**FOOD ENGINEERING MSc PROGRAMME**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **First Year** | | | | | | |
| **I.Semester** | | | | | | |
| Code | Course Title | ECTS | T+P | Credit | C/E | Language |
| 501011101 | [THE SCIENTIFIC RESEARCH METHODS AND I TS ETHICS](#en0) | 7.5 | 3+0+0 | 3 | **C** | Turkish |
| 507202501 | [FOOD ANALYSIS,THEORY AND APPLICATIONS](#en9) | 7.5 | 3+0+0 | 3 | **C** | Turkish |
|  | Elective Course-1 | 7.5 | 3+0+0 | 3 | E | Turkish |
|  | Elective Course-2 | 7.5 | 3+0+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+0 | 3 | E | Turkish |
|  | Elective Course-4 | 7.5 | 3+0+0 | 3 | E | Turkish |
|  | Elective Course-5 | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507202001 | Seminar | 7.5 | 0+1+0 | - | **C** | Turkish |
|  | Total of II. Semester | 30 |  | 9 |  |  |
|  | TOTAL OF FIRST YEAR | 60 |  | 21 |  |  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Second Year** | | | | | | | | |
| **III. Semester** | | | | | | | | | |
| Code | Course Title | | ECTS | | T+P | Credit | C/E | Language |
| 507201702 | MSc THESIS STUDY | | 25 | | 0+1+0 | - | **C** | Turkish |
| 507201703 | SPECIALIZATION FIELD COURSE | | 5 | | 3+0+0 | - | **C** | Turkish |
|  | | Total of III. Semester | 30 |  | |  |  |  | |
| **IV. Semester** | | | | | | | | | |
| Code | | Course Title | ECTS | T+P | | Credit | C/E | Language | |
| 507201702 | | MSc THESIS STUDY | 25 | 0+1+0 | | - | **C** | Turkish | |
| 507201703 | | SPECIALIZATION FIELD COURSE | 5 | 3+0+0 | | - | **C** | Turkish | |
|  | | Total of IV. Semester | 30 |  | |  |  |  | |
|  | | TOTAL OF SECOND YEAR | 60 |  | |  |  |  | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Elective Courses** | | | | | | |
| Code | Course Title | ECTS | T+P | Credit | C/E | Language |
| 507201506 | [ADVANCED ANALYSIS METHODSIN CEREAL PRODUCTS](#en1) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507202506 | [ADVANCED FOOD MICROBIOLOGY](#en7) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507201502 | [BIOACTIVE COMPOUNDS AND FUNCTIONAL FOODS](#en12) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507202507 | [BISCUIT PRODUCTION TECHNOLOGY](#en13) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507201510 | [CHEESE TECHNOLOGY](#en16) |  |  |  |  |  |
| 507202504 | [COCOA AND CHOCOLATE TECHNOLOGY](#en6) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507202512 | [Experimental Designs and Statistical Approaches in Food Engineering](#en22) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507202511 | [Fermented Dairy Products Technology](#en19) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507201509 | [FOOD POWDERS TECHNOLOGY](#en15) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507202505 | [FOOD QUALITY AND SAFETY](#en8) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507201507 | [LIPID CHEMISTRY](#en21) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507202503 | [MEAT BIOCHEMISTRY AND QUALITY](#en11) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507201505 | [MICROBIAL FOOD POISONING](#en3) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507201508 | [MOLECULAR METHODS USED IN FOOD ENGINEERING](#en20) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507201511 | [Novel Approaches in Fruit Vegetable Processing](#en17) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507202509 | [Olive Oil Production Technology and Quality Criteria](#en14) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507202510 | [Physical Properties of Foods](#en18) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507202502 | [POULTRY MEAT PROCESSING TECHNOLOGY](#en5) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507201503 | [QUALITY CONTROL AND ANALY.METH. IN MEAT PRODUCTS](#en10) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507201501 | [RED MEAT PRODUCTS AND PROCESSING TECHNOLOGIES](#en4) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507201504 | [SUGAR AND CONFECTIONERY TECHNOLOGY](#en2) | 7.5 | 3+0+0 | 3 | E | Turkish |
| 507202508 | [WHEAT CHEMISTRY AND TECHNOLOGY](#en23) | 7.5 | 3+0+0 | 3 | E | Turkish |

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

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

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

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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. | | | | | | | |

|  |  |
| --- | --- |
| **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 |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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:** | |  | | |

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | Biscuit Production Technology |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 (√)]** | | | | | | |
|  | | 3 | | | | 0 | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 50 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 50 |
| **PREREQUISITE(S)** | | | | | NONE | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | To teach the biscuit production, types, technology, and the effect of flour and other raw materials on production and quality properties | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The biscuit sector has a great development trend in our country, region and city in recent years. As a result, products such as biscuits and cakes make up a significant portion of our total bakery exports. In this course, it is aimed to give information about the biscuit sector, its types, raw materials, dough types, flour quality, production and quality control | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Thanks to the acquired information, it is possible to work in the fields related to the sector | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | Upon successful completion of this course, the students will be able to 1. Describes the definition of biscuit and the sector in our country, 2. Comprehends the quality properties of biscuit wheat and flour (protein, starch, lipid, pentosan), 3- have knowledge about other cereal flours and quality properties and some other important ingredients (milk, eggs, nuts, etc.), 4-have knowledge about sugar in biscuit production, 5- have knowledge about the shortening in biscuit production, 6-have knowledge about baking agents (bicarbonate) and emulsifiers in biscuit production, 7-biscuit dough types ( rotary, wire-cutt and wafer) recognizes, 8- Knows biscuit kneading and kneading machines, 9-Knows about biscuit shaping and baking, 10-Knows about cake production and raw materials, 11- Knows about cracker production, 12 - Understand the biscuit quality criteria, 13 - Understand the cake quality criteria | | | | | | | |
| **TEXTBOOK** | | | | | Prof. Dr. Berrin ÖZKAYA- Biscuit produciton technology graduate edutaion lesson notes, Ankara Üniversity, Food Engineering Department | | | | | | | |
| **OTHER REFERENCES** | | | | | Prof. Dr. Adem ELGÜN ve Prof. Dr. Zeki ERTUGAY. Cereal Processing Technology. Atatürk Üniversity Poblications, No:718 | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Situation of soft wheat products sector in our country, export capacity and targets. |
| 2 | Biscuit wheat flour and technological properties |
| 3 | Other cereal flours and some raw materials used in biscuit production and their properties |
| 4 | Sugar, sugar types, effects and usage patterns in biscuit production |
| 5 | Fats in biscuit production, effects, production, other fats |
| 6 | Chemical baking agents and effects, using yeast |
| 7 | Hard, soft and wafer doughs used in the production of different types of biscuits, their processing and properties |
| 8 | Midterm Examination |
| 9 | Modification of dough in kneading, kneaders and how to kneading |
| 10 | Shaping and cutting machines, baking systems and their properties |
| 11 | Cracker production technology |
| 12 | Cake production technology |
| 13 | Quality evaluation in biscuit |
| 14 | Quality evaluation in cake products |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Assc. Prof. Dr. Yaşar KARADUMAN **Date:** 29/12/2020

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | BIOACTIVE SUBSTANCES AND FUNCTIONAL FOOD |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 (√)]** | | | | | | |
|  | | 3 | | | |  | | | | | | |
| **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** | | | | | The course covers bioactive substances, functional foods, bioactivity, bioavalibility, bioaccessebility and health claims | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of this course is to give knowledge to students about definition and the current technology of bioactive substances and functional foods , methods used in the functional food technology and bioactivity studies basic knowledge in the issues of running principles of those methods with subsequent constitution of general point of view. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | To gain knowledge and experience about bioactive compounds and functional foods | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | The student gains knowledge on;  -bioactivity, bioavalibility, bioaccessebility and health claims,  -functional foods and developing principles  -bioactive substances  -health claims  -effects of bioactive substances on health  -recent developments on confectionery production methods | | | | | | | |
| **TEXTBOOK** | | | | | Wildman, R. E., & Bruno, R. S. (Eds.). (2019). Handbook of nutraceuticals and functional foods. CRC press | | | | | | | |
| **OTHER REFERENCES** | | | | | Hurst, W. J. (2008). Methods of analysis for functional foods and nutraceuticals. CRC Press.Shi, J., Mazza, G., & Le Maguer, M. (Eds.). (2016). Functional foods: biochemical and processing aspects (Vol. 2). CRC Press.Saarela, M. (Ed.). (2011). Functional foods: Concept to product. Elsevier.Shetty, K., & Sarkar, D. (Eds.). (2019). Functional Foods and Biotechnology: Sources of Functional Foods and Ingredients. CRC Press.Guo, M. (2013). Functional foods: principles and technology. Elsevier.Jayaprakasha, G. K., & Patil, B. S. (Eds.). (2015). Nutraceuticals and Functional Foods:: Chemistry And Health Promoting Properties Of Fruits And Beverages Involved In Prevention Of Chronic Diseases. EOLSS Publications | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Definition of Functional Foods and Bioactive Substances |
| 2 | Functional Food Processes |
| 3 | Health Claims |
| 4 | Bioaccesibility and Bioavalibility -1 |
| 5 | Bioaccesibility and Bioavalibility -2 |
| 6 | Polyphenols-1 |
| 7 | Polyphenols-2 |
| 8 | Midterm Exam |
| 9 | Antioxidant Activity and Substances |
| 10 | Probiotics |
| 11 | Carotenoids |
| 12 | Polyunsaturated Fatty Acids |
| 13 | Probiotics |
| 14 | Prebiotics and Dietary Fibres |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Prof. Nevzat Konar **Date:** 29/12/2020

