



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: 2021-22
Group(s): 30
Duration: First quarter
Second language:
English Friendly: Y
Bilingual: N

| Lecturer: FRANCISCO JAVIER CASTILLA PASCUAL - Group(s): 30 | | | |
|--|--------------------------------------|--------------|----------------------------|
| Building/Office | Department | Phone number | Email |
| politécnica/1.12 | INGENIERÍA CIVIL Y DE LA EDIFICACIÓN | 4874 | fcojavier.castilla@uclm.es |
| | | Office hours | |

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 fundament 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 observed.
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 evolution.
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

| 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 |
| 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. |
| Represent construction sequences using modeling tools in BIM environment |

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 beginning of the course

7. Activities, Units/Modules and Methodology

| Training Activity | Methodology | Related Competences | 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 commissioned 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 fulfilment 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 |

| | | | | | | |
|--|----------------------------------|-----------------|---|------------|---|---|
| Laboratory practice or sessions [ON-SITE] | Practical or hands-on activities | E15 G01 G06 G07 | 0.24 | 6 | N | Objectives of each of the topics exposed |
| Field work [ON-SITE] | Guided or supervised work | E15 G03 G07 | 0.24 | 6 | N | Experimentation with models or scale models of the construction or structural behavior of constructive elements. 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 |
|-------------------------------|-----------------------|----------------------------|--|
| 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 |
| Final test | 20.00% | 80.00% | 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 | 50.00% | 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% | 20.00% | Individual or group exposition of the work or part of the work done during the course. |
| Total: | | 100.00% | 100.00% |

According to art. 6 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. 13.2) 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 |
|---|--------------|
| Problem solving and/or case studies [PRESENCIAL][Guided or supervised work] | 4 |
| 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] | 4 |
| Final test [PRESENCIAL][Assessment tests] | 4 |
| Final test [PRESENCIAL][Assessment tests] | 4 |
| Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities] | 6 |
| Field work [PRESENCIAL][Guided or supervised work] | 6 |
| 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] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 3 |
| Unit 2 (de 12): Fundamentals of construction. | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 3 |
| Unit 3 (de 12): Traditional elements and construction systems. | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 8 |
| Problem solving and/or case studies [PRESENCIAL][Guided or supervised work] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 12 |
| Unit 4 (de 12): The construction of the classical Hellenic temples. | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 3 |
| Unit 5 (de 12): The construction of the great works of the Roman Empire | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 3 |
| Unit 6 (de 12): Byzantine architecture | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 3 |
| Unit 7 (de 12): Medieval architecture. I | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 3 |
| Unit 8 (de 12): Medieval architecture. II | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 3 |
| Unit 9 (de 12): The construction of the great domes of the Renaissance | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 3 |
| Unit 10 (de 12): The Industrial Revolution and the architecture of iron in the 19th century | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 3 |
| Unit 11 (de 12): Reinforced concrete and the new structural forms of the XX century | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 3 |
| Unit 12 (de 12): New technologies and specialization of constructive elements | |
| Activities | Hours |
| Class Attendance (theory) [PRESENCIAL][Lectures] | 2 |
| Study and Exam Preparation [AUTÓNOMA][Self-study] | 3 |
| 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] | 4 |
| Laboratory practice or sessions [PRESENCIAL][Practical or hands-on activities] | 6 |
| Field work [PRESENCIAL][Guided or supervised work] | 6 |

10. Bibliography and Sources

| Author(s) | Title/Link | Publishing house | City | ISBN | Year | Description |
|----------------------------|---|---|------|-------------------|------|---|
| 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_d5rHNhUsJcAKHcZdAFoQ6AEIJzAA | 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 | CEHOPI, 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.unilib.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 básico de términos de construcción y arquitectura |
| 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.unilib.com/titulo/Historia%20mundial%20de%20arquitectura%20urbanismo%20modernos/ | Destino | | 84-233-1014-0 | 1979 | Bibliografía especializada |
| Roth, Leland M. | Entender la arquitectura : sus elementos, historia y signifi http://gglii.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 | Bibliografía especializada |
| Ching, Francis D. K. | A Visual Dictionary of Architecture http://eds.a.ebscohost.com/eds/detail/detail?vid=0&sid=0494175a-6e79-44b9-8ebc-548d7c475906%40sessionmgr4006&bdata=Jmxhbmcs9ZXMmc2I0ZT1lZHMibGl2ZQ%3d%3d#AN=421887&db=edsebk | Hoboken : Wiley | | 9780470648858 | 2011 | Bibliografía en inglés |