

TED UNIVERSITY

CE 434

Coastal Engineering

SYLLABUS/SPRING 2023

Course Information

Required or Elective	<input type="checkbox"/> Required <input checked="" type="checkbox"/> Elective	Date Prepared	February 2023
Semester	Spring 2023	Class Hours, Lab. Hours and Classrooms	Class Hours: Tue. 09:00-10:00 (G101) Wed. 15:00-17:00 (G201)
Course Credit Hours/ ECTS credits	(3+0+2) 4 / 6	Pre-requisite/ Co-requisite	CE 331
Level of Course	Senior	Language of Instruction	<input checked="" type="checkbox"/> English <input type="checkbox"/> Turkish
Instructors and their office hours	Dr. Asli Numanoğlu Genç (asli.genc@tedu.edu.tr) (Office: D301) The office hours can be set by appointment.		
Teaching Assistant(s)	Res.Asst. Neslihan Pınar Gödek (npinar.godek@tedu.edu.tr)		
Student Assistant(s)	NA		
Textbook	Ergin, A. <i>Coastal Engineering</i> , 2 nd Ed., METU Press, 2019.		
Recommended Readings	1. Lecture notes on lms.tedu.edu.tr 2. Bascom, W. and McCoy, K., <i>Waves and Beaches-The Powerful Dynamics of Sea and Coast</i> , 3 rd Ed., Patagonia Press, 2020. 3. Dean, R.G and Dalrymple, R.A., <i>Water Wave Mechanics for Engineers and Scientists</i> , World Scientific, 2009.		
Course Web Pages	Please register to Moodle page http://lms.tedu.edu.tr and regularly follow this link to have access to course materials.		

Course Description

Linear wave theory, wave transformations (shoaling, refraction, breaking, diffraction, reflection), wind-generated waves and their prediction, wave climate, design of rubble mound and vertical wall breakwaters.

Course Objective

The objective of this course is to introduce the water wave theories and the applications of these theories in coastal engineering. This course aims to enable the students to understand the linear wave theory, engineering wave properties and wave statistics and spectra. An understanding of design of coastal structures will also be introduced.

Course Learning Outcomes

On successful completion of this course, a student will be able to explain basic concepts of coastal engineering and wind generated waves, assess forces acting on breakwaters and vertical wall structures.

Specifically, students will be able to,

1. Identify and understand various characteristics water wave parameters and characteristics [B1].
2. Analyze the wave transformations [B4].
3. Apply appropriate equations and principles to analyze the progressive waves [B3].
4. Predict wind generated waves [B6].
5. Determine the forces acting on coastal structures [B4].

Course Assignments

- A. **Homeworks (30%):** There will be two homeworks exam each having a 15% weight of overall grade.
- B. **Project (30%):** Students are expected to complete an analysis on wave climate and wave transformation using the HYDROTAM3D software.
- C. **Final Exam (40%):** There will be a cumulative final exam at the end of the semester.

Course Assessments & Learning Outcomes Matrix

Assessment Methods	Course Learning Outcomes
Homeworks	All
Project	All
Final Exam	All

Relationship to Program Outcomes

This course contributes to fulfillment of the following program outcomes:

- Identify, formulate, and solve engineering problems [PO6].
- Engage in life-long learning to face the future challenges and to achieve an enduring professional development [PO10].
- Employ state-of-the-art engineering techniques and computing tools necessary for creative engineering solutions Identify, formulate, and solve engineering problems [PO11].

