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| Description: logo | **ÇANKAYA UNIVERSITY**  **Faculty of Engineering** **Course Definition Form** |

This form should be used for either an elective or a compulsory course being proposed and curricula development processes for an undergraduate curriculum at Çankaya University, Faculty of Engineering. Please fill in the form completely and submit the printed copy containing the approval of the Department Chair to the Dean's Office, and mail its electronic copy to [kiper@cankaya.edu.tr](mailto:kiper@cankaya.edu.tr). Upon the receipt of *both copies*, the printed copy will be forwarded to the Faculty Academic Board for approval. Incomplete forms will be returned to the Department. The approved form is finally sent to the President’s office for approval by the Senate.

**Part I. Basic Course Information**

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| **Department Name** | CIVIL ENGINEERING | | | | **Dept. Numeric Code** | | |  |  | | --- | --- | | 1 | 9 | |
| **Course Code** | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | C | E | 2 | 0 | 9 |  |  | | **Number of Weekly Lecture Hours** | |  | | --- | | 2 | | **Number of Weekly Lab/Tutorial Hours** | |  | | --- | | 2 | | **Number of Credit Hours** | |  | | --- | | 3 | |
| **Course Web Site** | http:// ce209.cankaya.edu.tr | | | | **ECTS Credit** | | |  |  | | --- | --- | | 0 | 6 | |

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| **Course Name**  *This information will appear in the printed catalogs and on the web online catalog.* | |
| English Name | Geographic Information Systems |
| Turkish Name | Coğrafi Bilgi Sistemleri |

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| **Course Description**  *Provide a brief overview of what is covered during the semester. This information will appear in the printed catalogs and on the web online catalog.*  *Maximum 60 words.* |
| Definition of the GIS, Components of a GIS, Maps and Their Influence on the GIS, Map Projection Systems, Spatial Data Models, Spatial Data Structures, Sources of Spatial Data, Spatial Database Models, Creation of a Spatial Database, GIS Database Applications, GIS Software and Hardware, Spatial Data Visualization, Symbolization of Spatial Data, Spatial Queries and Analysis, Civil Engineering Applications, Spatial Programming. |

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| **Prerequisites**  (if any)  *Give course codes and check all that are applicable.* | 1st   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | | 2nd   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | | | | 3rd   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | | | 4th   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | |
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| Consent of the Instructor | | | Senior Standing | Give others, if any. | | |
| **Co-requisites**  (if any) | 1st   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | | 2nd   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | | | | 3rd   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | | 4th   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | | |
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| **Course Type**  *Check all that are applicable* | Must course for dept.  Must course for other dept.(s)  Elective course for dept.  Elective course for other dept.(s) | | | | | | |

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| **Course Classification**  *Give the appropriate percentages for each category.* | | | | | |
| Category | Mathematics & Natural Sciences | Engineering Sciences | Engineering Design | General Education | Other |
| Percentage | 20 | 40 | 40 |  |  |

**Part II. Detailed Course Information**

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| **Course Objectives**  *Explain the aims of the course. Maximum 100 words.* |
| This course aims to provide the students in various fields of Engineering and Architecture Sciences with a perspective, the necessary knowledge and skills on the theory and various applications of the GIT as well as to achieve the learning outcome of developing high level and methodological competence in applying GIT in their area of interest and for societal applications. |

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| **Learning Outcomes**  *Explain the learning outcomes of the course. Maximum 10 items.* |
| 1. Explain the basic GIT terminology. 2. Discuss what GIT is in terms of its components and functionality. 3. Describe the use of Global Positioning System (GPS) and Remote Sensing (RS) in a range of applications 4. Differentiate between coordinate systems and map projections. 5. Define what a raster and vector geospatial data types are. 6. Demonstrate proficiency in using ArcGIS software to produce a product 7. Create, manage, and update geospatial data. 8. Arrange information in a geospatial databases. 9. Perform routine spatial data query and analysis. 10. Plan, design and manage engineering projects requiring geospatial data and analysis |

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| **Textbook**(s)  *List the textbook(s), if any, and other related main course materials.* | | | | |
| Author(s) | Title | Publisher | Publication Year | ISBN |
| Keith C. Clarke | Getting Started with Geographic Information Systems (5th Edition) (Pearson Prentice Hall Series in Geographic Information Science) | Prentice Hall | 2010 | 978-0-13-149498-5 |
| Shahab Fazal | GIS Basics | New Age International Ltd. | 2008 | 978-81-22-42639-7 |
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| **Reference Book**s  *List the reference books as supplementary materials, if any.* | | | | |
| Author(s) | Title | Publisher | Publication Year | ISBN |
| Ian Heywood Sarah Cornelius Steve Carver | An Introduction to Geographical Information Systems | Prentice Hall | 2006 | 978-0-13-129317-5 |
| Peter A. Burrough, Rachael A. McDonnell | Principles of Geographical Information Systems (Spatial Information Systems) | OxfordUniversity Press | 1998 | 978-0-19-823365-7 |
| Wilpen L. Gorr, Kristen S. Kurland | GIS Tutorial 1: Basic Workbook | Esri Press | 2010 | 978-1-58948-259-3 |

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| **Teaching Policy**  *Explain how you will organize the course (lectures, laboratories, tutorials, studio work, seminars, etc.)* |
| 2 hours of lecturing and 2 hour of laboratory per week. Attendance and participation in laboratories is mandatory. After lecturing the students about the theoretical/application background, tutorials, assignments and hands-on exercises will be given and conducted during lab hours. |

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| **Laboratory/Studio Work**  *Give the number of laboratory/studio hours required per week, if any, to do supervised laboratory/studio work, and list the names of the laboratories/studios in which these sessions will be conducted.* |
| Laboratory is designed to provide students an opportunity for practical implementation of Geospatial Information Technologies in their daily life and area of interest. |

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| **Computer Usage**  *Briefly describe the computer usage and the hardware/software requirements in the course.* |
| Basic computer literacy skills like using of common hardware components (CD-ROM drives, printers, scanners) and application software such as word processors and spreadsheets, and management of files and directories are required. ArcGIS Desktop software will be used |

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| **Course Outline**  *List the topics covered within each week.* | |
| Week | Topic(s) |
| 1 | Course Overview |
| 2 | Introduction to Geospatial Information Technology |
| 3 | Geographic Information Systems |
| 4 | Coordinate Systems |
| 5 | Map Projections |
| 6 | Global Positioning System |
| 7 | Remote Sensing |
| 8 | Spatial Data Types |
| 9 | Working With Spatial Data |
| 10 | GIS Geo-Database Management Systems |
| 11 | Spatial Data Visualization, Symbology and Cartography |
| 12 | Types of Spatial Analysis and Query |
| 13 | Spatial Query |
| 14 | Spatial Analysis |

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| **Grading Policy**  *List the assessment tools and their percentages that may give an idea about their relative importance to the end-of-semester grade.* | | | | | | | | |
| Assessment Tool | Quantity | Percentage | Assessment Tool | Quantity | Percentage | Assessment Tool | Quantity | Percentage |
| Homework | 2 | 10 | Case Study |  |  | Attendance |  |  |
| Quiz | 2 | 10 | Lab Work | 14 | 20 | Field Study |  |  |
| Midterm Exam | 1 | 25 | Class Participation |  |  | Project |  |  |
| Term Paper |  |  | Oral Presentation |  |  | Final Exam | 1 | 35 |

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| **ECTS Workload**  *List all the activities considered under the ECTS.* | | | |
| Activity | Quantity | Duration  (hours) | Total Workload  (hours) |
| Attending Lectures (*weekly basis*) | 14 | 2 | 28 |
| Attending Labs/Recitations (*weekly basis*) | 14 | 2 | 28 |
| Preparation beforehand and finalizing of notes (*weekly basis*) | 14 | 1 | 14 |
| Collection and selection of relevant material (*once*) | 1 | 4 | 4 |
| Self study of relevant material (*weekly basis*) | 14 | 2 | 28 |
| Homework assignments | 2 | 5 | 10 |
| Preparation for Quizzes | 2 | 2 | 4 |
| Preparation for Midterm Exams (*including the duration of the exams*) | 1 | 10 | 10 |
| Preparation of Term Paper/Case Study Report (*including oral presentation*) | 0 | 0 | 0 |
| Preparation of Term Project/Field Study Report (*including oral presentation*) | 0 | 0 | 0 |
| Preparation for Final Exam (*including the duration of the exam*) | 1 | 10 | 20 |
| TOTAL WORKLOAD**/**25 | | | 146/25 = 5,84 |
| **ECTS Credit** | | | **6** |

*Total Workloads are calculated automatically by formulas. To update all the formulas in the document first press CTRL+A and then press F9.*

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| **Program Qualifications vs. Learning Outcomes**  *Consider the below program qualifications determined in terms of learning outcomes of all the courses in the curriculum and capabilities. Look at the learning outcomes of this course given above. Relate these two using the Likert Scale by marking with X in one of the five choices at the right..* | | | | | | |
| **No** | **Program Qualifications** | **Contribution** | | | | |
| **0** | **1** | **2** | **3** | **4** |
| 1 | Adequate knowledge in mathematics, science and engineering subjects pertaining to civil engineering; ability to use theoretical and applied information in these areas to model and solve engineering problems. |  |  |  | **x** |  |
| 2 | Ability to identify, formulate and solve complex engineering problems; ability to select and apply appropriate analysis and modeling methods for the purpose. |  |  |  |  | **x** |
| 3 | Ability to design a complex system, process, product under realistic constraints and conditions in such a way as to meet the requirements; ability to apply modern design methods for the purpose. |  |  |  |  | **x** |
| 4 | Ability to select and use modern techniques and tools necessary for the analysis and solution of complex problems encountered in civil engineering practice; ability to use information technologies effectively. |  |  |  |  | **x** |
| 5 | Ability to design and conduct experiments, gather data, analyze and interpret results for the study of complex engineering problems or discipline-specific research topics. |  |  |  | **x** |  |
| 6 | Ability to work effectively in intra-disciplinary and multi-disciplinary teams; individual working skills. |  | **x** |  |  |  |
| 7 | Ability to communicate effectively in verbal and in writing; knowledge of at least one foreign language; ability to write effective reports and understand written reports, to prepare design and production reports, to make effective presentations, to give and receive clear and understandable instructions. |  | **x** |  |  |  |
| 8 | Awareness of the necessity of lifelong learning; ability to access information, to follow developments in science and technology, and to keep continuously self-improved. |  |  | **x** |  |  |
| 9 | Knowledge of ethical principles, professional and ethical responsibility, and standards used in engineering practices. | **x** |  |  |  |  |
| 10 | Knowledge of business practices such as project management, risk management and change management; awareness of entrepreneurship, innovation; information about sustainable development. | **x** |  |  |  |  |
| 11 | Information about the effects of engineering practices on health, environment and safety in global and social dimensions and contemporary issues in the field of engineering; awareness of the legal consequences of engineering solutions. | **x** |  |  |  |  |

Contribution Scale to a Qualification: **0**-None, **1**-Little, **2**-Medium, **3**-Considerable, **4**-Largest

**Part III New Course Proposal Information**

*State only if it is a new course*

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| Is the new course **replacing** a former course in the curriculum**?** | | | | Yes | No | Former Course’s Code   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | C | E | 2 | 1 | 0 |  |  | | | | | Former Course’s Name  Geographic Information Systems | |
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| Is there any similar course which has content **overlap** with other courses offered by the university**?** | | | | Yes | No | Most Similar Course’s Code   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | |  |  |  |  |  |  |  | | | | | Most Similar Course’s Name | |
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| **Frequency** of Offerings  *Check all semesters that the course is planned to be offered.* | | | | Fall  Spring  Summer | | | | | | | |
| **First** Offering | Academic Year | | |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | 2 | 0 | 1 | 3 | / | 2 | 0 | 1 | 4 | | | | | Semester | | Fall  Spring | | |
| Maximum **Class Size** Proposed | | |  | | --- | | 55 | | Student **Quota** for Other Departments | | | | |  | | --- | | 5 | | Approximate **Number of Students** Expected to Take the Course | | | |  | | --- | | 60 | |
| **Justification for the proposal**  *Maximum 80 words* | | | | | | | | | | | |
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**Part IV Approval**

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| **Proposed by** | Faculty Member  *Give the Academic Title first.* | Signature | Date |
| Prof.Dr. H. Hakan MARAŞ |  | 06.06.2022 |
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| Departmental Board Meeting Date |  | Meeting Number |  | Decision Number |  |
| Department Chair | Prof.Dr. Mustafa GÖĞÜŞ | Signature |  | Date |  |

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| Faculty Academic Board Meeting Date |  | Meeting Number |  | Decision Number |  |
| Dean | Prof.Dr. Sıtkı Kemal İDER | Signature |  | Date |  |

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| Senate  Meeting Date |  | Meeting Number |  | Decision Number |  |