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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* | *Elective* |
| *Computer Engineering* | *Elective* |
| *Civil Engineering / Electrical Engineering* | *Elective* |
| **Course Code**  | *IE 460* |
| **Course Name** | *Adaptive Optimization* |
| **Language of Instruction** | *English* |
| **Type of Course** | **Departmental Area Elective** |
| **Level of Course** | Undergraduate |
| **Hours per Week** | **Lecture:** *3 hrs* | **Laboratory:**  | **Recitation:**  | **Practical:**  | **Studio:** | **Other:** |
| **ECTS Credit** | *6* |
| **Grading Mode** | *Letter Grade* |
| **Pre-requisites** | *CS 101 and IE 202* |
| **Co-requisites** |  |
| **Registration Restriction** |  |
| **Educational Objective** | *The objective of this course is to develop students’ ability to design and implement advanced adaptive search methods to solve linear, nonlinear, and mixed integer programming problems. To achieve this objective, students will learn (through lectures, articles from the literature, and course project) detailed analysis of meta-heuristic optimization methods and that how and when these techniques work, and what are their relative merits to each other and to more traditional approaches.* |
| **Course Description** | *Introduction to adaptive search, simulated annealing, genetic algorithm, tabu search, ant colony method, particle swarm optimization, introduction to constraint handling* |
| **Learning Outcomes**  | **LO1** | * *Solve combinatorial and continuous optimization problems using meta-heuristics*
* *Analyze the performance of adaptive search methods*
* *Identify advantages and disadvantages of different meta-heuristics*
* *Develop optimization algorithms for specific problems*
* *Build optimization tools catering to the modeling and optimization needs of manufacturing and service industries*
 |
| **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 | *Introduction to Adaptive Search* | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 |  |
| **S2** | 2-4 | *Simulated Annealing* | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 |  |
| **S3** | 5-8 | *Genetic Algorithm* | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 |  |
| **S4** | 9-10 | *Tabu Search* | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 |  |
| **S5** | 11 | *Particle Swarm Optimization* | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 |  |
| **S6** | 12 | *Ant Colony Optimization* | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 |  |
| **S7** | 13 | *Introduction to constraint handling* | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 | A1, A3, A4, A6 |  |
| **S8** | 14 | *Project Presentations* | A4, A6 | A4, A6 | A4, A6 | A4, A6 | A4, A6 |  |
| **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** | 35% | *Books, notes, and electronic devices are prohibited in the examinations except for calculator.* | *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** | 20% | *final work to be submitted at pre-specified time* | *No compensation, no makeup* |
| **A5** | **Report** |  | *-* | *-* |
| **A6** | **Presentation** | 10% | *Two presentations required (proposal and final)* | *No compensation, no makeup* |
| **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** |  |  |
| **4** | **Laboratory** |  |  |
| **5** | **Practical** |  |  |
| **6** | **Field Work** |  |  |
| ***Time expected to be allocated by student*** |
| **7** | **Project** | *Proposal 3 hrs**Development (14 weeks) × (1 hr per week)**Presentations 2 × 3 hrs* | *23* |
| **8** | **Homework** | *(14 weeks) × (1 hr per week)* | *14* |
| **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** | *177* |
| **IV. PART** |
| **Instructor** | **Name** | Dr. Masood JABARNEJAD |
| **E-mail** | masood.jabarnejad@antalya.edu.tr |
| **Phone Number** | *05539153010* |
| **Office Number** | *A1-69* |
| **Office Hours** | *3 hrs per week* |
| **Course Materials** | **Mandatory** |  |
| **Recommended** | *Metaheuristics for Hard Optimization,* Dreo, Petrowski, Siarry and Taillard |
| **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.* |