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | MEAT BIOCHEMISTRY AND QUALITY |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 (√)]** | | | | | | |
| 3 | |  | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | |  | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | None | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Within the scope of the course, detailed information about red meat will be presented, and changes in meat quality following animal slaughter will be discussed. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of the course is to discuss the basic compositions of red meat and fresh meat products and the factors affecting quality formation in detail. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Information on technological factors affecting meat and meat quality and changes in muscle after cutting are not included in the undergraduate education adequately and in detail. In this context, it is important to take the course on the area of expertise. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | It has the necessary equipment to transfer information / consultancy to the food industry in matters related to its area of expertise. Takes responsibility as a group leader for a specialist problem and plays an active role in solving food industry problems | | | | | | | |
| **TEXTBOOK** | | | | | MEAT SCIENCE AND TECHNOLOGY, Aydın ÖZTAN, Hacettepe University (2005)Lawrie, R.A. (1998). Meat Science. Woodhead Publishing Limited, UK. | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | General information about beef meat |
| 2 | Muscle Structure and Properties |
| 3 | Changes in the muscle after cutting |
| 4 | Changes in the muscle after cutting |
| 5 | Calcium and it's effects on quality of beef meat |
| 6 | The conversion of muscle to meat |
| 7 | Electrical stimulation |
| 8 | Midterm Examination |
| 9 | pH changes in meat |
| 10 | Water holding capacity and its effect on meat quality |
| 11 | PSE meat formation and its effects on meat quality |
| 12 | DFD meat formation and its effects on meat quality |
| 13 | Cold shortening |
| 14 | Color change in meat |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Prof. Dr. Muhammet İrfan AKSU **Date:** 29.12.2020

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | QUALITY CONTROL AND ANALYSIS METHODS IN MEAT PRODUCTS |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 (√)]** | | | | | | |
|  | | 3 | | | |  | | | | | | |
| **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** | | | | | Within the scope of the course, detailed information about quality of meat and meat products will be presented and quality criteria will be given in fresh and processed meat products. In addition, information will be given on the effects of raw material quality on product quality. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of the course is to increase the knowledge and skill levels of students within the scope of ensuring the quality, protection and determination of the meat and meat products during the production process and eliminating the problems about quality. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Information on quality and quality defects that may occur during the application of meat and meat products processing technologies is not included in the undergraduate education adequately and in detail. In this context, it is important to take the course on the area of expertise. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | It has the necessary equipment to transfer information / consultancy to the food industry in matters related to its area of expertise. Takes responsibility as a group leader for a specialist problem and plays an active role in solving food industry problems | | | | | | | |
| **TEXTBOOK** | | | | | Savell, J.W., Smith, G.C. 2000. Meat Science Laboratuary Manual,American press, Boston, massachusetts. Herbert, W. OCKERMAN, Quality Control of Post-mortem Muscle Tissue, Volume 1: Meat and Additives Analysis. The Ohio State University. -Savell, J.W., Smith, G.C. 2000. Meat Science Laboratuary Manual,American press, Boston, massachusetts. Gökalp, H.Y., Kaya, M., Zorba, Ö.,2010. Et Ürünleri İşleme Mühendisliği. Atatürk Univ. Publ. No: 786. | | | | | | | |
| **OTHER REFERENCES** | | | | | -Gökalp H.Y., Kaya M., Tülek Y. and Zorba O. (2010). Guide for quality control and laboratory application of meat products. Atatürk Univ. Publ. No:751. Erzurum, Turkey. | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | What is quality? General information about quality. |
| 2 | General information about general quality criteria in meat and meat products |
| 3 | Factors affecting quality in fresh meat |
| 4 | Factors affecting quality in meat products |
| 5 | Effects on product quality of raw materials |
| 6 | Quality criteria in fermented meat products |
| 7 | Quality criteria in cured-dried meat products |
| 8 | Midterm Examination |
| 9 | Quality criteria in meat products produced with emulsion technology |
| 10 | Quality criteria in cooked meat products |
| 11 | Quality criteria in canned meat products |
| 12 | Analysis Methods-I |
| 13 | Analysis Methods-II |
| 14 | Analysis Methods-III |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Prof. Dr. Muhammet İrfan AKSU **Date:** 29.12.2020

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | FOOD ANALYSIS THEORY AND APPLICATIONS |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | |  |  | | | 3 | 7.5 | COMPULSORY  ( x ) | | ELECTIVE  (   ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
|  | | 3 | | | |  | | | | | | |
| **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** | | | | | This course includes food analysis, standards used, legal regulations, sampling and techniques, microbiological analysis methods. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | To give information about the analytical methods used to illuminate the composition, chemical physical and microbiological properties of foods and to investigate their originality. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | The basic rules to be considered in food analysis, applications and evaluation of the results will contribute to reducing the possibility of mistakes that students may make in food analysis issues with this comprehensive course. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1-Understanding the importance of correct and reliable analysis in food analysis  2-Learning and evaluation of the results of the experiment in accordance with the method by preparing the solutions and chemicals necessary for an analysis given the procedure.  3-Learning the physical, chemical and microbiological analysis methods and differences used in food analysis  4-Students learn about nutritional analysis (phytic acid, total phenolic substance, total antioxidant activity and total mineral substance). | | | | | | | |
| **TEXTBOOK** | | | | | 1.Elgün, A., Türker, S ve Bilgiçli, N. 2000. Tahıl ve Ürünlerinde Analitik Kalite Kontrolü. Konya Ticaret Borsası Yayınları. Konya2.Food Microbiology, Adams, Martin Ray, Royal Society of Chemistry-Rsc ISBN:9780854042843.Food Microbiology, an introduction. Thomas J. Montville and Karl R. Matthews | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | General rules / issues to be considered in food analysis |
| 2 | Texture profile analysis in foods |
| 3 | Rheological methods in food processing |
| 4 | Determination of total phenolics and phenolic |
| 5 | The importance of microorganisms and counting methods in foods |
| 6 | Coliform bacteria count in foods |
| 7 | Staphylococcus aureus count in foods |
| 8 | Midterm Examination |
| 9 | Physical and technological quality analysis in cereal products |
| 10 | Quality properties and analysis of dietary fiber |
| 11 | Evaluation and analysis of gluten aggregation |
| 12 | Nitrogenous substances not in protein nature, effects and analysis of meat quality |
| 13 | Fat/oil extraction and fatty acid composition analysis |
| 14 | Evaluation of analysis results |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Prof. Dr. Muhammet İrfan AKSU, Prof. Dr. Nevzat KONAR, Dr. Öğrt. Üyesi Aysel GÜLBANDILAR, Dr. Öğrt. Üyesi Yaşar KARADUMAN **Date:** 29.12.2020

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | FOOD QUALITY AND SAFETY |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 (√)]** | | | | | | |
|  | | 3 | | | |  | | | | | | |
| **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** | | | | | TThe course covers food quality, food quality control, food safety, main food safety hazards, risk analysis and food safety management systems | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of this course is to give knowledge to students about definition and main issues of food quality and safety, methods used in the risk analysis and food safety management studies, basic knowledge in the issues of running principles of those methods with subsequent constitution of general point of view. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | To gain knowledge and experience about food quality and safety | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | The student gains knowledge on;  -food quality and safety terms,  -functional food quality control principles  -food safety risks  -risk analysis  -food safety management systems | | | | | | | |
| **TEXTBOOK** | | | | | Hoorfar, J., Jordan, K., Butler, F., & Prugger, R. (Eds.). (2011). Food chain integrity: a holistic approach to food traceability, safety, quality and authenticity. Elsevier. | | | | | | | |
| **OTHER REFERENCES** | | | | | Singh, R. P., & Heldman, D. R. (2001). Introduction to food engineering. Gulf Professional Publishing.D'Mello, J. F. (Ed.). (2003). Food safety: contaminants and toxins. CABI.Dreyer, M., & Renn, O. (2009). Food safety governance (pp. 111-120). Berlin: Springer.Zhao, Y. (2012). Specialty foods: processing technology, quality, and safety. CRC Press. | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction Food Quality and Safety |
| 2 | Food Quality -1 |
| 3 | Food Quality -2 |
| 4 | Food Quality Control -1 |
| 5 | Food Quality Control -2 |
| 6 | Food Safety Management Systems-1 |
| 7 | Food Safety Management Systems-2 |
| 8 | Midterm Exam |
| 9 | Chemical Hazards |
| 10 | Mycotoxins |
| 11 | Risk Analysis |
| 12 | Genetic Modified Organisms and Food |
| 13 | Food Allergens and Sensitivity |
| 14 | Migration |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Prof. Nevzat Konar **Date:** 29/12/2020

