Course unit title	***CONCEPTUAL DESIGN OF BUILDINGS***
Course unit code	1C3
Type of course unit	Compulsory
Semester	1
Number of ECTS credits allocated	6
Name of lecturer(s)	Rotter (CTU); Abecasis/Silva/Gervásio (UC); Della Corte (UNINA); Petzek (UPT); Vincent de Ville (ULg); Heistermann T. (LTU); Lecturer (Associate 1); Lecturer (Associate2).
Learning outcomes of the course unit	The students should, at the end of the unit, be able to conceptually design a bridge through the selection, in a wide library of structural solutions, of the most appropriate ones to be implemented. To achieve it, he will rely on his knowledge of these technical solutions, but also on his acquired ability to integrate various other conceptual aspects as the feasibility and the economy of the project.
Mode of delivery	Frontal lesson , design projects, home work
Prerequisites and co-requisites	General admission requirements
Course contents	1. week History and types of steel bridges History of bridge engineering, types of steel bridges, structural systems of steel bridges. 2. week Fundamental terms Subdivision of bridges, vertical alignment, bridge elements, headroom, spatial arrangement. 3. week: Basis of design Reliability of bridge structure, design standards, material, ultimate limit states, serviceability limit states, durability of steel bridges, connections. 4. week Bearings, expansion joint, bridge accessories Volumetric changes of bridges, types of bearings,

		expansion joints, expansion devices, handrails, crash barriers, drainage of bridges, lighting equipment.
	5. week	Bridge deck Permanent way of road bridges, permanent way of railway bridges, bridge deck of road bridges, concrete bridge deck, orthotropic bridge deck, railway bridge deck, bridge deck with ballast, other types of railway bridges decks.
	6. week	Plate girder steel bridges Types of steel bridges with plate girders, deck position, road bridges, railway bridges, structural principles.
	7. week	Design of plate girder steel bridges Ultimate limit states, serviceability limit states, cross section load capacity, design of structural members.
	8. week	Assembly of plate girder steel bridges 3 Connections, stability, assembly.
	9. week	Composite steel-concrete bridges 1 Basic principles, single and multi span beam ultimate limit states, serviceability limit states.
	10. week	Composite steel-concrete bridges 2 Shear connection, details, embedded beams, assembly and casting.
	11. week	Truss girder bridges Static systems, truss girder systems, structural arrangement of truss girder bridges, assembly joints, camber, static calculation, bridge deck interaction, load capacity of compression chord, assembly.
	12. week	Pedestrian footbridges Types of footbridges, construction arrangement, ultimate limit states, serviceability limit states.
	13. week	Examples of bridge structures

	Seminars: Design of composite road bridge.
Recommended or required reading	Hendy C. R., Murény C. J., Designers' Guide to EN 1993-2 Eurocode 3: Design of steel structures. Part 2: Steel bridges, Thomas Telford Ltd.,2007, 400 p. Parke G., Hewson N.: ICE manual of bridge engineering. ICE manuals, Thomas Telford Limited, 2008, 748 p.
Planned learning activities and teaching methods	Frontal lectures are organised from the beginning. In addition, students have to achieve the conceptual design of a particular bridge on the basis of assumed realistic design requirements provided by the lecturers. A feasibility study will also be carried out. At the end of the unit, a critical appraisal of the projects takes place, involving the lecturers and the students.
Assessment methods and criteria	The assessment includes the following evaluations: oral examination on the contents of the lectures and oral presentation/justification of the above mentioned project. As part of the oral examination, students will have to comment orally photographs presenting a particular bridge selected by the lecturers.
Language of instruction	English