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|  | **ECTS Course Description Form** |
| **PART I ( Senate Approval)** |
| **Offering School**  | **Engineering** |
| **Offering Department** | **Civil Engineering** |
| **Program(s) Offered to** | **Civil Engineering** | COMPULSARY |
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| **Course Code**  | CE 322  |
| **Course Name** | Hydraulics Engineering I |
| **Language of Instruction** | English |
| **Type of Course** | *Lecture* |
| **Level of Course** | Undergraduate |
| **Hours per Week** | **Lecture: 2** | **Laboratory:1** | **Recitation:**  | **Practical:**  | **Studio:** | **Other:** |
| **ECTS Credit** | **5** |
| **Grading Mode** | **Letter grade** |
| **Pre-requisites** | CE 321 |
| **Co-requisites** | **-** |
| **Registration Restriction** | *-* |
| **Educational Objective** | The main objectives of this course are: 1. Learn basic elements of open channel sections and classify the flow in an open channel. 2. Analysis and computation of critical and uniform flow in open channels.3. Analysis and computation of rapidly varied flow and introduction to hydraulic structures. |
| **Course Description** | This course focuses on the fundamentals of open channel flow, flow classification including uniform and non-uniform flow, laminar and turbulent flow, steady and unsteady flow, energy loss equation and computation of uniform flow, design of channels, compound channels and best hydraulic sections, critical flow computation, and computation of gradually and rapidly varied flow. This course also deals with the ways of measuring flow characteristics using hydraulic structures. |
| **Learning Outcomes**  | **LO1** | 1. Deriving mathematical relations corresponding to physical phenomena.
2. The design principles of open channel flows and they will gain the skill of application of these concepts.
3. Hydraulic jump, flow measurements in rivers
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| **LO2** |
| **LO3** |
| **PART II ( Faculty Board Approval)** |
| **Basic Outcomes (University-wide)** | **No.** | **Program Outcomes** | **LO1** | **LO2** | **LO3** |
| **PO1** | Ability to communicate effectively and write and present a report in Turkish and English.  | LO1, LO2, LO3 |
| **PO2** | Ability to work individually, and in intra-disciplinary and multi-disciplinary teams. | LO1, LO2, LO3 |
| **PO3** | Recognition of the need for life-long learning and ability to access information , follow developments in science and technology, and continually reinvent oneself. | LO1, LO2, LO3 |
| **PO4** | Knowledge of project management, risk management, innovation and change management, entrepreneurship, and sustainable development. | LO1, LO2, LO3 |
| **PO5** | Awareness of sectors and ability to prepare a business plan. | LO1, LO2, LO3 |
| **PO6** | Understanding of professional and ethical responsibility and demonstrating ethical behavior. | LO1, LO2, LO3 |
| **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. | LO1, LO2, LO3 |
| **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. | LO1, LO2, LO3 |
| **PO9** | Ability to identify, define, formulate and solve complex engineering problems; and electing and applying appropriate analysis and modeling methods for this purpose. | LO1, LO2, LO3 |
| **Discipline Specific Outcomes (program)** | **PO10** | Sufficient knowledge in mathematics, science and civil engineering; and the ability to apply theoretical and practical knowledge in these areas to model and solve engineering problems. | LO1, LO2, LO3 |
| **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. | LO1, LO2, LO3 |
| **PO12** | Ability to design experiments, conduct experiments, collect data, analyze and interpret results for the examination of civil engineering problems. | LO1, LO2, LO3 |
| **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** | **Subject** | **LO1** | **LO2** | **LO3** |
| **S1** | 1 | - Introduction to the course regulations and the topics covered- Review of Continuity Equation | *A1-A2-A3* | *A1-A2-A3* | *A1-A2-A3* |  |  |  |
| **S1** | 2 and 3 | fundamentals of open channel flow and flow classification | *A1-A2-A3* | *A1-A2-A3* | *A1-A2-A3* |  |  |  |
| **S2** | 4 and 5 | Uniform flow | *A1-A2-A3* | *A1-A2-A3* | *A1-A2-A3* |  |  |  |
| **S3** | 6 and 7 | design of channels | *A1-A2-A3* | *A1-A2-A3* | *A1-A2-A3* |  |  |  |
| **S 1-3** | 8 | Midterm Exam | *A1-A2-A3* | *A1-A2-A3* | *A1-A2-A3* |  |  |  |
| **S4** | 9 | Critical Flow | *A1-A2-A3* | *A1-A2-A3* | *A1-A2-A3* |  |  |  |
| **S5** | 10 and 11 | Rapidly varied flow | *A1-A2-A3* | *A1-A2-A3* | *A1-A2-A3* |  |  |  |
| **S6** | 12 | Hydraulic Jump  | *A1-A2-A3* | *A1-A2-A3* | *A1-A2-A3* |  |  |  |
| **S1-6** | 13 | \*\*\*\* Field Study1 \*\*\*\* | *A1-A2-A3* | *A1-A2-A3* | *A1-A2-A3* |  |  |  |
| **S7** | 14 | Hydraulic Structures | *A1-A2-A3* | *A1-A2-A3* | *A1-A2-A3* |  |  |  |
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| **Assessment Methods, Weight in Course Grade, Implementation and Make-Up Rules**  | **No.** | **Type** | **Weight** | **Implementation Rule** | **Make-Up Rule** |
| **A1** | **Exam** | *75%* | *No electronic devices are allowed in the examinations except a calculator.* | If the reason for not taking the exam is justified by the university, the student is informed about the time of the make-up exam. |
| **A2** | **Quiz** | *20%* | *The time and subject announce to the students at least one week in advance.* | There is no compensation for the quizzes. |
| **A3** | **Homework** | *5%* | *A homework is given by announcing deadline. Homework that are submitted after the deadline are not accepted.* | There is no compensation for homework. |
| **A4** | **Project** |  | *-* | - |
| **A5** | **Report** |  | - | - |
| **A6** | **Presentation** |  | - | - |
| **A7** | **Attendance/ Interaction** |  | - | - |
| **A8** | **Class/Lab./****Field Work** | 0.0% | Optional to attend for field visit | - |
| **A9** | **Other** |  |  |  |
| **TOTAL** | **100%** |
| **Evidence of Achievement of Learning Outcomes** | Letter grades determined by weighting on the specified percentages on the grades that are taken from exams, quizzes and home-works by the students. The teaching staff can make changes in the student's grades. |
| **Method for Determining Letter Grade** |

