1. BASIC INFORMATION

Course	Technology Projects Workshop
Degree program	Bachelor´s degree in Fundamentals of Architecture
School	Architecture, Engineering and design
Year	Fifth
ECTS	6 ECTS (150 hours)
Credit type	Mandatory
Language(s)	Spanish / English
Delivery mode	In campus
Semester	First semester
Academic year	2025-26
Coordinating professor	José Jurado Egea

2. PRESENTATION

The subject is taught as a technology workshop in which students test and practice one of the basic and fundamental aspects of the architect profession: **the integration of architectural design with the technical systems** that makes it a reality. It is about learning to combine architectural design, structural systems, construction systems and building services capable of creating a **global, coherent and integrated project** that is finally reflected in **technical documentation with the quality, precision and definition necessary** to carry out the work described.

This subject relies on the knowledge acquired previously in the different subjects of Building Technology as well as Design Studios, in terms of **terminology, concepts, functional organisation, energy, structure and construction**. The theoretical body and practical exercises will focus on offering an effective documentary base and realistic application criteria that allow the undertaking of both the conception of an **integrated and efficient design** and its **detailed constructive definition**. The aim of the **practical development exercise** as the central nucleus of the course, is to **reflect** on what has been learned so far, taking **initiatives** and proposing **personalised solutions**, adjusting the result in successive approaches and **simulations**, and finally to present professional documentation that is properly justified and developed.

3. COMPETENCIES AND LEARNING OUTCOMES

Core competencies:

- **CB1**: Students have demonstrated knowledge in their area of study that is based on general secondary education, at a level which, although supported by advanced textbooks, imply some knowledge of the **latest advances in their field of study**.
- **CB2**: Students know how to **apply their knowledge to their work** or vocation in a **professional manner** and possess the skills that are usually demonstrated through the **elaboration and defence of arguments and the resolution of problems** within their field of study.
- **CB3**: Students have the ability to **gather and interpret relevant data** (usually within their area of study) to **make judgments** that include a reflection on relevant **social, scientific or ethical** issues.

- **CB4**: Students can **transmit information, ideas, problems and solutions** to a specialized and non-specialized public.
- **CB5**: Students have developed the necessary **learning skills** to undertake further studies with a **high degree of autonomy**.

General competencies:

- **CG4**: Understanding of the **structural design, construction and engineering** problems associated with **building** design as well as their **technical resolutions**.
- **CG5**: Knowledge of **physical problems** and **technologies** and of the **function** of buildings so as to provide them **with internal conditions of comfort and protection against climatic factors**.
- **CG6**: Knowledge of the **industries, organisations, regulations and procedures** involved in translating **design concepts into buildings and integrating plans into overall planning**.
- **CG7**: Understanding of the **relationship between people and buildings**, and between these and their environment, and of the need to link buildings and the spaces to human **needs** and scale.

Cross-curricular competencies:

- **CT1**: **Responsibility**: aptitude or capacity to face the responsibility that the profession of architect has in society, particularly when elaborating projects that take into consideration social and environmental factors.
- **CT2**: **Self-confidence**.
- **CT3**: Awareness of **ethical values**:
- **CT4**: **Communication skills** in native language (both oral and written) and in the English language, in accordance with the principles of the Universidad Europea de Madrid, any concept or specification for the development of the regulated profession of architect. This includes learning the specific vocabulary of the degree as well as the ability to manage information.
- **CT5: Interpersonal skills**.
- **CT6: Flexibility**.
- **CT7: Teamwork**: ability to work in teams of architects, or in interdisciplinary teams (with shared responsibilities in many cases), managing and planning work groups, necessary in the scheme of competencies and task that are defined for projects of a certain scale in which different disciplines converge. This includes skills in **interpersonal relationships** and team **leadership**.
- **CT8: Initiative** and entrepreneurial spirit, both in the field of architecture and business.
- **CT9: Planning and time management**: ability to plan work in order to comply with delivery times and to respect the limits imposed by budgets and building codes.
- **CT10: Innovation and creativity**: creativity, imagination and aesthetic sensibility applied to the design in order to satisfy both the aesthetic and technical demands. This competence includes critical reasoning and historical culture.