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | ADVANCED FOOD MICROBIOLOGY |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 (√)]** | | | | | | |
| 3 | |  | | | |  | | | | | | |
| **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** | | | | | Course summary includes Food and microorganisms relations, undesirable effects of microorganisms, the effects of microorganisms in different food groups, antimicrobial substances produced by microorganism, bacteriocins, probiotics, Starter cultures of bacteria and their functions, Starter cultures of yeast and their functions, Starter cultures of molds and their functions, new development for prevention of microbial growth, predictive microbiology and significance in food safety. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Aim of course is discussion and evaluation of recent developments on the basis of basic subjects in Food Microbiology. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | 1. Determines the factors affecting microbial growth in foods and controls possible poisonings by means of methods applied in advanced food microbiology.  2. It meets the demand in the market by using different techniques in probiotic product development.  3. It plays a leading role in solving problems in production. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1. Recognizing the basic microorganisms and their sources in food  2. Recognizing microorganisms that cause food spoilage  3. Learning food-borne microbial diseases  4. Recognizing methods for preventing microbial growth | | | | | | | |
| **TEXTBOOK** | | | | | Food Microbiology. 2008. Adams, M. R. And Moss, O. RSC Publishing. Cambridge, UK.Gıda Mikrobiyolojisi, 2010. Osman Erkmen (Ed). Efil Yayınevi.Modern Food Microbiology. 2006. Jay, J. Chapman and Hall. NY | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Food and microorganism relations |
| 2 | Growth of microorganisms in protein rich foods |
| 3 | Growth of microorganisms in fat and lipid rich foods |
| 4 | Growth of microorganisms carbohydrate rich foods |
| 5 | Growth of microorganisms in specific foods |
| 6 | Starter cultures. |
| 7 | Microorganism used as starter cultures. |
| 8 | Midterm Examination |
| 9 | The properties and functions of starter cultures |
| 10 | Probiotics |
| 11 | Antimicrobials produced by microorganisms |
| 12 | Bacteriocins |
| 13 | The effect of new technologies against microbial growth |
| 14 | Predictive microbiology |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Ass.Prof. Aysel GÜLBANDILAR **Date:** 29.12.2020

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | COCOA AND CHOCOLATE TECHNOLOGY |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 (√)]** | | | | | | |
|  | | 3 | | | |  | | | | | | |
| **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** | | | | | The history of chocolate, chocolate and cocoa production and consumption in the world and Turkey, cocoa composition, production and processing technology, cocoa butter, used in chocolate production, raw materials and their properties, chocolate production, chocolate quality criteria, cocoa and chocolate phenolics, the functional properties of the cocoa and chocolate, chocolate aroma and sensory properties, chocolate analysis, chocolate products and production techniques, shelf life and packaging of chocolate and its products, recent developments in chocolate technology | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of this course is to give knowledge to students about the current technology of cocoa and chocolate, methods used in the cocoa processing and chocolate technology, basic knowledge in the issues of running principles of those methods with subsequent constitution of general point of view | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | To gain knowledge and experience about cocoa and chocolate science and technology | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | The student gains knowledge on;  -cocoa composition and processing techniques  -the chocolate definition  -chocolate production technology  -chocolate analysis methods.  -chocolate quality criterias  -the functional properties of chocolate and cocoa.  -chocolate packaging techniques.  -new developments in chocolate production | | | | | | | |
| **TEXTBOOK** | | | | | 1.Beckett, S.T. 2008. The science of chocolate (2nd Ed.) London, Cambridge, UK: Royal Society of Chemistry 2. Lawless, H.T., Heymann, H. 1998. Sensory Evaluation of Food: Principles and Practices. Chapman&Hall, New York, USA. 3.Mezger, T.G. 2002. The rheology handbook. Vincentz Verlag, Hannover, Germany. | | | | | | | |
| **OTHER REFERENCES** | | | | | 1.N. Konar, “Influence of Conching Temperature and Some Bulk Sweeteners on Physical and Rheological Properties of Prebiotic Milk Chocolate Including Containing Inulin.” European Food Research and Technology (ISI), 23:135-143 pp., 2013.2.N. Konar, B. Ozhan, N. Artik, S. Dalabasmaz, E.S. Poyrazoglu, “Rheological and Physical Properties of Inulin-Containing Milk Chocolate Prepared at Different Process Conditions.”, CyTA Journal of Food (ISI), 12(1): 55-64, 2014.3.N. Konar, B. Ozhan, N. Artik, E.S. Poyrazoglu, “Using Polydextrose as a Prebiotic Substance in Milk Chocolate-Effects of Process Parameters on Physical and Rheological Properties.”, CyTA Journal of Food (ISI), doi: 12(2): 150-159, 20144.N. Konar, E.S. Poyrazoglu, N. Artik, “Influence of calcium fortification on physical and rheological properties of non-sucrose prebiotic milk chocolates containing inulin and maltitol.”, Journal of Food Science and Technology (ISI), doi: 10.1007/s13197-013-1229-y.5.B. Ozhan, I. Haspolat, N. Artik, N. Konar, “Çikolatanın Tekstürel Özellikleri”, Standart, 604: 36-41 pp., 2012.6.B. Ozhan, N. Konar, E.S. Poyrazoglu, N. Artik, TGDF Gıda Kongresi dahilinde “Abstract Book” bildiri kitapçığındaki “Partikül Büyüklüğü ve Konçlama Süresinin Sütlü Çikolata Fiziksel ve Reolojik Özellikleri Üzerindeki Etkisi”, TGDF pp. 21, Antalya, Türkiye, 12-14 Kasım 2103.7.N.Konar, E.S.Poyrazoglu, N.Artik, EuroFoodChem XVII konferansı dahilinde "Book of Abstract" bildiri kitapçığındaki "Physical and Rheological Properties of Milk Chocolate Supplemented with Inulin and Isomalt", 142 pp., İstanbul, Turkey, 07-10 May, 2013.8.N. Konar, E.S. Poyrazoglu, Pharma-Nutrition’13 konferansı dahilinde "Abstract Book: Poster Abstracts" bildiri kitapçığındaki "Tooth-friendly and prebiotic milk chocolate containing inulin and maltitol", 80 pp., Changi, Singapore, 15-17 April 2013. | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | The history of chocolate, chocolate production and consumption in world and Turkey |
| 2 | Cocoa composition, planting ve processing technology |
| 3 | Cocoa butter |
| 4 | Ingredients of chocolate and their specificaitions |
| 5 | Chocolate production |
| 6 | Chocolate quality parameters-1 |
| 7 | Chocolate quality parameters-2 |
| 8 | Midterm Exam |
| 9 | Functional chocolate and cocoa |
| 10 | Chocolate aroma and sensory properties |
| 11 | Cocoa and chocolate polyphenols |
| 12 | Analysis of chocolate |
| 13 | Chocolate Derivated Products and Their Production Techniques |
| 14 | Packaging and Shelf Life of Chocolate and Its Products |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Prof. Nevzat Konar **Date:** 29/12/2020

