Course title: CONCRETE TECHONOLOGY

Course Basic Information	
Academic Unit:	**Faculty of Civil engineering**
Course title:	**Concrete Technology**
Level:	**Bachelor**
Course Status:	**Obligatory**
Year of Study:	**II-(second)-IV-th Semester**
Number of Classes per Week:	**2+2**
ECTS Credits:	**6**
Time /Location:	**According to the Timetable**
Teacher:	**Prof.Dr. Naser Kabashi**
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Course Description:	Concrete such building materials and constituent. Mix Design of Concrete include: Analytical and experimental method. Evaluations and determine the quality of concrete according the EN 206-1. Properties of fresh concrete, including the rheology of fresh concrete. Properties of hardening concrete. Self-Compaction Concrete (SCC), properties and applications. High Performance Concrete (HPC), properties and applications. Different type of Concrete: Centrifuge Concrete, Shot create Concrete, properties and applications. Production of Concrete in Batching Plants, transport and placing the concrete, curing and others activity.
Course Goals:	Ability of Students for Mix Design of Concrete, including the all activities from plant to work site involve the experimental testing of properties the fresh and hardening concrete. Ability of Students to determine the quality of concrete and to represent using the Standards.
Expected Learning Outcomes:	- *To understands the properties of constituents and requested conditions which need to fulfill.* - *To know Mix Design according the requested parameters* - *To use the adequate components for special types of concrete* - *To know to evaluate the behavior the concrete under several environment conditions.*

Student Workload (should be in compliance with student's Learnign Outcomes)			
Activity	**Hours**	**Day/ Week**	**Total**
Lectures	2	15	30
Theory/ Lab Work/Exercises	2	15	30
Practical Work	4	2	8
Consultations with the teaher	2	4	8
Field Work	1	15	15
Test, seminar paper	2	4	8
Homework	2	1	2
Self-study (library or home)	8	4	32
Preparation for final exam	1	5	5
Assessment time (test, quiz, final exam)	2	2	4
Projects, presentations, etc.	2	1	2

Individual research works	1	2	2
Total			**150**
Teaching Methods:	*-Lectures including the presentations and practical demonstration of properties of concrete* *-Exercises , including the numerical and laboratory* *-Seminars-semester work* *-Presentations of students work and discussion* *-Group work*		
Assessment Methods:	Limit for passing the exam : 55 % Presence of students in lectures and exercises: 15 % Individual assignments completed in class 5%; Individual assignments completed at home 15%; Evaluations with tests 10 % Final Exam 55%.		
Primary Literature:	1/Prof. Dr. N.Kabashi- Teknologjia e betonit (dispense) 2/Prof asoc. Fisnik Kadiu: Teknologjia e Materialeve te Ndërtimit		
Additional Literature:	3/K.Van Breugel: Simulation of hydration and formation of structure in hardening cement-based materials 4/A.M.Neville: Properties of Concrete 5/M Collepardi: Nuovo Calcestruzzo 6/ P.Krstulovic: Svojstvo I tehnologija betona 7/ Nawy: Fundamentals of High Performance Concrete		

Designed teaching plan		
Week	**Title of the Lecture**	**Exercises**
Week 1:	Concrete, constituents and properties • Cement , such constituent and type of cement • Effect of cement in stage of hardening the concrete	Cement examinations as a binder • Connection deadlines • Mechanical properties of cement
Week 2:	Aggregate, such constituent material • Fractions of Aggregate • Definitions of the Fractions • Design of optimal granulometri of aggregate	Determination of granulometry for Aggregate fractions
***Week 3*:**	Finnes Modul of Aggregate (FM) • Effect of FM in mix Design of Concrete • Geometrical package of aggregate particles in structure of concrete	Calculation of the Fineness Module for the sized aggregate - fractions
Week 4:	Mix Design of Concrete-Design steps • First step: Granulometric optimal curve • Second Step: Calculations the FM • Third Step: Calculations the W/C ratio • Fourth step: Calculations the amount of Aggregte in fractions	Calculation of design steps for a concrete example.

Week 5:	Mineral admixture and chemical admixtures in concrete • Properties of Mineral admixtures , types and aplications in Mix Design • Chemical Admixtures , types, properties and aplications in Mix Design	Calculation of granulometric mixing curve - analytical method and approximate method
***Week 6*:**	Effect of Environmental conditions in durability of Concrete • Corrosion of Concrete • Alkali Silica Reaction of Aggregate • Alkali Dolomite Reaction of Aggregate	Impact of exposure conditions - example of calculation based on EN 206-1
Week 7:	Fresh Concrete • Properties of fresh concrete and rehology of concrete • Effects of frsh concrete in formworks and calculations	Determination of Consistency Class-Cone Method; Propagation Method
Week 8:	Concrete in Hardening stage: • Transport of concrete • Loss of consistency • Casting in place of concrete • Curing of Concrete	Determination of Consistency Class-Vebe Method; slump Method with vibration.
Week 9:	Hardening Concrete • General properties of hardening concrete • Effect of W/C in properties of hardening concrete • Evaluations of properties according EN 206-1	Determining the consistency class-Web Method; Vibration Reduction Method Examination of hardened concrete properties: • Volumetric measures • Compressive strength • Tensile strength of concrete
Week 10:	Evalautions the Class of Concrete • Evaluations using the Criteria • Determination the Class of Concrete according the EN 2016-1 • Conformity of concrete	Example of calculating concrete grade using: cubic samples and cylindrical samples
***Week 11*:**	Effects of Enviromental conditions in durability of concrete • Effects of thaw-freesing cycles • Effects of abrasion • Effects of watertightnees	Concrete Impermeability Testing-Laboratory Examinations
***Week 12*:**	Concrete works • Types of Batching plants • Type of transport the concrete • Different methods of casting in place the concrete in different positions	Practical work - Concrete factory
***Week 13*:**	Special Concrete • SCC-self Compaction Concrete • Evaluations of properties the SCC and applications	Laboratory examinations of SCC concretes
***Week 14*:**	Special Concrete • HPC-High Performance Concrete	Laboratory examinations of HPC concretes

	• Evaluations of properties the HPC and applications	
***Week 15*:**	Special Concrete • Shot create Concrete • Comparison between the different types of concrete • Advantages and weakness during the applications	Sampling methods and examinations for Shotcreate concretes

Academic Policies and Code of Conduct
We start and finish class on time. *Tools used during class must be cleaned and stored away at the end of class.* *Mobile/smart phones, and other electronic devices (e.g. iPods) must be turned off (or on vibrate) and hidden from view during class time.* *Laptop and tablet computers are allowed for quiet use only; other activities such as checking personal e-mail or browsing the Internet are prohibited.*

Note | If a student has more than 3 class assignments evaluated below 50% he/she loses the right on taking the final exam. Evaluation is done from 0-100 %.