from different disciplines and to transfer this information to different groups. |  |  |  |
| **LO 7** | Gaining the ability to evaluate the environmentally friendly alternatives of the methods used against plant protection problems within the scope of sustainable agriculture. |  |  |  |
| **LO 8** | To be able to carry out a work or project that requires expertise independently and as a team member, to develop new approaches for solving possible problems and to find solutions by taking responsibility. |  |  |  |
| **LO 9** | Gaining the ability to perform a research related to the field within considering scientific ethics. |  |  |  |
| **LO 10** | Gaining the ability to use knowledge about biosecurity and bioethics in the field of plant protection. |  |  |  |

**Prepared by:** Assist. Prof. Dr. Serkan ÖNDER **Date:** 13.05.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **PLANT PROTECTION (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | Principles of nematology |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( x ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
|  | | 0 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | |  | |  |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 40 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | To have taken the nematology course in the Department of Plant Protection undergraduate program and/or the equivalent course for students applying from other faculties. | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | The biology, morphological features, ecology, research methods and new developments in the field of nematodes of nematodes will be examined. In addition, the collection, analysis and preparation methods of nematode samples both in nature and in laboratory conditions will be practiced. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of this course is to provide gains in the biology, morphological features, ecology, research methods and new developments in the field of nematodes. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | With this course, students will gain gains about the biology, morphological features, ecology, research methods and new developments in the field of nematodes. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | The basis of nematology  Living environments of nematodes around the world  Different nematode groups are recognized according to the feeding environment.  Detailed information on the importance and application of plant parasites, saprophytes and entomopathogenic nematodes that are important in agriculture. | | | | | | | |
| **TEXTBOOK** | | | | | Plant Nematology, Roland N. Perry, Maurice Moens, CABI, 2006- 447pp | | | | | | | |
| **OTHER REFERENCES** | | | | | Plant Parasitic Nematodes in Subtropical and Tropical Agriculture, 2018. 3rd Edition, Richard A Sikora, Danny Coyne, Johannes Hallmann, Patricia Timper. CABI, 898 pp | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | History of nematodes and general characteristics of nematodes. |
| 2 | Systematics and taxonomy |
| 3 | Nematodes in soil and plant environment, entomopathogenic nematodes |
| 4 | Ecology of nematodes, functions of nematodes in ecosystem |
| 5 | General biology of plant parasitic nematode species |
| 6 | Signs of nematode damage. |
| 7 | Physiological and biochemical genetic features of the disease caused by nematodes |
| 8 | Midterm exam |
| 9 | Plant parasitic nematode-crop loss relationship. |
| 10 | Control of nematodes. |
| 11 | Resistance to plant parasitic nematodes; genetics and breeding methods in resistance. |
| 12 | Crop rotation and other cultural measures used against nematodes |
| 13 | Biological control of nematodes. Biological control of insects and other animal pests with nematodes. |
| 14 | Chemical control of nematodes. |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PLANT PROTECTION MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | To be open to development under the guidance of science and to gain the ability to think analytically. |  |  |  |
| **LO 2** | Gaining the ability to follow and interpret literature by using knowledge and technology effectively in the field of plant protection. |  |  |  |
| **LO 3** | Gaining the ability to think up scientific hypotheses and to use research opportunities effectively. |  |  |  |
| **LO 4** | Gaining the ability to plan a scientific research project, analyse data and interpret findings. |  |  |  |
| **LO 5** | Gaining the ability to convert research results into output by scientific methods and to produce scientific publications. |  |  |  |