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | POULTRY MEAT PROCESSING TECHNOLOGY |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 (√)]** | | | | | | |
|  | | 3 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | No | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Within the scope of the course, detailed information about poultry meat and meat products will be presented, processing technologies and their effects on meat and product quality will be discussed. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The objective of the course is to discuss of techniques and processing technologies, preservation and quality properties of poultry meat and meat products, and design skills to gain knowledge | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Information on poultry meat and meat products processing technologies are not sufficiently and in detail in undergraduate education. In this context, it is important to take the course on the area of expertise. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | It has the necessary equipment to transfer information / consultancy to the food industry in matters related to its area of expertise. Takes responsibility as a group leader for a specialist problem and plays an active role in solving food industry problems | | | | | | | |
| **TEXTBOOK** | | | | | -POULTRY PRODUCTS PROCESSING, An Industry Guide. Shai Barbut, CRC Press, LLC, N.W., USA. (2012)-HANDBOOK of MEAT, POULTRY and SEAFOOD QUALITY, Editor Leo M. L. Nollet, Bleckwell Publishing (2007)-POULTRY MEAT PROCESSING, Edited by Alan R. Sams. CRC Press, (2001)-GUALITY CONTROL IN MEAT PRODUCTS, Poultry Meat and Products (AKSU, M.İ, and KAYA, M.) Edited by Merih KIVANÇ, 5. Bölüm. Anadolu Üniversitesi Yayınları, Yayın No:2080, (2010). | | | | | | | |
| **OTHER REFERENCES** | | | | | Aksu, M. I., Poultry Meat Processing Technology Textbook. | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Basic concepts about poultry meat and poultry products |
| 2 | Overview of developments in the World and Turkey about poultry products |
| 3 | General properties of poultry animals and meat |
| 4 | Effects on meat quality properties of poultry feeding systems |
| 5 | Basic anatomy and muscle biology of poultry |
| 6 | Compounds and properties of poultry meat |
| 7 | Primary processing of poultry |
| 8 | Midterm Examination |
| 9 | Stunning methods of poultry |
| 10 | Scalding methods of poultry |
| 11 | Cut up of poultry |
| 12 | Poultry products (smoked turkey breast, poultry roll, summer sausage, frankfurters, bologna and chicken nuggets) |
| 13 | Poultry/poultry products storage methods |
| 14 | Spoilage of poultry and poultry products |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Prof. Dr. Muhammet İrfan AKSU **Date:** 29.12.2020

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | RED MEAT PRODUCTS AND PROCESSING TECHNOLOGIES |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | |  |  | | |  |  | COMPULSORY  (   ) | | ELECTIVE  ( x ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
|  | | 3 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | No | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Within the scope of the course, detailed information about red meat and meat products will be presented, processing technologies and their effects on meat and product quality will be discussed. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The ob of the course is to provide students with information about the basic components of red meat, quality features and preservation methods, and to provide detailed information about the production technologies of red meat products such as pastırma, sucuk, kavurma and salami / sausage, which are widely produced in our country. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Information on poultry meat and meat products processing technologies are not sufficiently and in detail in undergraduate education. In this context, it is important to take the course on the area of expertise. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | It has the necessary equipment to transfer information / consultancy to the food industry in matters related to its area of expertise. Takes responsibility as a group leader for a specialist problem and plays an active role in solving food industry problems | | | | | | | |
| **TEXTBOOK** | | | | | Meat Products Processing Engineering, H.Y. Gökalp, M. Kaya, Ö. Zorba. Atatürk University Publications, 2010Meat Science and Technology, Aydın ÖZTAN, Hacettepe University (2005)Lawrie, R.A. (1998). Meat Science. Woodhead Publishing Limited, UK. | | | | | | | |
| **OTHER REFERENCES** | | | | | Meat and Meat Products Technology, Ş. Anar, 2nd Edition, Dora Publications, 2012 | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | What is red meat? Composition and properties of red meat |
| 2 | Quality criteria for red meat and meat products |
| 3 | Red meat preservation methods and their effects on quality |
| 4 | Red meat preservation methods and their effects on quality |
| 5 | Fresh red meat products |
| 6 | Traditional red meat products and their functional properties |
| 7 | Turkish fermented sausage production technology |
| 8 | Midterm Examination |
| 9 | "Kavurma" production technology |
| 10 | "Pastirma" production technology |
| 11 | Sausages production technology |
| 12 | Salami production technology |
| 13 | Canned production technology |
| 14 | Preservation methods of red meat product |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Prof. Dr. Muhammet İrfan AKSU **Date:** 29.12.2020

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | MICROBIAL FOOD POISONING |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 (√)]** | | | | | | |
| 3 | | 0 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | |  | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | his course includes the properties of foodborne pathogenic bacteria, molds, viruses and other food pathogens, poisoning mechanisms and prevention methods. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | To inform students regarding foodborne pathogen bacteria, molds, viruses and parasits and diseases they cause. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Have general information about food pathogens.  Knows the poisoning mechanism of pathogens.  Be aware of pathogen isolation methods. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1 - To gain general knowledge about foodborne pathogens  2 - To gain knowledge in estimation which pathogens can be found in which kinds of foods and causes which disease  3 - To learn the methods used to prevent the growth of pathogens in foods  4 - To learn methods used isolation of certain pathogens from certain foods | | | | | | | |
| **TEXTBOOK** | | | | | Foodborne Pathogens:Hazards, Risk Analysis and Control, 2001, edited by Clive Blackburn and Peter McClure | | | | | | | |
| **OTHER REFERENCES** | | | | | Gıda Mikrobiyolojisi-Editor:Prof.Dr.Osman ERKMEN | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction to Pathogen Bacteria and Poisoning Mechanism |
| 2 | Escherichia coli, Escherichia coli O157 : H7 |
| 3 | Campylobacter jejuni |
| 4 | Shigella Species |
| 5 | Salmonella Species |
| 6 | Yersinia Species |
| 7 | Brucella |
| 8 | Midterm Examination |
| 9 | Clostridium Species |
| 10 | Vibrio Species |
| 11 | Other Opportunistic Pathogens |
| 12 | Parasites, |
| 13 | Viruses |
| 14 | IMycotoxicosis |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Assistant Professor Aysel GÜLBANDILAR **Date:** 29.12.2020

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | SUGAR AND CONFECTIONERY TECHNOLOGY |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 (√)]** | | | | | | |
|  | | 3 | | | |  | | | | | | |
| **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** | | | | | Sugar definition and classification, sucrose and sucrose production, definition, properties and applications of strach based sugars, sugar alternatives as polyols and high intensity sugars, confectionery production methods (hard, soft and aerated candys), chewing gum technology, chocolate technology, sugar and health, functional confectionery | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of this course is to give knowledge to students about definition and the current technology of sugar and confectionery , methods used in the soconfectionery technology, basic knowledge in the issues of running principles of those methods with subsequent constitution of general point of view. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | To gain knowledge and experience about sugar and confectionert science and technology | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | The student gains knowledge on;  -confectionery production,  -confectionery analysis methods  -confectionery quality parameters  -sugar alternatives  -effects on sugar confectionery products on health  -recent developments on confectionery production methods | | | | | | | |
| **TEXTBOOK** | | | | | Hartel, R. W, von Elbe, J. H., & Hofberger, R. (2018). Confectionery science and technology. Switzerland: Springer International Publishing AG | | | | | | | |
| **OTHER REFERENCES** | | | | | Miniﬁe, B. W. (1989). Chocolate, cocoa and confectionery. London: Chapman & Hall.Ergun, R., Lietha, R., Hartel, R.W., 2010. Moisture and shelf life in sugar confections, Critical Reviews in Food Science and Nutrition, 50(2), 162-192.Kearsley, M, W., Deis, R.C., 2010. Maltiitol and Maltitol Syrups, Sweetners and Sugar Alternatives in Food Thecnology (eds) Mitchell, H.. Blackwell Publishing 205 -377. Oxford, UK.Malcolm W., Kearsley D., 2006. Maltitol and maltitol syrups Sweeteners and sugar alternatives in food technology, Hellen Mithell, 223-248Zacharis, C., 2012. Xylitol. In K. O’Donnell, M.W. Kearsley (Eds). Sweeteners and Sugar Alternatives in Food Technology (pp. 347-382), Oxford, Wiley-BlackwellZumbe, A., Lee A., Storey, D., 2001. Polyols in Confectionery: The Route To Sugar-Free, Reduced Sugar and Reduced Calorie Confectionery, British Journal of Nutrition, 85(1), 31-45.Wilson, R., 2007. Sweeteners, Blackwell Publishing.Subramaniam, P.J., 2007. Determining shelf-life of confectionery products, Manufacturing Confectioner, 87(6), 85–91. | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Sugar definition and classification |
| 2 | Sucrose and sucrose production |
| 3 | Starch based sugars: definition and production |
| 4 | Starch based sugars: applications |
| 5 | Sugar alternatives: high intensity sweeteners and polyols |
| 6 | Confectionery products-1 |
| 7 | Confectionery products-2 |
| 8 | Midterm Exam |
| 9 | Soft (chewy) and aerated candy technology |
| 10 | Chewing gum technology |
| 11 | Hard candy technology |
| 12 | Chocolate technology |
| 13 | Functional confectionery |
| 14 | Sugar metabolism and health |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Prof. Nevzat Konar **Date:** 29/12/2020