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| **Activities** | Midterm Exams | Quizzes | Homeworks | Final Exam  |
| **Quantity** | 1 | 1 | 2 | 1 |
| **Effects on Grading, %)** | 30 | 10 | 10 | 50 |

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| GRADE | A+ | A | A- | B+ | B | B- | C+ | C | C- | D+ | D | F |
| Equivalent number range | 100-95 | 100-95 | 94-85 | 84-80 | 79-75 | 74-65 | 64-60 | 59-55 | 54-50 | 49-45 | 44-40 | 0 |
| GPA | 4.00 | 4.00 | 3.70 | 3.30 | 3.00 | 2.70 | 2.30 | 2.00 | 1.70 | 1.30 | 1.00 | 0.00 |

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| **Teaching Methods, Student Work Load** | **No** | **Method** | **Explanation** | **Hours** |
| ***Time applied by instructor*** |
| **1** | **Lecture** |  | 3×14 |
| **2** | **Interactive Lecture** |  | - |
| **3** | **Recitation** |  | - |
| **4** | **Laboratory** |  | - |
| **5** | **Practical** |  |  |
| **6** | **Field Work** | A technical filed trip will be provided. | 6 |
| ***Time expected to be allocated by student*** |
| **7** | **Project** |  | *-* |
| **8** | **Homework** |  | 16 |
| **9** | **Pre-class Learning of Course Material**  |  | 42 |
| **10** | **Review of Course Material** |  | 50 |
| **11** | **Studio** |  | - |
| **12** | **Office Hour** |  | - |
| **TOTAL** |  *153* |
| **IV. PART** |
| **Instructor** | **Name** | Ali DAMNANDEH MEHR |
| **E-mail** | Ali.danandeh@antalya.edu.tr |
| **Phone Number** | 23 61 |
| **Office Number** | A1-15 |
| **Office Hours** | It will be determined during the semester. |
| **Course Materials** | **Mandatory** | Dawei Han. (2012). Conscience Hydraulics. Bookboon.com |
| **Recommended** | 1. Hydrology & Hydraulic Systems by Ram S. Gupta, Published by Prentice-Hall, New Jersy, U.S.A., 1989. 2. Mechanics of Fluids by Merle C. Potter and David C. Wiggert, Published by Prentice Hall, New Jersy, U.S.A., 1997.3. Open Channel Hydraulics by Ven Te Chow, Published by McGraw-Hill, Inc., U.S.A., 1959. |
| **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 will be made for students with verifiable disabilities. |
| **Safety Issues**  | The course does not require any special safety precautions. |
| **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.  |