| **LO 6** | Gaining the ability to use the information related to the field of expert by combining the information from different disciplines and to transfer this information to different groups. |  |  |  |
| **LO 7** | Gaining the ability to evaluate the environmentally friendly alternatives of the methods used against plant protection problems within the scope of sustainable agriculture. |  |  |  |
| **LO 8** | To be able to carry out a work or project that requires expertise independently and as a team member, to develop new approaches for solving possible problems and to find solutions by taking responsibility. |  |  |  |
| **LO 9** | Gaining the ability to perform a research related to the field within considering scientific ethics. |  |  |  |
| **LO 10** | Gaining the ability to use knowledge about biosecurity and bioethics in the field of plant protection. |  |  |  |

**Prepared by:** Doç Dr. Refik Bozbuğa **Date:** 18.05.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **PLANT PROTECTION (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | Soil Borne Fungal Pathogens |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 2 | | 0 | 2 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( x ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
|  | | 0 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Soil-borne fungi and the diseases they cause, the importance of soil-borne fungi among other pathogens, the factors affecting the microbial interaction mechanisms in the soil, the epidemiology of soil-borne fungi, the difficulties in the control of soil-borne fungi and new strategies in combating control methods | | | | | | | |
| **COURSE OBJECTIVES** | | | | | To teach soil-borne fungi, the diseases they cause and their control methods. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Graduates knowing the soil-borne fungi, the diseases they cause and their control methods. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | Knows soil-borne fungi, the diseases they cause and their control methods. | | | | | | | |
| **TEXTBOOK** | | | | | Soilborne Pathogens (A. U. Faculty of Agriculture Lecture Notes) | | | | | | | |
| **OTHER REFERENCES** | | | | | - Larry L. Singleton (Author), Jeanne D. Michael (Author), Charles M. Rush (Editor).1992. Methods for Research on Soilborne Phytopathogenic Fungi, Second Printing Edition.266p. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | | |
| **WEEK** | | **TOPICS** |
| 1 | General characteristics of soil-borne pathogens, their importance in phytopathology. | |
| 2 | Soilborne pathogens in the Protozoan kingdom; Morphological features, diseases caused, symptoms, distribution, control, isolation, diagnosis, storage and pathogenicity tests of Plasmodiophora brassicae, Spongospora subterranea, Polymyxa graminis and P. betae | |
| 3 | Morphological and cultural characteristics of Pythium species, the diseases they cause, symptoms, distribution, control, important species, methods used in isolation, diagnosis, storage and pathogenicity tests | |
| 4 | Morphological and cultural characteristics of Phytophthora species, the diseases they cause, symptoms, distribution, controls, important species, methods used in isolation, diagnosis, storage and pathogenicity tests | |
| 5 | Morphological and cultural characteristics of Sclerotinia sclerotiorum, S. minor and S. trifoliorum, diseases they cause, symptoms, distribution, control, isolation, diagnosis, storage and methods used in pathogenicity tests | |
| 6 | Morphological and cultural characteristics of Gaeumannomyces graminis and Phymatotrichum omnivorum, the diseases they cause, symptoms, distribution, control, isolation, diagnosis, storage and methods used in pathogenicity tests | |
| 7 | Morphological and cultural characteristics of Fusarium species, the diseases they cause, symptoms, distribution,controls, important species, methods used in isolation, diagnosis, storage and pathogenicity tests | |
| 8 | Morphological and cultural characteristics of Verticillium species, the diseases they cause, symptoms, distribution, controls, important species, methods used in isolation, diagnosis, storage and pathogenicity tests | |
| 9 | Morphological and cultural characteristics of Sclerotium species, the diseases they cause, symptoms, distribution, control, methods used in isolation, diagnosis, storage and pathogenicity tests | |
| 10 | Morphological and cultural characteristics of Armillaria mellea and Rosellinia necatrix, diseases they cause in plants, symptoms, distribution, control, methods used in isolation, diagnosis, storage and pathogenicity tests | |