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | Advanced Analysis Methods in Cereal Products |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 (√)]** | | | | | | |
|  | | 3 | | | | 0 | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 50 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 50 |
| **PREREQUISITE(S)** | | | | | NONE | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Advanced analysis methods are taught to determine the technological and nutritional quality of the final product in cereals especially wheat | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Wheat and its products have an important place in the nutrition of our country with the aspect of providing daily calories and meeting basic nutrients.  Advanced technological and nutritional analysis methods will be taught and evaluated in the course of wheat, flour, dough and products obtained in the production of many product groups such as bread, pasta, biscuits, bulgur, dough and breakfast cereals. At the same time, information will be provided on advanced quality analyzes for different areas of oats, triticale and barley from other grains. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Thanks to the information gained in R&D centers, especially in all sectors where bakery products are produced, it is possible to work | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | pon successful completion of this course, the students will be able to 1. Recognize the importance, grain structure and composition of cereals in our country and in the world, 2. Understand the Near Infrared Technique and the principles used in quality analysis, 3- Learn how to determine gluten aggregation properties with GlutoPeak, 4- Analysis of dough rheological properties with alveograph, energy value and gluten balance learns the evaluation of different bakery groups, 5- Learns the use of farinograph, acquires and evaluates the dough stability, softening and water removal values, 6- Learns the laboratory production and evaluation of bread, 7- The amount of starch analysis-using the colorimeter and starch grinning grasp the analysis of properties-Rapid Visco Analyzer, 8-Sodium do decyl sulfate (SD) Polyacrylamide Gel Electrophoresis Technique and Learns to determine the High and Low Molecular Weight Gluten Subunits. - High Pressure Liguid Ch Understands the analysis of amino acids in romotograpy (HPLC), 11-Grains soluble, insoluble and total dietary fiber analysis with gravimetric method, Protein / Nitrogen determination with 12-Learn to Dumas Burning Method 13-Learn to Solvent retention capacity anlysis | | | | | | | |
| **TEXTBOOK** | | | | | Prof. Dr. Hazım Özkaya, Prof. Dr. Berrin ÖZKAYA- Tahıl Ürünleri Analiz Yöntemleri. Gıda Teknolojisi Dergisi Yayınları, Ankara-2005 | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Nutritional and economic importance of cereals, especially wheat, in our country, composition and grain structure of grains |
| 2 | Spectrophotometers working with the principles of spectral reflection / absorption / refraction, their use and rapid calibration in cereals |
| 3 | Analysis and evaluation of gluten aggregation properties for wheat products with GlutoPeak device |
| 4 | Determination and evaluation of energy value and gluten balance of dough with alveograph |
| 5 | Determination and evaluation of dough stability, water absorpitonl and softening values by farinograph |
| 6 | Laboratory-type bread production-kneading, shaping, fermentation, baking and evaluation |
| 7 | Determination of total starch amount using polarimetre and evaluation of starch gelatinization properties with rapid visco anaylser |
| 8 | Midterm Examination |
| 9 | Determination of gluten elasticity and extensibility of YMA and DMA gluten by SDS-PAGE electrophoresis technique |
| 10 | The importance of beta glucan, beta glucan analysis in barley and oats |
| 11 | Extraction of important amino acids in cereals and determination by HPLC |
| 12 | The importance of dietary fiber in grains and determination gravimetrically |
| 13 | Solvent retention capacity analysis |
| 14 | Determination of nitrogen / protein content in cereals by DUMAS method |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Assc. Prof. Dr. Yaşar KARADUMAN **Date:** 29/12/2020

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | WHEAT CHEMISTRY AND TECHNOLOGY |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | None | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Within the scope of the course, the chemical components of wheat will be taught considering their importance in terms of technology and nutrition.t | | | | | | | |
| **COURSE OBJECTIVES** | | | | | Around 20 million tons of wheat is produced in our country, and our country and our region are one of the most important wheat production areas. Wheat is the most important herbal product used in the production of many products used in the nutrition of our people. The components (chemical structure) of wheat are the most important factors affecting the structural and nutritional properties of these products. Carbohydrates, proteins, enzymes and vitamins in the structure of wheat are the main features that determine the process and nutritional quality of products such as bread, pasta, biscuits, bulgur, phyllo, breakfast cereal, which have the most important place in the nutrition of our country's people. Within the scope of the course, it is aimed to teach the chemical components of wheat by considering their technological and nutritional importance. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Students who will know wheat chemistry from a technological point of view will contribute to their academic development by better understanding scientific studies. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | Upon successful completion of this course, the students will be able to 1- Recognizes the anatomy of wheat and the accumulation of components in the structure 2. Comprehends the chemical components of the wheat grain, 3- Learns the carbohydrates of wheat, 4- Learns the staleness of the bread and the effect of chemical components, 5-Makes the evaluation of the dietary fiber content of wheat, 6- Learns the cellulose and sugars, 7- Pentosans 8-Learns wheat proteins, 9-Learns wheat amylase enzymes and their functions, 10- Understands the functions of proteases and other enzymes, 11-Learns about wheat vitamins and microelements, 12-Learns phenolic components of wheat | | | | | | | |
| **TEXTBOOK** | | | | | Wheat Chemistry and Tehnology Lessons Notes-GM809529-Prof. Dr. Recai ERCAN | | | | | | | |
| **OTHER REFERENCES** | | | | | - | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | chemical structure of wheat branı, endosperm and germ in wheat grain |
| 2 | Properties and Differences of wheat amylose and amylopectin |
| 3 | Gelatinization and retragradation of wheat starch and influencing factors |
| 4 | Starch and its influnce in bread staling |
| 5 | Wheat sugars and pentosan content and impotance |
| 6 | Wheat cellulose |
| 7 | Wheat proteins and their classification |
| 8 | Midterm exmaination |
| 9 | Wheat diastases and their importance in bread-making |
| 10 | Gluten structure and imporatnce for wheat technology |
| 11 | Wheat proteases, lipoxygenases, glocosoxydase enzymes and their effects on dough formation |
| 12 | Wheat vitamins |
| 13 | Wheat microelemnts |
| 14 | Fenolic compounds of wheat |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Dr. Öğr. Üyesi Yaşar KAARADUMAAAN

**Date:** 10.11.2021

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | Experimental Designs and Statistical Approaches in Food Engineering |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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)** | | | | | None | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | To be able to perform basic and advanced statistical analyzes by using a package program and to interpret the results obtained. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | It is the comprehension, application and interpretation of statistical test methods in order to plan experimental studies and evaluate the results obtained. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Students' awareness of statistics in their fields of study is increased and they have the ability to expand the results or reports of studies at the national and international level. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | Entry and analysis of data  Solve multi variable statistical problems  Create optimization design and do modeling | | | | | | | |
| **TEXTBOOK** | | | | | K.Özdamar,Paket Programlar İle İst.Veri Analizi, Kaan Kitapevi, Eskişehir, 2013 | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Entry of data and file processes |
| 2 | Create and interpret table |
| 3 | Descriptive Statistic |
| 4 | Hyphothesis tests |
| 5 | Normality test, One Sample: Parametric-non parametric tests |
| 6 | Two independent groups: Parametric-non parametric tests |
| 7 | Anova, Two way Anova |
| 8 | Mid term exam |
| 9 | Repeated Measurements Variance Analysis |
| 10 | Mid term exam |
| 11 | Lineer Regression Analysis, Corelation |
| 12 | Lineer Regression Analysis, Corelation |
| 13 | Response Surface Methodology and Optimation |
| 14 | Desirability function and optimization |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Dr.İlyas ATALAR

**Date:** 10.11.2021

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | Lipid Chemistry |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 (√)]** | | | | | | |
| 3 | |  | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | NO | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Definition of lipids and their importance in nutrition, classification and nomenclature of fatty acids, saturated and unsaturated fatty acids, glycerides, lipid compounds (phospholipids, sphingolipids), sterols, waxes, color compounds, oxidation in lipids, mechanisms of auto-oxidation, techniques for fat modification | | | | | | | |
| **COURSE OBJECTIVES** | | | | | This course aims to give information about the lipid chemistry, to explain the glycerides and non-glyceride components which form lipids, to give information about fat modification techniques and other principles in lipid industry. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | This course includes all fundamentals regarding lipid chemistry that should be given in each food engineering graduate program. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | -Summarizes lipid chemistry  -Interprets glyceride formation  -Summarizes non-glyceride components  -Summarizes the oxidation mechanisms in lipids | | | | | | | |
| **TEXTBOOK** | | | | | Bailey, A. E., & Shahidi, F. (2005). Bailey's Industrial Oil & Fat Products. Hoboken, N.J: John Wiley & Sons. | | | | | | | |
| **OTHER REFERENCES** | | | | | Gunstone, F. D., Harwood, J. L., & Dijkstra, A. J. (2007). The Lipid Handbook. Boca Raton, Fla: CRC. | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction, the importance of lipids in nutrition, classification of lipids |
| 2 | Fatty acids |
| 3 | Fatty acids – continued |
| 4 | Introduction to glycerides, triglycerids, diglycerides and monoglycerides |
| 5 | Introduction to glycerides, triglycerids, diglycerides and monoglycerides – continued |
| 6 | Introduction to non-glyceride compounds – phospholipids |
| 7 | Sphingolipids |
| 8 | Midterm Exam |
| 9 | Sterols, waxes |
| 10 | Color components, vitamins |
| 11 | Degradation reactions of lipids |
| 12 | Oxidation mechanisms, auto-oxidation |
| 13 | Fat modification techniques |
| 14 | Current problems in lipid industry |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Assist. Prof. Dr. Onur KETENOĞLU **Date:** 16.06.2021

