| Pharmacy | | | |
|---|---|---|---|
| Bachelor | TR-NQF-HE: Level 6 | QF-EHEA: First Cycle | EQF-LLL: Level 6 |

## Course Introduction and Application Information

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|---|---|
| Course Code: | ECZ201 |
| Course Name: | Organic Chemistry |
| Semester: | Fall |
| Course Credits: | ECTS: 5 |
| Language of instruction: | Turkish |
| Course Condition: | |
| Does the Course Require Work Experience?: | No |
| Type of course: | Compulsory Courses |
| Course Level: | Bachelor \| TR-NQF-HE:6. Master`s Degree \| QF-EHEA:First Cycle \| EQF-LLL:6. Master`s Degree |
| Mode of Delivery: | E-Learning |
| Course Coordinator: | Dr. Öğr. Üy. ONUR ŞAHİN |
| Course Lecturer(s): | Assoc. Prof. Sinem TUNCEL KOSTAKOĞLU |
| Course Assistants: | |

### Course Objective and Content

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| Course Objectives: | To give information about the structure of organic compounds and the chemical reactions and physical properties of important organic compounds. Lessons are to improve the capacity of students to classify organic compounds and to comment on the chemical properties of organic compounds with different functional groups. To ensure knowledge and skills on subjects of working in organic area, modern separation methods, synthesis of organic compounds and clarification of structures. |

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| Course Content: | Chemical Bonding, Alkanes and Cycloalkanes, Alkenes and Alkynes, Structure, Derivation and Reactions, Aromatic Compounds, Stereochemistry, Organohalids: Substitution and Elimination Reactions, Alcohols, Phenols, Thiols, Ethers, Epoxides, Aldehydes and Ketones, Carboxylic Acids, Carboxylic Acid Derivatives Esters / Amides) and Amines |

## Learning Outcomes

The students who have succeeded in this course;
1) Describes the physical and structural properties of the compounds in the main classes of organic compounds and on what basic principles chemical reactions are based.
2) Describes to which organic reaction mechanism chemical events take place in organic synthesis.
3) Uses basic principles and concepts of organic chemistry in pharmaceutical applications
4) Has the information about the importance of organic substances and their use in chemical applications.
5) Learns scientists who has contributed to the development of organic chemistry and the importance of safety cautions while studying on organic matters
6) Classify organic substances and understand the reactions and mechanisms of organic compounds
7) Knows the tools and equipments used in basic laboratories and has the ability to collect these tools and materials for the synthesis of organic materials
8) Synthesizes an organic compound and purifies it and gives names systematically for it. Defines chemical properties and reaction mechanisms of any organic compound according to the structural formula.
9) Gains the ability to understand, interpret and perform an organic chemistry experiment and prepares an organic chemistry experiment report.
10) Interpret and perform purification methods such as distillation, crystallization and extraction.

## Course Flow Plan

| Week | Subject | Related Preparation |
|---|---|---|
| 1) | Theory: Chemical Bonding Lab: General laboratory rules, laboratory equipment introduction and laboratory safety | |
| 2) | Theory: Alkanes and Cycloalkanes Lab: Extraction | |
| 3) | Theory: Alkenes and Alkynes: Structure and Synthesis Lab: Extraction | |
| 4) | Theory: Alkenes and Alkynes: Reactions Lab: Recrystallization | |
| 5) | Theory:Aromatic Compounds Lab: Recrystallization | |
| 6) | Theory: Stereochemistry Lab: Chromatography | |
| 7) | Theory: Organohalids-Substitution and Elimination Reactions Lab: Chromatography | |
| 8) | MIDTERM EXAM | |
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| | | |
|---|---|---|
| 9) | Theory: Alcohols, Phenols, Thiols Lab: Tert-butyl chloride synthesis | |
| 10) | Theory: Ethers, Epoxides Lab: Tert-butyl chloride synthesis | |
| 11) | Theory:Aldehydes and Ketones Lab: Cyclohexanol synthesis | |
| 12) | Theory: Carboxylic Acids Lab: Cyclohexanol synthesis | |
| 13) | Theory: Carboxylic Acid Derivatives (Esters and Amides) Lab: Dibenzalacetone synthesis | |
| 14) | Theory: Amines Lab: Dibenzalacetone synthesis | |
| 15) | - | |
| 16) | FINAL EXAM | |

### Sources

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| Course Notes / Textbooks: | Organik Kimya-Kısa ve Öz (Robert C Atkins & Francis A Carey-Çeviri Editörleri: Gürol Okay, Yılmaz Yıldırır) |
| References: | Organik Kimya-11. Basımdan Çeviri (T. W. Graham Solomons, C.B. Fryhle, S. A. Snyder-Çeviri Editörü: Prof. Dr. Cavit Uyanık) |