| 11 | Morphological and cultural characteristics of Phoma spp. and Macrophomina phaseolina diseases, they cause in plants, symptoms, distribution, control, important species, methods used in isolation, diagnosis, storage and pathogenicity tests | |
| 12 | Morphological and cultural characteristics of Rhizoctonia group fungi, diseases they cause in plants, symptoms, distribution, control, important species, methods used in isolation, diagnosis, storage and pathogenicity tests | |
| 13 | Morphological and cultural characteristics of soil-borne plant pathogenic bacteria, diseases they cause in plants, symptoms, distribution, controls, important species. | |
| 14 | General characteristics of soil-borne (transmitted by nematodes and fungi) plant pathogenic viruses, diseases they cause in plants, symptoms, distribution and controls. | |
| 15,16 | Final Examination | |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PLANT PROTECTION MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | To be open to development under the guidance of science and to gain the ability to think analytically. |  |  |  |
| **LO 2** | Gaining the ability to follow and interpret literature by using knowledge and technology effectively in the field of plant protection. |  |  |  |
| **LO 3** | Gaining the ability to think up scientific hypotheses and to use research opportunities effectively. |  |  |  |
| **LO 4** | Gaining the ability to plan a scientific research project, analyse data and interpret findings. |  |  |  |
| **LO 5** | Gaining the ability to convert research results into output by scientific methods and to produce scientific publications. |  |  |  |
| **LO 6** | Gaining the ability to use the information related to the field of expert by combining the information from different disciplines and to transfer this information to different groups. |  |  |  |
| **LO 7** | Gaining the ability to evaluate the environmentally friendly alternatives of the methods used against plant protection problems within the scope of sustainable agriculture. |  |  |  |
| **LO 8** | To be able to carry out a work or project that requires expertise independently and as a team member, to develop new approaches for solving possible problems and to find solutions by taking responsibility. |  |  |  |
| **LO 9** | Gaining the ability to perform a research related to the field within considering scientific ethics. |  |  |  |
| **LO 10** | Gaining the ability to use knowledge about biosecurity and bioethics in the field of plant protection. |  |  |  |

**Prepared by:** Doç. Dr. Filiz ÜNAL **Date:** 18.05.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **PLANT PROTECTION (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | Sampling and Trial Methods in Plant Protection |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 2 | | 0 | 2 | | | 3 | 7,5 | COMPULSORY  ( x ) | | ELECTIVE  (   ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
|  | | 0 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Survey and sampling methods that the students of the Faculty of Agriculture Plant Protection Department will need in their future research will be taught in both theoretical and field conditions. In addition, trial methods and techniques to be established in field, greenhouse and in vitro conditions, selection of the appropriate trial design, planning and establishment of the trial, evaluation and interpretation of the results obtained | | | | | | | |
| **COURSE OBJECTIVES** | | | | | To learn the subjects of survey, sampling, isolation, trial setting and evaluation of trials, which are necessary for researches about Plant Protection. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | It contributes to field studies, field and greenhouse trials. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | -Knows survey and sampling methods in accordance with the purpose of diseases and pests,  - Knows the isolation of diseases,  - Knows how to set up a trial and evaluate and interpret trial results | | | | | | | |
| **TEXTBOOK** | | | | | - Düzgüneş O., Kesici T., Kav O. 1987. Araştırma ve Deneme Metotları Ankara Ü. Ziraat F. 381p.Genel Entomoloji, 2016. İ. Akif Kansu, Ankara Üniversitesi. 430s. | | | | | | | |
| **OTHER REFERENCES** | | | | | -Bora, T. ve Karaca, İ. 1970. Kültür Bitkilerinde Hastalığın ve Zararın Ölçülmesi. Ege Üniversitesi Zir. Fak. Yardımcı Ders Kitabı, No: 167.Plant Nematology 2013, Roland N Perry, Maurice Moens, 2nd edition, CABI, 568 sayfa.Genel Entomoloji, 2016. İ. Akif Kansu, Ankara Üniversitesi. 430s | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Demonstration of survey methods in studies on plant diseases in the field |