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | MOLECULAR METHODS USED IN FOOD ENGINEERING |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 (√)]** | | | | | | |
| 3 | |  | | | |  | | | | | | |
| **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** | | | | | It includes analyzing microorganisms in foods using molecular techniques and understanding the biochemical principles on which molecular techniques are based on proteins used in the analysis of foodstuffs. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of the course; to make students comprehend the biochemical principles on which molecular techniques are based on proteins used in the analysis of foodstuffs and to increase students' knowledge of molecular biology at a level to conduct research.  Also; to explain the molecular techniques used for the detection of microorganisms in foods, theoretically and practically. With this course, it is aimed to develop students' skills in applying these methods and interpreting the findings. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | This course includes information about the biochemical principles on which molecular techniques are based on proteins used in the analysis of foodstuffs. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | -  1. To learn the basics of molecular techniques used in the field of Food Engineering.  2. Obtaining information about the applications of molecular techniques.  3. To learn the principles on which nucleic acid-based molecular techniques used in food analysis are based. | | | | | | | |
| **TEXTBOOK** | | | | | Cocolin L. and Ercolini D. 2008. Molecular techniques in the microbial ecology of fermented foods. Springer New York, USA. | | | | | | | |
| **OTHER REFERENCES** | | | | | . | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Nucleic acids |
| 2 | DNA, RNA |
| 3 | Purification of nucleic acids |
| 4 | Polymerase chain reaction |
| 5 | SDS-PAGE methodd |
| 6 | Agarose Gel Electrophoresi |
| 7 | Sequence analysiss |
| 8 | Midterm Exam |
| 9 | Antibody Based Diagnostic Systems |
| 10 | ELISA Method |
| 11 | Use of molecular techniques in the microbiology laboratory |
| 12 | Recombinant DNA technologies |
| 13 | Real-time PCR |
| 14 | DNA Hybridization |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Assist. Prof. Dr. Aysel GÜLBANDILAR **Date:** 16.06.2021

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | Fermented Dairy Products Technology |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( x ) | Turkish |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
|  | | 0 | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 2 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | | 1 | | 20 |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 40 |
| **PREREQUISITE(S)** | | | | | None | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Pre-processing of milk, basic processes in yoghurt production, yoghurt formation mechanism, flavor and aroma formation in yoghurt, properties of yoghurt, changes in yoghurt during storage, defects in yoghurt, quality control, cleaning and disinfection. Other fermented milk products (Ayran, kefir, kumiss). | | | | | | | |
| **COURSE OBJECTIVES** | | | | | To enable students to gain knowledge and experience about the properties and production of fermented milk products (yogurt, ayran, kefir and kumiss, etc.) | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | It contributes to teaching the production technologies of all kinds of fermented milk products. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | Student has the necessary capability to transfer information/consultancy to the food industry on issues related to its field of expertise (dairy sector). Student plays an active role in solving problems related to the sector. | | | | | | | |
| **TEXTBOOK** | | | | | Barbaros Özer, 2006. Yoğurt Bilimi ve Teknolojisi, SİDAŞ basım evi, İzmir | | | | | | | |
| **OTHER REFERENCES** | | | | | Atilla Yetişemeyen (Editör), 2007. Süt teknolojisi. Ankara Üniversitesi, Ziraat Fakültesi, Süt Teknolojisi Bölümü, AnkaraDairy Science and Technology. P.Walstra etal., Taylor & Francis, 763pp ,2006.Dairy Technology. P.Walstra etal., Marcel&Decker publ., 727pp,1999 | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction of fermented milk products, general information |
| 2 | Pre-processing of milk |
| 3 | Basic steps in industrial yoghurt production |
| 4 | Mechanism of yoghurt clot formation, yoghurt texture |
| 5 | Yogurt biochemistry |
| 6 | Midterm exam 1 |
| 7 | Yogurt biochemistry |
| 8 | Yogurt microbiology |
| 9 | Yogurt defects and problems in the prodcution |
| 10 | Yogurt-like plant based fermented products |
| 11 | Midterm exam 2 |
| 12 | Ayran Production |
| 13 | Kefir, Kumiss Production |
| 14 | Cleaning, disinfection and automation in fermented milk plants |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Dr.İlyas ATALAR

**Date:** 10.11.2021

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | Physical Properties of Foods |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 (√)]** | | | | | | |
| 3 | |  | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | NO | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Size, shape and volume properties of foods, surface and interfacial tension, surfactants, fundamentals of food emulsions, Newtonian and non-Newtonian foods, textural and rheological properties of foods, thermal properties of foods, electromagnetic and dielectrical properties of foods, color, water activity | | | | | | | |
| **COURSE OBJECTIVES** | | | | | This course aims to give information about the fundamentals of physical properties of foods, additionally, food emulsions and viscoelastic properties of foods, textural properties of foods, thermal properties, color and dielectrical properties of foods, and water activity. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | The importance of this course is due to its aim at giving fundamental information regarding the basic physical properties of foods which all graduate students should already have gained. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1) Recognizes the basic fundamental properties of foods.  2) Explains the flow properties and surface tension.  3) Interprets the thermal properties of foods.  4) Recognizes color and dielectrical properties and their measurement techniques. | | | | | | | |
| **TEXTBOOK** | | | | | Sahin, S., Sumnu, S.G. (2006). Physical Properties of Foods. Springer New York | | | | | | | |
| **OTHER REFERENCES** | | | | | Ignacio Arana. (2012). Physical Properties of Foods: Novel Measurement Techniques and Applications. CRC Press. | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction, size, shape and volume properties of foods |
| 2 | Volume properties-continued, density |
| 3 | Types of density, specific gravity, porosity |
| 4 | Surfactants, surface tension, interfacial tension |
| 5 | Surface tension-continued, emulsions |
| 6 | Emulsion formation, emulsion stability |
| 7 | Factors affecting emulsion formation, food emulsions |
| 8 | Texture and rheology, flow properties of foods |
| 9 | Newtonian and non-Newtonian foods |
| 10 | Thermal properties of foods, enthalpy, latent heat |
| 11 | Thermal properties of foods-continued |
| 12 | Electromagnetic properties of foods |
| 13 | Color properties of foods |
| 14 | Sorption isotherms of foods and water activity |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Assoc. Prof. Dr. Onur KETENOĞLU **Date:** 10.11.2021

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | Novel Approaches in Fruit Vegetable Processing |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | None | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | This course introduces students to the basic concepts of recent advances and novel technologies in fruit and vegetable technology. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The aim of this course is to provide students with knowledge and experience about current and innovative technologies in fruit and vegetable technology and to provide them with expertise equipped to play an active role in solving problems related to the industry. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Gains knowledge about innovative technologies and approaches in fruit and vegetable technology. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1. Knows innovative technologies and approaches in fruit and vegetable technology  2. Gain knowledge about innovative drying methods  3. Gain knowledge about innovative juice technologies  4. Gain knowledge about innovative fruit and vegetable waste evaluation and recycling practices. | | | | | | | |
| **TEXTBOOK** | | | | | Sinha, N. K., Hui, Y. H., Evranuz, E. Ö., Siddiq, M., & Ahmed, J. (2010). Handbook of vegetables and vegetable processing. John Wiley & Sons. | | | | | | | |
| **OTHER REFERENCES** | | | | | (i) Houška, M., & da Silva, F. V. M. (Eds.). (2017). High pressure processing of fruit and vegetable products. CRC Press.(ii) Rosenthal, A., Deliza, R., Welti-Chanes, J., & Barbosa-Cánovas, G. V. (Eds.). (2018). Fruit preservation: novel and conventional technologies. Springer. (iii) Rajauria, G., & Tiwari, B. K. (2018). Fruit juices: an overview. Fruit Juices, 3-13.Yahia, E. M., & Carrillo-Lopez, A. (Eds.). (2018). Postharvest physiology and biochemistry of fruits and vegetables. Woodhead publishing. | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction to Fruit and Vegetable Technology |
| 2 | Novel Technology and Approaches in Fruit Juice Production-1 |
| 3 | Novel Technology and Approaches in Fruit Juice Production-2 |
| 4 | Novel Technology and Approaches in Fruit Drying-1 |
| 5 | Novel Technology and Approaches in Fruit Drying-2 |
| 6 | Fruit and Vegetables as Source of Plant Proteins-1 |
| 7 | Fruit and Vegetables as Source of Plant Proteins-2 |
| 8 | Midterm Exam |
| 9 | Novel Waste Management Applications in Fruit and Vegetable Technology-1 |
| 10 | Novel Waste Management Applications in Fruit and Vegetable Technology-2 |
| 11 | Biotechnological Applications |
| 12 | Storage |
| 13 | Edible Coatings |
| 14 | Consumer Behavior and Fruit and Vegetable Technology |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Prof. Dr. Nevzat Konar **Date:**      

