Proponent from WUT	
Title and degree	D.Sc. Eng. Professor of the Univeristy
Name and surname	Tomasz Piotrowski,
Faculty	Faculty of Civil Engineering
E-mail address in the WUT domain	tomasz.piotrowski@pw.edu.pl
Phone number	+48 603 765 228, +48 22 234 64 80

The person proposed as a visiting lecturer	
Title and degree	Professor. Phd
Name and surname	María José Martínez-Echevarría Romero
Exact affiliation	University of Granada, Spain
E-mail address	mjmartinez@ugr.es
Description of achievements (1/2-1 page)	Professor at the University of Granada since 2008, in the Department of Civil Engineering Construction and Engineering Projects. Currently she is part of the research group TEP-001 LabIC. She teachs Civil Engineering Construction and Material Science in Civil Engineering Degree as well as Material Science and Concrete in Science and Technology Architectural Heritage Master. Civil Engineering, PhD since 2012. Her research is focused on construction materials and the main research lines among others are: Reuse of waste in concrete; New technologies in self-compacting concrete; Study of corrosion of reinforcements in concrete; Revaluation of technological nutrients as building materials; Sustainable pavements and recycled asphalt mixes. She spent a 3-months predoctoral stay at the University of Nottingham, United Kingdom on 2011, and a 3-months postdoctoral one at University of Piura, Lima, Perú on 2014 with a JCR article as result of it. She has also worked for private companies (9 years of experience in different companies in the

	private sector) what allows her research and her teaching all the acquired knowledge. She accumulates a series of university management activities such as the direction of the Departmental Section of Construction Engineering, the Coordination of External Practices of the School, the participation as a member of the Master Academic Committee and the Internal Guarantee of the Quality and since 2021 and she is currently deputy director of the Civil Engineering School at the University of Granada. She has published interesting works on building materials such as: ***Martinez-Echevarria, M.J.;*** Castillo J.P.; Lopez-Alonso, M. and Rodríguez Montero, J. 2024. ***Reinforcement corrosion in self-compacting concrete made with waste filler of bituminous mixtures.*** Constr Build Mater. Volume 411, 12 January 2024, 134623 Gloria M. Cuenca-Moyano; Manolo Cabrera, Mónica López-Alonso, ***Martinez-Echevarria, M.J***.; Francisco Agrela, Julia Rosales. 2023. ***Design of lightweight concrete with olive biomass bottom ash for use in buildings***. Journal of Building Engineering 69 (2023) 106289 Alcivar Bastidas, S; Daniel Marx Petroche Sanchez, ***Martinez-Echevarria, M.J.*** 2023. ***The effect of different treatments on abaca fibers used in cementitious composites***. Journal of Natural Fibers, 20:1. Cabrera, M.; ***Martínez-Echevarría, M.J.;*** López-Alonso, M.; Agrela, F.; Rosales, J. 2021. ***Self-compacting recycled concrete using biomass bottom ash***. Materials 2021, 14(20), 6084 https://orcid.org/0000-0001-5799-1843 Scopus: 464 citations, 20 documents, h-index 9 Google Scholar : 644 citations, h-ndex 10

Code of the course	4606-VP-ES-00012	Name of the course	Polish	**Betony nowej generacji**	
			English	**New-generation concretes**	
Type of the course	Specialty subject				
Course coordinator	María José Martínez-Echevarría Romero		Course teacher	María José Martínez-Echevarría Romero	
Implementing unit	Faculty of civil Engineering	Scientific discipline / disciplines*	Civil Engineering, Geodesy and Transport Architecture and urban planning Environmental Engineering, Mining and Energy Materials Engineering Mechanical Engineering		
Level of education	Doctoral studies Master Studies	Semester	Fall: Courses in October and November 2024 2 weeks in October and 2 weeks in November (possible dates: 14-25.10 and 11-29.11) Lectures – 8 x 2h = 16h (possible online) Project classes – 4 x 1h = 4h Laboratory – 5 x 2h = 10h		
Language of the course	English				
Type of assessment	Pass or Fail	Number of hours in a semester	30	ECTS credits	2
Minimum number of participants	10	Maximum number of participants	30	Available for students (BSc, MSc)	MSc - Yes

Type of classes		Lecture	Auditory classes	Project classes	Laboratory	Seminar
Number of hours	in a week					
	in a semester	16		4	10	

* does not apply to the Researcher's Workshop

1. Prerequisites

No prerequisites are required

2. Course objectives

Obtain theoretical and practical knowledge in the design and technology of special concretes. The idea of the course is to familiarise students with new generation concretes used in construction. Knowledge of the physico-chemical and mechanical properties related to new concretes of greatest current application in civil works. Acquire a basic vision of the laboratory study of special concretes.

