UNIVERSIDAD DE CASTILLA - LA MANCHA

GUÍA DOCENTE

1. General information

Course: CONSTRUCTION I
Type: CORE COURSE
Degree: 315 - UNDERGRADUATE DEGREE IN BUILDING ENGINEERING
Center: 308 - SCHOOL POLYTECHNIC OF CUENCA
Year: 1
Main language: Spanish
Use of additional languages:
Web site:

Code: 59307
ECTS credits: 6
Academic year: 2023-24
Group(s): 30
Duration: First semester
Second language:
English Friendly: N
Bilingual: N

Lecturer: **JOSE LUIS SERRANO CANTO** - Group(s): **30**

Building/Office	Department	Phone number	Email	Office hours
Escuela Politécnica de Cuenca/Despacho 1.11	INGENIERÍA CIVIL Y DE LA EDIFICACIÓN	4850	joseluis.serrano@uclm.es	

Lecturer: **NELIA VALVERDE GASCUEÑA** - Group(s): **30**

Building/Office	Department	Phone number	Email	Office hours
ESCUELA POLITÉCNICA DE CUENCA / Despacho 2.10	INGENIERÍA CIVIL Y DE LA EDIFICACIÓN	4878	nelia.valverde@uclm.es	

2. Pre-Requisites

Since the course corresponds to the first year, no previous knowledge would be required. However, for a better learning, it is advisable to have knowledge of technical drawing, freehand drawing and basic notions of history.

As a good foundament for the rest of the subjects in the CONSTRUCTION itinerary, the student is recommended to attend all activities (compulsory or non compulsory), in order to optimize their effort with a guarantee of success

3. Justification in the curriculum, relation to other subjects and to the profession

Construction, from the most remote antiquity has been a fundamental activity for humanity. Today we know the history of humanity, largely due to archaeological remains and built heritage; trough them not only customs, philosophies and religious beliefs may be obs

This subject aims to analyze the different traditional construction systems that have supported the great works of architecture and engineering up to the modern age, as well as the circumstances that made them possible.

This subject will provide to the future graduate, a general vision of the art of building throughout history, as well as the ability to observe and analyze ancient constructions. Contemporary construction can not be understood without taking into account the constructive

The subject is also basic to further deepen the professional field of PATHOLOGY, REHABILITATION AND INTERVENTION in ancient buildings.

4. Degree competences achieved in this course

Course competences

Code	Description
E14	Knowledge of the historical evolution of the techniques and constructive elements and the structural systems that have given rise to the stylistic forms.
E15	Ability to identify the elements and construction systems, define their function and compatibility, and their implementation in the construction process. Formulate and resolve constructive details.
G01	Ability for analysis and synthesis
G03	Ability to manage information
G06	Critical thinking
G07	Teamwork
G12	Autonomous learning
G22	Correct oral and written communication

5. Objectives or Learning Outcomes

Course learning outcomes

Description

Understanding the evolution of construction systems and their application to old or modern works.

Additional outcomes

Represent construction sequences using modeling tools in BIM environment
IDENTIFY the constructive elements of the old buildings and the traditional construction (popular and monumental) and USE the vocabulary and basic terms that define them appropriately.
INTERPRET correctly the graphic and written documentation related to this type of constructions.
REPRESENT properly the geometrical tracings and basic constructive elements of the architecture and traditional construction.

6. Units / Contents

Unit 1: Architecture, Engineering and Construction.

- **Unit 1.1** Popular architecture and monumental architecture
- **Unit 1.2** Architects Engineers and other construction trades

Unit 2: Fundamentals of construction.

- **Unit 2.1** Materials and constructive elements.
- **Unit 2.2** Typology of structural Systems.

Unit 3: Traditional elements and construction systems.

- **Unit 3.1** Arches and vaults.
- **Unit 3.2** Walls
- **Unit 3.3** Lintel and truss systems.

Unit 4: The construction of the classical Hellenic temples.

- **Unit 4.1** Lintel and stone construction
- **Unit 4.2** The construction of the Parthenon of Athens

Unit 5: The construction of the great works of the Roman Empire

- **Unit 5.1** Opus and concrete vaults.
- **Unit 5.2** The construction of the pantheon and the Roman basilicas.

