**HORTICULTURE 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](#c18) | 7.5 | 3+0 | 3 | **C** | Turkish |
| 505002512 | [FUNDAMENTALS ECOLOGICAL, BIOLOGICAL AND PHYSIOLOGICAL PRINCIPLES OF HORTICULTURE](#c19) | 7.5 | 3+0 | 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 | |
| 505002001 | 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 |
| 505002702 | MSc THESIS STUDY | | 25 | | 0+1 | - | **C** | Turkish |
| 505001703 | 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 | |
| 505002702 | | MSc THESIS STUDY | 25 | 0+1 | | - | **C** | Turkish | |
| 505001703 | | 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 |
| 505001501 | [GROWTH AND DEVELOPMENT PHYSIOLOGY IN PLANTS](#c16) | 7.5 | 3+0 | 3 | E | Turkish |
| 505001502 | [STRESS PHYSIOLOGY IN PLANTS](#c15) | 7.5 | 3+0 | 3 | E | Turkish |
| 505001506 | [FERTILIZATION BIOLOGY OF FRUITS](#c8) | 7.5 | 3+0 | 3 | E | Turkish |
| 505001507 | [PHYSIOLOGICAL DISORDERS IN FRUITS](#c11) | 7.5 | 3+0 | 3 | E | Turkish |
| 505001508 | [PLANT GENETIC RESOURCES IN HORTICULTURE](#c3) | 7.5 | 3+0 | 3 | E | Turkish |
| 505001509 | [NEW DEVELOPMENTS IN VEGETABLE GROWING I](#c12) | 7.5 | 3+0 | 3 | E | Turkish |
| 505001510 | [ORNAMENTAL PLANTS AND USE FOR LANSCAPE ARCH.](#c14) | 7.5 | 3+0 | 3 | E | Turkish |
| 505001513 | [Ornamental Bulbous Plant](#c33) | 7.5 | 3+0 | 3 | E | Turkish |
| 505001511 | [VEGETABLE SEED PRODUCTION](#c17) | 7.5 | 3+0 | 3 | E | Turkish |
| 505001512 | [FRUIT GENETIC RESOURCES](#c22) | 7.5 | 3+0 | 3 | E | Turkish |
| 505001515 | [Climatic Requirements of Grapevine](#c25) | 7.5 | 3+0 | 3 | E | Turkish |
| 505001516 | [Photosynthesis Ecology in Pomology](#c26) | 7.5 | 3+0 | 3 | E | Turkish |
| 505001517 | [Variety X Climate Relationships in Walnut Cultivation](#c27) | 7.5 | 3+0 | 3 | E | Turkish |
| 505001518 | [Protected Berry Cultivation](#c24) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002502 | [PLANT GROWTH REGULATORS](#c7) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002504 | [INTEGRATED TRAINING AND PRUNING SYS OF HORT.CROPS](#c6) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002505 | [Horticultural Plant Propagation Techniques](#c34) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002506 | [CHROMATOGRAPHIC ANALYSIS METHODS IN HORTICULTURE](#c5) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002508 | [NEW DEVELOPMENTS IN VEGETABLE GROWING II](#c13) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002509 | [SEASONAL FLOWERS](#c9) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002510 | [BASIC LABORATUAR TECHNIQUES](#c2) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002511 | [ADVANCED VEGETABLE BREEDING](#c1) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002513 | [THE IMPORTANCE AND EFFECTS OF GLOBAL CLIMATE CHANGE ON HORTICULTURE](#c20) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002514 | [SOILLESS CULTURE TECHNIQUES IN HORTICULTURE](#c21) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002515 | [PHYSIOLOGICAL DISORDERS IN VEGETABLES](#c23) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002516 | [Indoor Ornamental Plant](#c35) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002517 | [BASIC TECHNIQUES OF HORTICULTURAL LABORATORY](#c36) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002519 | [FRUIT BREEDING](#c10) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002520 | [Organic Fruit Growing](#c29) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002521 | [NEW DEVELOPMENTS IN BERRY FRUITS](#c28) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002522 | [New Tecniques in Production Fruit Treeof Nursery Trees](#c30) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002523 | [GRAPEVINE BIOLOGY](#c32) | 7.5 | 3+0 | 3 | E | Turkish |
| 505002524 | [GRAPEVINE PHYSIOLOGY](#c31) | 7.5 | 3+0 | 3 | E | Turkish |

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**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505002511 | **TITLE** | Advanced Vegetable Breeding |

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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 (√)]** | | | | | | |
|  | |  | | | | X | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 20 |
| Quiz | | | | |  | |  |
| Homework | | | | | 3 | | 40 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | | - | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Flowers and fertilization biology of vegetables based on family and species, breeding objectives, breeding methods used in vegetable breeding (selection, inbreeding and crossbreeding, testing, mutagens application etc.) and techniques accelerate variety development. Breeding programs and special breeding techniques in vegetables theoretically and practically will be studied | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Course Learning Objectives  to teach breeding objectives in some important vegetable spicies, heredity of important traits, demonstrate an understanding of traditional and modern (biotech) breeding methods used invegetable crops breeding. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Scientific and technical aspects of vegetable breeding which is defined as obtain new varieties in vegetable species which has a high economic importance in crop production is studied in this course | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | At the end of this course the students;  1-Understand and demonstrate inbreeding  2-Crossbreeding  3-Understand modern (biotech) breeding techniques used by plant breeders to accelerator breeding program  4-Understand theoretical and practical information in vegetable species breeding techniques | | | | | | | |
| **TEXTBOOK** | | | | | Recently published research papers and final reports | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Flower, pollination and fertilization biology of vegetables, |
| 2 | Breeding of self-fertilized vegetable species |
| 3 | Breeding of self-fertilized vegetable species |
| 4 | Breeding of self-fertilized vegetable species |
| 5 | Breeding of cross-pollinated vegetable species |
| 6 | Midterm Examination 1 |
| 7 | Breeding of cross-pollinated vegetable species |
| 8 | Breeding of cross-pollinated vegetable species |
| 9 | Breeding hybrid varieties |
| 10 | Breeding hybrid varieties |
| 11 | Midterm Examination 2 |
| 12 | Breeding hybrid varieties |
| 13 | The use of biotechnology in plant breeding |
| 14 | The use of biotechnology in plant breeding |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assoc. Prof. Nuray ÇÖMLEKÇİOĞLU | **Date:** | | 30.04.2015 | | | |

**Signature**:

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**ESKISEHIR OSMANGAZI UNIVERSITY**

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**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505002510 | **TITLE** | Basic Laboratory 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 (√)]** | | | | | | |
|  | |  | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 2 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Information, introduction and utilization of instruments and equipments used in laboratory for research in horticulture, preparations of chemical solutions and their characteristics. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | to introduce various materials and devices in laboratory and to teach some basic techniques | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | To learn to work in the laboratory for analysis in Horticultural crops. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | Gets information about points to consider when working in laboratory.  Knows about various materials, devices and equipments used in horticultural research and makes use of them.  Gets information about properties of chemicals and preparation of solutions. | | | | | | | |
| **TEXTBOOK** | | | | | Altan, A., 1995. The technique of laboratory. Çukurova University Agricultural Faculty textbook no:36, Adana. | | | | | | | |
| **OTHER REFERENCES** | | | | | Hışıl, Y., 1994. Enstrümental Gıda analizleri-I (Yüksek Basınçlı sıvı Kromatografisi). Ege Üniversitesi Mühensilik Fakültesi ders kitapları yayın no:31, 218s.Hışıl, Y., 1994. Enstrümental Gıda analizleri-II (Gaz, İnce Tabaka, Kolon, Kağıt Kromatografileri ve Elektroforez). Ege Üniversitesi Mühendislik Fakültesi ders kitapları yayın no:30, 192s.Gündüz, T., 1993. İnstrümental Analiz. Bilge yayıncılık ve dağıtım, Ankara, 607 s.Schram, S. B., 1982. The LCD Basic Book on liquid chromatography. Milton Roy company, St. petersburg, Florida, 114s.Gratzfeld-Hüsgen, A. and Schuster, R., 1996. HPLC for Food Analysis. Hewlett-Packard Company, Germany, 132p.Owen, T., 1996. Fundamentals of UV-visible Spectroscopy. Hewlett-Packard Company, germany, 142p.Cemeroğlu, B., 2007. Gıda analizleri. Gıda teknolojisi derneği yayınları no:34, 535s. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Principles of using laboratory and precautions in laboratory |
| 2 | Laboratory equipments |
| 3 | The introduction of glass materials, properties and usage |
| 4 | The introduction and usage of laboratory equipment |
| 5 | Calibration of laboratory equipment |
| 6 | Midterm Examination 1 |
| 7 | Solution preparation |
| 8 | Titration and calculations |
| 9 | Standard preparation and calibration |
| 10 | Spectrophotometry |
| 11 | Midterm Examination 2 |
| 12 | Working with spectrophotometer |
| 13 | High pressure liquid chromatography |
| 14 | Gas chromatography |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Asiss.Prof. Dr. Cenap Yılmaz | **Date:** | | 12/05/2015 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505001508 | **TITLE** | Plant Genetic Resources in Horticulture |

