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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 Department**  |
| **Program(s) Offered to** | Industrial Engineering Department | Area Elective |
| Other Engineering Departments | Non-Area Elective |
|  |  |
| **Course Code**  | IE 431 |
| **Course Name** | Scheduling |
| **Language of Instruction** | English |
| **Type of Course** | **Departmental Area Elective** |
| **Level of Course** | Undergraduate |
| **Hours per Week** | **Lecture:** 3 hrs | **Laboratory:** | **Recitation**: 2 hrs | **Practical:**  | **Studio:** | **Other:** |
| **ECTS Credit** | 6 |
| **Grading Mode** | Letter Grade |
| **Pre-requisites** | IE 201 Operations Research I (IE 202 Operations Research II may help more) |
| **Co-requisites** |  |
| **Registration Restriction** |  |
| **Educational Objective** |  |
| **Course Description** | This course gives an introduction to a broad range of scheduling problems that arise in both manufacturing and service organizations. A variety of scheduling techniques, starting from basic principles and leading to algorithms and computerized scheduling systems will be examined. The techniques to problems arising in production scheduling, project management and service scheduling will be applied .The emphasis is on practicality, with the goal of bringing the student up to the position where he or she knows where to look and what to expect to be able to do when faced with a situation that seems to involve some sort of scheduling problem. |
| **Learning Outcomes**  | **LO1** | The students who succeeded in this course;1. Will be able to perform methods and techniques that are available for building scheduling systems in different manufacturing and service systems
2. Will be able to develop mathematical models for dealing with scheduling problems
3. Will be able to use and analyze the results of software packages that are designed to solve scheduling problems
4. Will be able to describe applications in practice

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| **LO2** |
| **LO3** |
| **LO4** |
| **PART II ( Faculty Board Approval)** |
| **Basic Outcomes (University-wide)** | **No.** | **Program Outcomes** | **LO1** | **LO2** | **LO3** | **LO4** |  |  |
| **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: Scheduling function in an enterprise, Examples to scheduling problems in manufacturing and services | A1 |  |  |  |  |  |
| **S2** | 2 | Scheduling Models: Notation, constraints, objectives. Problem classification |  | A1 |  | A4 |  |  |
| **S3** | 3-4 | Project Planning: CPM, PERT, Graph theory concepts, Time/cost trade-off. (Students are not expected to know any graph theory). | A1,A2 |  | A3 | A4 |  |  |
| **S4** | 5-6 | Heuristics for Scheduling: Dispatching Rules and Shifting Bottleneck | A1,A2 | A3 | A3 | A4 |  |  |
| **S5** | 7-10 | Search: Tree search (Branch and Bound, Beam Search) and Local search (Simulated Annealing, Tabu Search, Genetic Algorithms) | A1, |  | A3 | A4 |  |  |
| **S6** | 11-12 | Service Scheduling: Interval Scheduling, Reservations, and Timetabling | A1 |  | A3 | A4 |  |  |
| **S7** | 13-14 | Service Scheduling: Workforce Scheduling | A1,A3 |  |  | A4 |  |  |
| **Assessment Methods, Weight in Course Grade, Implementation and Make-Up Rules**  | **No.** | **Type** | **Weight** | **Implementation Rule** | **Make-Up Rule** |
| **A1** | **Exam** | %65 | 1 midterm 1 final exam | If a student misses an exam and provides an acceptable legitimate document, a makeup exam should be provided. |
| **A2** | **Quiz** | %10 | 2 in class quizzes |  |
| **A3** | **Homework** | %15 | 5 homework assignments | There will be no make-up for homework. Late submissions are not accepted. |
| **A4** | **Project** |  |  | Course project are done in groups. Aim of the course project is to read and analyze a scheduling case on an industrial application. Related solver and data files are submitted to students. Students are expected to run and play with case files, do what if analysis and answer the questions at the end of the case. |
| **A5** | **Report** |  | - | - |
| **A6** | **Presentation** | %10 | - | For each course project, students should give the problem definition, give information about the application, explain the mathematical model and proposed solution approach, suggest improvements (if any) and comment on the applicability of the study in Turkey. |
| **A7** | **Attendance/ Interaction** |  | - | - |
| **A8** | **Class/Lab./****Field Work** |  | - | - |
| **A9** | **Other** |  |  |  |
| **TOTAL** | **100%** |
| **Evidence of Achievement of Learning Outcomes** | Students will demonstrate learning outcomes through exams, homework assignments, and the term project report and presentation.Every topic is tested with at least one exam question. In order to pass, a student needs to accumulate certain percentage of points and this percentage is determined by the class mean. |
| **Method for Determining Letter Grade** | The method on which the letter grade is based on will be announced at the beginning of the semester, and this method may be subjected to change depending on the performance of the students.1 midterm exam, 1 final exam, 2 in-class quizzes, 5 homework assignments,1 term project presentation grade are used for grading. The table shows the maximum points to be collected from the exams and homework.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Assessment | Assignments Average | Quizzes Average | Project Presentation | Midterm | Final | TOTAL |
| Points | 15 | 10 | 10 | 30 | 35 | 100 |

Letter grade is determined using the table below:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Total points | 100-95 | 94-90 | 89-85 | 84-80 | 79-75 | 74-70 | 69-65 | 64-60 | 59-55 | 54-50 |
| Letter Grade | A | A- | B+ | B | B- | C+ | C | C- | D+ | D |

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| **Teaching Methods, Student Work Load** | **No** | **Method** | **Explanation** | **Hours** |
| ***Time applied by instructor*** |
| **1** | **Lecture** | Lecturing and utilizing chalkboard/whiteboard. Sample questions and answers to strengthen learning. In class exams. |  2hrs weekly |
| **2** | **Interactive Lecture** | The instructor stops and asks students questions and encourages them to answer. | 1hr weekly |
| **3** | **Recitation** | Problems and solutions are demonstrated on chalkboard / whiteboard. | 2hrs weekly |
| **4** | **Laboratory** |  |  |
| **5** | **Practical** |  |  |
| **6** | **Field Work** |  |  |
| ***Time expected to be allocated by student*** |
| **7** | **Project** | The problem subject of the project is researched and presented. |  2hrs weekly |
| **8** | **Homework** | Application of LEKIN software and AMPL software |  |
| **9** | **Pre-class Learning of Course Material**  | New subjects are learned by reading course notes before class. | 0.5hrs weekly |
| **10** | **Review of Course Material** | Review of the subjects before exams in order to prepare. | 1hr weekly |
| **11** | **Studio** | - | - |
| **12** | **Office Hour** | Asking questions to instructor or to the teaching assistant out of class hour. | 2hrs weekly |
| **TOTAL** |  |
| **IV. PART** |
| **Instructor** | **Name** | Assist. Prof. Dr. Kamer Özgün |
| **E-mail** | kamer.ozgun@antalya.edu.tr |
| **Phone Number** | *+90(242)2450346* |
| **Office Number** | *+90(242)2450346* |
| **Office Hours** |  |
| **Course Materials** | **Mandatory** | Michael L. Pinedo, Planning and Scheduling in Manufacturing and Services, Springer Series, (2005). |
| **Recommended** | Michael L. Pinedo, Scheduling: Theory, Algorithms, and Systems, Fifth Edition, Springer Series |
| **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 for of scholastic dishonesty is a serious academic violation and will result in a disciplinary action. |
| **Students with Disabilities** | Reasonable accommodations are made for students with verifiable disabilities. |
| **Safety Issues**  | Safety of the classroom, the students and the instructor are maintained by the university policies and regulations. |
| **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.  |