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | CHEESE TECHNOLOGY |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 | | | | V | | | | | | |
| **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** | | | | | This course introduces students to the basic concepts of cheese production and introduces them to the importance of cheese technology in the dairy industry. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | To introduce the clot formation mechanism and various methods, systems and machines used in the production stages of cheese; to explain in detail the technologies, product and production parameters of local and foreign type cheeses, to specify all kinds of cheese defects and the measures that can be taken in this context. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Within the scope of this course; additives and processing aids used in cheese making are introduced; preparation of milk for cheese production, coagulation and processing of curd are given in detail; the technology of many local and foreign cheeses is explained; cheese defects and measures to be taken are indicated; Extensive information is given about the evaluation of whey. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1-Perceiving and solving the problems encountered in cheeses  2-To be able to produce an idea about the processes applied to a cheese he has seen.  3-To be able to comprehend the effects of the parameters applied in technological processes on cheese variety and quality. | | | | | | | |
| **TEXTBOOK** | | | | | Textbook: 1. Third, M., "Cheese Technology from A to Z", Volume II, Meta Press, Bornova, İzmir, 2008.3 | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction, cheese definition, history, cheese variety, local and industrial production information |
| 2 | Raw material of cheese: milk |
| 3 | Additives and excipients used in cheese making |
| 4 | Properties of casein and whey proteins |
| 5 | Coagulation of milk with rennet |
| 6 | Selection and standardization of milk to be processed into cheese |
| 7 | Coagulation of milk and processing of curd |
| 8 | Midterm Exam |
| 9 | Salting and pre-ripening Mixing |
| 10 | Theories of maturation and aroma formation in cheese |
| 11 | Packaging of cheeses |
| 12 | Quality and quality defects in cheese |
| 13 | Local and foreign type cheese production |
| 14 | Local and foreign type cheese production |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Assoc.Prof.Ilyas ATALAR

**Date:** 12.04.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | FOOD POWDERS TECHNOLOGY |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 | | | | X | | | | | | |
| **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** | | | | | Physical properties of powdered foods, production conditions, processing conditions, storage problems | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The purpose of the course is; To provide students with knowledge and experience about the properties and production of powdered foods, and to gain expertise equipped to play an active role in solving problems related to the sector. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Gains knowledge about the properties and production conditions of powdered foods. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1- Knows the properties of powdered foods.  2- Gain knowledge about powder food production methods.  3- Have knowledge about the processes such as mixing, separation, transportation and processing of powders. | | | | | | | |
| **TEXTBOOK** | | | | | Food Powders, Gustavo V. Barbosa-Canovas,2005 Kluwer Academic/Plenum Publishers, New York Powdered foods general information233 Spring Street, New York, New York 10013 | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Food powders general information |
| 2 | Particle properties |
| 3 | Powder Production and Processing |
| 4 | Transport Features |
| 5 | Size Reduction |
| 6 | Size Enlargement, Agglomeration |
| 7 | Encapsulation Process |
| 8 | Midterm Exam |
| 9 | Blending |
| 10 | Separation and Classification |
| 11 | Drying Techniques -1 |
| 12 | Drying Techniques -2 |
| 13 | Problems in Storage of Powders 1 |
| 14 | Problems in Storage of Powders 2 |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Assoc.Prof.Ilyas ATALAR

**Date:** 12.04.2022 **Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** |  | **TITLE** | Olive Oil Production Technology and Quality Criteria |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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 (√)]** | | | | | | |
| 3 | |  | | | |  | | | | | | |
| **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** | | | | | Fundamental of olive oil, current status of olive and olive oil worldwide and countrywide, equipment used in oil production, oil processing parameters, problems in oil production, olive oil quality criteria | | | | | | | |
| **COURSE OBJECTIVES** | | | | | This course aims to give information about the current status of olive worldwide and countrywide, to introduce the equipment and process parameters, and to give information about the quality criteria of olive oil. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | The course includes detailed information about current olive oil processing techniques, problems faced in the production, process steps, and the whole procedure that olives pass through oil processing from raw material to final product. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1) Summarizes the current status of olive  2) Recognizes the equipment used in olive oil production  3) Interprets the olive oil processing steps and explains process parameters  4) Explains olive oil quality criteria. | | | | | | | |
| **TEXTBOOK** | | | | | Kayahan, M., Tekin, A. (2006). Zeytinyağı Üretim Teknolojisi. Gıda Mühendisleri Odası Yayınları, Ankara. | | | | | | | |
| **OTHER REFERENCES** | | | | | Gunstone, F. (2011). Vegetable Oils in Food Technology: Composition, Properties and Uses. John Wiley & Sons | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction, olive oil production data from Turkey and worldwide |
| 2 | Introduction to olive, its properties and composition |
| 3 | Introduction to olive oil processing, pre-processing |
| 4 | Cleaning, separation and washing |
| 5 | Steps of olive oil processing |
| 6 | Equipment used in olive oil processing |
| 7 | Process parameters in olive oil processing |
| 8 | Effects of oil processing parameters on final oil quality |
| 9 | Composition of olive oil |
| 10 | Composition of olive oil-continued |
| 11 | Quality criteria of olive oil |
| 12 | Quality criteria of olive oil-continued |
| 13 | By-products in olive oil processing |
| 14 | Problems faced in oil processing |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Assoc. Prof. Dr. Onur KETENOĞLU **Date:** 10.11.2021