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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 (√)]** | | | | | | |
|  | |  | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 2 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | The distribution of genetic resources of horticultural crops in the world and in Turkey, gene banks, working groups, the characterization and identification of genetic resources, molecular markers are used to identify, in situ and ex situ conservation, cryopreservation, genetic evaluation and breeding utilization of resources are studied. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | To teaching the situation, conservation, and characterisation of plant genetic resources | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | |  | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1.Understanding of situation and conversation of genetic resources of horticultural plants.  2. Learning the characterisation and uses of genetic resources of horticultural plants. | | | | | | | |
| **TEXTBOOK** | | | | | 1. Henry, R.J., 2005. Plant Diversity and Evolution: Genotypic and Phenotypic Variation in Higher Plants. CABI Publishing, Australia.2. Şehirali, S. ve M. Özgen, 1987. “Bitkisel Gen Kaynakları” Ders Kitabı, A.Ü. Ziraat Fakültesi Yayınları, No: 1020, Ders kitabı No: 294, A. Ü. Basımevi, Ankara, 239 s. | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction to plant genetic resources |
| 2 | Plant genetic centers |
| 3 | Plant genetic resources in Turkey and World |
| 4 | Gen banks |
| 5 | Field working for genetic resources |
| 6 | Midterm Examination 1 |
| 7 | Seed storage |
| 8 | Vegetatif material storage |
| 9 | Characterization and description of genetic resources |
| 10 | Markers used for description of genetic resources |
| 11 | Midterm Examination 2 |
| 12 | In situ and ex situ storage |
| 13 | Cryoprezevation |
| 14 | Evaluation of genetic resources |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Asiss.Prof. Dr. Cenap Yılmaz | **Date:** | | 12/05/2015 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505002505 | **TITLE** | Horticultural Plant Propagation 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 (√)]** | | | | | | |
|  | |  | | | | X | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 2 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Seed propagation, grafting, cutting, layering and micro propagation techniques will be discussed in detailed. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | All plant propagation techniques that used in horticulture will be explained theoretically and practically. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Propagation techniques of Horticultural Plants will be understood and propagation of different plants will be explained in detail. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1.Understanding how to propagate horticultural plants.  2.Understanding propagation by seeds and grafting.  3. Understanding propagation by cutting, layering and in vitro culture.  2.Ability of practicing different propagation techniques. | | | | | | | |
| **TEXTBOOK** | | | | | 1.Çelik, M., 1983. Meyve Yetiştiriciliğinde Anacın Önemi ve Türkiye Meyveciliğinde Anaç Sorunu. Ankara Ünv. Ziraat Fak. Yayın no: 886. Derlemeler 47.2.Hartman, H.T., and D.E. Kester, 1983. Plant Propagation Principles and Practices. Prentice-Hall. Inc. Engle wood clifts, New Jersey.3.Özçağıran, R., 1974. Meyve Ağaçlarında Anaç ile Kalem Arasındaki Fizyolojik İlişkiler. Ege Üniversitesi Ziraat Fakültesi yayın no: 243.4.Poincelot, R.P., 1980. Horticulture Principles and Practical Applications. Prentice-Hall, Inc., Englewood clifts, New Jersey.5.Robert, C.M. and Titchmarsh, W., 1981. The Complete Book of Plant Propagation. Ward Lock Limited, London.6.Torres, K.C., 1989. Tissue Culture Techniques for Horticultural Crops. Avi Books, New York.7.Yılmaz, M., 1992. Modern Bahçe Bitkileri Yetiştirme Tekniği. Çukurova Üniversitesi Basım Evi, Adana. | | | | | | | |
| **OTHER REFERENCES** | | | | | 1.Özçağıran, R., A. Ünal, E. Özeker, M. İsfendiyaroğlu, 2005. Ilıman İklim Meyve Türleri, Sert Çekirdekli Meyveler, Ege Ünv. Ziraat Fakültesi Yayınları, no: 553.2. Özçağıran, R., A. Ünal, E. Özeker, M. İsfendiyaroğlu, 2005. Ilıman İklim Meyve Türleri, Yumuşak Çekirdekli Meyveler, Ege Ünv. Ziraat Fakültesi Yayınları, no: 556.3.Özçağıran, R., A. Ünal, E. Özeker, M. İsfendiyaroğlu, 2005. Ilıman İklim Meyve Türleri, Ser Kabuklu Meyveler, Ege Ünv. Ziraat Fakültesi Yayınları, no: 566. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | An overview on Horticultural propagation techniques |
| 2 | Generatif (seed) propagation |
| 3 | Generatif (seed) propagation |
| 4 | Generatif (seed) propagation |
| 5 | Grafting |
| 6 | Midterm Examination 1 |
| 7 | Grafting |
| 8 | Cutting |
| 9 | Cutting |
| 10 | Layering |
| 11 | Midterm Examination 2 |
| 12 | Propagation by tubers |
| 13 | In vitro propagation |
| 14 | In vitro propagation |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assoc.Prof. Dr. Yasemin Evrenosoğlu | **Date:** | | 30/04/2015 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505002506 | **TITLE** | Chromatographic Analysis Methods in Horticulture |

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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 | | | | | 2 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | This course included prenciples of chromatography , extractions methods, biolgical methods, preperation, application and evelations of paper and thin layer chromatography and tehnics of HPLC, Gas chromatography mass spectrophotometry paper and thin layer chromatography, radioassay and immunoassay. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | To teaching the analysis methods for different chemical substances and chromatographic analysis methods in Horticulture. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | To learning different chromatographic methods for improving yield and fruit quality in horticulture | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1.Understanding of chromatographic analysis methods in horticultural products.  2. Learning analysis methods for different chemical substances in horticultural products. | | | | | | | |
| **TEXTBOOK** | | | | | 1. Hışıl, Y., 1994. Enstrümental Gıda analizleri-I (Yüksek Basınçlı sıvı Kromatografisi). Ege Üniversitesi Mühensilik Fakültesi ders kitapları yayın no:31, 218s.2. Hışıl, Y., 1994. Enstrümental Gıda analizleri-II (Gaz, İnce Tabaka, Kolon, Kağıt Kromatografileri ve Elektroforez). Ege Üniversitesi Mühendislik Fakültesi ders kitapları yayın no:30, 192s.3. Gündüz, T., 1993. İnstrümental Analiz. Bilge yayıncılık ve dağıtım, Ankara, 607 s.4. Schram, S. B., 1982. The LCD Basic Book on liquid chromatography. Milton Roy company, St. petersburg, Florida, 114s.5. Gratzfeld-Hüsgen, A. and Schuster, R., 1996. HPLC for Food Analysis. Hewlett-Packard Company, Germany, 132p.6. Owen, T., 1996. Fundamentals of UV-visible Spectroscopy. Hewlett-Packard Company, germany, 142p.7. Cemeroğlu, B., 2007. Gıda analizleri. Gıda teknolojisi derneği yayınları no:34, 535s. | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction to chromatography |
| 2 | The theory of chromatographic separation |
| 3 | Paper chromatography |
| 4 | Column chromatography |
| 5 | Thin layer chromatography |
| 6 | Midterm Examination 1 |
| 7 | Thin layer chromatography |
| 8 | Thin layer chromatography |
| 9 | High-performance liquid chromatography(HPLC) |
| 10 | High-performance liquid chromatography(HPLC) |
| 11 | Midterm Examination 2 |
| 12 | High-performance liquid chromatography(HPLC) |
| 13 | Supercritical fluid chromatography |
| 14 | Electrophorez |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Asiss.Prof. Dr. Cenap Yılmaz | **Date:** | | 12/05/2015 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505002504 | **TITLE** | Integrated Training and Pruning Systems of Horticulture |

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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 (√)]** | | | | | | |
|  | |  | | | | X | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 2 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Besides, training systems like goblet, summit branch, alternate summit branch, and palmet, different actual training systems like slim spindle that can be used for dwarf fruit gardens will be handled. Different pruning systems that used for stone fruits, pome fruits, vines and berry fruits will be discussed. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Contemporary pruning and training systems in different fruit crops and grapes will be explained theoretically and practically. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Theoretical and practical informations on pruning and training systems will be gained. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1.Understanding pruning systems in different fruit crops and grapes.  2.Understanding physiological basics of pruning  3.Practicing ability on classical pruning and training systems.  4.Practicing ability on new pruning and training systems. | | | | | | | |
| **TEXTBOOK** | | | | | 1.Ağaoğlu, Y.S., 1986. Üzümsü Meyveler. Ankara Üniversitesi Ziraat Fakültesi Yayınları 984, Ders Kitabı: 290.2.Özçağıran, R., A. Ünal, E. Özeker, M. İsfendiyaroğlu, 2005. Ilıman İklim Meyve Türleri, Sert Çekirdekli Meyveler, Ege Ünv. Ziraat Fakültesi Yayınları, no: 553.3.Özçağıran, R., A. Ünal, E. Özeker, M. İsfendiyaroğlu, 2005. Ilıman İklim Meyve Türleri, Yumuşak Çekirdekli Meyveler, Ege Ünv. Ziraat Fakültesi Yayınları, no: 556.4.Özçağıran, R., A. Ünal, E. Özeker, M. İsfendiyaroğlu, 2005. Ilıman İklim Meyve Türleri, Ser Kabuklu Meyveler, Ege Ünv. Ziraat Fakültesi Yayınları, no: 566.5.Ünal, A., 1996. Meyve Ağaçlarında Budama. Ege Üniversitesi Ziraat Fakültesi Bahçe Bitkileri Bölümü, Yükseklisans Ders Notları. | | | | | | | |
| **OTHER REFERENCES** | | | | | - | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Pruning and aims |
| 2 | Branch types of fruit trees |
| 3 | Pruning according to time |
| 4 | Physiological basics of pruning |
| 5 | Classical training systems (goblet, central leader, modified central leader, palmet, pyramid) |
| 6 | Midterm Examination 1 |
| 7 | Classical training systems (goblet, central leader, modified central leader, palmet, pyramid) |
| 8 | Classical training systems (goblet, central leader, modified central leader, palmet, pyramid) |
| 9 | Classical training systems (goblet, central leader, modified central leader, palmet, pyramid) |
| 10 | New training systems (slender spindle, hitec, vertical axis, superspindle,….) |
| 11 | Midterm Examination 2 |
| 12 | New training systems (slender spindle, hitec, vertical axis, superspindle,….) |
| 13 | New training systems (slender spindle, hitec, vertical axis, superspindle,….) |
| 14 | New training systems (slender spindle, hitec, vertical axis, superspindle,….) |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assoc.Prof. Dr. Yasemin Evrenosoğlu | **Date:** | | 30/04/2015 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505002502 | **TITLE** | Plant Growth Regulators |

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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 | | | | | 2 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Plant growth hormones (auxins, gibberellins, cytokinins, gibberellins, ethylene, abscisic acid, polyamines, salicilic acid, jasmonic acid and brassinosteroids) are introduced. Their effects on plants and antagonistic reactions of these compounds are discussed. The methods of exogenous application of growth regulators and samples are explained. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Description, biosynthesis, metabolism of plant growth hormones | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Learning the effect of plant growth regulators on horticultural species | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1.Understanding of plant growth hormones and other regulators, their biosynthesis and their effects  2.Learning of exogenous application methods of plant growth regulators. | | | | | | | |
| **TEXTBOOK** | | | | | 1.Davis, D.J. 1987. Plant Hormones and their Role in Plant Growth and Development. Kluver Academic Publishes, Netherland, 681 p.2.Eriş, A. 2003. Bahçe Bitkileri Fizyolojisi. Uludağ Üniversitesi Ziraat Fakültesi Ders Notları, No:11, V. Basım, Bursa3.Leopold, A.C. and Kriedemann, P.E.1964. Plant Growth and Development. Mcgraw-Hill Book Company, New York, 545 p.4.Salisbury, F.B. and Ross, C.W.1992. Plant Physiology. California, 682 p.5.Taiz, L. and Zeiger, E. 2002. Plant Physiology. Sinauer Associates, Inc | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction of plant hormones |
| 2 | Treatment methods of plant growth regualtors |
| 3 | Auxins |
| 4 | Gibberellins |
| 5 | Cytokinins |
| 6 | Midterm Examination 1 |
| 7 | Abscisic acid |
| 8 | Etylene |
| 9 | Brassinosteroids |
| 10 | Jasmonic acid |
| 11 | Midterm Examination 2 |
| 12 | Polyamines |
| 13 | Salicilic acid |
| 14 | Other plant growth regulators |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Asiss.Prof. Dr. Cenap Yılmaz | **Date:** | | 12/05/2015 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505001506 | **TITLE** | Fertilization Biology |