| 2 | Demonstration of sampling methods in the field |
| 3 | Explaining the isolation methods of diseases |
| 4 | Planning and setting up of experiments in greenhouse, field and in vitro conditions |
| 5 | Demonstration of trial layouts and patterns that will be set up for different purposes |
| 6 | Evaluation of trial results and statistical analysis |
| 7 | Evaluation and interpretation of statistical analysis |
| 8 | Midterm Exams |
| 9 | Demonstrating survey methods in studies on plant pests in the field, |
| 10 | Demonstrating sampling methods in the field, |
| 11 | Explaining insect collection methods, |
| 12 | Planning and setting up experiments in greenhouse, field and/or in vitro conditions on insects and nematodes, |
| 13 | Demonstration of trial order and patterns to be established for different purposes in insects and nematodes |
| 14 | Evaluation and interpretation of test results on insects and nematodes and demonstrating survey methods in studies on plant pests in the field |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE PLANT PROTECTION MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | To be open to development under the guidance of science and to gain the ability to think analytically. |  |  |  |
| **LO 2** | Gaining the ability to follow and interpret literature by using knowledge and technology effectively in the field of plant protection. |  |  |  |
| **LO 3** | Gaining the ability to think up scientific hypotheses and to use research opportunities effectively. |  |  |  |
| **LO 4** | Gaining the ability to plan a scientific research project, analyse data and interpret findings. |  |  |  |
| **LO 5** | Gaining the ability to convert research results into output by scientific methods and to produce scientific publications. |  |  |  |
| **LO 6** | Gaining the ability to use the information related to the field of expert by combining the information from different disciplines and to transfer this information to different groups. |  |  |  |
| **LO 7** | Gaining the ability to evaluate the environmentally friendly alternatives of the methods used against plant protection problems within the scope of sustainable agriculture. |  |  |  |
| **LO 8** | To be able to carry out a work or project that requires expertise independently and as a team member, to develop new approaches for solving possible problems and to find solutions by taking responsibility. |  |  |  |
| **LO 9** | Gaining the ability to perform a research related to the field within considering scientific ethics. |  |  |  |
| **LO 10** | Gaining the ability to use knowledge about biosecurity and bioethics in the field of plant protection. |  |  |  |

**Prepared by:** Doç. Dr. Filiz ÜNAL **Date:** 18.05.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | Joint Course for the Institute | **SEMESTER** | Fall-Spring |

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| **COURSE** | | | |
| **CODE** | 501011101 | **TITLE** | The Scientific Research Methods and Its Ethics |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| MSc-  Ph.D | 3 | | 0 | 0 | | | 3+0 | 7,5 | COMPULSORY  ( X ) | | ELECTIVE  (   ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
| 1,5 | | 1,5 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | None | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Science, the scientific thought and other fundamental concepts, the scientific research process and its techniques, Methodology: Data Collecting-Analysis-Interpretation, Reporting the scientific research (Preparation of a thesis, oral presentation, article, project), Ethics, Ethics of scientific research and publication. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The main objectives are: To examine the foundations of scientific research and the scientific research methods, to teach the principles of both the methodology and the ethics, to realize the process on a scientific research and to evaluate the results of research, to teach reporting the results of research (on a thesis, presentation, article). | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Applying the scientific research methods and the ethical rules in their professional life. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | Gaining awareness on ethical principles at basic research methods, becoming skillful at analyzing and reporting the data obtained in scientific researches, being able to have researcher qualification with occupational sense of responsibility, having the scientific and vocational ethics’ understanding and being able to defend this understanding in every medium. | | | | | | | |
