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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* | *Mandatory* |
| *Computer Engineering, Civil Engineering* | *Elective* |
| *Electrical and Electronics Engineering, Management* | *Elective* |
| **Course Code**  | *IE 312* |
| **Course Name** | *Engineering Quality Control* |
| **Language of Instruction** | *English* |
| **Type of Course** | *Lecture* |
| **Level of Course** | *3rd year* |
| **Hours per Week** | **Lecture:** 3 | **Laboratory: 1** | **Recitation:** 1 | **Practical:**  | **Studio:** | **Other:** |
| **ECTS Credit** | *7* |
| **Grading Mode** | *Letter Grade* |
| **Pre-requisites** | *IE 211* |
| **Co-requisites** | *-* |
| **Registration Restriction** | *-* |
| **Educational Objective** | *​Provide an introduction to the fundamental concepts of statistical process control, strategic total quality management, six sigma and the application of these concepts, philosophies, and strategies to issues arising in government and industry.**Statistical analysis and control graph interpretation and their complexity in the workplace application provides a better understanding of the student. Gains skills in diagnosing and analyzing problems which will cause variation in manufacturing and service sector processes.Provide a basic understanding of "widely-used" quality analysis tools and techniques. Create an awareness of the quality management problem-solving techniques currently in use.* |
| **Course Description** | *The design of Modern quality control techniques and statistical process control systems offers acceptance sampling and process improvement.* |
| **Learning Outcomes**  | **LO1** | *LO1 defining terms and words related to Quality management, explaining why quality culture is important**LO2 use of a wide range of methods and recent developments (e.g. QA/QC, STQM, Six Sigma and DFSS) on Quality control**LO3 Analyzing and evaluating Data**LO4 Current Statistical methods in-depth learning, engineering and quality control applications in the fields* *LO5 Learning the use of Minitab software in the quality control area**LO6 Prepare and interpret control graphs for Quality supervision and improvement* |
| **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.  | **1**  | **1**  | **0**  | **0**  | **0**  | **0**  |
| **PO2** | **Ability** to work individually, and in intra-disciplinary and multi-disciplinary teams. | **0**  | **0**  | **0**  | **0**  | **1**  | **1**  |
| **PO3** | **Recognition** of the need for life-long learning and **ability** to access information, follow developments in science and technology, and continually reinvent oneself. | **0**  | **2**  | **0**  | **0**  | **0**  | **0**  |
| **PO4** | **Knowledge** of project management, risk management, innovation and change management, entrepreneurship, and sustainable development. | **2**  | **2**  | **0**  | **0**  | **0**  | **1**  |
| **PO5** | **Awareness** of sectors and **ability** to prepare a business plan. | **1**  | **2**  | **0**  | **1**  | **0**  | **2**  |
| **PO6** | **Understanding** of professional and ethical responsibility and **demonstrating** ethical behavior. | **1**  | **0**  | **0**  | **0**  | **0**  | **0**  |
| **Faculty Specific Outcomes** | **PO7** | Ability to develop, select and use modern techniques and tools necessary for engineering applications and ability to use information technologies effectively. | **0**  | **1**  | **0**  | **2**  | **3**  | **1**  |
| **PO8** | Recognition of the effects of engineering applications on health, environment and safety in the universal and societal dimensions and the problems of the time and awareness of the legal consequences of engineering solutions. | **0**  | **1**  | **0**  | **0**  | **0**  | **0**  |
| **PO9** | Ability to identify, define, formulate and solve complex engineering problems; and electing and applying appropriate analysis and modeling methods for this purpose. | **0**  | **0**  | **3**  | **2**  | **2**  | **2**  |
| **Discipline Specific Outcomes (program)** | **PO10** | Sufficient knowledge in mathematics, science and Industrial engineering; and the ability to apply theoretical and practical knowledge in these areas to model and solve engineering problems. | **0**  | **2**  | **1**  | **2**  | **3**  | **1**  |
| **PO11** | Ability to design a complex system, process, device or product to meet specific requirements under realistic constraints and conditions of economic, environmental, sustainability, manufacturability, ethics, health, safety, social and political issues; and the ability to apply modern design methods for this purpose. | **0**  | **0**  | **0**  | **1**  | **2**  | **2**  |
| **PO12** | Ability to design systems, conduct experiments, collect data, analyze and interpret results for the examination of Industrial engineering problems. | **0**  | **0**  | **1**  | **0**  | **0**  | **2**  |
| **Specialization Specific Outcomes** | **PO N….** |  | **0**  | **0**  | **2**  | **1**  | **1**  | **3**  |
| **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 : Concept and evaluation of quality control.* | *A1, A2, A3, A8* |
| **S2** | *2* | *Measurement & Metrology, precision vs accuracy. Process capability, standardization & Interchangeability.* | *A1, A2, A3, A8* |