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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 (√)]** | | | | | | |
|  | |  | | | | X | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 2 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Pollination, floral structures, pollen structure, characteristics of stigma and stilus, pollinator insects, cleistogamie, artificial pollination, fertilization, germination of pollen, vigor of egg cell, infertilities, incompatibility, fertilizer cultivars will be discussed. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | To develop the basis of students in pollination and fertilization of plant species. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | By the understanding how to pollinate and fertilization of plant species, practicing on growing and breeding techniques in light of this information. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1.Understanding pollination of plant species  2.Understanding fertilization of plant species.  3.Understanding pollination and fertilization of different fruit and vegetable species.  4.To have the ability of practicing growing and breeding techniques in light of this information. | | | | | | | |
| **TEXTBOOK** | | | | | 1. Özçağıran, R., 2000. Bahçe Bitkilerinde Döllenme Biyolojisi (Ders notları). Ege Universitesi Ziraat Fakültesi, Bahçe Bitkileri Bölümü.2. Janick, J., Moore, J. N., 1975. Advances in Fruit Breeding. Purdue University Press, West Lafayette, Indiana.3. Moore, J.N., Janick, J., 1983. Methods in Fruit Breeding. Purdue University Press, West Lafayette, Indiana. | | | | | | | |
| **OTHER REFERENCES** | | | | | 1. Hörandl, E., 2010. The evolution of self-fertility in apomictic plants. Sexual Plant Reproduction 23:1, 73-86.2. Owens, S.J., Miller, R., 2009. Cross- and self-fertilization of plants â Darwin's experiments and what we know now. Botanical Journal of the Linnean Society 161:4, 357-395.3. Friedman, J., Barrett., S.C.H., 2009 The consequences of monoecy and protogyny for mating in wind-pollinated Carex. New Phytologist 181:2, 489-497.4. Penet, L., Collin, C.L., Ashman., T.L., 2009. Florivory increases selfing: an experimental study in the wild strawberry, Fragaria virginiana. Plant Biology 11:1, 38-45. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Polination, flower structure and infloressens |
| 2 | Flower structures of fruits and vegetables |
| 3 | Pollen and embrio sac formation |
| 4 | Fertilization |
| 5 | Factors effecting fertilization |
| 6 | Midterm Examination 1 |
| 7 | Fertilization of some fruits and their pollinators |
| 8 | Fertilization of some vegetables and their pollinators |
| 9 | Abnormalities in generatif reproduction of plants |
| 10 | Seed and fruit development |
| 11 | Midterm Examination 2 |
| 12 | Embrio abortions |
| 13 | Kseni metakseni |
| 14 | Fruit falls |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assoc.Prof. Dr. Yasemin Evrenosoğlu | **Date:** | | 30/04/2015 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505002509 | **TITLE** | Seasonal Flower |

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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 (√)]** | | | | | | |
|  | |  | | | | X | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 2 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | To teach the basic principle of seasonal flowers cultivation, the place and the importance of them among ornamental plants, the knowledge belonging to the group, family, botanical name, morphological features, ecological demands, production techniques and care recommendations of the seasonal flowers grown annual, bi-annual and perennial. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Annual, biannual and perennial seasonal flowers, ecological demands and propogation methods will be explained theoretically and practically. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | In addition to general information about seosonal flower , theoretical and practical informations on propogation methods and using in landscape will be gained. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1.The seasonal flowers grown annual, bi-annual and perennial  2. Ecological demands and propogation methods of them  3. How to use this flowers in landscape Ecological demands and production methods of the The seasonal flowers grown annual, bi-annual and perennia | | | | | | | |
| **TEXTBOOK** | | | | | 1. Hatipoğlu, A., Gülgün, B. (2000). Tek ve Çok Yıllık Mevsimlik Çiçekler, Kent Matbaası, İzmir.2. Orçun, E. (1968). Süs Bitkileri II (İlkbahar ve Yaz Çiçekleri) ege Üniversitesi Ziraat Fakültesi Yayın No:142 İzmir.3. Tanrıverdi, F. (1993) Çiçek Üretim Tekniği, İnkılap Yayınevi, İstanbul. | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | The importance of seasonal flowers and their dendrological features |
| 2 | The production of seasonal flowers, the features and preparation and the sterilization of germination environment. |
| 3 | The seed sowing and germination. External conditions affecting the germination |
| 4 | Environmental conditions, light, heat, water, fertilizer and growth reterdants |
| 5 | The production, use, growing demands and care of some seasonal flowers Alyssum, Aster,Begonia and Bellis |
| 6 | Midterm Examination 1 |
| 7 | The production use growing demands and care of Calystegia, Campanula, Catharantus and Chrysanthemum |
| 8 | The production use growing demands and care of Dahlia, Dianthus, Delphinum and Gazania |
| 9 | The production use growing demands and care of Impatiens, Petunia, Portulaga, Primula and Ageratum |
| 10 | The production use growing demands and care of Calceolaria, Calendula, Cherianthus, Cosmos and Celosia. |
| 11 | Midterm Examination 2 |
| 12 | The production use growing demands and care of Salvia, Tagates, Phlox erecta, Zinnia |
| 13 | The production use growing demands and care of Viola, Ageratum, Calceolaria, Calendula and Cherianthus |
| 14 | Using of Seasonal Flowers in landscape |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Asst.Prof. Dr. Sibel Sarıçam | **Date:** | | 30/04/2015 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505001503 | **TITLE** | Fruit Breeding |

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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 (√)]** | | | | | | |
|  | |  | | | | X | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 2 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Evoluation and development of fruit species, fertilisation biology, aims of breeding, breeding techniques and different researches belong to different fruit species will be noticed. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Breeding of different fruit species and different breeding techniques will be discussed. New cultivars in our country and in the world will be searched and followed. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Students will learn about fruit breeding techniques, and currently obtained new cultivars. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1.To have the ability of practising classical breeding techniques.  2.To have the ability of practising new breeding techniques.  3.Understanding how to breed fruit species  4. Understanding how to obtain new fruit cultivars. | | | | | | | |
| **TEXTBOOK** | | | | | 1. Kumar, N., 2006. Breeding of Horticultural Crops. Jai Bharat Printing Press, Rohtash Nagar, Shahdara Delhi.2. Dabholkar, A.R., 2006. General Plant Breeding. Ashok Kumar Mittal Concept Publishing Company, New Delhi.3. Janick, J., Moore, J. N., 1975. Advances in Fruit Breeding. Purdue University Press, West Lafayette, Indiana. | | | | | | | |
| **OTHER REFERENCES** | | | | | 1. Moore, J.N., Janick, J., 1983. Methods in Fruit Breeding. Purdue University Press, West Lafayette, Indiana. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Gene, chromosome, DNA concepts |
| 2 | Aims of breeding and evoluation |
| 3 | Origins of cultivars, variation of plants |
| 4 | Classical breeding, hybridization and selection |
| 5 | New breeding techniques |
| 6 | Midterm Examination 1 |
| 7 | Apple breeding and cultivars |
| 8 | Pear breeding and cultivars |
| 9 | Peach-Apricot breeding and cultivars |
| 10 | Plum-Cherry breeding and cultivars |
| 11 | Midterm Examination 2 |
| 12 | Nuts breeding and cultivars |
| 13 | Grape breeding and cultivars |
| 14 | Citrus breeding and cultivars |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assoc.Prof. Dr. Yasemin Evrenosoğlu | **Date:** | | 30/04/2015 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505001507 | **TITLE** | Physiological Disorders in Fruits |

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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 | | | | | 2 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | General definition of the physiological disorders of pre and post harvest periods examined on the fruits. Relationships between the cultural processes and ecology, general disorders, disorders examined on different cultivars, and precautions to be taken. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Description of reasons and mechanism of physiological disorders of fruit species. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Learning about physiological disorders that affects on the yield and fruit quality of fruit trees | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1.Understanding of reasons and mechanism of physiological disorders of fruits.  2.Learning of physiological disorders according to fruit species | | | | | | | |
| **TEXTBOOK** | | | | | 1.Eriş, A. 2003. Bahçe Bitkileri Fizyolojisi. Uludağ Üniversitesi Ziraat Fakültesi Ders Notları, No:11, V. Basım, Bursa2.Leopold, A.C. and Kriedemann, P.E.1964. Plant Growth and Development. Mcgraw-Hill Book Company, New York, 545 p.3.Salisbury, F.B. and Ross, C.W.1992. Plant Physiology. California, 682 p.4.Taiz, L. and Zeiger, E. 2002. Plant Physiology. Sinauer Associates, Inc | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction to physiological disorders |
| 2 | Disorders by genetic material |
| 3 | Disorders by environment |
| 4 | Disorders by plant nutrition |
| 5 | Disorders in pome fruits |
| 6 | Midterm Examination 1 |
| 7 | Disorders in pome fruits |
| 8 | Disorders in stone fruits |
| 9 | Disorders in nuts |
| 10 | Disorders in small fruits |
| 11 | Midterm Examination 2 |
| 12 | Disorders in citrus fruits |
| 13 | Disorders in Mediterranean fruits |
| 14 | Disorders in tropical fruits |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Asiss.Prof. Dr. Cenap Yılmaz | **Date:** | | 12/05/2015 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505001509 | **TITLE** | New Developments in Vegetable Growing-I |

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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 (√)]** | | | | | | |
|  | |  | | | | X | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 20 |
| Quiz | | | | |  | |  |
| Homework | | | | | 3 | | 40 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | | - | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Studying and discuss recently published papers about latest developments in areas of vegetable cultivation and breeding | | | | | | | |
| **COURSE OBJECTIVES** | | | | | this course aims to  Studying recent developments on new methods and technologies in vegetable science and literature review on the subject and evaluation of the information obtained from results of recently publsed research papers | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | National and international latest researchs on vegetable science which has an important place in the horticultural crops is discussed in this course | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | At the end of this course the student;  1- can produce solutions to problems that can be encountered by studying controversially latest developments in the vegetable science  2- can resolve the problems encountered in vegetable growing using research methods and establishing cause-and-effect relationship  3- can learns new methods in the cultivation of vegetables and transfer to practical  4- follows national and international new developments in vegetable growing. Learns review literature on a topic, evaluation and presentation of the information obtained | | | | | | | |
| **TEXTBOOK** | | | | | Recently published research papers and final reports | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Review and discuss literature on breeding and cultivation of winter vegetables |
| 2 | Review and discuss literature on breeding and cultivation of winter vegetables |
| 3 | Review and discuss literature on breeding and cultivation of winter vegetables |
| 4 | Review and discuss literature on breeding and cultivation of winter vegetables |
| 5 | Review and discuss literature on breeding and cultivation of winter vegetables |
| 6 | Midterm Examination 1 |
| 7 | Review and discuss literature on breeding and cultivation of winter vegetables |
| 8 | Review and discuss literature on breeding and cultivation of winter vegetables |
| 9 | Review and discuss literature on breeding and cultivation of winter vegetables |
| 10 | Review and discuss literature on breeding and cultivation of winter vegetables |
| 11 | Midterm Examination 2 |
| 12 | Review and discuss literature on breeding and cultivation of winter vegetables |
| 13 | Review and discuss literature on breeding and cultivation of winter vegetables |
| 14 | Review and discuss literature on breeding and cultivation of winter vegetables |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assoc. Prof.Nuray ÇÖMLEKÇİOĞLU | **Date:** | | 30.04.2015 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505002508 | **TITLE** | New Developments in Vegetable Growing-II |

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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 (√)]** | | | | | | |
|  | |  | | | | X | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 20 |
| Quiz | | | | |  | |  |
| Homework | | | | | 3 | | 40 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | | - | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Studying and discuss recently published papers about latest developments in areas of vegetable cultivation and breeding | | | | | | | |
| **COURSE OBJECTIVES** | | | | | this course aims to  Studying recent developments on new methods and technologies in vegetable science and  literature review on the subject and evaluation of the information obtained from results of recent research | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | National and international latest researchs on vegetable science which has an important place in the horticultural crops is discussed in this course | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | At the end of this course the student;  1- can produce solutions to problems that can be encountered by studying controversially latest developments in the vegetable science  2- can resolve the problems encountered in vegetable growing using research methods and establishing cause-and-effect relationship  3- can learns new methods in the cultivation of vegetables and transfer to practical  4- follows national and international developments in vegetable growing. Learns review literature on a topic, evaluation and presentation of the information obtained | | | | | | | |
| **TEXTBOOK** | | | | | Recently published research papers and final reports | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Review and discuss literature on breeding and cultivation of summer vegetables |
| 2 | Review and discuss literature on breeding and cultivation of summer vegetables |
| 3 | Review and discuss literature on breeding and cultivation of summer vegetables |
| 4 | Review and discuss literature on breeding and cultivation of summer vegetables |
| 5 | Review and discuss literature on breeding and cultivation of summer vegetables |
| 6 | Midterm Examination 1 |
| 7 | Review and discuss literature on breeding and cultivation of summer vegetables |
| 8 | Review and discuss literature on breeding and cultivation of summer vegetables |
| 9 | Review and discuss literature on breeding and cultivation of summer vegetables |
| 10 | Review and discuss literature on breeding and cultivation of summer vegetables |
| 11 | Midterm Examination 2 |
| 12 | Review and discuss literature on breeding and cultivation of summer vegetables |
| 13 | Review and discuss literature on breeding and cultivation of summer vegetables |
| 14 | Review and discuss literature on breeding and cultivation of summer vegetables |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assoc. Prof. Nuray COMLEKCIOGLU | **Date:** | | 30.04.2015 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505001510 | **TITLE** | Ornamental Plants and Use for Landscape Architecture |