| **TEXTBOOK (Turkish)** | | | | | Karasar, N. (2015). Bilimsel Araştırma Yöntemi. Nobel Akademi Yayıncılık, Ankara. | | | | | | | |
| **OTHER REFERENCES** | | | | | **1-**Büyüköztürk, Ş., Çakmak, E. K., Akgün, Ö. E., Karadeniz, Ş., Demirel, F. (2012). Bilimsel Araştırma Yöntemleri. Pegem Akademi Yayınevi, Ankara.  **2-**Tanrıöğen, A. (Editör). (2014). Bilimsel Araştırma Yöntemleri. Anı Yayıncılık, Ankara.  **3-**Türkiye Bilimler Akademisi Bilim Etiği Komitesi. Bilimsel Araştırmada Etik ve Sorunları, Ankara: TÜBA Yayınları, (2002).  **4-**Ekiz, D. (2009). Bilimsel Araştırma Yöntemleri: Yaklaşım, Yöntem ve Teknikler. Anı Yayıncılık, Ankara.  **5-**Day, Robert A. (Çeviri: G. Aşkay Altay). (1996). Bilimsel Makale Nasıl Yazılır ve Nasıl Yayımlanır?, TÜBİTAK Yayınları, Ankara.  **6-**Özdamar, K. (2003). Modern Bilimsel Araştırma Yöntemleri. Kaan Kitabevi, Eskişehir.  **7-**Cebeci, S. (1997). Bilimsel Araştırma ve Yazma Teknikleri. Alfa Basım Yayım Dağıtım, İstanbul.  **8-**Wilson, E. B. (1990). An Introduction to Scientific Research. Dover Pub. Inc., New York.  **9-**Çömlekçi, N. (2001). Bilimsel Araştırma Yöntemi ve İstatistiksel Anlamlılık Sınamaları. Bilim Teknik Kitabevi, Eskişehir. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Science, scientific thought and other basic concepts (University, history of university, higher education, science, scientific thought and other related concepts) |
| 2 | Science, scientific thought and other basic concepts (University, history of university, higher education, science, scientific thought and other related concepts) |
| 3 | The scientific research and its types (Importance of the scientific research, types of science, scientific approach) |
| 4 | The scientific research process and its techniques (Access to the scientific knowledge, literature search, determining the research issue, definition of the problem, planning) |
| 5 | The scientific research process and its techniques (Access to the scientific knowledge, literature search, determining the research issue, definition of the problem, planning) |
| 6 | The scientific research process and its techniques (Access to the scientific knowledge, literature search, determining the research issue, definition of the problem, planning) |
| 7 | The method and the approach: Collecting, analysis and interpretation of the data (Data, data types, measurement and measurement tools, collecting data, organizing data, summarizing data, analysis and the interpretation of data) |
| 8 | The method and the approach: Collecting, analysis and interpretation of the data (Data, data types, measurement and measurement tools, collecting data, organizing data, summarizing data, analysis and the interpretation of data) |
| 9 | Finalizing the scientific research (Reporting, preparing the thesis, oral presentation, preparing an article and a project) |
| 10 | Finalizing the scientific research (Reporting, preparing the thesis, oral presentation, preparing an article and a project) |
| 11 | Finalizing the scientific research (Reporting, preparing the thesis, oral presentation, preparing an article and a project) |
| 12 | Ethics, scientific research and publication ethics (Ethics, rules of ethics, occupational ethics, non-ethical behaviors) |
| 13 | Ethics, scientific research and publication ethics (Ethics, rules of ethics, occupational ethics, non-ethical behaviors) |
| 14 | Ethics, scientific research and publication ethics (Ethics, rules of ethics, occupational ethics, non-ethical behaviors) |
| 15,16 | Mid-term exam, Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE INSTITUTE’S GRADUATE PROGRAMME’S LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (M.Sc.-Ph.D.)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | Having the scientific and vocational ethics’ understanding and being able to defend this understanding in every medium. | | |  | |  |  |
| **LO 2** | Being able to have researcher qualification with occupational sense of responsibility. | | |  | |  |  |
| **LO 3** | Becoming skillful at analyzing and reporting the data obtained in scientific researches. | | |  | |  |  |
| **LO 4** | Gaining awareness on ethical principles at basic research methods. | | |  | |  |  |
| **Prepared by :** | | |  | **Date:** | | 14.06.2016 | | | |

**Signature**: