CONCRETE TECHNOLOGY

1	Course Title:	CONCRETE TECHNOLOGY
2	Course Code:	INS3020
3	Type of Course:	Optional
4	Level of Course:	First Cycle
5	Year of Study:	3
6	Semester:	6
7	ECTS Credits Allocated:	5.00
8	Theoretical (hour/week):	2.00
9	Practice (hour/week):	1.00
10	Laboratory (hour/week):	0
11	Prerequisites:	
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Dr. Ögr. Üyesi ALİ MARDANI AGHABAGLOU
15	Course Lecturers:	
16	Contact information of the Course Coordinator:	ali.mardani16@gmail.com
17	Website:	
18	Objective of the Course:	The aim of this course is to provide a sound knowledge of physical, chemical and mechanical properties of concrete making materials and concrete.
19	Contribution of the Course to Professional Development:	
20	Learning Outcomes:	

	1	To know the characteristics of concrete and concrete making materials
	2	To choose the appropriate concrete type for any construction practice
	3	To conduct tests on concrete ingredients and concrete, and to present the results by preparing laboratory report
	4	To design a specific concrete mixture
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21	Course Content:

Course Content:

Week	Theoretical	Practice
1	Introduction, advantages and disadvantages of the concrete, typical properties, historical development of the cement and concrete, cements: composition of portland cement, TS EN cement types, special cements	Term project

2	Cements: properties of portland cement; chemical expectations, physical characteristics, setting time, fineness, volume stability, heat of hydration, strength,	
3	Hydration of portland cement, properties of the hydration products, microstructure of the cement paste, porosity of the cement paste, calculation of capillary pores and gel/space ratio, interfacial transition zone (ITZ)	
4	Mineral admixtures and blended cements: classification, pozzolanic reaction, composition and physical properties of the mineral admixtures, blended cements, mineral admixture-containing concrete design, effect of the mineral admixtures on properties of the concrete mixture	
5	Mixing water and curing water: Harmful substances present in water, aggregates: characteristics affecting the concrete properties, aggregate properties needed for concrete design	
6	Aggregates: aggregate properties needed for concrete design (continued), aggregate durability, non-standard aggregates, chemical admixtures: admixture used in the concrete, water reducing admixtures,	
7	Chemical admixtures: set-retarding admixtures, antifreeze admixtures, air entraining admixtures, fresh concrete: workability and	
8	Mix design (continues), setting time of the concrete, fresh concrete tests concrete production:	
9	Midterm exams	
10	Curing of concrete: water curing, steam	
11	Concrete production in adverse conditions	
12	Deformations in the concrete: Poisson's ratio, elastic modulus,	
13	Concrete durability: permeability, sulfate attack,	
14	Acid attack, carbonation, corrosion, freezing-thawing, abrasion, ASR	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	14	1.00	14.00
Self study and preperation	14	6.00	84.00
Homeworks	2	10.00	20.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	2.00	2.00
Others	0	0.00	0.00
Final Exams	1	2.00	2.00
Total Work Load			150.00
Total work load/ 30 hr			5.00
ECTS Credit of the Course			5.00

22	Textbooks, References and/or Other Materials:	1. Neville, A.M., “Properties of Concrete”, 4th Ed. Longman, 1995. 2. G.D. Taylor, Materials of Construction, Construction Press, Second Edition, 1983. 3. P.K. Mehta, P.J.M. Monteiro, Concrete: Microstructure, Properties and Materials, Mc Graw-Hill, Third Edition, 2006. 4. Concrete Bülent baradan
23	Assesment	

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	1	20.00
Quiz	1	10.00
Home work-project	1	10.00
Final Exam	1	60.00
Total	4	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		

24 **ECTS / WORK LOAD TABLE**

25 **CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS**

	PQ1	**PQ2**	**PQ3**	**PQ4**	**PQ5**	**PQ6**	**PQ7**	**PQ8**	**PQ9**	**PQ10**	**PQ11**	**PQ12**	**PQ13**	**PQ14**	**PQ15**	**PQ16**
ÖK1	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	0	0	0	0	5	5	4	0	0	0	0	0	0	0	0	0
ÖK4	4	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0

LO: Learning Objectives PQ: Program Qualifications

Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**