| **S3** | *3* | *Inspection and Gauges : Inspection methods. Types of Gauges.* | *A1, A2, A3, A8* |
| **S4** |  *4* | *Limits Fits and Tolerances. Non-Destructive Testings & Evaluation.* | *A1, A2, A3, A8* |
| **S5** | *5* | *Control Charts for SQC : Statistical Quality Control (SQC).* | *A1, A2, A3, A8* |
| **S6** | *6* | *Control charts for variables such as X, R charts and control charts for attributes such as p-chart, c-chart.* | *A1, A2, A3, A8* |
| **S7** | *7* | *Construction & use of the control charts. Process capability, Acceptance Sampling for SQC : Principle of acceptance sampling. Producer’s and consumer’s risk. Sampling plans –single, double & sequential. Sampling by attributes and variables.* | *A1, A2, A3, A8* |
| **S8** | *8* | *Midterm* |  |
| **S9** | *9* | *Reliability : Introduction to reliability, bath-tub curve. Life expectancy. Reliability based design. Series & Parallel System.* | *A1, A2, A3, A8* |
|  | *10* | *Defect Diagnosis and prevention : Basic causes of failure, curve/control of failure. MTBF. Maintainability, Condition monitoring and dignostic techniques.* | *A1, A2, A3, A8* |
|  | *11* | *Value Engineering : Elements of value analysis, Techniques.* | *A1, A2, A3, A8* |
|  |  | *12* | *TQM : Basic Concept, Quality control , Quality Assurance and Quality., Management and Total Quality Management. Implementation of TQM . ISO 9000 and its series, Zero defect.* | *A1, A2, A3, A8* |
|  |  | *13* | *Taguchi method, Six Sigma concepts Other Factors in Quality : Human Factors such as attitude and errors. Material- Quality* | *A1, A2, A3, A8* |
|  |  | *14* | *Quality circles, Quality in sales & service.* | *A1, A2, A3, A8* |
| **Assessment Methods, Weight in Course Grade, Implementation and Make-Up Rules**  | **No.** | **Type** | **Weight** | **Implementation Rule** | **Make-Up Rule** |
| **A1** | **Exam** | *30% Midterm, 30% Final* | *In class Exam* | *If a student misses an exam and provides an acceptable legitimate document, a make-up exam should be provided for the midterm.* |
| **A2** | **Quiz** | 10% | *In Class* | *No Makeups* |
| **A3** | **Homework** | *20%* | *Take Home* | *50% deduction of points due to late submission* |
| **A4** | **Project** |  |  |  |
| **A5** | **Report** |  |  |  |
| **A6** | **Presentation** |  |  |  |
| **A7** | **Attendance/ Interaction** |  |  |  |
| **A8** | **Class/Lab./****Field Work** | 10% |  *In lab* | *Late comers are not accepted to the lab* |
| **A9** | **Other** |  |  |  |
| **TOTAL** | **100%** |
| **Evidence of Achievement of Learning Outcomes** | *Letter grades depend on the weighted total of the* *scores attained from homework, midterm, final,*  *according to the weights given above.***100%** |
| **Method for Determining Letter Grade** | *Better Result of a Curve in class or the Catalog System given below:**A+:100 A: 95-99 A-: 90-94**B+: 85-89 B: 80-84 B-: 75-79**C+: 70-74 C: 65-69 C-: 60-64**D+: 55-59 D: 50-54 F:0-50***Method****Explanation** |
| **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.*  | *14 weeks 3 hours =42* |
| **2** | **Interactive Lecture** | *The instructor stops and asks students questions and encourages them to answer.* |  |
| **3** | **Recitation** | *Problems and solutions are demonstrated on chalkboard/whiteboard.*  | *14 weeks 2 hours =28* |
| **4** | **Laboratory** | *Conducting experiments in lab and writing reports.* |  |
| **5** | **Practical** | *Supervised practical experience in a student’s field of study that provides him/her the opportunity to apply knowledge gained in an academic setting.* | *14 weeks 2 hours =28* |
| **6** | **Field Work** | *Students out into the real world to experience new information.*  | *6 weeks 2 hours =12* |
| ***Time expected to be allocated by student*** |  |  |
| **7** | **Project** | The problem subject of the project is researched and a report is written.  |  |
| **8** | **Homework** | Answers of given questions are prepared at home.  | *14 weeks 2 hours =28* |
| **9** | **Pre-class Learning of Course Material**  | New subjects are learned by watching videos or reading course notes before class.  | *14 weeks 2 hours =28* |
| **10** | **Review of Course Material** | Review of the subjects before exams in order to prepare.  | *14 weeks 1 hour =14* |
| **11** | **Studio** | Activity leading to skill development of the student’s design or performance ability and/or artistic growth. |  |
| **12** | **Office Hour** | Asking questions to instructor or to the teaching assistant out of class hour. |  |
| **TOTAL** | *180* |
| ***IV. PART*** |
| **Instructor** | **Name** | *Dr. Semail Ülgen* |
| **E-mail** | *sulgen@antalya.edu.tr* |
| **Phone Number** | *0242 2452307* |
| **Office Number** | *A1-33* |
| **Office Hours** | *2 hrs per week* |
| **Course Materials** | **Mandatory** | [*Douglas C. Montgomery*](http://eu.wiley.com/WileyCDA/Section/id-302479.html?query=Douglas+C.+Montgomery)*, Statistical Quality Control: A Modern Introduction, 7th Edition International ISBN: 978-1-118-32257-4* |
| **Recommended** | *Oakland, John S.,Total Quality Management and Operational Excellence. 4th ed. New York. Routledge, 2014.* |
| **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.* |
|  | *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.* |
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