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| antalya bilim Ã¼niversitesi ile ilgili gÃ¶rsel sonucu | **ECTS Course Description Form** |
| **PART I ( Senate Approval)** |
| **Offering School**  | *College of Engineering*  |
| **Offering Department** | *Industrial Engineering* |
| **Program(s) Offered to** | *Industrial Engineering* | *Compulsory* |
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|  |  |
| **Course Code**  | *IE 433* |
| **Course Name** | *Dynamic Programming* |
| **Language of Instruction** | *English* |
| **Type of Course** | **Departmental Area Elective** |
| **Level of Course** | Undergraduate |
| **Hours per Week** | **Lecture:** *3 hrs* | **Laboratory:**  | **Recitation:** 1 | **Practical:**  | **Studio:** | **Other:** |
| **ECTS Credit** | *6* |
| **Grading Mode** | *Letter Grade* |
| **Pre-requisites** | *IE 201 and IE303* |
| **Co-requisites** |  |
| **Registration Restriction** |  |
| **Educational Objective** | *The objective of this course is to teach students the art of formulating recursive equations, and how and why dynamic programming can solve many of optimization problems involving sequential decision making. The students will learn advanced knowledge of solving optimization problems that involve sequential decision making in both deterministic and stochastic environment.* |
| **Course Description** | *Introduction to Dynamic Programming, shortest path problems, Resource Allocation (including Investments), Knapsack Problems, Equipment Replacement, Decision Trees and Dynamic Programming Networks, Stochastic Dynamic Programming* |
| **Learning Outcomes**  | **LO1** | * *Familiarity with principles of dynamic programming and the algorithms*
* *Familiarity with using dynamic programming to solve various optimization problems*
* *Familiarity with stochastic dynamic programming*
* *Gaining the knowledge that is directly applicable to the needs of applications that are complex, adaptable, and large scale.*
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| **LO2** |
| **LO3** |
| **LO4** |
| **LO5** |
| **LO6** |
| **n..** |
| **PART II ( Faculty Board Approval)** |
| **Basic Outcomes (University-wide)** | **No.** | **Program Outcomes** | **LO1** | **LO2** | **LO3** | **LO4** | **LO5** | **LO6** |
| **PO1** | **Ability** to communicate effectively and write and present a report in Turkish and English.  | 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸 🗸  |
| **PO2** | **Ability** to work individually, and in intra-disciplinary and multi-disciplinary teams. |
| **PO3** | **Recognition** of the need for life-long learning and **ability** to access information , follow developments in science and technology, and continually reinvent oneself. |
| **PO4** | **Knowledge** of project management, risk management, innovation and change management, entrepreneurship, and sustainable development. |
| **PO5** | **Awareness** of sectors and **ability** to prepare a business plan. |
| **PO6** | **Understanding** of professional and ethical responsibility and **demonstrating** ethical behavior. |
| **Faculty Specific Outcomes** | **PO7** |  |
| **PO8** |  |
| **PO9** |  |
| **PO10** |  |
| **PO11** |  |
| **PO12** |  |
| **Discipline Specific Outcomes (program)** | **PO13** |  |
| **PO14** |  |
| **PO15** |  |
| **PO16** |  |
| **PO17** |  |
| **PO18** |  |
| **Specialization Specific Outcomes** | **PO N….** |  |
| **PART III ( Department Board Approval)** |
| **Course Subjects, Contribution of Course Subjects to Learning Outcomes, and Methods for Assessing Learning of Course Subjects** | **Subjects** | **Week** |  | **LO1** | **LO2** | **LO3** | **LO4** | **LO5** | **LO6** |
| **S1** | 1-2 | *Introduction to dynamic programming, dynamic programming algorithm* | A1, A3 | A1, A3  | A1, A3  | A1, A3  |  |  |
| **S2** | 3-4 | *Knapsack Problems*  | A1, A3  | A1, A3  | A1, A3  | A1, A3  |  |  |