Teaching Methods & Learning Activities

- | | |
|---|---|
| <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Telling/Explaining <input checked="" type="checkbox"/> Discussions/Debates <input checked="" type="checkbox"/> Questioning <input checked="" type="checkbox"/> Reading <input type="checkbox"/> Peer Teaching <input type="checkbox"/> Scaffolding/Coaching <input checked="" type="checkbox"/> Demonstrating <input checked="" type="checkbox"/> Problem Solving <input checked="" type="checkbox"/> Inquiry <input type="checkbox"/> Collaborating <input type="checkbox"/> Think-Pair-Share <input type="checkbox"/> Predict-Observe-Explain <input type="checkbox"/> Microteaching <input type="checkbox"/> Case Study/Scenario Analysis | <ul style="list-style-type: none"> <input type="checkbox"/> Simulations & Games <input type="checkbox"/> Video Presentations <input type="checkbox"/> Oral Presentations/Reports <input type="checkbox"/> Concept Mapping <input type="checkbox"/> Brainstorming <input type="checkbox"/> Drama/Role Playing <input type="checkbox"/> Seminars <input type="checkbox"/> Field Trips <input type="checkbox"/> Guest Speakers <input type="checkbox"/> Hands-on Activities <input type="checkbox"/> Service Learning <input type="checkbox"/> Web Searching <input type="checkbox"/> Experiments <input type="checkbox"/> Other(s): |
|---|---|

Student Workload

<input checked="" type="checkbox"/> Lectures 42...hrs	<input type="checkbox"/> Research Review hrs
<input checked="" type="checkbox"/> Course Readings..... 30...hrs	<input type="checkbox"/> Report on a Topic hrs
<input type="checkbox"/> Workshophrs	<input checked="" type="checkbox"/> Case Study Analysis 30.. hrs
<input type="checkbox"/> Online Discussion..... hrs	<input type="checkbox"/> Oral Presentation..... hrs
<input type="checkbox"/> Debatehrs	<input type="checkbox"/> Poster Presentation..... hrs
<input type="checkbox"/> Work Placementhrs	<input type="checkbox"/> Demonstration hrs
<input type="checkbox"/> Field Trips/Visitshrs	<input type="checkbox"/> Web Designs..... hrs
<input type="checkbox"/> Observation.....hrs	<input type="checkbox"/> Mock Designs hrs
<input type="checkbox"/> Lab Applications..... hrs	<input checked="" type="checkbox"/> Team Meetings..... 15..... hrs
<input type="checkbox"/> Hands-on Work.....hrs	<input type="checkbox"/> Other:..... hrs
<input checked="" type="checkbox"/> Exams/Quizzes 35 ...hrs	TOTAL 152 .. hrs
<input type="checkbox"/> Resource Reviewhrs	

Assessment Methods

<input checked="" type="checkbox"/> Test/Exam	<input type="checkbox"/> Self-evaluation
<input type="checkbox"/> Quiz	<input type="checkbox"/> Peer Evaluation
<input type="checkbox"/> Oral Questioning	<input type="checkbox"/> Portfolio
<input type="checkbox"/> Performance Project	<input type="checkbox"/> Presentation (Oral, Poster)
<input type="checkbox"/> Written <input type="checkbox"/> Oral	<input checked="" type="checkbox"/> Other(s): Project work, homeworks
<input type="checkbox"/> Observation	

Course Outline

Week	Topic
1	1. INTRODUCTION 1.1. The field of coastal engineering 1.2. Continental shelf and coastal area
2	2. WAVE HYDRAULICS 2.1. Coastal hydraulics 2.2. Flow of ideal fluids – Fundamental concepts
3	3. FORMULATION OF SURFACE WAVE PROBLEM 3.1 Equations and unknowns 3.2 Boundary conditions 3.3 Difficulties in obtaining the solution
4	4. SMALL AMPLITUDE WAVE THEORY 4.1. Linearization of the Surface Wave Problem 4.2. Solution for the Velocity Potential 4.3. Wave Celerity, Length and Period
5	4.4. Basic Wave Parameters 4.5. Particle Velocities and Orbital Motion 4.6. Particle Trajectory
6	4.7. Wave Pressure 4.8. Pressure within a Progressive Wave 4.9. Wave Energy-Wave Power 4.10. Wave Reflection
7	5. WAVES IN SHOALING WATER 5.1. Basic definitions 5.2. Wave shoaling and wave refraction
8	5.3. Wave diffraction 5.4. Wave breaking
9	6. DESCRIPTION OF OCEAN WAVES 6.1. Statistical properties of sea waves 6.2. The statistical distribution of wind wave heights
10	6.3 Applications on “Description of ocean waves”
11	7. WIND GENERATED WAVES 7.1. Development of wave field 7.2. Prediction of wind waves
12	7.3 Applications on “Wind Generated Waves”
13	8. BREAKWATERS 8.1. Rubble mound breakwaters 8.2. Vertical wall
14	8.3. Applications on “Breakwaters”