Specific competencies:

- **CE27**: Adequate knowledge of **industrialised building systems**.
- **CE31**: Knowledge of **measurement, assessment and survey** methods.
- **CE35**: Ability to solve **passive environmental conditioning**, including thermal and acoustic insulation, **climate control**, **energy efficiency** and **natural lighting**.

- **CE37**: Ability to design, prepare and develop basic projects for **executions**, sketches and draft projects.

Learning outcomes:

- **RA1**: Student applies **non-conventional technology** in the **design and execution** processes of the **structures, envelopes and installations**
- **RA2:** Student develops design and representation of **specific building solutions that do not follow standardised forms**.
- **RA3:** Student applies **criteria for the selection, dimensioning, justification and compatibility** of these building, structural and installation systems.
- **RA4:** Determine the most suitable the **building process**, as well estimating **costs and deadlines**.
- **RA5**: Assess and optimise the building's **energy efficiency** and ways to **manage energy**.

The following table shows the relationship between the competencies developed during the course and the learning outcomes pursued:

Competencies	Learning outcomes
CE27, CT1, CT3, CT7, CT9, CG4, CB1	RA1: Apply non-conventional technologies in the design and execution processes of structures, envelopes and building services.
CE27, CT2, CT6, CT8, CT10, CG6, CB2, CB3, CB5	RA2: To develop the design and representation of concrete constructive solutions not adapted to standardized details.
CE27, CT1, CT7, CG7, CB4	RA3: Apply criteria of selection, dimensioning, justification and compatibility of these construction, structural and MEP systems.
CE27, CE31, CE37, CT9, CG6	RA4: To determine the most suitable construction process, as well as to evaluate costs and deadlines.
CE35, CT1, CG5	RA5: Valuing and optimising the energy consumption of buildings and the ways of efficient energy management.
CE27, CT1, CT3, CT7, CT9, CG4, CB1	RA1: Apply non-conventional technologies in the design and execution processes of structures, envelopes and building services.

4. CONTENT

The contents of the course are structured by the following main approaches:

- Integrated design in Architecture of MEP Facilities, Construction and Advanced Structures, emphasizing the mutual interaction of these three disciplines and their influence on architectural design.
- Non-traditional construction systems and management of the specific construction process.
- Introduction to complex typologies
- Fire resistance, durability, cost analysis, recycling.
- Software: modelling, simulation and integration programs.

When you access the course on the Virtual Campus, you will find a description of the specific sessions and activities that will develop these focal points.

5. TEACHING-LEARNING METHODOLOGIES

The types of teaching-learning methodologies used are indicated below:

- Lectures, field trips, master classes, site visits, etc.

- Problem/Project based learning.
- Workshop based learning

6. LEARNING ACTIVITIES

Listed below are the types of learning activities and the number of hours the student will spend on each one:

Learning activity	Number of hours	Use of IA
Master classes	12.5 h	Promoted in lesson review
Guided studies, practical exercises and problem-solving	50 h	Promoted in research
Presentation of projects	12.5 h	Promoted in oral presentation training
Teamwork	25 h	Promoted in research and discussion
Independent work	25 h	Promoted in research and discussion
Tutorials, follow-up and assessment/evaluations	25 h	Not allowed
TOTAL	**150 h**	

Further details on the AI-use policy will be published through the virtual campus platform once the course has started.

7. ASSESSMENT

Listed below are the assessment systems used and the weight each one carries towards the final course grade:

Assessment system	Weight
Activity 1 Integrated Project Delivery (group work)	25%
Activity 2 Project (individual)	75%

When you access the course on the *Campus Virtual*, you'll find a description of the assessment activities you have to complete, as well as the delivery deadline and assessment procedure for each one.

7.1. First exam period

To pass the course in the first exam period (Ordinary call), you must obtain a final course grade of at least 5 out of 10 (weighted average).

The grade is determined by the average of the grades in each one of the two activities in accordance with their weight in percentage, provided that the grade for Activity 2 (individual project) is equal to or higher than 4.0. Punctual attendance is mandatory (min. attendance of 70%, including justified and non-justified absences). Likewise, you must complete the exercises, activities and delivery on time to pass the course.

