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| **COURSE DESCRIPTION** | | | | | | | | |
| **Course code and title** | **FIZ2123 FLUID MECHANICS** | | | | | | | |
| **Course Semester** | 3 | | | | | | | |
| **Course Content** | A Brief History of Fluid Mechanics, Classification of Fluid Flows, System and Control Volume, Importance of Dimensions and Units, Mathematical Modeling of Engineering Problems, Density and Specific Gravity,Vapor Pressure and Cavitation, Energy and Specific Heats, Coefficient of Compressibility, Viscosity, Surface Tension and Capillary Effect, Pressure, The Manometer, The Barometer and Atmospheric Pressure, Introduction to Fluid Statics, Hydrostatic Forces on Submerged Plane Surfaces,Hydrostatic Forces on Submerged Curved Surf, Buoyancy and Stability, Fluids in Rigid-Body Motion Problems, Lagrangian and Eulerian Descriptions, Fundamentals of Flow Visualization, Plots of Fluid Flow Data, Other Kinematic Descriptions, The Reynolds Transport Theorem Problems, Conservation of Mass, Mechanical Energy and Efficiency, The Bernoulli Equation, Applications of the Bernoulli Equation, General Energy Equation, Energy Analysis of Steady Flows Problems, Newton’s Laws and Conservation of Momentum, The Linear Momentum Equation | | | | | | | |
| **Recommended or Required Reading** | Akışkanlar Mekaniği Temelleri ve Uygulamaları, Yunus A. Çengel John M. Cimbala, Güven Bilimsel Kitabevi, 2012, İzmir | | | | | | | |
| **Recommended or Required Reading** | **1.** Fundamentals of Fluid Mechanics, B.R.Munson, D.F.Young, T.H. Okiishi, John Wiley&Sons Inc.1998  **2.** Elementary Fluid Mechanics, J.Vennard, R.Street, John Wiley&Sons Inc.1976  **3.** Fluid Mechanics, V.L.Streeter, B.Wiylie, K.Bedford, Mc Graw-Hill,1998 | | | | | | | |
| **Credits of Course (ECTS)** | 3 | | | | | | | |
| **Prerequisites** | There is no prerequisite for this course. There is a compulsory course attendance. | | | | | | | |
| **Type of Course** | Elective | | | | | | | |
| **Language of Instruction** | Turkish | | | | | | | |
| **Purpose and Object of the Course** | To determine the required coordinate system and physical variables for modelling fluid mechanics problems | | | | | | | |
| **Learning Outcomes Of The Course Unit** | 1. To solve internal and external potential and viscosity problems with analitically and numerically.  2. To determine the required physical variables for modelling fluid mechanics problems | | | | | | | |
| **Planned Learning Activities and Teaching Methods** | The mode of delivery of this course is face to face | | | | | | | |
| **Course Per Week** | **1. Week** INTRODUCTION and BASIC CONCEPTS The No-Slip Condition, A Brief History of Fluid Mechanics, Classification of Fluid Flows,  **2. Week** INTRODUCTION and BASIC CONCEPTS System and Control Volume, Importance of Dimensions and Units, Mathematical Modeling of Engineering Problems  **3. Week** PROPERTIES OF FLUIDS Density and Specific Gravity,Vapor Pressure and Cavitation, Energy and Specific Heats  **4. Week** PROPERTIES OF FLUIDS Coefficient of Compressibility, Viscosity, Surface Tension and Capillary Effect  **5. Week** PRESSURE AND FLUID STATICS Pressure, The Manometer, The Barometer and Atmospheric Pressure  **6. Week** PRESSURE AND FLUID STATICS Introduction to Fluid Statics, Hydrostatic Forces on Submerged Plane Surfaces,Hydrostatic Forces on Submerged Curved Surf  **7. Week** PRESSURE AND FLUID STATICS Buoyancy and Stability, Fluids in Rigid-Body Motion Problems  **8. Week** FLUID KINEMATICS Lagrangian and Eulerian Descriptions, Fundamentals of Flow Visualization  **9. Week** Midterm Exam, FLUID KINEMATICS Plots of Fluid Flow Data, Other Kinematic Descriptions  **10. Week** FLUID KINEMATICS The Reynolds Transport Theorem Problems  **11. Week** MASS, BERNOULLI, AND ENERGY EQUATIONS Conservation of Mass, Mechanical Energy and Efficiency  **12. Week** MASS, BERNOULLI, AND ENERGY EQUATIONS The Bernoulli Equation, Applications of the Bernoulli Equation  **13. Week** MASS, BERNOULLI, AND ENERGY EQUATIONS General Energy Equation, Energy Analysis of Steady Flows Problems  **14. Week** MOMENTUM ANALYSIS OF FLOW SYSTEMS Newton’s Laws and Conservation of Momentum, The Linear Momentum Equation, The Angular Momentum Equation Problems  **15. Week** Final exam | | | | | | | |
| **Workload** | Theoretical Study Hours of Course Per Week: 3hours  Practicing Hours of Course Per Week:0  Reading:3 hours  Searching in Internet and Library:2  Designing and Applying Materials:2  Preparing Reports: 4  Preparing Presentation:4  Presentation:4  Mid-Term and Studying for Mid-Term: 6 hours  Final and Studying for Final: 10 hours | | | | | | | |
| **Assessment Methods And Criteria** |  | **Number** | | **Total contribution**  **(%)** | |  | | |
| Mid-terms | 1 | | 40 | |
| Assignment | 1 | | 20 | |
| Exercise | - | | - | |
| Projects | - | | - | |
| Practice |  | |  | |
| Quiz | - | | - | |
| Contribution of In-term Studies to Overall Grade (%) | - | | 60 | |
| Contribution of Final Examination to Overall Grade (%) | - | | 40 | |
| Attendance | - | | - | |
| **Efficiency** | **Activities** | | **Total number of weeks** | | **Time**  **(Weekly)** | | **Total efficiency at the end of the semester** |
| Theoretical Study Hours of Course Per Week | | 14 | | 3 | | 42 |
| Practicing Hours of Course Per Week | | 14 | | 0 | | 0 |
| Reading | | 2 | | 3 | | 6 |
| Searching in Internet and Library | | 2 | | 2 | | 4 |
| Designing and Materials, Applying | | 2 | | 2 | | 6 |
| Preparing Reports | | 1 | | 4 | | 4 |
| Preparing Presentation | | 1 | | 4 | | 4 |
| Presentation | | 1 | | 4 | | 4 |
| Mid-Term and Studying for Mid-Term | | 1 | | 1 | | 6 |
| Final and Studying for Final | | 1 | | 10 | | 10 |
| Other | | - | | - | | - |
| TOTAL WORKLOAD | | - | | - | | 86 |
| TOTAL WORKLOAD/ 25 | |  | |  | | 3,44 |
| ECTS of Course | |  | |  | | 3 |
| **Course's Contribution To Program** | |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | No | PROGRAM LEARNING OUTCOMES | 1 | 2 | 3 | 4 | 5 | | 1 | Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipline; ability to use theoretical and applied information in these areas to model and solve engineering problems. |  |  |  | X |  | | 2 | Ability to identify, formulate, and solve complex engineering problems; ability to select and apply proper analysis and modeling methods for this purpose. |  |  |  |  | X | | 3 | Ability to design a complex system, process, device or product under realistic constraints and conditions, in such a way as to meet the desired result; ability to apply modern design methods for this purpose. |  |  | X |  |  | | 4 | Ability to devise, select, and use modern techniques and tools needed for engineering practice; ability to employ information technologies effectively. |  |  |  | X |  | | | | | | | |
| **Name of Lecturer(s) and**  **E-mail(s) of Lecturer(s)** | Prof. Dr. Şule UĞUR, (suleugur@gazi.edu.tr) | | | | | | |