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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 (√)]** | | | | | | |
|  | |  | | | | X | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 2 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Literature screening about ornamental plants and it’s use for landscaping, to prepare project and presantation | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aims of the course are to study the topic on ornamental plants, prepare the results as a project and to present the subject to community. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | In addition to general information about ornamental plants, theoretical and practical informations on using in landscape will be gained | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1. To recognise ornamental plants  2. To learn ecological demands of them  3. How to use this plants in landcape | | | | | | | |
| **TEXTBOOK** | | | | | Orçun, E. (1972). Özel Bahçe Mimarisi Dendroloji, İğne Yapraklı Ağaç ve Ağaçcıklar, Cilt I, İzmir.Orçun, E. (1972Peyzaj Mimarisi Dendroloji, Yapraklı Ağaç-Ağaçcıkların Özellikleri ve Peyzaj Mimarisinde Kullanılışları, Cilt II, İzmir.Ceylan, G. (2004). Dış Mekan Süs Bitkileri ve Payzajda Kullanımları, Flora Yayınları, İstanbul. | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Importants of Ornamen tal Plants |
| 2 | Trees in Landscape |
| 3 | Trees in Landscape |
| 4 | Trees in Landscape |
| 5 | Bushes in Landscape |
| 6 | Midterm Examination 1 |
| 7 | Bushes in Landscape |
| 8 | Climbing Plants |
| 9 | Climbing Plants |
| 10 | Seasonal Plants in Landscape |
| 11 | Midterm Examination 2 |
| 12 | Arid Plants, Road Tree |
| 13 | Air Pollution Resistant Plant , High Temperature-Frost Resistant Plants |
| 14 | Fast Growing Plants, Shadow Plants |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assist. Prof. Dr. Sibel Sarıçam | **Date:** | | 30/04/2015 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505001502 | **TITLE** | PLANT STRESS PHYSIOLOGY |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | |  |  | | | 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 (√)]** | | | | | | |
|  | |  | | | | X | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 2 | | 30 |
| Quiz | | | | | 1 | | 10 |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Concepts and sense of stress, resistance, tolerance and adaptation are identified. Drought stress, salinity stress, frost stress, low temperature stress and heavy metal stress in plants are explained. Endogenous and exogenous factors affecting stress are explained with physiological and molecular aspects. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | 1.Understanding of what limits plant distribution  2.Understanding of stress mechanism in plants | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Understanding of stress mechanism in plants | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1.Learn plant stress concept in advanced level  2.Learn and classifies the plant stress factors  3.Describe plant stress factors  4.Learn the effects of stress factors on plant growth and development  5.Learn the stress management in plant growing  6.Develop innovative solutions for the stress induced problems in plants | | | | | | | |
| **TEXTBOOK** | | | | | 1. Levitt, J. 1980. Responses of Plants to Environmental Stress. Academic Press, London, 606 p. | | | | | | | |
| **OTHER REFERENCES** | | | | | 1.Hale, M.G. and Orcutt, D.M. 1987. The Physiology of Plants under Stress. A Wiley-Interscience Publication, New York, 194 p.2.Li, P.H. and Sakai, A. 1982. Plant Cold Hardiness and Freezing Stress. Academic Press, London, 693 p. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | The content and importance of the course |
| 2 | Descriptions and concepts |
| 3 | Stress factors-I |
| 4 | Stress factors-II |
| 5 | Effects of stress factors-I |
| 6 | Midterm Examination 1 |
| 7 | Effects of stress factors-II |
| 8 | Defense mechanisms in stress physiology-I |
| 9 | Defense mechanisms in stress physiology-II |
| 10 | Defense mechanisms in stress physiology-III |
| 11 | Midterm Examination 2 |
| 12 | Discussion of recent studies in stress physiology-I |
| 13 | Discussion of recent studies in stress physiology-II |
| 14 | Discussion of recent studies in stress physiology-III |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Prof.Dr.Ece Turhan | **Date:** | | 03/09/2015 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505001501 | **TITLE** | GROWTH AND DEVELOPMENT PHYSIOLOGY IN PLANT |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | |  |  | | | 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 (√)]** | | | | | | |
|  | |  | | | | X | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 2 | | 30 |
| Quiz | | | | | 1 | | 10 |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Physiological properties of growth & development of plants; exogenous and endogenous factors affecting plant growth & development; main physiological phenomena (germination, dormancy, flowering, pollination, senescence, etc) in plants; theories of growth & development; molecular aspects of these phenomena. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The purpose of this course is to give students advanced growth and development physiology of plants. In the context of this course, description of factors effecting growth and development and physiology and molecular biology of growth and development are discussed. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Description of mechanism of growth and development physiology in plant. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1.Learn the cycle and stages of growth and development in plants  2.Learn the factors effecting growth and development in plants  3.Learn the physiologic stages of plants in advanced level  4.Learn the control of growth and development of plants  5.Learn the leading of growth and development of plants  6.Learn the plant management | | | | | | | |
| **TEXTBOOK** | | | | | 1. Salisbury, F.B., Ross, C.W., 1992. Plant Physiology.Califorfina | | | | | | | |
| **OTHER REFERENCES** | | | | | 1.Taiz,L., Zeiger,E.,1991. Plant Physiology. The Benjamin/Cummins. Publishing Company. Inc. California2. Eriş, A. 2003. Bahçe Bitkileri Fizyolojisi. Uludağ Üniversitesi Ziraat Fakültesi Ders Notları, No:11, V. Basım, Bursa. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | The content and importance of the course |
| 2 | Growth and development |
| 3 | Growth and development in molecular biology, Dynamics of growth |
| 4 | External factors effecting growth and development |
| 5 | Internal factors effecting growth and development |
| 6 | Midterm Examination 1 |
| 7 | Seed and bud dormancy |
| 8 | Germination |
| 9 | Flowering |
| 10 | Juvenility, maturity, ageing |
| 11 | Midterm Examination 2 |
| 12 | Fertility |
| 13 | Fruit growing and ripening |
| 14 | Control and leading growth and development |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Prof.Dr.Ece Turhan | **Date:** | | 03/09/2015 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | Vegetable Seed Production |

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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 (√)]** | | | | | | |
| x | |  | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 2 | | 50 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 25 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 25 |
| **PREREQUISITE(S)** | | | | | - | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Seed formation and development, seed types, seed quality tests, and seed industry status in the world and Turkey will be described in theory and practice. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Teaching of pollination, fertilization, and seed development in vegetables, effective ecological factors in seed production and methods of seed production | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Scientific and technical aspects of high quality seed production in economically important vegetable species and seed quality tests are learned in this course | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | theoretical and practical knowledge on  - flower structure, pollination and fertilization (reproduction) biology of vegetables  - inbreeding and crossbreeding (hybridization) in vegetables  - standard and F1 hybrid seed production techniques in vegetables  - seed harvesting, separation, drying and seed quality testing by species | | | | | | | |
| **TEXTBOOK** | | | | | - Vegetable Seed Production, 3 rd Edition, Raymond A.T. George, CABI, 2009-320 p.2- Tohumluk ve Teknolojisi, Sezen ŞehiraliFakülteler Matbası, İst. 1997 422 sayfa | | | | | | | |
| **OTHER REFERENCES** | | | | | 1- Kültür Sebzeleri (Sebze Yetiştirme), Ege Üniversitesi basımevi İzmir. Hüseyin Vural, Dursun Eşiyok, İbrahim Duman. 20002- Özel Sebzecilik, Onur grafik matbaa ve Reklam Hizmetleri, İstanbul. Ahmet Şalk, Levent Arın, 2008 | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | The status of vegetable seed industry |
| 2 | The importance of seeds in vegetable production |
| 3 | Flower and pollination biology in vegetables |
| 4 | Pollination, fertilization and seed development |
| 5 | Effective ecological factors in seed production |
| 6 | Midterm Examination 1 |
| 7 | Variety types of vegetables |
| 8 | Classes of seed (Breeder Seed, foundation seed, registered seed and certificated seed) |
| 9 | Seed quality characteristics |
| 10 | Vegetable seed production methods |
| 11 | Midterm Examination 2 |
| 12 | Hybrid vigor, heterosis, F1 hybrid seed production techniques |
| 13 | Seed harvesting, separation and storage |
| 14 | Seed vigor and tests |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assoc. prof. Nuray ÇÖMLEKÇİOĞLU | **Date:** | | 05.04.2016 | | | |

**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**:

**T.R.**

**ESKİŞEHİR OSMANGAZİ UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLİED SCİENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | HORTICULTURE (MSc) | **YARIYIL** | FALL/SPRİNG |

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| **COURSE** | | | |
| **CODE** | 505002512 | **TITLE** | Fundamentals Ecological, Biological and Physiological Principles of Horticulture |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7.5 | COMPULSORY  ( X ) | | ELECTİVE  ( ) | TURKİSH |
| **CREDİT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Horticulture** | | | | | | |
|  | |  | | | | X | | | | | | |
| **ASSESSMENT CRITERİA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution ( % )** |
| Midterm | | | | |  | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | To give advance information on ecological, biological and physiological principles of horticultural plants | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Growth, development and maturation in horticulture and maintenance of vitality. The explanation of vital activities and functions in physics, chemistry and biological rules. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Analytical thinking, synthesize and able to express their ideas. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | * It can be learned the importance and effects of ecological factors in horticultural plants. * It can be learned classify important biological events in horticultural plants. * it can be known important physiological events in horticultural plants * The students can understand about stress * The students can make a link between ecology, biology and physiology. | | | | | | | |
| **TEXTBOOK** | | | | | Kaşka, Nurettin ve Kargı Paydaş Sevgi (2007) Meyve Ağaçları Fizyolojisi (büyüme ve Gelişme),Nobel Kitabevleri, Adana (Çeviri)Gökmen, Sabri (2007) Genel Ekoloji, Nobel Yayın Dağıtım, Ankara | | | | | | | |
| **OTHER REFERENCES** | | | | | Akman, Yıldırım ve Darıcı, Cengiz (1998) Bitki Fizyolojisi (Beslenme ve Gelişme Fizyolojisi), Ankara | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPİCS** |
| 1 | General Characteristics of Horticultural Plants in Terms of Ecological, Biological and Physiological Aspect, Effect of Ecological Factors on Physiological Characteristics |
| 2 | Vegetative and Generative Growth Concepts - Topics |
| 3 | Flower and Fruit Initiation |
| 4 | Physiological and Biological Factors Affecting Fruit Growth and Development |
| 5 | Plant-Water Relationships, Mineral Uptake by Plants, Transportation Systems of Plants |
| 6 | The Use of Mineral Materials (Ions) and Their Main Tasks in the Plant |
| 7 | *Midterm Examination*  The Effects of Plant Nutrient Elements |
| 8 | Plant Nutrient Elements Needs of Plants, The Symptoms of Excess And Deficiency of Plant Nutrient Elements |
| 9 | Growth Rule, Relationships Between Carbohydrates and Plant Development |
| 10 | Carbon Assimilation (Photosynthesis), Respiration |
| 11 | Storage and Transportation of Assimilates |
| 12,13 | The Place, Importance and Usage of Growth Regulators in The Plant Physiology of Horticulture |
| 14 | Biochemistry of Abscission and Senescence, general evaluation of course contents |
| 15,16 | *Final Examination* |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNİNG OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately |  |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately |  |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment |  |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants |  |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions |  |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills |  |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility |  |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. |  |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. |  |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility |  |  |  |

