|  |  |
| --- | --- |
| https://i0.wp.com/www.webiusdigital.com/wp-content/uploads/2018/03/Antalya-Bilim-%C3%9Cniversitesi-Logo.jpg?fit=300%2C300&ssl=1 | **ECTS Course Description Form** |
| **PART I ( Senate Approval)** |
| **Offering School**  | **College of Engineering**  |
| **Offering Department** | **Industrial Engineering** |
| **Program(s) Offered to** | **Industrial Engineering** |  |
| **Other Engineering Departments** | **Elective** |
|  |  |
| **Course Code**  | **IE 240** |
| **Course Name** | **Introduction to Industry 4.0** |
| **Language of Instruction** | **English** |
| **Type of Course** | **Departmental Area Elective** |
| **Level of Course** | **Undergraduate** |
| **Hours per Week** | **Lecture: 3** | **Laboratory:** | **Recitation:**  | **Practical:**  | **Studio:** | **Other:** |
| **ECTS Credit** | **6** |
| **Grading Mode** | **Letter grade** |
| **Pre-requisites** | **-** |
| **Co-requisites** | **-** |
| **Registration Restriction** | ***-*** |
| **Course Description** | **Industry 4.0 aims to support cyber-physical systems and processes physically, to support human beings physically, to create virtual factory environments, to communicate objects to each other and to people, and to make decentralized mobility decisions on this issue. This course aims to equip students with the competence of the Industrial 4.0 components in the following areas: Internet of things, Intelligent and Collaborative Robots, Big Data and Analysis, Virtual Reality, Contemporary Production Systems and Technologies, Artificial Intelligence, Cyber Security, Cloud System, Modeling and Simulation.** |
|  |  |
| **Learning Outcomes**  | **LO1** | 1. **The student will demonstrate an Industry 4.0 transition methodology plan.**
2. **The student will demonstrate critical analysis skills by applying tools, methodologies, and procedures specified during the course to solve selected company problems.**
3. **The student will demonstrate an understanding of duties of all processes involved in analyzing factory processes.**
4. **The students will develop solutions to realistic problems**
5. **Students will prepare an effective plan for the collection and use of data.**
 |
| **LO2** |
| **LO3** |
| **LO4** |
| **LO5** |
|  |
|  |
| **Basic Outcomes (University-wide)** |
| **Basic Outcomes (University-wide)****Faculty Specific Outcomes** | **PO1** | **Program Outcomes** | **LO1** | **LO2** | **LO3** | **LO4** | **LO5** | **LO6** |
| **PO2** | **Ability** to communicate effectively and write and present a report in Turkish and English.  | 🗸 🗸 🗸 🗸 🗸 🗸🗸 🗸 🗸 🗸 🗸 🗸🗸 🗸 🗸 🗸 🗸 🗸🗸 🗸 🗸 🗸 🗸 🗸🗸 🗸 🗸 🗸 🗸 🗸🗸 🗸 🗸 🗸 🗸 🗸 |
| **PO3** | **Ability** to work individually, and in intra-disciplinary and multi-disciplinary teams. |
| **PO4** | **Recognition** of the need for life-long learning and **ability** to access information , follow developments in science and technology, and continually reinvent oneself. |
| **PO5** | **Knowledge** of project management, risk management, innovation and change management, entrepreneurship, and sustainable development. |
| **PO6** | **Awareness** of sectors and **ability** to prepare a business plan. |
| **PO7** | **Understanding** of professional and ethical responsibility and **demonstrating** ethical behavior. |
| **Faculty Specific Outcomes****Discipline Specific Outcomes (program)** | **PO8** |  |
| **PO9** |  |
| **PO10** |  |
| **PO11** |  |
| **PO12** |  |
| **PO13** |  |
| **Discipline Specific Outcomes (program)****PART III ( Department Board Approval)** | **PO14** |  |
| **PO15** |  |
| **PO16** |  |
| **PO17** |  |
| **PO18** |  |
|  |  |
| **PART III ( Department Board Approval)** |
| **Course Subjects, Contribution of Course Subjects to Learning Outcomes, and Methods for Assessing Learning of Course Subjects** | **S1** | **Week** |  | **LO1** | **LO2** | **LO3** | **LO4** | **LO5** | **LO6** |
| **S2** | **1** | **Introducing course: Defining Industry 4.0**  | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** |  |
| **S3** | **2** | **Introducing course: Defining Industry 4.0 components** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** |  |
| **S4** | **3** | **Presentation of Case Studies Industry 4.0 Applications** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** |  |
| **S5** | **4** | **Presentation of Case Studies Industry 4.0 Applications** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** |  |
| **S6** | **5** | **Demonstrating the problems and needs of the company for implementation** | ***A1-A2-A3-A8*** | ***A1-A2-A3-A8*** | ***A1-A2-A3-A8*** | ***A1-A2-A3-A8*** | ***A1-A2-A3-A8*** |  |
| **S7** | **6** | **Demonstrating the problems and needs of the company for implementation** | ***A1-A2-A3-A8*** | ***A1-A2-A3-A8*** | ***A1-A2-A3-A8*** | ***A1-A2-A3-A8*** | ***A1-A2-A3-A8*** |  |
| **S8** | **7** | **Demonstrating As-Is Model of Company** | ***A1-A2-A3*** | ***A1-A2-A3***  | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** |  |
| **S9** | **8** | **Demonstrating As-Is Model of Company** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** |  |
| **S10** | **9** | **Demonstrating As-Is Model of Company** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** |  |
| **S11** | **10** | **Design of To-Be Model for Industry 4.0 Trantition of Company** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** |  |
| **S12** | **11** | **Design of To-Be Model for Industry 4.0 Trantition of Company** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** |  |
| **S13** | **12** | **Final Presentation of Projects** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** | ***A1-A2-A3*** |  |
| **S14** | **13** | **Industry Speaker, Q&A** | **A7** | **A7** | **A7** | **A7** | **A7** |  |
| **No.** | **14** | **Industry Speaker, Q&A** | **A7** | **A7** | **A7** | **A7** | **A7** |  |
| **Assessment Methods, Weight in Course Grade, Implementation and Make-Up Rules** **Evidence of Achievement of Learning Outcomes** |  | **Type** | **Weight** | **Implementation Rule** | **Make-Up Rule** |
| **A1** | **Exam** | ***85%*** | ***No electronic devices are allowed in the examinations except for calculators.*** | **If the reason for not taking the exam is justified by the school, the student is informed about the time of the make-up exam.** |
| **A2** | **Quiz** | ***10%*** | ***The time and subject announce to the students at least one week in advance.*** | **There is no compensation for the quizzes.** |
| **A3** | **Homework** | ***5%*** | ***Homework are given by announcing deadline. Homework that are submitted after the deadline are not accepted.*** | **There is no compensation for the Homework.** |
| **A4** | **Project** |  |  |  |
| **A5** | **Report** |  | - | - |
| **A6** | **Presentation** |  | - | - |
| **A7** | **Attendance/ Interaction** |  | - | - |
| **A8** | **Class/Lab./****Field Work** |  | - | - |
| **TOTAL** | **Other** |  |  |  |
| **Letter grades determined by weighting on the specified percentages on the grades that are taken from exams, quizzes and homework by the students. The teaching staff can make changes in the student's grades.** | **100%** |
| **Method for Determining Letter Grade** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Activities** | **Midterm Exams** | **Quizzes** | **Homework** | **Final Exam**  |
| **Quantity** | **2** | **2** | **2** | **1** |
| **Effects on Grading, %)** | **35** | **10** | **5** | **50** |

 |
| **Teaching Methods, Student Work Load** | **No** |
| **Teaching Methods, Student Work Load****IV. PART** | **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.** | **3x14** |
| **2** | **Interactive Lecture** | **Industry Speaker, Q&A** | **6** |
| **3** | **Recitation** |  | **-** |
| **4** | **Laboratory** |  | **-** |
| **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.** | **1x14** |
| **6** | **Field Work** | **Company visit for process analysis of company** | **15** |
| ***Time expected to be allocated by student*** |
| **7** | **Project** |  | ***65*** |
| **8** | **Homework** |  |  |
| **9** | **Pre-class Learning of Course Material**  | **New subjects are learned by watching videos or reading course notes before class.** | **42** |
| **10** | **Review of Course Material** |  |  |
| **11** | **Studio** |  | **-** |
| **12** | **Office Hour** |  | **-** |
| **TOTAL** |  ***184*** |
| **IV. PART** |
|  | **Name** | **Ali Cem Başarır** |
| **Instructor** | **E-mail** | **alicem.basarir@antalya.edu.tr** |
| **Phone Number** | **0532 308 06 88** |
| **Office Number** | **A1-50** |
| **Office Hours** |  |
| **Mandatory** | **It will be determined during the semester.** |
| **Course Materials****Other** | **Recommended** | 1. **‘’Industrie 4.0 Maturity Index’’ Günther Schuh, Reiner Anderl,Jürgen Gausemeier, Michael ten Hompel,Wolfgang Wahlster, Acatech Study**
2. **IMPULS Industrie 4.0 Readness,** **Aachen, Cologne, October 2015**
 |
| **Scholastic Honesty** |  |
| **Other** | **Students with Disabilities** | **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.** |
| **Safety Issues**  | **Reasonable accommodations will be made for students with verifiable disabilities.** |
| **Flexibility** | **The course does not require any special safety precautions.** |
|  |  |