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** | 507202904 | **TITLE** | POWDER TECHNOLOGIES IN FOOD ENGINEERING |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( X ) | ENGLISH |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
|  | | X | | | | X | | | | | | |
| **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** | | | | | Physical properties of powdered foods, production conditions, processing conditions, storage problems | | | | | | | |
| **COURSE OBJECTIVES** | | | | | The purpose of the course is; To provide students with knowledge and experience about the properties and production of powdered foods, and to gain expertise equipped to play an active role in solving problems related to the sector. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Gains knowledge about the properties and production conditions of powdered foods. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1- Knows the properties of powdered foods.  2- Gain knowledge about powder food production methods.  3- Have knowledge about the processes such as mixing, separation, transportation and processing of powders. | | | | | | | |
| **TEXTBOOK** | | | | | Food Powders, Gustavo V. Barbosa-Canovas,2005 Kluwer Academic/Plenum Publishers, New York Powdered foods general information233 Spring Street, New York, New York 10013 | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Food powders general information |
| 2 | Particle properties |
| 3 | Powder Production and Processing |
| 4 | Transport Features |
| 5 | Size Reduction |
| 6 | Size Enlargement, Agglomeration |
| 7 | Encapsulation Process |
| 8 | Midterm Exam |
| 9 | Blending |
| 10 | Separation and Classification |
| 11 | Drying Techniques -1 |
| 12 | Drying Techniques -2 |
| 13 | Problems in Storage of Powders 1 |
| 14 | Problems in Storage of Powders 2 |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Assoc.Prof.Ilyas ATALAR **Date:** 03.11.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** | 507202901 | **TITLE** | Lipid Chemistry |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( X ) | ENGLISH |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
| 3 | |  | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | NO | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Definition of lipids and their importance in nutrition, classification and nomenclature of fatty acids, saturated and unsaturated fatty acids, glycerides, lipid compounds (phospholipids, sphingolipids), sterols, waxes, color compounds, oxidation in lipids, mechanisms of auto-oxidation, techniques for fat modification | | | | | | | |
| **COURSE OBJECTIVES** | | | | | This course aims to give information about the lipid chemistry, to explain the glycerides and non-glyceride components which form lipids, to give information about fat modification techniques and other principles in lipid industry. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | This course includes all fundamentals regarding lipid chemistry that should be given in each food engineering graduate program. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | -Summarizes lipid chemistry  -Interprets glyceride formation  -Summarizes non-glyceride components  -Summarizes the oxidation mechanisms in lipids | | | | | | | |
| **TEXTBOOK** | | | | | Bailey, A. E., & Shahidi, F. (2005). Bailey's Industrial Oil & Fat Products. Hoboken, N.J: John Wiley & Sons. | | | | | | | |
| **OTHER REFERENCES** | | | | | Gunstone, F. D., Harwood, J. L., & Dijkstra, A. J. (2007). The Lipid Handbook. Boca Raton, Fla: CRC. | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction, the importance of lipids in nutrition, classification of lipids |
| 2 | Fatty acids |
| 3 | Fatty acids – continued |
| 4 | Introduction to glycerides, triglycerids, diglycerides and monoglycerides |
| 5 | Introduction to glycerides, triglycerids, diglycerides and monoglycerides – continued |
| 6 | Introduction to non-glyceride compounds – phospholipids |
| 7 | Sphingolipids |
| 8 | Sterols |
| 9 | Waxes |
| 10 | Color components, vitamins |
| 11 | Degradation reactions of lipids |
| 12 | Oxidation mechanisms, auto-oxidation |
| 13 | Fat modification techniques |
| 14 | Current problems in lipid industry |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Assoc. Prof. Dr. Onur KETENOĞLU **Date:** 03.11.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** | 507202902 | **TITLE** | Physical Properties of Foods |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( X ) | ENGLISH |
| **CREDIT DISTRIBUTION** | | | | | | | | | | | | |
| **Basic Science** | | **Basic Engineering** | | | | **Knowledge in the discipline**  **[if it contains considerable design content, mark with (√)]** | | | | | | |
| 3 | |  | | | |  | | | | | | |
| **ASSESSMENT CRITERIA** | | | | | | | | | | | | |
| **SEMESTER ACTIVITIES** | | | | | **Evaluation Type** | | | | | **Number** | | **Contribution**  **( % )** |
| Midterm | | | | | 1 | | 40 |
| Quiz | | | | |  | |  |
| Homework | | | | |  | |  |
| Project | | | | |  | |  |
| Report | | | | |  | |  |
| Seminar | | | | |  | |  |
| Other (………) | | | | |  | |  |
| **Final Examination** | | | | | | | 60 |
| **PREREQUISITE(S)** | | | | | NO | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | Size, shape and volume properties of foods, surface and interfacial tension, surfactants, fundamentals of food emulsions, Newtonian and non-Newtonian foods, textural and rheological properties of foods, thermal properties of foods, electromagnetic and dielectrical properties of foods, color, water activity | | | | | | | |
| **COURSE OBJECTIVES** | | | | | This course aims to give information about the fundamentals of physical properties of foods, additionally, food emulsions and viscoelastic properties of foods, textural properties of foods, thermal properties, color and dielectrical properties of foods, and water activity. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | The importance of this course is due to its aim at giving fundamental information regarding the basic physical properties of foods which all graduate students should already have gained. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | 1) Recognizes the basic fundamental properties of foods.  2) Explains the flow properties and surface tension.  3) Interprets the thermal properties of foods.  4) Recognizes color and dielectrical properties and their measurement techniques. | | | | | | | |
| **TEXTBOOK** | | | | | Sahin, S., Sumnu, S.G. (2006). Physical Properties of Foods. Springer New York | | | | | | | |
| **OTHER REFERENCES** | | | | | Ignacio Arana. (2012). Physical Properties of Foods: Novel Measurement Techniques and Applications. CRC Press. | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Introduction, size, shape and volume properties of foods |
| 2 | Volume properties-continued, density |
| 3 | Types of density, specific gravity, porosity |
| 4 | Surfactants, surface tension, interfacial tension |
| 5 | Surface tension-continued, emulsions |
| 6 | Emulsion formation, emulsion stability |
| 7 | Factors affecting emulsion formation, food emulsions |
| 8 | Texture and rheology, flow properties of foods |
| 9 | Newtonian and non-Newtonian foods |
| 10 | Thermal properties of foods, enthalpy, latent heat |
| 11 | Thermal properties of foods-continued |
| 12 | Electromagnetic properties of foods |
| 13 | Color properties of foods |
| 14 | Sorption isotherms of foods and water activity |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Assoc. Prof. Dr. Onur KETENOĞLU **Date:** 03.11.2022

**Signature**:

**T.R.**

**ESKISEHIR OSMANGAZI UNIVERSITY**

**GRADUATE SCHOOL OF NATURAL AND APPLIED SCIENCES**

**COURSE INFORMATION FORM**

|  |  |  |  |
| --- | --- | --- | --- |
| **DEPARTMENT** | **FOOD ENGINEERING** **(MSc)** | **SEMESTER** |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **COURSE** | | | |
| **CODE** | 507202903 | **TITLE** | Experimental Designs and Statistical Approaches in Food Engineering |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **LEVEL** | **HOUR/WEEK** | | | | | | **Credit** | **ECTS** | **TYPE** | | | **LANGUAGE** |
| **Theory** | | **Practice** | **Laboratory** | | |
| **MSc** | 3 | | 0 | 0 | | | 3 | 7,5 | COMPULSORY  (   ) | | ELECTIVE  ( x ) | ENGLISH |
| **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)** | | | | | None | | | | | | | |
| **SHORT COURSE CONTENT** | | | | | To be able to perform basic and advanced statistical analyzes by using a package program and to interpret the results obtained. | | | | | | | |
| **COURSE OBJECTIVES** | | | | | It is the comprehension, application and interpretation of statistical test methods in order to plan experimental studies and evaluate the results obtained. | | | | | | | |
| **COURSE CONTRIBUTION TO THE PROFESSIONAL EDUCATION** | | | | | Students' awareness of statistics in their fields of study is increased and they have the ability to expand the results or reports of studies at the national and international level. | | | | | | | |
| **LEARNING OUTCOMES OF THE COURSE** | | | | | Entry and analysis of data  Solve multi variable statistical problems  Create optimization design and do modeling | | | | | | | |
| **TEXTBOOK** | | | | | K.Özdamar,Paket Programlar İle İst.Veri Analizi, Kaan Kitapevi, Eskişehir, 2013 | | | | | | | |
| **OTHER REFERENCES** | | | | |  | | | | | | | |

|  |  |
| --- | --- |
| **COURSE SCHEDULE (Weekly)** | |
| **WEEK** | **TOPICS** |
| 1 | Entry of data and file processes |
| 2 | Create and interpret table |
| 3 | Descriptive Statistic |
| 4 | Hyphothesis tests |
| 5 | Normality test, One Sample: Parametric-non parametric tests |
| 6 | Two independent groups: Parametric-non parametric tests |
| 7 | Anova, Two way Anova |
| 8 | Mid term exam |
| 9 | Repeated Measurements Variance Analysis |
| 10 | Mid term exam |
| 11 | Lineer Regression Analysis, Corelation |
| 12 | Lineer Regression Analysis, Corelation |
| 13 | Response Surface Methodology and Optimation |
| 14 | Desirability function and optimization |
| 15,16 | Final Examination |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CONTRIBUTION OF THE COURSE LEARNING OUTCOMES TO THE FOOD ENGINEERING MSc PROGRAM LEARNING OUTCOMES** | | **CONTRIBUTION LEVEL** | | |
| **NO** | **LEARNING OUTCOMES (MSc)** | **3**  High | **2**  Mid | **1**  Low |
| **LO 1** | Has the skills of accessing, evaluating, interpreting and applying the knowledge in the area of engineering |  |  |  |
| **LO 2** | Has the skills of designing, applying and evaluating scientific research |  |  |  |
| **LO 3** | Integrates knowledge from different disciplines |  |  |  |
| **LO 4** | Has the skills of developing methods in constructing and solving engineering problems |  |  |  |
| **LO 5** | Has the skills of developing and applying new and original ideas in system and process designs |  |  |  |
| **LO 6** | Has extensive knowledge about modern techniques and methods applied in food technology |  |  |  |
| **LO 7** | Plays an active role in the establishment and operation of activities in his/her specalization area |  |  |  |
| **LO 8** | Effectively utilizes Information Technologies (presentation, word processing, statistics and graphic softwares) for his/her work |  |  |  |
| **LO 9** | Has the required endowments to advice food sector on matters related to his/her specialization area |  |  |  |
| **LO 10** | Has the skill of systematically extending the results of his/her works, nationally and internationally, in written form or orally |  |  |  |
| **LO 11** | Takes responsibility in the solution of a problem related to his/her specialization area as group leader and Plays an active role in the solution of the problems of food industry |  |  |  |

**Prepared by:** Dr.İlyas ATALAR

**Date:** 03.11.2021

**Signature**: