**BİRUNİ UNİVERSİTY**

**“The Future of Science”**

**FACULTY OF PHARMACY**

**…Pharmaceutical and Medicinal Chemistry….. DEPARTMENT**

 **COURSE INFORMATION PACKAGE**

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| **Course Code** | **Course optic Code**  |  **Theory****hours/week** | **Application****hours/week** | **Credit** | **ECTS** |
|  **……ECZ337……** |  |   | …3. |  …2… |  **…2……** |
| **Course Name** | **Pharmaceutical and Medicinal Chemistry Laboratory I** |
| **Semester** | **2016-2017 Fall** |
| **Course Type** | **Obligatory**  |
| **Course Language** | **Turkish** |
| **Prequisites** | **Organic Chemistry** |
| **Mode of Delivery** | **In class, interactive.** |
| **Disabled Students** | **Disabled students, they need information about their own status submitted to the faculty may request the provision of necessary convenience.**  |
| **Instructor(s)** | **Prof. Dr. Süreyya Ölgen** |
| **Course Assistant** | **Araş. Gör. Ceren Can** |
| **Teaching Methods:**  | 1: Lecture, 2: Question-Answer, 3: Discussion, 4: Demonstration, 5: Study Group, 6: Brain Storming, 7: Sample Case 8: Self Study, 9: Similarity Search, 10: Experiment/Practice-Application, 11: Problem Solving |
| **Assessment Methods:** | A: Pre-Testing, B:Exam, C: Laboratory Report, D: Performance Task, E: Obey the safety rules, G: Pre-study |
| **Course Objective** | Give Theoretical Information about Computer Aided Drug Design (CADD) Methods- Basic Principles and type of programs. Give the application experience of drawing structures, 3D structural analysis, energy minimization, dynamic calculation and conformational analysis. QSAR and molecular docking theory and demonstration. Give practical application of purification and seperation techniques such as extraction, distillation, crystallization and chromatography. General information of qualitative analysis methods-Functional Group and elementary analysis. Elementel analysis and computer application. UV theory and qualitative analysis application. IR theory and qualitative analysis application. NMR and Mass theory and spectral elucidations. |

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| **Learning Outcomes** | **The students will be able;**1. Students gain the knowledge about the computer aided drug design methods,
2. Gains knowledge about the purification and seperation techniques such as extraction, distillation, crystallization and chromatography and apply the methods.
3. Gains application experiences of qualitative analysis methods including instrumental analysis and functional group analysis to identify the structure of synthetic, semi synthetic compounds and drugs.
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| **Week** **1.****2.****3.****4.****5.****6.****7.** **8.****9.****10.****11.****12.****13.****14.****15.****16.** | **Course Contents and Learning Activities** Laboratory safety Rules and First Aid. Computer Aided Drug Design MethodsDrawing Molecule, 3D Structure Analysis, Energy Minimization, Dynamic Calculation and Conformational Analysis Purification and Seperation Techniques-Theoretical InformationExtraction ApplicationDistillation ApplicationCrystallization ApplicationKromatography ApplicationQualitative Analysis Methods-Functional Group Analysis- Theoretical InformationTesting for Carbonyl Groups (Ester, Aldehyde, Ketone)-Known SampleTesting for Alcohol and Amine Groups- Known SampleAnalysis of Unknown SamplesMidtermInstrumental Qualitative Analysis Methods I-UV, IR Theoretical Information and Application Instrumental Qualitative Analysis Methods II-Mass and NMR Theoretical Information Spectral Elucidations-Problem SolvingAnalysis of Unknown Samples-Application with Spectral Elucidation |

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| **Assessment Methods**  | **Number** | Percentage % |
| **Attendance(a)** | 16 | 10 |
| **Laboratory Report** | 9 | 9 |
| **Application/Obey the Rules** | 8 | 8 |
| **Field Activities** | 0 | 0 |
| **Course Preparation-Pre Study** | 8 | 8 |
| **Pre-tests** | 8 | 8 |
| **Presentation** | 0 | 0 |
| **Homework** | 0 | 0 |
| **Seminar** | 0 | 0 |
| **Midterm exam** | 1 | 17 |
| **Final exam** | 1 | 40 |
| **Total** |  | 100 |