**Prepared by: Prof. Dr. Rafet ASLANTAŞ** **Date: 13.11.2017** **Signature**:

**T.R.**

**ESKİŞEHİR OSMANGAZİ UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLİED SCİENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | HORTICULTURE (MSc) | **YARIYIL** | SPRİNG |

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| **COURSE** | | | |
| **CODE** | 0 | **TITLE** | The Importance and Effects of Global Climate Change on Horticulture |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | - | - | | | 3 | 7.5 | COMPULSORY  (   ) | | ELECTİVE  ( X ) | TURKİSH |
| **CREDİT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Horticulture** | | | | | | |
|  | |  | | | | X | | | | | | |
| **ASSESSMENT CRITERİA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution ( % )** |
| Midterm | | | | |  | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Causes and ecological consequences of global climate change is to determine the effects of cultivation of horticultural crops. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | System to determine the effects of climate change on agriculture in horticulture | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Analytical thinking, projecting and able to express their opinions. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | * They can learn the causes of global climate change. * They can learn about the ecological consequences of global climate change * They will be informed about global climate change impacts on agriculture, learn about horticulture plants. * Upon completion, students will be aware of climate change-related research * The ability to have the presence predictions about the subject. * They will be informed about alternative culture. | | | | | | | |
| **TEXTBOOK** | | | | | Rafet Aslantaş (2017) İklim değişikliğinin Bahçe Bitkileri Yetiştiriciliğine Etkileri(Ders Notları) Atatürk Üniversitesi Ziraat Fakültesi Bahçe Bitkileri Bölümü | | | | | | | |
| **OTHER REFERENCES** | | | | | Necmettin ÇEPEL 2002. Ekolojik Sorunlar ve Çözümleri TÜBİTAK Popüler Bilim Kitapları | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPİCS** |
| 1 | Historical Development, Indicators and Causes of Global Climate Change |
| 2 | Ecological results of climatic changing |
| 3 | Horticultural production areas/regions ecology and production implications of ecosystem changes in the presence of plants in the garden |
| 4 | Horticultural production areas/regions ecology and production implications of ecosystem changes in the presence of plants in the garden (continued) |
| 5 | Horticulture in the presence of the ecosystem,its importance and its future, |
| 6 | Changes in horticultural crops growing techniques, |
| 7 | The annual maintenance works that changes, |
| 8 | *Midterm Examination*  Changes in input use, |
| 9 | Changes in product design and production, |
| 10 | The importance of protecting soil and water, |
| 11 | The use of soilless culture, the importance and the future, |
| 12 | The use of soilless culture, the importance and the future (continued), |
| 13 | Low water consuming species, water harvesting, water limitation and its applications, |
| 14 | Scientific Meetings, Publications and Reports on the Subject General Review and Predictions |
| 15,16 | *Final Examination* |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNİNG OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately |  |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately |  |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment |  |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants |  |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions |  |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills |  |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility |  |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. |  |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. |  |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility |  |  |  |

**Prepared by: Prof. Dr. Rafet ASLANTAŞ**  **Date: 13.11.2017**

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | Soilless Culture Techniques in Horticulture |

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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 | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Classification of soilless agriculture, water and substrate culture techniques, advantages and disadvantages of soilless agriculture, soilless agriculture techniques in different plant groups. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Planting techniques in soilless medium and teaching the systems used in this stage. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | The student will have knowledge of soilless agriculture. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | Learns soilless farming technique.  Student knows the materials used in soilless agriculture.  Learns how to make the bottom for soilless agriculture.  Learns to grow plants in soilless agriculture. | | | | | | | |
| **TEXTBOOK** | | | | | Gül A., 2008. Topraksız Tarım. Hasad Yayıncılık, 144 s.- Gül A., Tüzel İ.H., Okur B.,Tuncay Ö., Aykut N., Engindeniz S., 2000. Serada Topraksız Tarım Tekniği ile Hıyar Yetiştiriciliği. TÜBİTAK TARP Yayınları, 51 s. | | | | | | | |
| **OTHER REFERENCES** | | | | | Savvas, D. And Passam, H., 2002. Hydroponics Production of Vegetables and Ornementals. Embryo Publications, Ethens Greece. ISBN: 960-8002-12-5- Douglas, J.S., 1990. Advanced Guide to Hydroponics (Soilless Culture). Pelham Boks/Stephen Grene Pres. ISBN : 0-7207-1571-7 | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Soilless culture, the history, definition, terminology. |
| 2 | The reasons that compullsorry of soilles culture. |
| 3 | Classification of soilless culture. |
| 4 | The advantages and disadvantages of soilless cultivation. |
| 5 | The reasons for intensive use in protected cultivation of soilless agriculture. |
| 6 | Midterm Examination 1 |
| 7 | Open and closed soilless culture systems, Preparation of nutrient solution and delivery to plants. |
| 8 | Preparation of nutrient solution and delivery to plants. |
| 9 | Water culture methods used in soilless agriculture. |
| 10 | Substrate culture methods used in soilless agriculture. |
| 11 | Midterm Examination 2 |
| 12 | Substrate culture techniques to increase the number of plants in the unit. |
| 13 | Comparison of aquaculture and substrate cultures. |
| 14 | Presentations of assignments related to the course. |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assist. Prof. Kenan SÖNMEZ | **Date:** | |  | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | Fruit Genetic Resources |

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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 (√)]** | | | | | | |
|  | |  | | | | X | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | |  | |  |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 30 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | | 1 | | 30 |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | | - | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | The distribution of genetic resources of fruit crops in the world and in Turkey, gene banks, working groups, the characterization and identification of genetic resources, molecular markers are used to identify, in situ and ex situ conservation, cryopreservation, genetic evaluation and breeding utilization of resources are studied. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | To teaching the situation, conservation, and characterisation of fruit genetic resources | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | It will have knowledge on the status, conservation, characterization and evaluation of fruit genetic resources. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1.Understanding of situation of fruit genetic resources.  2.Learning the conservation of fruit genetic resources.  2. Learning the characterisation of fruit genetic resources.  4. Learning the uses of genetic resources of fruit crops. | | | | | | | |
| **TEXTBOOK** | | | | |  | | | | | | | |
| **OTHER REFERENCES** | | | | | 1. Henry, R.J., 2005. Plant Diversity and Evolution: Genotypic and Phenotypic Variation in Higher Plants. CABI Publishing, Australia.2. Şehirali, S. ve M. Özgen, 1987. “Bitkisel Gen Kaynakları” Ders Kitabı, A.Ü. Ziraat Fakültesi Yayınları, No: 1020, Ders kitabı No: 294, A. Ü. Basımevi, Ankara, 239 s. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction to fruit genetic resources |
| 2 | Centers of origin |
| 3 | Fruit genetic resources in Turkey and World |
| 4 | Gen banks |
| 5 | In situ and ex situ conservation |
| 6 | Midterm Examination 1 |
| 7 | Seed and vegatative material storage |
| 8 | Cryoprezevation |
| 9 | Characterization and description of fruit genetic resources |
| 10 | Characterization and description of fruit genetic resources |
| 11 | Midterm Examination 2 |
| 12 | Characterization and description of fruit genetic resources |
| 13 | Markers used for description of fruit genetic resources |
| 14 | Evaluation of fruit genetic resources |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Dr. Cenap YILMAZ | **Date:** | | 03.04.2018 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | Physiological Disorders in Vegetables |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( X ) | Türkçe |
| **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 | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | - | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Causes of physiological spoilage in vegetables and methods to be developed against these disorders. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Detection of the negative effects of a number of physiological factors in pre-harvest or post-harvest storage conditions in vegetables and determination of measures to be taken against these disorders. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Physiological problems encountered in summer and winter vegetables on the basis of species and the measures to be taken to reduce or eliminate the damages will be obtained. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | To be able to diagnose the physiological problems.  Elimination of possible physiological problems before they occur.  To produce solutions to emerging problems, to reach the source of information. | | | | | | | |
| **TEXTBOOK** | | | | | - Snowdon, A.L., 1991. A Colour Atlas Postharvest Diseases And Disorders Of Fruits And Vegetables, Vol.II Vegetables. Wolfe Scientific, London.-Savvas D., Ntatsi G., Passam H.C., 2008. Plant nutrition and physiological disorders in greenhouse grown tomato, pepper and eggplant. The European Journal of Plant Science and Biotechnology, 45-61.-Karaçalı, İ., 2014. Bahçe Ürünlerinin Muhafaza ve Pazarlanması | | | | | | | |
| **OTHER REFERENCES** | | | | | -Weichmann, J., 1987. Postharvest Physiology of Vegetables. Marcel Dekker, Inc., NewYork, | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Definition of physiological disorders in vegetables, making of country and undergound and outdoor |
| 2 | Physiological defects seen in outdoor tomatoes. |
| 3 | Physiological defects seen in tomatoes grown under the covers. |
| 4 | Physiological imperfections in open-planted pepper. |
| 5 | Physiological defects in pepper grown under cover. Physiological imperfections in open-planted eggplant. |
| 6 | Midterm Examination 1 |
| 7 | Physiological defects seen in eggplant grown under the cover. |
| 8 | Physiological defects seen in open and covered cucumbers (Cucumis sativus). |
| 9 | Physiological defects in celery (Apium graviolens). |
| 10 | Physiological defects in lettuce (Lactuca sativa). |
| 11 | Midterm Examination 2 |
| 12 | Physiological defects in cauliflower (Brassica oleracea var. Botrytis) and Brokkolide (Brassica oleracea var. Italica). |
| 13 | Physiological defects in carrot (Dautus carota). Physiological defects in cabanas (Brassica oleraceae spp). |
| 14 | Physiological defects seen in radish (Raphanus sativus). |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Dr.Öğr.Üy. Kenan SÖNMEZ | **Date:** | |  | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505002518 | **TITLE** | IFOOD ADDITIVES AND TOXICOLOGY |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 3 | | | 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 | | | | | 1 | | 20 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | - | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Description of food additives, intended use, food additive process, antioxidants,, acidity regulators, emulsifiers, gums, preservatives, flavorings, colorants, agents of flavor, sweeteners. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | To teach general properties of food additives, toxicological evaluations, classes, usage areas in foods, legal regulations. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | General properties of food additives will gain information about the toxicological evaluations | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1- In the food industry, to have knowledge about a standard production suitable for human health  2- To inform about the legislation of food additives used in the steps of the production standard of foods  3- Reviewing the location of food additives used in the food sector as a subject matter expert | | | | | | | |
| **TEXTBOOK** | | | | | Saldamlı, İ. (1985). Gıda katkı Maddeleri ve İngrediyenler. Hacettepe Üniversitesi Mühendislik Fakültesi, Gıda Mühendisliği Bölümü. Ankara Çakmakçı, S. ve Çelik, İ. (2000). Gıda Katkı Maddeleri. Atatürk Üniversitesi Ziraat fakültesi Ofset Tesisi. Erzurum Gıda katkı maddeleri ile ilgili her türlü kitap ve bilimsel yayınlarProf. Dr. Tomris ALTUĞ (2009) Gıda Katkı Maddeleri; | | | | | | | |
| **OTHER REFERENCES** | | | | | - | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Food additives and purpose of using |
| 2 | Regulation on food additives |
| 3 | Classification of food additives |
| 4 | The evaluation of the sensory properties of food additives and health |
| 5 | Antioxidants: classification, chemical structure, properties and functions |
| 6 | Acidity regulators: classificaiton, chemical structure, properties and functions |
| 7 | Emulsifiers: classificaiton, chemical structure, properties and functions |
| 8 | Midterm exam-Stabilizers: classificaiton, chemical structure, properties and functions |
| 9 | Gum: classificaiton, chemical structure, properties and functions |
| 10 | Antimicrobials: classificaiton, chemical structure, properties and functions |
| 11 | Midterm exam -Antimicrobials: classificaiton, chemical structure, properties and functions |
| 12 | Coloring agents: classificaiton, chemical structure, properties and functions |
| 13 | Flavors and sweeteners: classificaiton, chemical structure, properties and functions |
| 14 | Aggregation inhibitors: classificaiton, chemical structure, properties and functions |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Ass.Prof. Aysel GÜLBANDILAR | **Date:** | | 13.11.2019 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505002517 | **TITLE** | BASIC TECHNIQUES OF HORTICULTURAL LABORATORY |