### Course - Program Learning Outcome Relationship

| **Course Learning Outcomes** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
|---|---|---|---|---|---|---|---|---|---|---|
| Program Outcomes | | | | | | | | | | |
| 1) Applies and develops the universal and social dimensional effects of basic, professional and technological knowledge in the field of pharmacy as well as pharmacy practice interdisciplinary by following legal, deontological and ethical rules. | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2) Defines the terminology related to the pharmacy profession; solves problems , accesses scientific information in the field of pharmacy, after monitoring and evaluating the current literature, applies , communicates, shares by using information technologies effectively and efficiently. | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3) Uses theoretical and practical knowledge about the anatomical structure of the human body, the physiological working principles of systems, biochemical, immunological events in the organism and | | | | | | | | | | |

| microorganisms.<br>**Course Learning Outcomes** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
|---|---|---|---|---|---|---|---|---|---|---|
| 4) Uses basic and advanced analytical techniques and methods by running qualitative/quantitative analyzes and interprets the findings by using appropriate statistical methods. | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5) Defines medicinal plants, herbal drugs and active substances; gains the skills for the development of natural products used for medical purposes. | | | | | | | | | | |
| 6) Applies patient-centered and individualized pharmaceutical care service together with other healthcare personnel within the framework of rational drug use by using the principles of clinical pharmacy, pharmacoeconomics, pharmacotherapy and phytotherapy. | | | | | | | | | | |
| 7) Knows the biological properties, structure-activity relationships, and metabolisms of drugs and gains the skill for the synthesize and development of new drug candidates. | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 8) He/She is competent at formulations, production, stability, quality assurance, licensing, patent studies, legal regulations of products containing natural origin and / or synthetic active substances, advanced therapy medicinal products, radiopharmaceuticals and cosmetic products. | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 9) Interprets the pharmacokinetic and pharmacodynamic properties of drugs, the factors that change their effect, their toxic effects, pharmacolygical activities and their risk assessment method. Reports the drug interactions and adverse drug reactions, monitors and applies the theoretical/practical knowledge for preventing them. | | | | | | | | | | |
| 10) As a health professional in his/her profession he/she acts as a caregiver, decision maker, communicator, manager, lifelong learner, instructor, leader and researcher, he/she complies with the principles of evidence-based pharmacy by making teamwork for the benefit of society, national and universal values. | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | | | | | | | | |

| Course Learning Outcomes | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 210 |
|---|---|---|---|---|---|---|---|---|---|---|
| 11) He/She works in various fields such as community pharmacy, hospitals, pharmaceutical medical devices, herbal products and cosmetics sectors, health institutions and agencies, clinical research organizations , universities and R&D centers. | | | | | | | | | | |

## Course - Learning Outcome Relationship

| No Effect | 1 Lowest | 2 Average | 3 Highest |
|---|---|---|---|
| | | | |

| | Program Outcomes | Level of Contribution |
|---|---|---|
| 1) | Applies and develops the universal and social dimensional effects of basic, professional and technological knowledge in the field of pharmacy as well as pharmacy practice interdisciplinary by following legal, deontological and ethical rules. | 1 |
| 2) | Defines the terminology related to the pharmacy profession; solves problems , accesses scientific information in the field of pharmacy, after monitoring and evaluating the current literature, applies , communicates, shares by using information technologies effectively and efficiently. | 1 |
| 3) | Uses theoretical and practical knowledge about the anatomical structure of the human body, the physiological working principles of systems, biochemical, immunological events in the organism and microorganisms. | |
| 4) | Uses basic and advanced analytical techniques and methods by running qualitative/quantitative analyzes and interprets the findings by using appropriate statistical methods. | 1 |
| 5) | Defines medicinal plants, herbal drugs and active substances; gains the skills for the development of natural products used for medical purposes. | |
| 6) | Applies patient-centered and individualized pharmaceutical care service together with other healthcare personnel within the framework of rational drug use by using the principles of clinical pharmacy, pharmacoeconomics, pharmacotherapy and phytotherapy. | |
| 7) | Knows the biological properties, structure-activity relationships, and metabolisms of drugs and gains the skill for the synthesize and development of new drug candidates. | 1 |
| 8) | He/She is competent at formulations, production, stability, quality assurance, licensing, patent studies, legal regulations of products containing natural origin and / or synthetic active substances, advanced therapy medicinal products, radiopharmaceuticals and cosmetic products. | 1 |

| | | |
|---|---|---|
| 9) | Interprets the pharmacokinetic and pharmacodynamic properties of drugs, the factors that change their effect, their toxic effects, pharmacolygical activities and their risk assessment method. Reports the drug interactions and adverse drug reactions, monitors and applies the theoretical/practical knowledge for preventing them. | |
| 10) | As a health professional in his/her profession he/she acts as a caregiver, decision maker, communicator, manager, lifelong learner, instructor, leader and researcher, he/she complies with the principles of evidence-based pharmacy by making teamwork for the benefit of society, national and universal values. | 2 |
| 11) | He/She works in various fields such as community pharmacy, hospitals, pharmaceutical medical devices, herbal products and cosmetics sectors, health institutions and agencies, clinical research organizations , universities and R&D centers. | 2 |

### Assessment & Grading

| Semester Requirements | Number of Activities | Level of Contribution |
|---|---|---|
| Midterms | 1 | % 30 |
| Final | 1 | % 70 |
| **total** | | **% 100** |
| PERCENTAGE OF SEMESTER WORK | | % 30 |
| PERCENTAGE OF FINAL WORK | | % 70 |
| **total** | | **% 100** |

### Workload and ECTS Credit Calculation

| Activities | Number of Activities | Preparation for the Activity | Spent for the Activity Itself | Completing the Activity Requirements | Workload |
|---|---|---|---|---|---|
| Course Hours | 14 | 0 | 2 | | 28 |
| Application | 8 | 4 | | | 32 |
| Study Hours Out of Class | 14 | 0 | 4 | | 56 |
| Midterms | 1 | 4 | 2 | | 6 |
| Final | 1 | 4 | 2 | | 6 |
| **Total Workload** | | | | | **128** |