Unit 6: Byzantine architecture

- **Unit 6.1** The construction of Hagia Sophia of Constantinople

Unit 7: Medieval architecture. I

- **Unit 7.1** The evolution in the construction of the Christian basilica
- **Unit 7.2** The construction of Romanesque temples.

Unit 8: Medieval architecture. II

- **Unit 8.1** The stone skeleton
- **Unit 8.2** The construction of the great Gothic temples

Unit 9: The construction of the great domes of the Renaissance
Unit 10: The Industrial Revolution and the architecture of iron in the 19th century
Unit 11: Reinforced concrete and the new structural forms of the XX century
Unit 12: New technologies and specialization of constructive elements

ADDITIONAL COMMENTS, REMARKS

The proposed syllabus aims to analyze the most important engineering and architecture works made throughout history up to the industrial revolution, to understand the application of the different systems and construction elements studied at the begining of the cou

7. Activities, Units/Modules and Methodology

Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	E14 E15	1.2	30	N	-	Introduction of each unit by the teacher. The most significant topics and difficult aspects will be exposed.
Problem solving and/or case studies [ON-SITE]	Guided or supervised work	G06	0.24	6	N	-	Practical exercises of graphic representation in BIM environment and exposition of cases to be analyzed in different sessions
Study and Exam Preparation [OFF-SITE]	Self-study	E14 E15 G12	1.8	45	N	-	Search of information and reading of complementary bibliography by the student.
Writing of reports or projects [OFF-SITE]	Self-study	E15 G07	1.8	45	Y	Y	Tasks comissioned to students (individually or in groups, depending on the number of students) throughout the course. The teachers will guide in the realization of these works and resolution of the arising problems. in tutoring hours. Each task will follow for its cumplimentation the guidelines established in the classes and tutorials.
Group tutoring sessions [ON-SITE]	Guided or supervised work	G01 G03	0.08	2	N	-	Follow-up tutoring for the tasks commissioned

Project or Topic Presentations [ON-SITE]	Assessment tests	G01 G22	0.08	2	Y	Y	Oral Presentation of course work and tasks commissioned by the teacher
Other on-site activities [ON-SITE]	Assessment tests	E14 E15 G01 G12	0.16	4	Y	N	Evidence of the progress of knowledge and achievement of the specific objectives of each of the topics exposed
Final test [ON-SITE]	Assessment tests	E14 E15	0.16	4	Y	Y	Evidence of knowledge and achievement of the specific objectives of each of the topics exposed
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities	E15 G01 G06 G07	0.24	6	N	-	Experimentation with models or scale models of the construction or structural behavior of constructive elements.
Field work [ON-SITE]	Guided or supervised work	E15 G03 G07	0.24	6	N	-	Observation and data collection on traditional construction buildings
		Total:	**6**	**150**			
		Total credits of in-class work: 2.4	**Total class time hours: 60**				
		Total credits of out of class work: 3.6	**Total hours of out of class work: 90**				

As: Assessable training activity
Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System

Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Final test	30.00%	70.00%	The weighting will be 20% or 40% depending on the results of the progress tests. It will serve as a recovery for students who have not passed any of the progress tests. A score greater than or equal to 4 out of 10 is required in order to perform the weighted average with other activities. It will be held on the date established in the official exam calendar of the EPC
Theoretical papers assessment	40.00%	0.00%	Elaboration of the proposed course tasks that may be coordinated with other subjects according to guidelines established at the beginning. A score greater than or equal to 4 out of 10 is required
Oral presentations assessment	10.00%	30.00%	Individual or group exposition of the work or part of the work done during the course.
Test	20.00%	0.00%	They will be done according to the course calendar. They will be weighted according to the number of tests performed. A score greater than or equal to 3 out of 10 is required in each of them in order to perform the weighted average with other activities
Total:	**100.00%**	**100.00%**	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject , an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:

Continuous assessment:

The final mark of the course will be the weighted media of the qualifications (over 10 points) according to the system and the percentages established in the previous section. A grade equal to or greater than 5 is required to pass the course.

Non-continuous evaluation:

The final mark of the course will be the weighted media of the qualifications (over 10 points) according to the system and the percentages established in the previous section. A grade equal to or greater than 5 is required to pass the course.