| **S3** | 5-6 | *Shortest path problems, Critical Path Method* | A1, A3  | A1, A3  | A1, A3  | A1, A3  |  |  |
| **S4** | 7-8 | *Resource Allocation (including Investments)* | A1, A3  | A1, A3  | A1, A3  | A1, A3  |  |  |
| **S5** | 9-10 | *Equipment Replacement* | A1, A3  | A1, A3  | A1, A3  | A1, A3  |  |  |
| **S6** | 11-12 | *Decision Trees* | A1, A3  | A1, A3  | A1, A3  | A1, A3  |  |  |
| **S7** | 13-14 | *Stochastic Dynamic Programming* | A1, A3  | A1, A3  | A1, A3  | A1, A3  |  |  |
| **S8** |  |  |  |  |  |  |  |  |
| **S9** |  |  |  |
| **S10** |  |  |
| **S11** |  |  |
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| **Assessment Methods, Weight in Course Grade, Implementation and Make-Up Rules**  | **No.** | **Type** | **Weight** | **Implementation Rule** | **Make-Up Rule** |
| **A1** | **Exam** | 65% | *No electronic devices are allowed in the examinations except for calculators.* | *If an exam is missed, a make-up exam may be granted if student’ absence from the exam is because of a valid and documented excuse.* |
| **A2** | **Quiz** |  |  |  |
| **A3** | **Homework** | 30% | *Submission by the deadline* | *Late homework is penalized by a percentage* |
| **A4** | **Project** | - | *-* | - |
| **A5** | **Report** | - | - | - |
| **A6** | **Presentation** | - | - | - |
| **A7** | **Attendance/ Interaction** | 5% | - | *No compensation, no makeup* |
| **A8** | **Class/Lab./****Field Work** |  | - | - |
| **A9** | **Other** |  |  |  |
| **TOTAL** | **100%** |
| **Evidence of Achievement of Learning Outcomes** | *%70 course attendance and gaining 70% or more on taken exams, homework, project, and presentations.*  |
| **Method for Determining Letter Grade** | *The %70 total attendance is required otherwise student will fail the course due to absenteeism. Letter grades are determined by applying catalogue system on student’s total weighted grade. Following is an example:*≥ 97% A+[93 97) A[90 93) A-[87 90) B+[83 87) B[80 83) B-[77 80) C+[73 77) C[70 73) C-[67 70) D+[60 67) D< 60 F |
| **Teaching Methods, Student Work Load** | **No** | **Method** | **Explanation** | **Hours** |
| ***Time applied by instructor*** |
| **1** | **Lecture** | *(14 weeks) × (3 hrs per week)* | *42* |
| **2** | **Interactive Lecture** |  |  |
| **3** | **Recitation** | *(14 weeks) × (1 hr per week)* | *14* |
| **4** | **Laboratory** |  |  |
| **5** | **Practical** |  |  |
| **6** | **Field Work** |  |  |
| ***Time expected to be allocated by student*** |
| **7** | **Project** |  |  |
| **8** | **Homework** | *(14 weeks) × (2 hrs per week)* | *28* |
| **9** | **Pre-class Learning of Course Material**  | *(14 weeks) × (1 hr per week)* | *14* |
| **10** | **Review of Course Material** | *(14 weeks) × (3 hrs per week)* | *42* |
| **11** | **Studio** |  |  |
| **12** | **Office Hour** | *(14 weeks) × (3 hrs per week)* | *42* |
| **TOTAL** | *182* |
| **IV. PART** |
| **Instructor** | **Name** |  |
| **E-mail** |  |
| **Phone Number** |  |
| **Office Number** |  |
| **Office Hours** |  |
| **Course Materials** | **Mandatory** |  |
| **Recommended** |  |
| **Other** | **Scholastic Honesty** | *Violations of scholastic honesty include, but are not limited to cheating, plagiarizing, fabricating information or citations, facilitating acts of dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. Any form of scholastic dishonesty is a serious academic violation and will result in a disciplinary action.* |
| **Students with Disabilities** | *Reasonable accommodations will be made for students with verifiable disabilities.* |
| **Safety Issues**  | *The course does not require any special safety precautions.* |
| **Flexibility** | *Circumstances may arise during the course that prevents the instructor from fulfilling each and every component of this syllabus; therefore, the syllabus is subject to change.  Students will be notified prior to any changes.* |