

NAME OF THE COURSE		COASTAL ZONE STRUCTURES					
Code		Year of study	1, II. semester				
Course teacher	Alen Harapin, PhD, Full professor	Credits (ECTS)	5.0				
Associate teachers		Type of instruction (number of hours)	L	S	E	F	
			30		15		
Status of the course	compulsory	Percentage of application of e-learning	/				
COURSE DESCRIPTION							
Course objectives	The objectives of the course are to introduce students with basis of planning, design and analysis of structures in coastal zones. After the course, students will become familiar with the various types of coastal structures, design and construction of those structures and design guides and codes.						
Course enrolment requirements and entry competences required for the course	Undergraduate qualification (6 th level of EQF or CROQF) in the technical sciences. A student should comprehend basics of conventional reinforced concrete structures.						
Learning outcomes expected at the level of the course (4 to 10 learning outcomes)	<p>The student is qualified to:</p> <ul style="list-style-type: none"> • fully independent design simple coastal structures; • design quality construction from the standpoint of durability; • propose and select optimal solutions of coastal structures; • be site engineer of simple coastal structures (as Contractor); • make repair design for the damaged coastal structures. 						
Course content broken down in detail by weekly class schedule (syllabus)	<p>Brief introduction to the coastal environment (tides and waves, currents, beach processes, generic types of coastal structures, design parameters and procedures) (2);</p> <p>Durability of concrete in coastal environment (location and environment, forms of degradation, design for durability, detailing for durability, construction for durability, retrofitting durability, inspection of deterioration) (4);</p> <p>Design guides and codes (general design codes and design guides, specific design codes and design guides) (4);</p> <p>The design of coastal structures (loads, the design process, concrete mixing, types of structures with examples) (10);</p> <p>Movements and joints (design criteria, types of joint, construction) (2);</p> <p>Planning and construction (planning, concreting, temporary works, control of work on site) (6);</p> <p>Maintenance and repair (defects and damage, maintenance and repair options, repair materials) (2)</p> <p>(the number in brackets indicating the number of hours for this lesson)</p>						
Format of instruction	<input checked="" type="checkbox"/> lectures <input type="checkbox"/> seminars and workshops <input checked="" type="checkbox"/> exercises <input type="checkbox"/> <i>on line</i> in entirety <input type="checkbox"/> partial e-learning <input type="checkbox"/> field work		<input checked="" type="checkbox"/> independent assignments <input type="checkbox"/> multimedia <input type="checkbox"/> laboratory <input type="checkbox"/> work with mentor				
Student responsibilities	Preparation of an assignment.						
Screening student work (name the	Class attendance	1.0	Research		Practical training		

<i>proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course)</i>	Experimental work		Report			
	Essay		Seminar essay	1.0		
	Tests		Oral exam	0.5		
	Written exam	0.5	Project	2.0		
Grading and evaluating student work in class and at the final exam	Final exam and assessment of the assignment					
Required literature (available in the library and via other media)	Title			Number of copies in the library	Availability via other media	
	Concrete in Coastal Structures, edited by: R. T. L. Allen, Thomas Telford Publishing 1998					
	M.L. Gambhir: Concrete Technology, Theory and practice, Tata McGraw Hill, 2009.					
	Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings				www	
	Eurocode 2 - Design of concrete structures - Part 3: Liquid retaining and containment structures				www	
	Eurocode 8: Design of structures for earthquake resistance -Part 1: General rules, seismic actions and rules for buildings				www	
Optional literature (at the time of submission of study programme proposal)	(1) Bresler B.: Reinforced concrete engineering, John Wiley and Sons, 1974; (2) Nawy E.G.: Reinforced concrete, Prentice-Hall, 1985.					
Quality assurance methods that ensure the acquisition of exit competences	Quality assurance will be performed at three levels: (1) University level, through questionnaires; (2) Faculty level by Quality Control Committee; (3) Lecturer's level.					
Other (as the proposer wishes to add)	Learning outcomes are at 7th level of EQF-a and CROQF					

