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| antalya bilim Ã¼niversitesi ile ilgili gÃ¶rsel sonucu | **ECTS Course Description Form** |
| **PART I ( Senate Approval)** |
| **Offering School**  | **School of Engineering** |
| **Offering Department** | **Industrial Engineering** |
| **Program(s) Offered to** | **Industrial Engineering** | **Civil Engineering** |
| **Computer Engineering** | **Mechanical Engineering** |
| **Electrical and Electronics Engineering** | **Materials science and Nanotechnology** |
| **Course Code**  | **MATH 300** |
| **Course Name** | **Numerical Analysis for Engineers** |
| **Language of Instruction** | **English** |
| **Type of Course** | *Elective* |
| **Level of Course** | **Senior** |
| **Hours per Week** | **Lecture: 3** | **Laboratory:** | **Recitation:**  | **Practical: 1** | **Studio:** | **Other:** |
| **ECTS Credit** | **6** |
| **Grading Mode** | **Catalog** |
| **Pre-requisites** | **-** |
| **Co-requisites** | **-** |
| **Registration Restriction** | *-* |
| **Educational Objective** | *To understand the various types of numerical methods ,differentiate the capabilities and limitations of these methods and applications to different areas of Engineering problems* |
| **Course Description** | *The solutions of linear/nonlinear equations, and systems, interpolation and polynomial approximation, numerical differentiation & integration, the solution of differential equations, curve fitting, numerical optimization* |
| **Learning Outcomes**  | **LO1** | *Ability to apply basic sciences in the field of engineering.**Ability to find the necessary numerical solution for the real world engineering problems**Ability to use MATLAB programming Language for the numerical solutions**Ability to develop new numerical methods or improve the existing ones by learning the defined ones.* |
| **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** | An ability to identify, formulate, and solve engineering problems |
| **PO8** | An ability to use the techniques, skill, and modern engineering tools necessary for engineering practice |
| **PO9** | The broad education necessary to understand the impact of engineering solutions in a global and societal context |
| **PO10** |  |
| **PO11** |  |
| **PO12** |  |
| **Discipline Specific Outcomes (program)** | **PO13** |  |
| **PO14** |  |
| **PO15** |  |
| **PO16** |  |
| **PO17** |  |
| **PO18** |  |
| **Specialization Specific Outcomes** | **PO N….** | *Ability to create algorithmic solutions to inspect, improve and enhance**existing systems by means of analytical approaches* |
| **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** |  | *Modeling and Solving of Mathematic Problems* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* |  |  |
| **S2** |  | *Number representation, round-off error, truncation error* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* |  |  |
| **S3** |  | *The Solution of Nonlinear Equations - Close Methods* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* |  |  |
| **S4** |  | *The Solution of Nonlinear Equations –Open Methods* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* |  |  |
| **S5** |  | *The Solution of Root of Polynomial* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* |  |  |
| **S6** |  | *The Solution of Linear Systems, Matrices and Gauss Siedel* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* |  |  |
| **S7** |  | *The Solution of Nonlinear Systems* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* |  |  |
| **S8** |  | *Finite Differences* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* |  |  |
| **S9** |  | Interpolation | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* |  |  |
| **S10** |  | *Numerical Differentiation* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* |  |  |
| **S11** |  | *Numerical Integration* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* |  |  |
|  | **S12** |  | *Curve Fitting* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* |  |  |
|  | **S13** |  | *The Solution of Differential Equations* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* |  |  |
|  | **S14** |  | *Numerical Optimization* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* | *D1-D2-D3* |  |  |
| **Assessment Methods, Weight in Course Grade, Implementation and Make-Up Rules**  | **No.** | **Type** | **Weight** | **Implementation Rule** | **Make-Up Rule** |
| **A1** | **Exam** | *30% Midterm, 40% Final* | *Exams will be announced 2 weeks ago and applied in class.*  |  |
| **A2** | **Quiz** | *10%* | *Pop-up quizzes will be given.*  |  |
| **A3** | **Homework** | *20%* | *At the end of each chapter hw problems will be assigned and collected after a week.*  |  |
| **A4** | **Project** |  |  |  |
| **A5** | **Report** |  | - | - |
| **A6** | **Presentation** |  | - | - |
| **A7** | **Attendance/ Interaction** |  | - | - |
| **A8** | **Class/Lab./****Field Work** |  | - | - |
| **A9** | **Other** |  |  |  |
| **TOTAL** | **100%** |
| **Evidence of Achievement of Learning Outcomes** |  |
| **Method for Determining Letter Grade** |  |
| **Teaching Methods, Student Work Load** | **No** | **Method** | **Explanation** | **Hours** |
| ***Time applied by instructor*** |
| **1** | **Lecture** |  | 3 hours 40 minutes in week |
| **2** | **Interactive Lecture** |  |  |
| **3** | **Recitation** |  |  |
| **4** | **Laboratory** |  | 50 minutes |
| **5** | **Practical** |  |  |
| **6** | **Field Work** |  |  |
| ***Time expected to be allocated by student*** |
| **7** | **Project** |  |  |
| **8** | **Homework** |  | 3 hours in a week |
| **9** | **Pre-class Learning of Course Material**  |  | 1 hour in a week |
| **10** | **Review of Course Material** |  | 1 hour in a week |
| **11** | **Studio** |  |  |
| **12** | **Office Hour** |  |  |
| **TOTAL** |  |
| **IV. PART** |
| **Instructor** | **Name** | Asst. Prof. Sevgi Şengül Ayan |
| **E-mail** | sevgi.sengul@antalya.edu.tr |
| **Phone Number** | 05444402893 |
| **Office Number** | A1-38 |
| **Office Hours** |  |
| **Course Materials** | **Mandatory** |  |
| **Recommended** |  |
| **Other** | **Scholastic Honesty** |  |
| **Students with Disabilities** |  |
| **Safety Issues**  |  |
| **Flexibility** |  |