7.2. Second exam period

To pass the course in the second exam period (Extraordinary call), there are options: "Continuation" and "Global".

- The Extraordinary Call can be fulfilled in the "Continuation" mode if the student has obtained an average grade in the Ordinary call and the grade of the activity 2 is equal to or higher than 4.0. In this case he/she will be able to continue and complete the individual project (activity 2) to improve this grade and reach an average grade of 5.0 and thereby pass the subject.
- The "Global" modality is applied if the overall grade in the Ordinary call and/or Activity 2 is lower than 4.0 and therefore the course grades (if any) are not considered. A global work/project on the full course (new project brief) must hence be developed within the Extraordinary call.

8. SCHEDULE

This table shows the delivery deadline for each activity to be assessed in the course:

Assessable activities	Deadline
Activity 1 Integrated Project Delivery (group work)	Week 1 to 5
Activity 2 Project (individual) minimum grade 4,0	Week 6 to 17

This schedule may undergo modifications for logistical reasons. Any modification will be notified to the students in a timely manner.

9. BIBLIOGRAPHY

The recommended bibliography is listed below:

Books:

- Allen, Deward and Iano, Joseph. *Fundamentals of Building Construction: Materials and Methods*. New York. Wiley editors. 2008.
- Allen, E. y Zalewski, W. *Form and Forces, Designing efficient, expressive structures*. New Jersey: Wiley and sons, 2010.
- Araujo, R. *La Arquitectura como Técnica (1) Superficies*. Madrid: A.T.C. Ediciones, 2007
- Araujo, R. *La Arquitectura como Técnica (2) Construir en Altura*. Madrid: Ed. Reverte. 2012
- Araujo, R. y Seco, E. *Construir con acero. Arquitectura en España. Tomo 5.* Ed.Publicaciones ENSIDESA. 1994.
- Arroyo Portero, J. Carlos. *Números gordos en el proyecto de estructuras*. Madrid: Ed. Cinter, 2001.
- Charleson, A. W., Correa, J. y Nuñez, I. *La estructura como arquitectura*. Madrid: Reverte, 2007.
- Herranz Aguilar, J.C. y Vázquez Moreno, J. N*úmeros gordos en el proyecto de instalaciones*. Madrid: Cinter, 2012.
- Paricio, Ignacio. *La piel ligera*. Barcelona. Actar. 2010
- Schittich, C. (Ed). En *Detail. Pieles nuevas*. Basel: Birkhäuser, 2003.
- Schaich, Jörg y Bergermann, Rudolf: *Light Structures*. Ed. Prestel. München. 2003.
- Varios. *DETAIL. Construction Manual*. Ed. Birkhäuser.
    - Polymers & Membranes
    - Glass
    - Facade
    - Timber
    - Components and Systems

Periodicals:

- Tectónica, ATC Ediciones, en especial números 1 (envoleventes I fachadas ligeras), 2 (envolventes II cerramientos pesados), 6 (cubiertas planas), 8 (cubiertas inclinadas), 10 (vidrio), 16 (muro cortina), 17 (geometrías complejas), 19 (plásticos), 21 (instalaciones), 22 (aluminio) 25 (hormigón III), 32 (envolventes metálicas) y 34 (cubiertas).
- DETAIL edición española, en especial números: 7+8/2003 y 7/2001 (Fachadas y muros exteriores), 11/2005, 7+8/2004 y 5/2001 (Estructuras de cubiertas), 7+8/2002 y 7+8/2005 (Cubiertas planas, inclinadas y onduladas).
- Schittich, Sobek y otros Construire en Verre (Presses Polytechniques et Universitaires Romandes).

10. EDUCATIONAL GUIDANCE AND DIVERSITY UNIT

From the Educational Guidance and Diversity Unit we offer support to our students throughout their university life to help them reach their academic achievements. Other main actions are the inclusion of students with specific educational needs, universal accessibility on the different campuses of the university and equal opportunities.

From this unit we offer to our students:

1. Accompaniment and follow-up by means of counselling and personalized plans for students who need to improve their academic performance.
2. In terms of attention to diversity, non-significant curricular adjustments are made in terms of methodology and assessment for those students with specific educational needs, pursuing an equal opportunities for all students.
3. We offer students different extracurricular resources to develop different competences that will encourage their personal and professional development.
4. Vocational guidance through the provision of tools and counselling to students with vocational doubts or who believe they have made a mistake in their choice of degree.