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| **Textbook/****References** |  ***Different texts from various sources*** |
|  | 1. Richard B. Silverman, The organic Chemistry of Drug Design and Drug Action, 2nd Ed. Elsevier, 2011.
2. Kar, Ashutosh. Advanced Practical Medicinal Chemistry.: New Age International, p16 <http://site.ebrary.com/>
3. Hugo Kubinyi, Methods and Principles in Medicinal Chemistry: Bioisosteres in Medicinal Chemistry: John Wiley & Sons, p21 http://site.ebrary.com/
4. Dickson, C., Medicinal Chemistry Laboratory Manual “Investigations in Biological and Pharmaceutical Chemistry” CRC Press, 1998
5. Farmasötik Kimya Pratikleri I ve II, Ankara Üniversitesi Eczacılık Fakültesi Yayınları, 2015.
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| No | **Competencies of Pharmacy Program** | Katkı |
| 1 | 2 | 3 | 4 | 5 |
| 1 | Implements skills in all areas of occupations obtained from pharmaceutical basic and professional sciences within the scope and framework of rules of ethics, religion, language, race, gender and socio-economic discrimination in collaboration with the relevant professional administrators and regulatory authorities. |  |  | X |  |  |
| 2 | Communicates effectively with community members, health care professionals, policy makers and administrators to transfer informations of professional pharmacy applications and usage of pharmaceutical products. |  | X |  |  |  |
| 3 | In the frame of pharmaceutical care and clinical applications, evaluates accuracy and cost-effectiveness of medication treatment, solves the problems and gives decisions. | X |  |  |  |  |
| 4 | Acquires the current and evidence-based information by using relevant information technologies to apply the rational use of natural, synthetic and biotechnological drugs and gives education, information and consultation to community members, other health-care providers and constitutions.  |  | X |  |  |  |
| 5 | Experiences the basic and professional knowledge to manage, apply and make decision of the entire process related to design, handling and consumption of natural, synthetic and biotechnological pharmaceuticals. |  |  |  |  | X |
| 6 | Possess cultural competency and consciousness to design, implement, and monitors patient-oriented pharmacy practice for the improvement of the quality of heath care by making joint cooperation. | X |  |  |  |  |
| 7 | Raises consciousness to application of modern scientific and technological developments in pharmaceutical field by the awareness of lifelong learning. |  |  |  | X |  |
| 8 | Experiences to research and development, quality control, good manufacturing practices and has knowledge to manage and apply the license process of pharmaceutical products.  |  |  |  |  | X |
| 9 | As a pharmacist with the universal norms, has foreign language proficiency to follow professional developments, conducts research and developments and competent to communicate patients and other healthcare professionals. |  | X |  |  |  |
| 10 | Gathers patient histories, determines needs and priorities of patients, prevents individual diseases, knows how to define and apply the planning and management process of treatment.  | X |  |  |  |  |

WORKLOAD AND ECTS CALCULATION

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| **Activities** | **Number** | **Duration (hour)** | **Total Work Load** |
| **Course Duration (x16)** |   |   |  |
| **Laboratory** | 8 | 3 | 24 |
| **Application** |  |  |  |
| **Specific practical training** | 8 | 1 | 8 |
| **Field activities** |  |  |  |
| **Presentation / Seminar Preparation** |  |  |  |
| **Project** |  |  |  |
| **Homework assignment** |  |  |  |
| **Pre Test (Study duration)** | 8 | 1 | 8 |
| **Midterms (Study duration)** | 1 | 10 | 10 |
| **Final Exam (Study duration)**  | 1 | 10 | 10 |
| Total Workload | **26** | **25** | **60** |
| **ECTS Credit of Course (Total WorrkLoad/25)** |  |  | **4.4** |