Course Policies and Some Remarks

General

1. Date for the final exam will be announced at the end of the semester by the University. The final exam will cover all topics.
2. Cell phones should be turned off and kept out of sight during the classes. You are not also allowed to use your computers/ tablets etc. at the classroom.
3. If you are late for more than 10 minutes, please do not enter the class.
4. You are not allowed to use cell phones during the exams.

Attendance

Attendance is strongly recommended for this course. Hands on exercises and application on the knowledge gained will be carried out in classes.

Make Up Exams

Make-ups for midterm exams will NOT be offered generally. If you have a legitimate reason for missing an exam, then you must arrange to make up the exam BEFORE the scheduled time of the exam. The only exceptions are illness or emergency. In case of an illness or emergency you need to supply a documentation that supports your claim. Also please read the document given in the link: <http://www.tedu.edu.tr/tr/main/yonetmelikler-ve-yonergeler>

Calculator Policy

You may use a calculator during exams.

Plagiarism

All of the following are considered plagiarism:

- “Turning in someone else’s work as your own
- Copying words or ideas from someone else without giving credit
- Failing to put a quotation in quotation marks
- Giving incorrect information about the source of a quotation
- Changing words but copying the sentence structure of a source without giving credit
- Copying so many words or ideas from a source that it makes up the majority of your work, whether you give credit or not” (www.plagiarism.org)

Plagiarism is a very serious offense and will be penalized accordingly by the university disciplinary committee. The best way to avoid accidentally plagiarizing is to work on your own before you ask for the help of other resources. Collaboration on non-collected homework and in studying is strongly encouraged; however, the work you hand in must be solely your own. For more information on TEDU policy on intellectual integrity see the “Student Handbook” in the following link: <https://student.tedu.edu.tr/tr/student>

Cheating

Cheating has a very broad description which can be summarized as “acting dishonestly”. Some of the things that can be considered as cheating are the following: copying answers on exams, homework and lab works, using prohibited material on exams, lying to gain any type of advantage in class, providing false, modified or forged data in a report, plagiarizing, modifying graded material to be re-graded, causing harm to colleagues by distributing false information about an exam, homework or lab. Cheating is a very serious offense and will be penalized accordingly by the university disciplinary committee. For more information on TEDU policy on intellectual integrity, see the “Student Handbook” in the following link: <https://student.tedu.edu.tr/tr/student>.

STUDENT SERVICES INFO:

o Student Development and Psychological Counseling Center

The Center is a service mandated with providing crisis intervention and supportive listening services to the campus community. A major part of fulfilling that mandate is raising awareness of our service so students know they are never alone in dealing with problems. You may contact the SDPCC at: ogrencidanismamerkezi@tedu.edu.tr, 0312 585 0316, Office A122, Or visit their website at <http://csc.tedu.edu.tr/>

o TEDU COPeS - Psycho-Social Support

TED University Psychosocial Support Team was initially established in order to facilitate coping with the psychological, social, familial, academic, and professional difficulties that may arise due to adverse conditions associated with COVID-19 pandemic for TEDU students and employees.

In time we have expanded our services to provide psychosocial support in diverse disasters. In this line, TEDU COPeS offers psychosocial support for TED University students and employees in the aftermath of Kahramanmaraş earthquakes.

For further information and/or questions, visit their website at <https://copes.tedu.edu.tr/>

o Specialized Support and Students with Disabilities

Students who may require specialized support due to a disability affecting mobility, vision, hearing, learning, mental or physical health should consult with Specialized Support and Disability Coordinator, Asst. Prof. Emrah Keser E-mail: emrah.keser@tedu.edu.tr, or visit the website at <https://www.tedu.edu.tr/tr/main/engelsiz-tedu>