Students in need of educational support can write to us at:
orientacioneducativa@universidadeuropea.es .

11. ONLINE SURVEYS

Your opinion matters!

The Universidad Europea encourages you to participate in several surveys which help identify the strengths and areas we need to improve regarding professors, degree programs and the teaching-learning process.

The surveys will be made available in the “surveys” section in virtual campus or via e-mail.

Your assessment is necessary for us to improve.

Thank you very much for your participation.

WORK PLAN FOR THE COURSE

HOW TO COMMUNICATE WITH YOUR PROFESSOR

Whenever you have a question about the content or activities, don't forget to post it to your course forum so that your classmates can read it.

You might not be the only one with the same question!

If you have a question that you only want to ask your professor, you can send him/her a private message from the Campus Virtual. And if you need to discuss something in more detail, you can arrange an advisory session with your professor.

It's a good idea to check the course forum on a regular basis and read the messages posted by your classmates and professors, as this can be another way to learn.

SCHEDULE ACTIVITIES

This table shows the delivery deadline for each assessable activity in the course, as well as the delivery dates:

Curso 2023-24					
	Martes		Viernes		
12-sep.	Presentación curso	15-sep.		Activ. 1 INVESTIGACIÓN 10%	
19-sep.		22-sep.			
26-sep.	**Final Investigación: Presentación**	29-sep.	*Lanzamiento IPD*		Activ. 2 IPD 20%
3-oct.		6-oct.			
10-oct.		13-oct.			
17-oct.		20-oct.			
24-oct.	**Presentación en clase IPD**	27-oct.	**Final IPD: entrega final Canvas / lanz Proyecto**		
31-oct.		3-nov.		Activ. 3 PROYECTO 70%	
7-nov.		10-nov.			
14-nov.		17-nov.	**Entrega intermedia 1**		
21-nov.		24-nov.			
28-nov.		1-dic.			
5-dic.		8-dic.	fiesta		
12-dic.		15-dic.	**Entrega intermedia 2**		
19-dic.		22-dic.			
26-dic.	navidad	29-dic.	navidad		
2-ene.	navidad	5-ene.	navidad		
9-ene.	no clase	12-ene.			
16-ene.		19-ene.			
23-ene.	**Final Proyecto**	26-ene.			

This schedule may be subject to changes for logistical reasons relating to the activities. The student will be notified of any change as and when appropriate.

DESCRIPTION FOR ASSESSMENT ACTIVITIES

- Activity 1 Research (teamwork): Research (4 students per team) on the topic of the course on university library and canteen.
- Activity 2 Virtual model IPD (teamwork): Modelling and documentation (5 students per team) of a public market (plans and information will be available), every team will develope its own variations on tecnical types (structures, envelope and MEP systems).
- Actividad 3 Individual Project individual (mín. grade 4,0): Each student will develope his/her proposal for a university library and canteen.

RUBRICS FOR ASSESSMENT ACTIVITIES

Activity 3:

Student: LASTNAME1 LASTNAME2, FIRST NAME							
Comment:							
WHAT WILL BE ASSESSED		HOW IT WILL BE ASSESSED					GRADE
		Uncorrect or not submitted	Insuficient	Pass	Good	Excelent	
	Value chapter:	0%	25%	50%	75%	100%	10,00
PROPOSAL	4	***Singularity*** *or* ***innovation*** *or level of* ***optimization*** *in :* *Envelope, construction process, structural type and building services/MEP* ***Level of coherence*** *of the technical systems with the goals or the premises of the project.* ***Energy balance*** *and emissions as close as possible to 0.*	Propuesta de objetivos o presupuestos teóricos muy convencionales, poco innovadora o con muy bajo grado de optimización omuy poco coherente con los objetivos del proyecto. Balance energético o de emisiones excesivo. O documentación que no permite valorar ninguno de los anteriores.	Propuesta de objetivos o presupuestos teóricos convencionales, con insuficiente innovación en la mayoría de los sistemas, o bajo nivel de cumplimiento de los objetivos. Balance energético desequilibrado o emisiones excesivas. O la documentación no permite valorar suficientemente ninguno de los anteriores.	Propuesta de objetivos o presupuestos teóricos convencionales, con poca innovación en la mayoría de los sistemas, o con coherencia media en el cumplimiento de objetivos. Balance energético medio o emisiones medias.	Propuesta de objetivos o presupuestos teóricos actuales, innovador en una parte importante de los sistemas, coherente en el cumplimiento de objetivos. Balance energético cercano a 0 o emisiones bajas.	Propuesta de objetivos o presupuestos teóricos propositivos o ambiciosos, con alto nivel de innovación en alguno de los sistemas, alto grado de coherencia con los objetivos de proyecto. Balance energético casi nulo o emisiones nulas.	100%
INTEGRATION	3	*Level of* ***integration*** *of* ***design and technology****. Justification for the chosen technical systems (construction, structures and MEP) based on* ***their relation and synergies****. A clear and concise explanation of* ***conflicts*** *that might arise between these systems, where problems may occur and how these are resolved or mitigated.*	No realizado, no hay documentación especifica que permita valorar el grado de integración o es ilegible.	Información sobre integración muy escasa o no demuestra un grado de integración mínimo de las diferentes áreas en un diseño coherente, o la tecnología se incorpora de forma ortopédica a la propuesta.	Contiene documentación específica sobre la integración de tecnología y diseño, pero no hay integración real de la tecnología propuesta o no se aprecia reflexión suficiente en el diseño para incorporarla.	Aparece explicación e información específica de integración, se incorporan tecnologías adecuadas aunque poco integradas con el diseño o hay aspectos de la ejecución poco reflexionados.	Existe explicación e información específica bien expuesta de integración. Se incorporan tecnologías innovadoras (o convencionales utilizadas de forma innovadora) que se articulan entre sí de forma equilibrada favoreciendo la consecución de los objetivos del proyecto.	100%
DOCUMENTATION	3	***Description*** *and justification of chosen types (report and annex),* ***plans*** *and* ***virtual model*** *(please see brief and its list of documentation to be submitted).*	Faltan documentos de importancia, no hay justificación que permita valorar si el predimensionado es correcto o la escala es incorrecta, faltan leyendas o rotulación, o su calidad gráfica es muy baja.	Omisión de algún documento de relevancia o planos completos pero sin información explicativa (textos, esquemas, rotulación, leyendas) o calidad gráfica mejorable o falta la explicación del funcionamiento del área escogida o es incomprensible o incoherente. La justificación no es correcta y no permite saber si el predimensionado es correcto o el predimensionado es claramente incorrecto.	Se aportan casi todos los documentos relevantes relativos al área escogida pero los planos generales revelan alguna incoherencia, o falta documentación en planos de detalle sobre algún elemento importante, o la escala es inapropiada o el grafismo mejorable. Existe justificación genérica, está realizada sobre premisas correctas pero el predimensionado no es adecuado.	Se aportan todos los documentos relevantes relativos a los sistemas generales, están correctamente descritos y son comprensibles, Pero los esquemas de análisis general contienen errores u omisiones o los planos no incluyen todos los elementos relevantes o la escala y el grafismo son mejorables. Justificación bien documentada y predimensionado correcto.	Se aportan todos los documentos relevantes relativos a los sistemas generales, están correctamente descritos y son comprensibles, los esquemas de análisis general son coherentes y los planos incluyen todos los elementos relevantes y la escala y el grafismo son apropiados y legibles. Se ha realizado justificación bien documentada y coherente y se ha predimensionado correctamente.	100%

PLAGIARISM REGULATION

In accordance with the current student disciplinary regulations at Universidad Europea:

- Plagiarism, in full or in part, of intellectual works of any kind, is considered a very serious offense.
- Very serious offenses relating to plagiarism and the use of fraudulent means to pass assessment tests shall result in exclusion from the exams for the relevant period, as well as the inclusion of the offense and its details in the student's academic record. For more information you can find all information regarding disciplinary regulations at the following link: https://universidadeuropea.com/conocenos/normativa/