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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 | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Information, introduction and utilization of instruments and equipments used in laboratory for research in horticulture, preparations of chemical solutions and their characteristics, and learning about pomological and some phytochemical analyses. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | to introduce various materials and devices in laboratory and to teach some basic analysis in Horticultural crops. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | To learn to work in the laboratory for analysis in Horticultural crops. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1- Gets information about points to consider when working in laboratory.  2- Knows about various materials, devices and equipments used in horticultural research and makes use of them.  3- Gets information about properties of chemicals and preparation of solutions.  4- Learning about pomological and some phytochemical analyses. | | | | | | | |
| **TEXTBOOK** | | | | |  | | | | | | | |
| **OTHER REFERENCES** | | | | | Altan, A., 1995. Laboratuar tekniği. Çukurova Üniversitesi Ziraat Fakültesi Ders kitabı no: 36, Adana.Hışıl, Y., 1994. Enstrümental Gıda analizleri-I (Yüksek Basınçlı sıvı Kromatografisi). Ege Üniversitesi Mühensilik Fakültesi ders kitapları yayın no:31, 218s.Owen, T., 1996. Fundamentals of UV-visible Spectroscopy. Hewlett-Packard Company, germany, 142p.Cemeroğlu, B., 2007. Gıda analizleri. Gıda teknolojisi derneği yayınları no:34, 535s. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Principles of using laboratory and precautions in laboratory |
| 2 | Safe working in laboratory |
| 3 | Laboratory equipments |
| 4 | The introduction of glass materials, properties and usage |
| 5 | The introduction and usage of laboratory equipment |
| 6 | Calibration of laboratory equipment |
| 7 | Solution preparation |
| 8 | Midterm Examination -Titration and calculations |
| 9 | Pomological anayses |
| 10 | Spectrophotometry |
| 11 | Standard preparation and calibration |
| 12 | Working with spectrophotometer |
| 13 | High pressure liquid chromatography |
| 14 | Gas chromatography |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Dr. Öğr. Üy. Cenap YILMAZ | **Date:** | | 08.11.2019 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505002516 | **TITLE** | Indoor Ornamental Plant |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 3 | | | 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 | | | | | 1 | | 20 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | - | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Definition, classification, propagation techniques and care of indoor ornamental plants, pest and diseases and physiological disorders | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of this course is to enable students to know the botanical features of indoor ornamental plants and propagation techniques and to comprehend its economic importance. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | General information about indoor ornamental plants as well as propagation methods, ecological conditions and their care will be gained. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1. To be able to understand the importance of indoor ornamental plants  2. To be able to comprehend the general characteristics of indoor ornamental plants  3. To be able to evaluate, solve and understand the problems encountered  4. To be able to apply classical and modern technologies in production | | | | | | | |
| **TEXTBOOK** | | | | | Uzun, G. (….). Türkiye İç Mekan Bitkileri Tanıtım Kitabı, Floraplus Kitapları, İstanbul.Yazgan, M., Uslu, A., Tanrıvermiş, E. (2003). İç Mekan, SASBÜD, Yalova.Tanrıverdi, F. (1993). Çiçek Üretim Tekniği, İnkılap Kitapevi, İstanbul. | | | | | | | |
| **OTHER REFERENCES** | | | | | - | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Defination, Features and Importance of Indoor Ornamental Plants |
| 2 | Classification of Indoor ornamental Plants |
| 3 | Indoor Ornamental Plant Sector in Turkey and World |
| 4 | Environmental Conditions for Indoor Ornamental Plants |
| 5 | Propagation of Indoor ornamental Plants |
| 6 | Special propagation techniques of Indoor ornamental Plants |
| 7 | Care of Indoor Ornamental Plants |
| 8 | Midterm exam/ Pests and disease on Indoor Ornamental Plants, Care Mistakes |
| 9 | Indoor Plants Air Purifying |
| 10 | Introduce and propagation of Some Important Indoor Plants |
| 11 | Midterm exam - Introduce and propagation of Some Important Indoor Plants |
| 12 | Introduce and propagation of Some Important Indoor Plants |
| 13 | Introduce and propagation of Some Important Indoor Plants |
| 14 | Introduce and propagation of Some Important Indoor Plants |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assoc.Prof.Dr. Sibel SARIÇAM | **Date:** | | 05.11.2019 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505001513 | **TITLE** | Ornamental Bulbous Plant |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 3 | | | 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 | | | | | 1 | | 20 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | - | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Definition, classification, biological characteristics and physiology of ornamental bulbous plant, propagation techniques of bulbous plant, pest and diseases and physiological disorders | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of this course is to enable students to know the botanical, physiological principles of bulbous plant and propagation techniques and to comprehend its economic importance. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | General information about ornamental bulbous plants as well as propagation methods and their use will be gained. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1. To be able to understand the importance of bulbous ornamental plants  2. To be able to comprehend the general characteristics of ornamental bulbous plants  3. To be able to evaluate, solve and understand the problems encountered  4. To be able to apply classical and modern technologies in production | | | | | | | |
| **TEXTBOOK** | | | | | Atay, S. (1996). Soğanlı Bitkiler, Doğal hayatı Koruma Derneği yayınları, İstanbul.Tanrıverdi, F. (1993). Çiçek Üretim Tekniği, İnkılap Kitapevi, İstanbul. | | | | | | | |
| **OTHER REFERENCES** | | | | | - | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | The production of ornamental bulbous plants in world and Turkey |
| 2 | Botanical properties of ornamental bulbous plants |
| 3 | Propagation techniques of ornamental bulbous plants |
| 4 | Points to be considered in the propogation of ornamental bulbous plants |
| 5 | Harvesting and classification of ornamental bulbous plants |
| 6 | Midterm exam-Storage of ornamental bulbous plants |
| 7 | Pretreatment on ornamental bulbous plants |
| 8 | Forcing of ornamental bulbous plant |
| 9 | Pest and disease on ornamental bulbous plant |
| 10 | Physiological disorders in ornamental bulbous plants |
| 11 | Midterm exam - Natural flower bulbs as ornamental plants |
| 12 | Hyacinthus (Hyacinth), Narcissus (Narcissus) botanical characteristics and cultivation |
| 13 | Lilium (Lily), Tulipa (tulip) botanical characteristics and cultivation |
| 14 | Freesia (Freesia), Iris (Iris) botanical characteristics and cultivation |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assoc.Prof.Dr. Sibel SARIÇAM | **Date:** | | 08.04.2019 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** | 505001514 | **TITLE** | Physiological Disorders in Fruits |

