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| **OURSE INFORMATON** | | | | | | | | |
| **Course Title** | | *Code* | *Semester* | | *L+P Hour* | *Credits* | *ECTS* | |
| Discrete Mathematics for Computer Science | | COMP133 | 1 | | 3 | 3 | 5 | |
| **Prerequisites** | - | | | | | | |
| **Language of Instruction** | | | | English | | | |
| **Course Level** | | | | Bachelor's Degree (First Cycle Programmes) | | | |
| **Course Type** | | | | Compulsory | | | |
| **Course Coordinator** | | | |  | | | |
| **Instructors** | | | | Prof. Dr. Avadis Hacınlıyan, Assist. Prof. Dr.Engin Kandıran | | | |
| **Assistants** | | | | Staff | | | |
| **Goals** | | | | To learn a particular set of mathematical facts and how to apply them and how to think mathematically. | | | |
| **Content** | | | | **Logic; Sets and Functions; Fundamentals of Algorithms; Integers and matrices; Counting Techniques; Chromatics Polinomials; Graphs; Trees; Boolean Algebra; Finite-State Machine with/without Output** | | | |

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| **Learning Outcomes** | **Program Learning Outcomes** | **Teaching Methods** | **Assessment Methods** |
| The student will learn the basics of creating a mathematical model. | 11 | 1, 2, 3 | A,C |
| The student will learn mathematical concepts and terminology | 7 | 1, 2, 3 | A,C |
| The student will know how to analyze recursive definitions, and how to use it. | 7 | 1, 2, 3 | A,C,E |
| Understand basic concepts of probability and probability distributions. | 8 | 1, 2, 3 | A,C |
| The student will understand how to use different types of discrete structures. | 3 | 1, 2, 3 | A,E |
| The student will know how to perform mathematical proofs. | 8 | 1, 2, 3 | A,C,E |

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| **Teaching Methods:** | 1: Lecture, 2: Question-Answer, 3: Discussion, 4: Simulation, 5: Case Study |
| **Assessment Methods:** | A: Testing B: Presentation, C: Homework, D: Project, E: Laboratory |

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| **COURSE CONTENT** | | |
| **Week** | **Topics** | **Study Materials** |
| 1 | Vectors and Matrices | Lecture Notes |
| 2 | Set Theory and Relations | Lecture Notes |
| 3 | Function and Algorithms | Lecture Notes |
| 4 | Logic and Propositional Calculus | Lecture Notes |
| 5 | Techniques of Counting | Lecture Notes |
| 6 | Advanced Counting Techniques and Recursion | Lecture Notes |
| 7 | Probability | Lecture Notes |
| 8 | **Mid-term Exam** |  |
| 9 | Graph Theory | Lecture Notes |
| 10 | Directed Graph | Lecture Notes |
| 11 | Trees and Their Application I | Lecture Notes |
| 12 | Trees and Their Application II | Lecture Notes |
| 13 | Language, Automata and Grammars | Lecture Notes |
| 14 | Finite State Machines and Turing Machines | Lecture Notes |
| 15 | Final Exam |  |

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| **RECOMMENDED SOURCES** | |
| **Textbook** | Discrete Mathematics and Its Applications, Kenneth H. Rosen, McGraw-Hill  Discrete Mathematics, R. Johnsonbaugh, Prentice Hall |
| **Additional Resources** | Lecture notes, scientific calculator, spreadsheet |

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| **MATERIAL SHARING** | |
| **Documents** | Guidelines and additional examples for Lecture Topics |
| **Assignments** | Homework Assignments |
| **Exams** | Midterm Exam and Final Exam |

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| **ASSESSMENT** | | |
| **IN-TERM STUDIES** | **NUMBER** | **PERCENTAGE** |
| Mid-terms | 1 | 40 |
| LAB AND Quizzes | 3 | 20 |
| Attendance | - | 0 |
| **Total** |  | **100** |
| **Contribution of Final Examination to Overall Grade** |  | 40 |
| **Contribution of In-Term Studies to Overall Grade** |  | 60 |
| **Total** |  | **100** |

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| **COURSE CATEGORY** | Expertise/Field Courses |

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| **COURSE'S CONTRIBUTION TO PROGRAM** | | | | | | | | | | | | | |
| No | Program Learning Outcomes | | Contribution | | | | | | | | | | |
| 1 | | 2 | | 3 | 4 | | 5 | |  | |
| 1 | Software Developer graduates have the knowledge and the skills to design and develop the complete systems for multi-media visual user interface. | |  | |  | |  |  | |  | |  | |
| 2 | Software Developer graduates have advanced the knowledge and skills to design, develop and install the application systems for multi-media. | |  | |  | |  |  | |  | |  | |
| 3 | Software Developer graduates have the knowledge and the skills to design, develop and apply algorithms and data structures to solve the basic problems of information processing, within the framework of discrete mathematics. | |  | |  | |  |  | |  | | x | |
| 4 | Software Developer graduates have the knowledge and the skills to design and develop computer applications, based on user specified requirements, using modern structured development tools and install them on various hardware platforms and deploy their usage. | |  | |  | |  |  | |  | |  | |
| 5 | Software Developer graduates have the knowledge and the skills to design and develop computer applications, based on user specified requirements, using modern object-oriented development tools and install them on various hardware platforms and deploy their usage. | |  | |  | |  |  | |  | |  | |
| 6 | Software Developer graduates know the logic of computer operating systems, the basic set of system commands, how to control access to system resources by users of different departments and how to monitor the running of jobs in the system. | |  | |  | |  |  | |  | |  | |
| 7 | Software Developer graduates have the knowledge and the skills to design and develop data models serving different requirements, database applications that would access and process data using various types of software, including queries, reports and business applications. | |  | |  | |  |  | | x | |  | |
| 8 | Software Developer graduates have the knowledge and the skills to design and develop business applications that would provide data access, modification and processing for data kept in enterprise database systems. | |  | |  | |  | x | |  | |  | |
| 9 | Software Developer graduates have the knowledge about computer networks, and have  the skills to design,  develop and monitor  computer networks, how to configure them  and how to maintain their performance. | |  | |  | |  |  | |  | |  | |
| 10 | Software Developer graduates have the knowledge and the skills to design and develop visual user interfaces for the web, web-based applications for n-tier client/server configurations, how to deploy them in enterprises. | |  | |  | |  |  | |  | |  | |
| 11 | | Software Developer graduates,  within his/her job responsibilities can communicate the necessary information  both written and orally in Turkish, English and another foreign language, respecting the values the societal institutions and establishments, of which he/she has acquired in the program. | |  | |  | X | |  | |  | |  | |
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| **ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION** | | | |
| Activities | Quantity | Duration (Hour) | Total Workload (Hour) |
| Course Duration (Including the exam week: 15x Total course hours) | 15 | 3 | 45 |
| Hours for off-the-classroom study (Pre-study, practice) | 15 | 3 | 45 |
| Mid-terms | 1 | 10 | 10 |
| Homework | 14 | 1 | 14 |
| Final examination | 1 | 10 | 10 |
| **Total Work Load** |  |  | 124 |
| **Total Work Load / 25 (h)** |  |  | 4,96 |
| **ECTS Credit of the Course** |  |  | 5 |

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