Specifications for the resit/retake exam:

Students who have been continuously evaluated in the Final exam and have not passed the course will be able to keep the grades and recover the parts that have not reached the minimum grade.

Specifications for the second resit / retake exam:

Students who have been continuously evaluated in the final and retake exams and have not passed the course will be able to keep the grades and recover the parts that have not reached the minimum grade.

9. Assignments, course calendar and important dates

Not related to the syllabus/contents

Hours	hours

General comments about the planning: The dates of the final test (for the final exam) and the resit test will be the day, time and place designated for this purpose by the Subdirectorate of Studies of the School. The student will have all the detailed information in the Moodle virtual platform of the subject. The time distribution of activities corresponding to each subject will be prepared in accordance with the school calendar of the semester

Unit 1 (de 12): Architecture, Engineering and Construction.

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Study and Exam Preparation [AUTÓNOMA][Self-study]	3
Writing of reports or projects [AUTÓNOMA][Self-study]	3

Unit 2 (de 12): Fundamentals of construction.

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	3
Writing of reports or projects [AUTÓNOMA][Self-study]	3

Unit 3 (de 12): Traditional elements and construction systems.

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.5
Writing of reports or projects [AUTÓNOMA][Self-study]	4.5
Field work [PRESENCIAL][Guided or supervised work]	2

Unit 4 (de 12): The construction of the classical Hellenic temples.

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	3
Writing of reports or projects [AUTÓNOMA][Self-study]	3
Field work [PRESENCIAL][Guided or supervised work]	2

Unit 5 (de 12): The construction of the great works of the Roman Empire

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	3
Writing of reports or projects [AUTÓNOMA][Self-study]	3
Group tutoring sessions [PRESENCIAL][Guided or supervised work]	1
Field work [PRESENCIAL][Guided or supervised work]	2

Unit 6 (de 12): Byzantine architecture

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	3
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	3
Writing of reports or projects [AUTÓNOMA][Self-study]	3
Project or Topic Presentations [PRESENCIAL][Assessment tests]	1
Other on-site activities [PRESENCIAL][Assessment tests]	2
Final test [PRESENCIAL][Assessment tests]	1

Unit 7 (de 12): Medieval architecture. I

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.5
Writing of reports or projects [AUTÓNOMA][Self-study]	4.5
Final test [PRESENCIAL][Assessment tests]	1

Unit 8 (de 12): Medieval architecture. II

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	1
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.5
Writing of reports or projects [AUTÓNOMA][Self-study]	4.5
Final test [PRESENCIAL][Assessment tests]	1

Unit 9 (de 12): The construction of the great domes of the Renaissance

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	3
Writing of reports or projects [AUTÓNOMA][Self-study]	3
Final test [PRESENCIAL][Assessment tests]	1

Unit 10 (de 12): The Industrial Revolution and the architecture of iron in the 19th century

Activities	Hours
Class Attendance (theory) [PRESENCIAL][Lectures]	2

Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.5
Writing of reports or projects [AUTÓNOMA][Self-study]	4.5
Group tutoring sessions [PRESENCIAL][Guided or supervised work]	1
Final test [PRESENCIAL][Assessment tests]	1
Unit 11 (de 12): Reinforced concrete and the new structural forms of the XX century	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.5
Writing of reports or projects [AUTÓNOMA][Self-study]	4.5
Project or Topic Presentations [PRESENCIAL][Assessment tests]	1
Final test [PRESENCIAL][Assessment tests]	1
Unit 12 (de 12): New technologies and specialization of constructive elements	
Activities	**Hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	2
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	.5
Study and Exam Preparation [AUTÓNOMA][Self-study]	4.5
Writing of reports or projects [AUTÓNOMA][Self-study]	4.5
Other on-site activities [PRESENCIAL][Assessment tests]	2
Final test [PRESENCIAL][Assessment tests]	4
Global activity	
Activities	**hours**
Class Attendance (theory) [PRESENCIAL][Lectures]	30
Problem solving and/or case studies [PRESENCIAL][Guided or supervised work]	6
Study and Exam Preparation [AUTÓNOMA][Self-study]	45
Writing of reports or projects [AUTÓNOMA][Self-study]	45
Group tutoring sessions [PRESENCIAL][Guided or supervised work]	2
Project or Topic Presentations [PRESENCIAL][Assessment tests]	2
Other on-site activities [PRESENCIAL][Assessment tests]	4
Final test [PRESENCIAL][Assessment tests]	10
Field work [PRESENCIAL][Guided or supervised work]	6
	Total horas: 150

10. Bibliography and Sources

Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Ching, Francis D. K..	A Visual Dictionary of Architecture http://eds.a.ebscohost.com/eds/detail/detail?vid=0&sid=0494175a-6e79-44b9-8ecb-548d7c475906%40sessionmgr4006&bdata=Jmxhbmc9ZXMmc2l0ZT1lZHMtbGl2ZQ%3d%3d#AN=421887&db=edsebk	Hoboken : Wiley		9780470648858	2011	Bibliografía en inglés
Mark, Robert (ed)	Architectural Technology up to the scientific revolution https://www.amazon.es/Architectural-Technology-Scientific-Revolution-Large-scale/dp/0262132877	The MIT Press		0-262-13287-7	1993	Bibliografía básica para los temas 4 a 9 en Inglés
Ortega Andrade, F	Apuntes historia de la arquitectura http://editorial.cda.ulpgc.es/estructuras/construccion/1_historia/index.htm	Universidad de Las Palmas				Lecturas recomendadas asociadas a los temas 4 a 6
Ragon, Michael	Hª Mundial de la Arquitectura y el urbanismo modernos (1800-1910) http://www.uniliber.com/titulo/Historia%20mundial%20la%20arquitectura%20urbanismo%20modernos/	Destino		84-233-1014-0	1979	Bibilografía especializada
Roth, Leland M.	Entender la arquitectura : sus elementos, historia y signifi http://ggili.com/es/tienda/productos/entender-la-arquitectura	Gustavo Gili		978-84-252-1700-5	2008	Lecturas recomendadas sobre los temas 4 a 12
Viollet-le-Duc, E.	La construcción medieval : el artículo "Construcción" del "D https://books.google.es/books?id=P7ow0B-C0PYC&hl=es&redir_esc=y	Centro de Estudios Históricos de Obras Públicas y		84-920297-3-0	1996	Bibilografía especializada
Adam, Jean-Pierre	La construcción romana : materiales y técnicas https://books.google.es/books?id=6zihAAAACAAJ&dq=La+construcci%C3%B3n+romana+jean-pierre+adam&hl=es&sa=X&ved=0ahUKEwj25Z_d5rHNAhUsJcAKHcZdAFoQ6AEIJzAA	Editorial de los Oficios		84-930427-4-9	2002	Bibliografía especializada
Choisy, Auguste	El arte de construir en Bizancio https://books.google.es/books?id=whBMkLuqXmcC&printsec=frontcover&dq=El+arte+de+construir+en+Bizancio&hl=es&sa=X&ved=0ahUKEwjWkvCe57HNAhUICsAKHW8PB_4Q6AEIHjAA#v=onepage&q=El%20arte%20de%20construir%20en%20Bizancio&f=false	CEHOPU, CEDEX, Instituto Juan de Herrera		84-89977-03-8	1997	Bibliografía especializada
Ferri Cortes, J. (y otros)	Principios de Construcción http://www.editorial-club-universitario.es/libro.asp?ref=4884	Editorial club Universitario		978-84-9948-385-6	2011	Bibliografía básica para los temas 1 a 3
Jacobs, David	Los constructores de catedrales de la Edad Media http://www.uniliber.com/ficha/los-constructores-de-catedrales-de-la-edad-media-asesor-robert-branner-taduc-de-ana-coderch-jacobs-david_2052829/	Timun Mas		84-7176-149-1	1974	Bibliografía especializada
Mark, Robert (ed)	Tecnología arquitectónica hasta la revolución científica: ar http://www.akal.com/libros/TecnologIa-arquitectOnica-hasta-la-revolucIOn-cientIfica/9788446014423	Akal		84-460-1442-4	2002	Bibliografía básica para los temas 4 a 9
Morales Gómez, Adoración	Diccionario visual de términos arquitectónicos https://catalogobiblioteca.uclm.es/cgi-bin/abnetopac/O7079/ID6d20446b/NT2	Cátedra		978-84-376-2506-5	2010	Diccionario báscio de términos de construcción y arquitectura