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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 (√)]** | | | | | | |
|  | |  | | | | X | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | |  | |  |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 30 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | | 1 | | 30 |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | | - | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | General definition of the physiological disorders of pre and post harvest periods examined on the fruits. Relationships between the cultural processes and ecology, general disorders, disorders examined on different cultivars, and precautions to be taken. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Description of reasons and mechanism of physiological disorders of fruit species. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Learning about physiological disorders that affects on the yield and fruit quality of fruit trees. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1.Understanding of reasons and mechanism of physiological disorders of fruits. Understanding of reasons and mechanism of physiological disorders of fru1. Understanding of reasons and mechanism of physiological disorders of fruits.  2.Learning of physiological disorders according to fruit species. Learning of physiological disorders according to fruit species Learning of physiological disorders according to fruit species | | | | | | | |
| **TEXTBOOK** | | | | | - | | | | | | | |
| **OTHER REFERENCES** | | | | | 1. Eriş, A. 2003. Bahçe Bitkileri Fizyolojisi. Uludağ Üniversitesi Ziraat Fakültesi Ders Notları, No:11, V. Basım, Bursa2. Leopold, A.C. and Kriedemann, P.E.1964. Plant Growth and Development. Mcgraw-Hill Book Company, New York, 545 p.3. Salisbury, F.B. and Ross, C.W.1992. Plant Physiology. California, 682 p.4. Taiz, L. and Zeiger, E. 2002. Plant Physiology. Sinauer Associates, Inc. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction to physiological disorders |
| 2 | Physiological disorders by genetic material |
| 3 | Physiological disorders by environment |
| 4 | Physiological disorders by plant nutrition |
| 5 | Physiological disorders in pome fruits |
| 6 | Mid-Term Examination 1 - Physiological disorders in pome fruits |
| 7 | Physiological disorders in pome fruits |
| 8 | Physiological disorders in stone fruits |
| 9 | Physiological disorders in stone fruits |
| 10 | Physiological disorders in stone fruits |
| 11 | Mid-Term Examination 2 - Physiological disorders in nut fruits |
| 12 | Physiological disorders in small fruits |
| 13 | Physiological disorders in subtropical fruits |
| 14 | Physiological disorders in tropical fruits |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Dr. Öğr. Üy. Cenap YILMAZ | **Date:** | | 08.04.2019 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | Variety X Climate Relationships in Walnut Cultivation |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 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 | | | | | 1 | | 25 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 25 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 50 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | World walnut production is increasing day by day. Although there are some problems in Turkey, there is a certain increase in walnut production. The most critical issue in setting up a garden in walnut cultivation is the issue of which variety will be recommended for which climate. Walnut, The cultivar x climate relationship is the most complex fruit type. The climate data of approximately 40 provinces suitable for walnut production in Turkey will be discussed. The most important data; About 15 climate data such as last frost date, first frost date, vegetation period (days), total temperature, total and seasonal precipitation (mm), humidity (%) change in spring, fog situation in spring will be examined. Considering all the vegetal characteristics (morphological and physiological) of walnut varieties, data analyzes will be made about which variety will best suit which region. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The student who takes the course will have learned the most important climatic data in walnut cultivation in detail. Again, he will learn to make detailed criticisms about which walnut varieties grown in Turkey are more suitable for which regions. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Thanks to this lesson, the issue of which walnut variety will be recommended to which region will be clarified. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1. The student learns the climate data in detail.  2. Learns the morphological and phenological characteristics of important walnut varieties used in Turkey.  3. Theoretically analyze the issue of which walnut variety will be more suitable for which region.  4. The world learns how to have a say in walnut production again. | | | | | | | |
| **TEXTBOOK** | | | | | 1. Eric Germain; Jean-Pierre Prunet; Alain Garcın; LE NOYER, 1999, Ctifl, Editions centre technique interprofessionnel des fruits et legumes. 22 rue Bergere-75009 Paris.2. David E. Ramos, 1999. Walnut Production Manuel. University of California Publicatiıon 3373 ISBN:1-879906-27-9 | | | | | | | |
| **OTHER REFERENCES** | | | | | Climate data of the General Directorate of Meteorology on the basis of provinces and districts for many years | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Walnut production in the world and in Turkey |
| 2 | Main problems in walnut production in Turkey |
| 3 | Why is climate data the most critical issue in setting up a orchard in walnut cultivation? |
| 4 | What does the variety x climate relationship mean? |
| 5 | Examination of the climate data of approximately 40 cities where walnuts are grown in Turkey. |
| 6 | Analysis in terms of last frost date and first frost date by regions and provinces |
| 7 | Examination of temperature parameters such as vegetation period (days) and total temperature according to provinces |
| 8 | Examination of the total and seasonal precipitation amount (mm), |
| 9 | Examination of climate data such as humidity (%) change in spring, fog situation in spring |
| 10 | Water content values and frost resistance of annual and older branches in walnut varieties |
| 11 | Evaluation of spring awakening(bud burst) dates of nearly 30 walnut cultivars such as Şebin, Bilecik, Yalova Group Varieties, Kaman 1, Kaman 5, Franquette, Fernor, Fernette, Chandler, Pedro, Midland, Hartley. |
| 12 | Calculation of bud yield status and potential yield strength (PVG) of walnut varieties in annual shoots |
| 13 | Making data analyzes about which variety will suit which region better, taking into account all vegetative characteristics (morphological and physiological) of walnut varieties. |
| 14 | General evaluation of the course |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Prof. Dr. Yakup ÖZKAN | **Date:** | | 27.04.2022 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | Photosynthesis Ecology in Pomology |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 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 | | | | | 1 | | 25 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 25 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 50 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | This course mostly focuses on fruit trees. The anatomic situation and gas diffusion of leaves, the leaf anatomy according to variety and environment conditions, gas dimensions, effects of inside and outside factors on carbohydrate production, CO2 curve of photosynthesis, the effect of light on photosynthesis ratio, the light curved of photosynthesis, the effect of temperature on, temperature curve of photosynthesis, the balance of total organic production and photosynthesis per area in an apple, sweet cherry and walnut orchard. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of this course is to teach the student how the tree accumulates substance (carbohydrate) by taking into account the factors affecting photosynthesis in a modern orchard. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Critical to this course, nutrition and irrigation, as well as the contribution of the main light factor to material production in closed orchards are examined. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1. The student tries to understand more closely how a fruit tree feeds and accumulates matter.  2.Learns in detail the light factor that affects photosynthesis in material accumulation.  3. Learns which garden systems will obtain the most efficient material accumulation in a modern orchard.  4. Learn in detail the functions of internal and external factors affecting photosynthesis for maximum energy (matter) accumulation in large plantations. | | | | | | | |
| **TEXTBOOK** | | | | |  | | | | | | | |
| **OTHER REFERENCES** | | | | | 1.Herold A.. Regulation of photosynthesis by sink activity—the missing link, New Phytol., 1980, vol. 86 (pg. 131-144). 2.Guinn G., Mauney J.R.. Hesketh J.D, Jones J.W. Analysis of CO2 exchange assumptions: feedback control, Predicting Photosynthesis for Ecosystem Models, 1980Boca RatonCRC(pg. 1-16) 3. Paul M.J., Foyer C.. Sink regulation of photosynthesis, J. Exp. Bot., 2001, vol. 52 (pg. 1383-1400 | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | What is photosynthesis? What does photosynthetic ecology mean? |
| 2 | The anatomic situation and gas diffusion of leaves, |
| 3 | The leaf anatomy according to variety and environment conditions, |
| 4 | Gas dimensions, |
| 5 | Effects of inside and outside factors on carbohydrate production, |
| 6 | CO2 curve of photosynthesis, |
| 7 | The effect of light on photosynthesis ratio, |
| 8 | The light curved of photosynthesis, |
| 9 | The effect of temperature on, |
| 10 | Temperature curve of photosynthesis, |
| 11 | Preparation of the substance production balance sheet in an classic apple ochard |
| 12 | Preparation of the substance production balance sheet in an dwarfed apple ochard |
| 13 | Preparation of the substance production balance sheet in an classic and semi-dwarfed sweet cherry orchard |
| 14 | Preparation of the substance production balance sheet in an classic walnut ochard |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Prof. Dr. Yakup ÖZKAN | **Date:** | | 27.04.2022 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | Climatic Requirements of Grapevine |

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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 (√)]** | | | | | | |
|  | |  | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | The scientific methods to be followed in determining the climatic demands of the grapevine and the determination of the suitable grape variety for any ecology will be discussed. Before the establishment of a vineyard with the interpretation of climate data, studies will be carried out to determine the positive and risky factors with the synthesis of climatic, geographical, and ecological structures that are considered sufficient for viticulture. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | It was intended to teach the concept of climate, evaluate climate data, classify suitable climatic regions for viticulture based on the climatic demands of the vine, determine suitable varieties for any ecology based on bioclimatic index calculations, and analyze the potential effects of climate change on grape phenology and vine physiology. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | To determine the suitable and negative conditions for cultivation, interpret and decide on the suitable variety by using the current climate data and bioclimatic index calculations to select grape varieties to be grown in any ecology. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1- Learns climate and evaluation of climate data.  2- Knows the climatic demands of the vine.  3- Classifies suitable climatic regions for viticulture in the world and in our country.  3- Comprehends the points to be considered in determining suitable ecologies for viticulture.  4- Learns to determine grape varieties suitable for any ecology.  5- Gain skills in the calculation of bioclimatic indices.  6- Evaluates the effects of climate change on grapevine physiology. | | | | | | | |
| **TEXTBOOK** | | | | | Personal lecture notes compiled from various sources and current scientific studies. | | | | | | | |
| **OTHER REFERENCES** | | | | | Keller, M., 2010. The Science of Grapevine. Burlington, MA, USA: Academic Press (2010), pp. 377.Ağaoğlu, Y.S., (2002). Bilimsel ve Uygulamalı Bağcılık Asma Fizyolojisi I, Kavaklıdere Eğitim Yayınları, Ankara, 446s. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Information and Introduction to the Lesson |
| 2 | Definition of Climate and Considerations in the Evaluation of Climate Data |
| 3 | Climatic Requirements of Vine (Extreme Temperature Values, Sunshine, Precipitation, Wind) |
| 4 | Climate and Ecological Considerations in the Vineyard Plantation |
| 5 | Frost Risk and Precautions in Viticulture |
| 6 | Evaluation of Climate Regions Around the World and Our Country in Terms of Viticulture |
| 7 | Midterm Examination |
| 8 | Evaluation of Climate Regions Around the World and Our Country in Terms of Viticulture |
| 9 | Evaluation of Climatic Demand Differences of Grape Varieties Cultivated for Table Grapes, Raisin, and Wine Grapes |
| 10 | Introduction to Bioclimatic Indices and Purposes of Use |
| 11 | Heat Requirements (Growing Degree Days, GDD) and Winkler Index Calculations |
| 12 | Calculations of Branas, Huglin Heliothermic, and Jones Indices |
| 13 | Calculations of Drought, Night Coolness, and Dryness Indicators |
| 14 | Effects of Climate Change on Viticulture in Terms of Grape Phenology |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assistant Professor Turcan TEKER | **Date:** | | 27.04.2022 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | Protected Berry Cultivation |

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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 | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Greenhouse systems, berry types suitable for greenhouse cultivation and their flower structures and pollination methods, cultivation system and pruning methods used under cover, problems and solutions that may be encountered in greenhouse cultivation will be discussed. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | To teach the problems encountered in this field and the solutions by acquiring the basic information about the cultivation of berry fruits under cover. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Students learn which species and varieties are grown in greenhouse berry cultivation. They will have information about what should be considered when growing these fruit species and varieties under cover, and the practical cultivation practices in greenhouse berry cultivation. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1) Knows the greenhouse systems  2) Recognizes berry types in terms of suitability for growing under cover.  3) Learns the flower structures and pollination forms of berry types,  4) Learns the cultivation system and pruning methods to be applied to the suitable species under the cover.  5) Knows the problems that may be encountered in greenhouse berry cultivation and the ways of their elimination. | | | | | | | |
| **TEXTBOOK** | | | | | 1- Personal lecture notes compiled from different sources and current scientific studies. | | | | | | | |
| **OTHER REFERENCES** | | | | | Genel Meyvecilik (Editörler R. Gerçekçioğlu, Ş. Bilginer, A. Soylu), Özel Meyvecilik (S. Özbek), Üzümsü Meyveler (S. Ağaoğlu), Serler;inşası-kliması (A. Günay), Seracılık ve Örtüaltı Yetiştiriciliği (Ü. Ertekin), Örtü altı sebzeciliği;Genel seracılık (A.Sevgican) | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | The history and purpose of greenhouse fruit cultivation |
| 2 | Greenhouses systems |
| 3 | Greenhouses |
| 4 | High plastic tunnels |
| 5 | Protected cultivation of strawberry (greenhouse preparation, selection of varieties, determination of planting date…) |
| 6 | Protected cultivation of strawberry (cultural operations) |
| 7 | Midterm Examination |
| 8 | Soilless practices of strawberry cultivation in greenhouse |
| 9 | Protected cultivation of raspberry |
| 10 | Protected cultivation of raspberry |
| 11 | Protected cultivation of blackberry |
| 12 | Protected cultivation of blackberry |
| 13 | Protected cultivation of currant |
| 14 | Protected cultivation of blueberry |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assoc. Prof. Volkan OKATAN | **Date:** | | 27.04.2022 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | GRAPEVINE BIOLOGY |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | x | x | | | 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 (√)]** | | | | | | |
|  | |  | | | | x | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 35 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 15 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 50 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | This course consists of the origin, taxonomy, and botanical classification of the vine, morphological and anatomical structures of the vegetative and generative organs of the vine, fertilization biology in grapevine, differentiation morphological and physiological phase, reproductive anatomy, and fruit setting forms (normal, stenospermocarpy, parthenocarpic, empty seeded nucleation, and polyembryony). | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of this course is to explain the origin, taxonomy and botanical classification of the vine, to examine the morphology and anatomy of vine in terms of the relationship between tissue, organ, and plant. Students also gain knowledge and skills about fertilization biology of vines. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | The vegetative and generative organs of the vine will be examined in detail in terms of morphological and anatomical aspects. Therefore, students will gain the ability to understand the formation of organs of the vine and their relationships with each other. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1- Obtain the basic information about vine anatomy and biology,  2- Understand the morphological and anatomical structures and functions of the grapevine organs (vegetative and generative),  3- Learn about grapevine genetics and genetic defects in grapevines,  4- Gain current research skills on the subject. | | | | | | | |
| **TEXTBOOK** | | | | | Ağaoğlu,Y.S.,1999. Bilimsel ve Uygulamalı Bağcılık Cilt 1: Asma Biyolojisi. Kavaklıdere Eğitim ve Yayınları, 212,s | | | | | | | |
| **OTHER REFERENCES** | | | | | Keller, M. (2015). The science of grapevines. Academic press. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Origin, taxonomy and botanical classification of the vine |
| 2 | Origin, taxonomy and botanical classification of the vine |
| 3 | Morphological-anatomical structure and function of the vegetative organs of the vine |
| 4 | Morphological-anatomical structure and function of the vegetative organs of the vine |
| 5 | Morphological-anatomical structure and function of the generative organs of the vine |
| 6 | Morphological-anatomical structure and function of the generative organs of the vine |
| 7 | Fertilization biology in vines, floral development stages |
| 8 | MIDTERM |
| 9 | Fertilization biology in vines, formation of gender |
| 10 | Fertilization biology in vines, reproductive anatomy |
| 11 | Fertilization biology in vines, reproductive anatomy |
| 12 | Fruit set in grapevines, normal fruit set |
| 13 | Fruit set in grapevines, stenospermocarpy, parthenocarpy, empty nucleation seeded and polyembryonia |
| 14 | Fruit set in grapevines, stenospermocarpy, parthenocarpy, empty nucleation seeded and polyembryonia |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Asst. Prof. Dr. Turcan TEKER | **Date:** | | 17.11.2021 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | GRAPEVINE PHYSIOLOGY |

