**T.C.**

**ESKİŞEHİR OSMANGAZİ ÜNİVERSİTY**

**FACULTY OF SCIENCES**

**MATHEMATİCS AND COMPUTER SCIENCES DEPARTMENT**

**COURSE INFORMATION FORM**

| Course Name | Course Code |
|---|---|
| Algebraic Topology | 821618004 |

| Semester | Number of Course Hours per Week | | Credit | ECTS |
|---|---|---|---|---|
| | **Theory** | **Practice** | | |
| 8 | 3 | 0 | | 5 |

| Course Category (Credit) | | | | |
|---|---|---|---|---|
| **Basic Sciences** | **Engineering Sciences** | **Design** | **General Education** | **Social** |
| x | | | | |

| Course Language | Course Level | Course Type |
|---|---|---|
| Turkish | Undergraduate | Compulsory |

| **Prerequisite(s) if any** | |
|---|---|
| **Objectives of the Course** | The main of the course is to introduce the concepts and techniques involved in the basic topics listed in this lecture and to develope skills in applying those concepts and techniques to the solution of problems |
| **Short Course Content** | Connected Spaces, Paths and Path connected spaces, Homotopies of continuous functions, Homotopies of paths, Homotopy groups, Fundamental groups, |

| | **Learning Outcomes of the Course** | **Contributed PO(s)** | **Teaching Methods *** | **Measuring Methods **** |
|---|---|---|---|---|
| 1 | Have sufficient knowledge in Topology subjects. | 1,2 | 1,2 | A |
| 2 | Learn the Homotopy. | 1,2 | 1,2 | A |
| 3 | Develops ability to analyze and solve problems encountered | 3,4,5,9 | 2,10 | A |
| 4 | Analytical thinking skills develop and the ability to make individual and independent decisions develops. | 3,4,5,9 | 10,11 | A |
| 5 | The ability to analyze and interpret data, apply interpretation to other data, and apply this information in a computer environment develops. | 13 | 10,11 | A |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |

***Teaching Methods 1:**Expression, **2:**Discussion, **3:**Experiment, **4:**Simulation, **5:**Question-Answer, **6:**Tutorial, **7:**Observation, **8**:Case Study, **9:**Technical Visit, **10:**Trouble/Problem Solving, **11:**Induvidual Work, **12**:Team/Group Work, **13:**Brain Storm, **14:**Project Design / Management, **15:**Report Preparation and/or Presentation

****Measuring Methods A:**Exam, **B:**Quiz, **C:**Oral Exam, **D:**Homework, **E:**Report, **F:**Article Examination, **G:**Presentation, **I:**Experimental Skill, **J:**Project Observation, **K:**Class Attendance; **L:**Jury Exam

| Main Textbook | **A First Course in Algebraic Toplogy, Czes Kosniowsky** |
|---|---|
| **Supporting References** | *1)   Topology, James R. Munkres*<br>2)  Essential Topology, Martin, D. Crossley |
| **Necessary Course Material** | |

| **Course Schedule** | |
|---|---|
| **1** | Homotopy |
| **2** | Homotopies of continuous functions |
| **3** | Paths and multiplication of paths, |
| **4** | Homotopies of paths, |
| **5** | Characteristics of homotopies |
| **6** | Homotopy Equivalances |
| **7** | Problem Solving |
| **8** | Midterm |
| **9** | Homotopy groups |
| **10** | Fundamental groups |
| **11** | Problem solving |
| **12** | Fundamental groups of product spaces |
| **13** | Fundamental group of circle |
| **14** | Examples of Fundamental group |
| **15** | Problem solving |
| **16,17** | Final exam |

| **Calculation of Course Workload** | | | |
|---|---|---|---|
| **Activities** | **Number** | **Time (Hour)** | **Total Workload (Hour)** |
| Course Time (number of course hours per week) | 14 | 3 | 42 |
| Classroom Studying Time (review, reinforcing, prestudy,....) | 14 | 3 | 42 |
| Homework | 5 | 3 | 15 |
| Quiz Exam | | | |
| Studying for Quiz Exam | | | |
| Oral exam | | | |
| Studying for Oral Exam | | | |
| Report (Preparation and presentation time included) | | | |
| Project (Preparation and presentation time included) | | | |
| Presentation (Preparation time included) | | | |
| | | | |
| | | | |
| Mid-Term Exam | 1 | 1 | 1 |
| Studying for Mid-Term Exam | 1 | 20 | 20 |
| Final Exam | 1 | 1 | 1 |
| Studying for Final Exam | 1 | 30 | 30 |
| | **Total workload** | | 151 |
| | **Total workload / 30** | | 151/30 |
| | **Course ECTS Credit** | | 5 |

| Evaluation | |
|---|---|
| **Activity Type** | **%** |
| Mid-term | 40 |
| Quiz | |
| Homework | 10 |
| Bir öğe seçin. | |
| Bir öğe seçin. | |
| **Final Exam** | 50 |
| **Total** | 100 |

| NO | PROGRAM OUTCOME | Contribution |
|---|---|---|
| | **RELATIONSHIP BETWEEN THE COURSE LEARNING OUTCOMES AND THE PROGRAM OUTCOMES (PO)** (5: Very high, 4: High, 3: Middle, 2: Low, 1: Very low) | |
| 1 | The ability to apply knowledges of Mathematics and Computer Sciences, | 4 |
| 2 | To have sufficient theoretical and practical knowledge of Mathematics at international level, | 5 |
| 3 | The ability of describing, modelling and solving of mathematical problems at Mathematics and related subjects, | 5 |
| 4 | The skill to solve and design a problem process in accordance with a defined target, | 5 |
| 5 | Skills to analyze data, interpret and apply to other datum and using these data on computer, | 4 |
| 6 | The skill to use the modern techniques and computational tools needed for mathematical applications, | 3 |
| 7 | The skill to make team work within the discipline and interdisciplinary, | 2 |
| 8 | The ability to improve oneself by following the developments on other modern, scientific and technological subjects as well as Mathematics and Computer Sciences, | 2 |
| 9 | The skill to communicate orally and in written way, in a clear and concise manner by having individual work skills and ability to independently decide and analytical thinking, | 4 |
| 10 | The skill to have professional and ethical responsibility, | 2 |
| 11 | The skill to have consciousness for quality issues and scientific research, | 2 |
| 12 | The skill to be sensitive to environmental issues related with problems and development of living area and consistent in the social relations, | 1 |
| 13 | Ability to solve problems in the working life faced to find an appropriate algoritms via mathematical modeling and to write computer programs, | 4 |
| 14 | The skill to developed design of software systems at different complex levels, | 1 |
| 15 | The credence of necessity of life-long learning and ability to apply the formation long-life learning. | 1 |

| LECTUTER(S) | | | | |
|---|---|---|---|---|
| **Prepared by** | Prof. Dr. İbrahim İlker AKÇA | | | |
| **Signature(s)** | | | | |

**Date:**06.06.2024