NAZIV PREDMETA		KONSTRUKCIJE U OBALNIM ZONAMA				
Kod		Godina studija	1., II semestar			
Nositelj/i predmeta	Prof.dr.sc. Alen Harapin, Redoviti profesor	Bodovna vrijednost (ECTS)	5			
Suradnici		Način izvođenja nastave (broj sati u semestru)	P	S	V	T
			30		15	
Status predmeta	obvezni	Postotak primjene e- učenja	/			
OPIS PREDMETA						
Ciljevi predmeta	Cilj predmeta je upoznati studenta sa osnovama planiranja, projektiranja i proračuna obalnih konstrukcija. Nakon što odsluša predmet studenti su upoznati sa različitim tipovima obalnih konstrukcija, njihovim projektiranjem i izvedbom, kao i sa različitim uputama za projektiranje/izvedbu i standardima.					
Uvjeti za upis predmeta i ulazne kompetencije potrebne za predmet	Preddiplomska kvalifikacija (6 razina EQF-a ili HKO-a) iz tehničkih znanosti. Student treba razumijevati osnove konvencionalnih armirano betonskih konstrukcija					
Očekivani ishodi učenja na razini predmeta (4-10 ishoda učenja)	<p>Nakon odslušanog i položenog predmeta student posjeduje znanja za:</p> <ul style="list-style-type: none"> • U potpunosti samostalno projektirati jednostavnije obalne konstrukcije • Projektirati kvalitetne konstrukcije sa stajališta trajnosti • Predložiti i odabrati optimalna rješenja obalnih konstrukcija • Voditi gradilišta jednostavnih obalnih konstrukcija • Izraditi projekt sanacije oštećenih obalnih konstrukcija 					
Sadržaj predmeta detaljno razrađen prema satnici nastave	<p>Kratki uvod u obalno inženjerstvo (plime i valovi, struje, obalni procesi, osnovni tipovi obalnih konstrukcija, parametri za proračun) (2);</p> <p>Trajnost betona u obalnom okolišu (položaj i okoliš, načini razaranja konstrukcije, proračun prema zahtjevima trajnosti, detaljiranje prema zahtjevima trajnosti, izgradnja prema zahtjevima trajnosti, kontrola pogoršanja stanja) (4)</p> <p>Smjernice za proračun i norme (opće norme i smjernice za proračun, specifične norme i smjernice za proračun) (4);</p> <p>Proračun i dizajn obalnih građevina (opterećenja, tijek proračuna, betonske mješavine, tipovi konstrukcija s primjerima) (10);</p> <p>Dilatacije i spojevi (kriteriji proračuna, tipovi veza, izvedba) (2);</p> <p>Planiranje i izvedba (planiranje, betoniranje, privremeni radovi, kontrola radova na gradilištu) (6);</p> <p>Održavanje i popravci (nedostaci i štete, opcije održavanja i popravaka, materijali za popravke) (2);</p> <p>(brojevi u zagradama označavaju broj nastavnih sati po pojedinoj temi)</p>					
Vrste izvođenja nastave:	<input checked="" type="checkbox"/> predavanja <input type="checkbox"/> seminari i radionice <input checked="" type="checkbox"/> vježbe <input type="checkbox"/> <i>on line</i> u cijelosti <input type="checkbox"/> mješovito e-učenje <input type="checkbox"/> terenska nastava		<input checked="" type="checkbox"/> samostalni zadaci <input type="checkbox"/> multimedija <input type="checkbox"/> laboratorij <input type="checkbox"/> mentorski rad <input type="checkbox"/> (ostalo upisati)			
Obveze studenata	Priprema za zadatak					
Praćenje rada studenata (<i>upisati udio u ECTS bodovima za svaku</i>)	Pohađanje nastave	1.0	Istraživanje		Praktični rad	
	Ekperimentalni rad		Referat		(Ostalo upisati)	

<i>aktivnost tako da ukupni broj ECTS bodova odgovara bodovnoj vrijednosti predmeta):</i>	Esej		Seminarski rad	1.0	(Ostalo upisati)	
	Kolokviji		Usmeni ispit	0.5	(Ostalo upisati)	
	Pismeni ispit	0.5	Projekt	2.0	(Ostalo upisati)	
Ocjenjivanje i vrjednovanje rada studenata tijekom nastave i na završnom ispitu	Završni ispit i procjena izrađenog projekta					
Obvezna literatura (dostupna u knjižnici i putem ostalih medija)	Naslov				Broj primjeraka u knjižnici	Dostupnost putem ostalih medija
	Concrete in Coastal Structures, edited by: R. T. L. Allen, Thomas Telford Publishing 1998.					
	M.L. Gambhir: Concrete Tehnology, Theory and practice, Tata McGraw Hill, 2009.					
	Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings					www
	Eurocode 2 - Design of concrete structures - Part 3: Liquid retaining and containment structures					www
	Eurocode 8: Design of structures for earthquake resistance -Part 1: General rules, seismic actions and rules for buildings					www
Dopunska literatura	Bresler B.: Reinforced concrete engineering, John Wiley and Sons, 1974; Nawy E.G.: Reinforced concrete, Prentice-Hall, 1985.					
Načini praćenja kvalitete koji osiguravaju stjecanje utvrđenih ishoda učenja	Praćenje kvalitete obavljat će se na tri razine: (1) Sveučilište kroz anketu; (2) Fakultet pomoću Povjerenstva za kontrolu kvalitete nastave; (3) Predmetni nastavnik/ca.					
Ostalo (prema mišljenju predlagatelja)	Ishodi učenja su na 7. razini EKO-a i HKO-a.					