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| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | x | x | | | 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 (√)]** | | | | | | |
|  | |  | | | | x | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 35 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 15 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 50 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | This course covers root, vegetative, generative growth and development physiology and fertility physiology in vines. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | This course aims to develop a comprehensive understanding of grapevine development and growth physiology, including the vegetative cycle in grapevine. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Students can use informations about vine growth and development physiology, basic functions in vegetative and generative organs, flowering physiology, internal and external factors affecting berry set and fruit quality in their professional carreers. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1- Learns the physiology of growth and development in vine,  2- Comprehends the basic physiological events in vegetative and generative organs,  3- Learns the physiology of flowering and berry setting,  4- Learns the effect of internal and external factors on berry setting. | | | | | | | |
| **TEXTBOOK** | | | | | Ağaoğlu,Y.S.,1999. Bilimsel ve Uygulamalı Bağcılık Cilt 1: Asma Biyolojisi. Kavaklıdere Eğitim ve Yayınları, 212,sAğaoğlu, Y.S., 2002. Bilimsel ev Uygulamalı Bağcılık. Cilt II, Asma Fizyolojisi. Tomurcuk Bağ Yay., 445p. | | | | | | | |
| **OTHER REFERENCES** | | | | | Keller, M. (2015). The science of grapevines. Academic press. | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Importance and definitions of growth and development physiology in vines |
| 2 | Root growth and development physiology |
| 3 | Vegetative growth and development physiology; life cycle of a vine |
| 4 | Vegetative growth and development physiology; life cycle of a vine |
| 5 | Generative growth and development physiology; mechanism of inflorescence formation |
| 6 | Generative growth and development physiology; effects of internal factors on inflorescence formation |
| 7 | Generative growth and development physiology; effects of internal factors on inflorescence formation |
| 8 | MIDTERM |
| 9 | Generative growth and development physiology; effects of external factors on inflorescence formation |
| 10 | Fertility physiology in vines |
| 11 | Flowering physiology |
| 12 | Berry growth and development |
| 13 | Berry growth and development |
| 14 | Effects of abiotic factors on growth, development and ripening of berries |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Asst. Prof. Dr. Turcan TEKER | **Date:** | | 17.11.2021 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | New Tecniques in Production Fruit Treeof Nursery Trees |

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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 | | | | | 1 | | 25 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 25 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 50 |
| **PREREQUISITE(S)** | | | | | NO | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Subcejts of this lesson are defination of propagation, general view of propagation, propagation with seed, propagation with seed in fruit growing, methods to incerease germination ratio of seeds, the purpose of grafting and it's advantages, the factors about grafting succes, budding methods, cleft grafting methods, rootstocks, reasons of graft incompatibility, sign of incompatibility, cuttings, rooting of cuttings, preparing hormones for cuttings, layering and tissue culture. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Fast production of nursery stocks, importance of rootstocks, new techniques at propagation, propagation of clonal rootstock, tissue culture an producing nursery stocks | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Students will learn new developments and techniques in fruit sapling production. They will learn about the newly developed rootstock and cultivar. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | Teaches the purpose of the replicator and the methods used in plant reproduction.  Teaches propagation with seed.  Teaches grafting techniques  Teaches rootstocks used in fruit growing  Teaches how to make propagation methods with cutting and prepare hormones.  Teaches the methods of propagation by layering  Teaches micro propagation methods. | | | | | | | |
| **TEXTBOOK** | | | | | "Bahçe Bitkileri Yetiştirme Tekniği" Çeviri Prof. Dr. Nurettin KAŞKA Prof Dr. Muhsin YILMAZ - "Çoğaltma Teknikleri" Prof Dr. Muhsin YILMAZ - “Grafting and Budding” A practical Guide for Fruit and Nut Plants and Ornamentals. W.J. Lewis; D McE Alexander - Articles published in local and foreign journals related to the subject - Grafting knife, saw, grafting paste, graft ligament, graft type, parafilm. | | | | | | | |
| **OTHER REFERENCES** | | | | | Presentations and articles | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Definition of propagation |
| 2 | General view of propagation |
| 3 | Propagation with seed |
| 4 | Propagation with seed in fruit growing |
| 5 | Methods to increase germination ratio of seeds |
| 6 | The purpose of grafting and it's advantages |
| 7 | The factors about grafting success |
| 8 | Budding methods |
| 9 | Cleft grafting methods |
| 10 | Cleft grafting methods |
| 11 | Rootstocks |
| 12 | Reasons of graft incompatibility sign of incompatibility |
| 13 | Cuttings rooting of cuttings |
| 14 | Preparing hormones for cuttings |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assoc. Prof. Volkan OKATAN | **Date:** | | 18.11.2021 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| --- | --- | --- | --- |
| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | Organic Fruit Growing |

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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 | | | | | 1 | | 25 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 25 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 50 |
| **PREREQUISITE(S)** | | | | | NO | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | The establishment principles of organic fruit orchard, organic sapling production techniques, the selection of rootstock and variety, the fertilization, irrigation, pruning and harvest techniques, the restrictive factors which organic pomology practices, the effect on fruit and tree characteristics of organic fertilizer, the differences between organic fruit production and conventional production consist of this lesson. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of this course is to teach the basic principles of organic fruit production | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Students will learn about the potential of our country in organic fruit growing and production. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1 Learns the current situation of organic fruit production in our country and world.  2 Gains knowledge about the principles of organic fruit growing  3. Learns the latest principles in the organic growing. | | | | | | | |
| **TEXTBOOK** | | | | | 1. Kuepper, G. 2003. Manures for Organik Crop Production, ATTRA National Sustainable Agriculture Information Service. 2. Altındişli, A. ve İlter, E. 2002. Ekolojik Tarımda İlke ve Kavramlar Organik Tarım Eğitimi Ders Notları. Tarım ve Köy İşleri Bakanlığı. | | | | | | | |
| **OTHER REFERENCES** | | | | | Presentations and articles | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | What is organic agriculture ? |
| 2 | The establishment principles of organic fruit orchard |
| 3 | Organic sapling production techniques, |
| 4 | The selection of rootstock and variety in organic growing |
| 5 | The fertilization in organic fruit growing |
| 6 | Pruning in organic fruit growing |
| 7 | Harvest techniques, |
| 8 | Irrigation and cultivation |
| 9 | Critical Cleft grafting methods |
| 10 | The situation of organic fruit growing in world |
| 11 | The restrictive factors which organic pomology practices |
| 12 | The effect on fruit and tree characteristics of organic fertilizer |
| 13 | The differences between organic fruit production and conventional production |
| 14 | Final |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 3** | To have the skill of utilizing different techniques for sustainable usage and protection of genetic resources in horticultural area and environment | | |  | |  |  |
| **LO 4** | To have the information on good agricultural practices and ecological agriculture, and by the way, to decide the right time of cultural practices of the horticultural crops, and to have the ability of describing the pest and diseases of horticultural plants | | |  | |  |  |
| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Prof. Dr. Yakup ÖZKAN | **Date:** | | 19.11.2021 | | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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| **DEPARTMENT** | **HORTICULTURE (MSc)** | **SEMESTER** |  |

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| **COURSE** | | | |
| **CODE** |  | **TITLE** | NEW DEVELOPMENTS IN BERRY FRUITS |

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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 (√)]** | | | | | | |
|  | |  | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 25 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 25 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (     ) | | | | |  | |  |
| **Final Examination** | | | | | | | 50 |
| **PREREQUISITE(S)** | | | | | NO | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | This course covers the review of results from research with strawberries, blackberries, raspberries and other berry fruits. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of this course is to teach new developments in berry fruit species. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Students will recognize different types and varieties of berry fruits. They will have information about how these fruit species are bred and what can be done to obtain new varieties. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1- general condition of berry fruits. 2- Learns the new developments in strawberry cultivation. 3- Learns the new developments in blackberry cultivation. 4- Learns the new developments in raspberry cultivation. 5- Learns the new developments in currant cultivation. 6- Learns the new developments in the cultivation of other berry fruits | | | | | | | |
| **TEXTBOOK** | | | | | Current articles on berry fruits in national and international congresses, symposiums and scientific journals in related fields Ağaoğlu S. 1986. The Book of Grape Fruits | | | | | | | |
| **OTHER REFERENCES** | | | | | Presentations and articles | | | | | | | |

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| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Examining the articles about Strawberry Cultivation |
| 2 | Examining the articles about Strawberry Cultivation |
| 3 | Examining the articles about Strawberry Cultivation |
| 4 | Examination of articles on currant cultivation |
| 5 | Examination of articles on currant cultivation |
| 6 | Examination of articles on currant cultivation |
| 7 | Examination of articles on blackberry cultivation |
| 8 | Examination of articles on blackberry cultivation |
| 9 | Examination of articles on raspberry cultivation |
| 10 | Examination of articles on raspberry cultivation |
| 11 | Examination of articles on Cultivation of other berry fruits |
| 12 | Examination of articles on Cultivation of other berry fruits |
| 13 | Examination of articles on Cultivation of other berry fruits |
| 14 | Examination of articles on Cultivation of other berry fruits |
| 15,16 | Final Examination |

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| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE HORTICULTURE MSc PROGRAM LEARNING OUTCOMES** | | | | **CONTRIBUTION LEVEL** | | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | | | **3**  High | | **2**  Mid | **1**  Low |
| **LO 1** | To have integrated theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
| **LO 2** | To have theoretical and practical (land and laboratory) information on growing and breeding of fruits, vegetables, grapevine and ornamental plants, and to use and transfer these information accurately | | |  | |  |  |
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| **LO 5** | To have the skill on observing the changes through harvest, post harvest, and storage of horticultural crops, and to have the integrated information on storage conditions | | |  | |  |  |
| **LO 6** | To have the ability of getting the data on horticultural area, and evaluation, recording, project creation and application skills | | |  | |  |  |
| **LO 7** | To have the ability of working in individual, multiple and different disciplined teams, and having the responsibility | | |  | |  |  |
| **LO 8** | Ability to communicate in written and oral forms in Turkish/English; proficiency at least one foreign language. | | |  | |  |  |
| **LO 9** | Awareness of life-long learning; ability to reach information; follow developments in science and technology and continuous self-improvement. | | |  | |  |  |
| **LO 10** | Understanding of professional and ethical issues and taking responsibility | | |  | |  |  |
| **Prepared by :** | | | Assoc. Prof. Volkan OKATAN | **Date:** | | 18.11.2021 | | | |

**Signature**: