**OSTIM TECHNICAL UNIVERSITY FACULTY OF ENGINEERING**

**COURSE SYLLABUS**

**FALL 2022-2023**

| **CENG 105 – Computer Programming 1** | | | | | | |
|---|---|---|---|---|---|---|
| **Course Name** | **Course Code** | **Weekly Hours** | | | **Credit** | **ECTS** |
| | | **Theory** | **Application** | **Laboratory** | | |
| Computer Programming 1 | CENG 105 | 3 | 2 | 0 | 4 | 5 |

| **Instructors** | **Contact Information** |
|---|---|
| Prof. Dr. Serdar MÜLDÜR | serdar.muldur@ostimteknik.edu.tr |
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| **Teaching Assistants** | **Contact Information** |
| Ar. Gör. Emine Aşar | emine.asar@ostimteknik.edu.tr |
| **Language of Instruction** | English |
| **Course Status** | Compulsory |
| **Course Level** | Undergraduate |
| **Learning and Teaching Techniques** | Lecture, Discussion, Question Answer, Practice |
| **Prerequisites** | None |

**Course Objectives**

This course gives a brief introduction to programming language constructs, solving algorithmic problems, and basic data structures in C. It is designed as a first course of programming and supported by laboratory sessions.

**Learning Outcomes**

1. An ability to apply knowledge of science, mathematics, andengineering.
2. An ability to design programs andalgorithms
3. An ability to work with multi-disciplinaryteams.
4. An ability to identify, formulate, and solve engineeringproblems.
5. Takeresponsibilitytosolveunpredictableandcomplexproblemsencounteredinapplicationsasan individual and as a member of ateam
6. Plan and manage activities inteamwork
7. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
8. Can do research on interdisciplinaryfields.

**Course Outline**

Introductory Concepts of Computing: Historical Overview and Contents of Computing. Automatic problem solving: algorithms, representation languages, programming chain. Programmable digital calculator: basic



elements of electronic technology. Nature and representation of information (numerical, alphanumeric, images, multimedia).
Fundamental concepts of programming: Introduction to algorithms: representation of the control flow. Introduction to design for subsequent refinements.

| |
|---|
| Fundamentals of programming in C language and in a language for numerical computation - Abstraction mechanisms: Structure of a C program. Data abstraction through data types (numbers, characters and strings, vectors, structures). Structured mechanisms for controlling the execution sequence. The standard libraries of the C language and the input and output functions.<br>Programming techniques in a language for numerical computation: The concept of subprogram: functions and procedures as abstractions. Parameters, how to pass parameters, effect of a subroutine. File management. Management of matrices. Graphic visualization techniques.<br>Introductory concepts of advanced programming: Introduction to recursion. Functional parameters and higher order functions.<br>Compositionandorganizationofcomputersystems:Structureofacomputer(functionalunitsanduse)and classification of computers. Basic structure of a computer network. Introduction to operating system functions and networksoftware. |

| | **Weekly Topics and Related Preparation Studies** | |
|---|---|---|
| **Weeks** | **Topics** | **Laboratory** |
| 1 | Introduction to Computers, Operating Systems, Algorithms and Programming | Tutorial on IDE installation |
| 2 | Flow Charts, C Programming Language Syntax, Data Types, Arithmetic Operators, Standard Inputs and Outputs | Tutorial on Arithmetic Operators |
| 3 | Format Specifiers, Operators, Control Structures - If | Tutorial on If Statements |

| | | |
|---|---|---|
| | Statements | |
| 4 | Control Structures Cont'd – If Else Statements, Nested Conditional Statements, Switch Statement | Assignment on If Else and Switch Statements |
| 5 | Repetition Structures: While and Do While Statements | Homework on While and Do While Statements |
| 6 | Repetition Structures: For Statements, break and continue Statements, Type Conversion and Casting | Assignment on For Statements |
| 7 | Functions, C Standard Library, Math Library | |
| **8** | **Midterm Exam** | Tutorial on Functions and Math Library |
| 9 | User-defined Functions, Scopes of | Homework on Userdefined Functions |

| | | |
|---|---|---|
| | Variables and Parameters | |
| 10 | Random Numbers, Enumeration, Recursion | Assignment on Random Numbers and Enumeration |
| 11 | Arrays, Examples on Arrays | Homework on Arrays |
| 12 | Passing Arrays to Functions, Sorting Arrays, Searching Arrays | Assignment on Array Operations |
| 13 | Pointers, Pass-by-value, Pass-by-reference, Character Arrays and Strings | |
| 14 | Character and String Input Output Functions, String Library | Homework on Pointers and Strings |
| 15 | File Processing, Creating, Writing and Reading Sequential-Access Files | |
| **16** | | |

| | | | |
|---|---|---|---|
| | **Final Exam** | | |

**Textbook(s) / References / Materials**

| Title | Authors | Edition | Publisher |
|---|---|---|---|
| C: How to Program,- International Edition | H. Deitel, P. Deitel | 7 | Prentice Hall |

**Assessment**

| Studies | Number | Contribution (%) |
|---|---|---|
| Attendance | 14 | 5 |
| Lab | 4 | 10 |
| Application | | |
| Field Study | | |
| Course-Specific Internship (if any) | | |
| Quizzes / Studio / Critical | | |
| Homework | 4 | 10 |
| Presentation | | |
| Projects | | |
| Report | | |
| Seminar | | |
| Midterm Exams / Midterm Jury | 1 | 30 |
| General Exam / Final Jury | 1 | 45 |
| | **Total** | **100** |

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|---|---|
| **Success Grade Contribution of Semester Studies** | |
| **Success Grade Contribution of End of Term** | |
| **Total** | **100** |

**Relationship Between Course Learning Outcomes and Program Competencies**

| | Learning Outcomes | Contribution Level | | | | |
|---|---|---|---|---|---|---|
| | | **1** | **2** | **3** | **4** | **5** |
| 1 | An ability to apply knowledge of science, mathematics, and engineering. | | | | x | |
| 2 | An ability to design programs and algorithms | | | | | x |
| 3 | An ability to work with multi-disciplinary teams. | | | x | | |
| 4 | An ability to identify, formulate, and solve engineering problems. | | | | x | |
| 5 | Take responsibility to solve unpredictable and complex problems encountered in applications as an individual and as a member of a team | | | | x | |
| 6 | Plan and manage activities in teamwork | | | | x | |
| 7 | An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice. | | | | x | |
| 8 | Can do research on interdisciplinary fields. | | | x | | |

**ECTS / Workload Table**

| **Activities** | **Number** | **Duration(Hours)** | **TotalWorkload** |
|---|---|---|---|
| Course hours (Excluding the exam weeks) | 14 | 3 | 42 |
| Laboratory | 10 | 2 | 20 |

| | | | |
|---|---|---|---|
| Application | | | |
| Course-Specific Internship | | | |
| Field Study | | | |

| | | | |
|---|---|---|---|
| Study Time Out of Class | 14 | 2 | 28 |
| Presentation / Seminar Preparation | | | |
| Projects | | | |
| Reports | | | |
| Homeworks | 4 | 3 | 12 |
| Quizzes / Studio Review | | | |
| Preparation Time for Midterm Exams / Midterm Jury | 1 | 15 | 15 |
| Midterm Exams / Midterm Jury | 1 | 2 | 2 |
| Preparation Period for the Final Exam / General Jury | 1 | 25 | 25 |
| Final Exam / General Jury | 1 | 2 | 2 |
| **Total Workload** | | | **146** |