3. Course content (separate for each type of classes)

Lecture

Lectures will provide nature, characteristics and performance of concrete. Going in depth into the development and design of special concretes and analysing the peculiarities of dosage and its final characteristics will be studied. After the first introductory lecture 5 lectures on new generation concretes will be presented including:

- Fibre Reinforced Concrete (FRC)
- Recycled Aggregate Concretes (RAC)
- Lightweight Aggregate Concrete (LAC)
- Self-Compacting Concretes (SCC)

- Other new generation concretes with special characteristics: High Strength Concrete (HSC), High Performance Concrete (HPC), high permeability porous concrete (without fines), Roller-Compacted Concrete, Shotcrete, Concrete for non-structural use, Self-Cleaning Concrete, Translucent Concrete.
Project classes
Project classes will cover design and calculation the dosage of examples of new generation concretes.
Laboratory
Casting of the of designed examples of new generation concretes and study of its mechanical behaviour and durability.

4. Learning outcomes			
Type of learning outcomes	Learning outcomes description	Reference to the learning outcomes of the WUT DS	Learning outcomes verification methods*
Knowledge			
K01	He has detailed knowledge new generation concretes and special technologies for performing concrete works, including concreting in extreme conditions, unconventional methods of mixture compaction and principles of concrete curing.	SD_W3	project evaluation; Exam
K02	The graduates have knowledge of the materials used in construction processes to the extent consistent with the specialization profile, their origin, testing methods and production and use terms.	SD_W2	project evaluation; Exam
K03	To understand the latest trends in the world of building materials in terms of their formulation and identify the potential advantages they can offer over more traditional materials.	SD_W1, SD_W2	project evaluation; Exam
K04	Designing ways of optimising the properties of different construction materials for specific applications through modifications in their structure and composition and knowing advanced processing and synthesis systems that enable sustainable construction materials with improved properties to be obtained.	SD_W3	project evaluation; Exam
Skills			
S01	The graduates can carry out analytical work and do research leading to solutions of engineering, technological and organizational problems arising in engineering practice. They can present the results in written and oral form.	SD_U1, SD_U6	presentation evaluation
S02	The graduates can plan and carry out laboratory tests and field research and also analyze the results.	SD_U1, SD_U7	report evaluation
S03	The graduates can prepare descriptions preparing them to undertake a scientific task. They can prepare a plan of research work.	SD_U7	report evaluation

S04	The graduates can analyse possible design solutions with regard to technology and organization and select the optimal variant of realization.	SD_U1	report evaluation
Social competences			
SC01	Team work	SD_K4	presentation evaluation
SC02	The graduates can clearly formulate and present their opinions.	SD_K2	presentation evaluation
SC03	The graduates can acquire needed information from various sources, integrate, interpret, and critically evaluate as well as draw up conclusions, and formulate and fully justify their own opinions.	SD_K2	presentation evaluation

*Allowed learning outcomes verification methods: exam; oral exam; oral test; project evaluation; report evaluation; presentation evaluation; active participation during classes; homework; tests

5. Assessment criteria

Practical exercises 25 %

Laboratory activitys 25 %

Exam: 50 %

6. Literature

Primary references:

[1] A.M. NEVILLE: Properties of concrete. Fourth ed. Prentice Hall. Edinburgh (2000).

[2] P.L.J. DOMONE y J.M. ILLSTON: Construction materials: their nature and behaviour. 4ª ed. SponPress, Londres (2010).

[3] M. FERNÁNDEZ CÁNOVAS: Hormigón. Servicio de publicaciones CICC y P. Madrid (2007). RC-16, Instrucción para la Recepción de Cementos.

[4] DE BRITO, Jorge; AGRELA, Francisco (ed.). New trends in Eco-efficient and Recycled Concrete. Woodhead Publishing, 2018.

Secondary references:

[1] https://www.fib-international.org/

[2] LEE, GEOFFREY; McAdamm, PETER.: "Formwork: Practical Guide". Routledge. 1998.

[3] M.F. ASHBY y D.R.H. JONES: Engineering materials. Ed. Butterworth Heinemann. Oxford (1995).

[4] ACI. American Concrete Institute. Standards, practices and manuals on design of concretes.

[5] ASTM American Society for Testing Materials.

[6] CEN. European Standards (EN).

7. PhD student's workload necessary to achieve the learning outcomes**

No.	Description	Number of hours
1	Hours of scheduled instruction given by the academic teacher in the classroom	30
2	Hours of consultations with the academic teacher, exams, tests, etc.	5
3	Amount of time devoted to the preparation for classes, preparation of presentations, reports, projects, homework	15
4	Amount of time devoted to the preparation for exams, test, assessments	15

Total number of hours	**50**
ECTS credits	**2**

** 1 ECTS = 25-30 hours of the PhD students work (2 ECTS = 60 hours; 4 ECTS = 110 hours, etc.)

8. Additional information	
Number of ECTS credits for classes requiring direct participation of academic teachers	2
Number of ECTS credits earned by a student in a practical course	1