



SINGULAR BUILDING SYSTEMS

35535 - SINGULAR BUILDING SYSTEMS (2024-25)

General

Code: 35535

Lecturer responsible:

SIRVENT PEREZ, CESAR DANIEL

Credits ECTS:	
Theoretical credits:	0,00
Practical credits:	2,40
Distance-base hours:	3,60

Departments involved

- **Dept:** ARCHITECTURAL CONSTRUCTIONS

Area: ARCHITECTURAL CONSTRUCTIONS

Theoretical credits: 0

Practical credits: 2,4

This Dept. is responsible for the course.

This Dept. is responsible for the final mark record.

Study programmes where this course is taught

- [DEGREE IN FUNDAMENTALS OF ARCHITECTURE](#)
Course type: COMPULSORY (Year: 4)

Competencies and objectives

Course context for academic year 2024-25

Singular Building Systems understands technology as an inseparable part of the architectural creation process. The specific subject matter of this course is industrialisation in architecture. The objective is to use light prefabrication technologies and dry construction, modular grid-based composition, and passive bioclimatic design strategies as initial tools and variables to generate more sustainable, efficient, and climate-resilient architectures.

The contents and concepts will be addressed in a highly practical manner: the course revolves around a Project that students must tackle, solve, and define as if it were a real case, at the level of an Execution Project, emphasizing its material reality, and detailing every necessary aspect for construction.

The course follows the self-titled "I+CT METHOD"; we believe that Architecture is both Idea and Construction, "Art and Technique" as Gropius advocated in the Bauhaus, or "Built Idea" in the words of Campo Baeza. We also revive and reinterpret concepts from the Metabolist Movement and the Archigram Group, which are closely related to the central theme of the course. The keywords or key concepts of this course are:

LIGHT PREFABRICATION. Use of "dry" construction technology, which requires its own technical and compositional language: modulation, standardisation, assembly, tolerances, joints, ...

REPETITION and standardisation. Industrial mass production and the scientific organisation of work (Taylorism, Fordism) ensure cost and time reductions, and an increase in quality and safety.

Workshop CONSTRUCTION. PRE-fabrication involves two locations: Workshop and Site. The more that is built in the workshop and the less on site, the more prefabricated our building will be.

THREE-DIMENSIONAL CELLS. Basic construction modules "cells" (prefabricated: Workshop) will be designed, which, when properly related to others, will generate an "organism" (assembly: Site).

MODULAR GRIDS. Measurements are not random but standardised. The final form is generated from the addition of cells on modular grids, following predetermined aggregation rules.

AGGREGATIVE Systems. Consist of material elements (three-dimensional cells) and immaterial elements (grids and ordering rules).

ORGANIC Growth. Three-dimensional modular aggregation processes allow for phase-based construction, extended over time.

FLEXIBLE, Variable, Mobile. Possibility to assemble and disassemble the building several times easily. Projects will have a marked ephemeral, nomadic, and temporary character.

Construction process or STORYBOARD. Parameters such as maximum weight or road transport dimensions must be considered from the outset for project design.

SUSTAINABILITY and efficiency. The goal is to achieve energy self-sufficiency. Active energy systems (renewable) must be integrated into the design.

BIOCLIMATIC Design. The ecological transition requires new ways of designing that include passive environmental conditioning strategies from the outset: 'form follows energy'.

General Competences (CG)

- **CG.4** : Comprendre els problemes de la concepció estructural, de construcció i d'enginyeria vinculats als projectes d'edificis, a més de les tècniques de resolució d'aquests.
- **CG.5** : Conèixer els problemes físics, les diverses tecnologies i la funció dels edificis, per tal de dotar-los de condicions internes de comoditat i protecció dels factors climàtics.
- **CG.6** : Conèixer les indústries, organitzacions, normatives i procediments per a plasmar els projectes en edificis i integrar els plànols en la planificació.
- **CG.7** : Comprendre les relacions entre les persones i els edificis i entre aquests i l'entorn, a més de la necessitat de relacionar els edificis i els espais situats entre aquests en funció de les necessitats i de l'escala humanes.

Skills/Skills

- **CB 2** : Que els estudiants sàprien aplicar els coneixements al seu treball o vocació d'una forma professional i posseïsquen les competències que solen demostrar-se per mitjà de l'elaboració i defensa d'arguments i la resolució de problemes dins de la seua àrea d'estudi.
- **CB 3** : Que els estudiants tinguen la capacitat de reunir i interpretar dades rellevants (normalment dins de la seua àrea d'estudi) per a emetre judicis que incloguen una reflexió sobre temes rellevants d'índole social, científica o ètica.
- **CB 4** : Que els estudiants puguen transmetre informació, idees, problemes i solucions a un públic especialitzat o no especialitzat.
- **CB 5** : Que els estudiants hagen desenvolupat les habilitats d'aprenentatge necessàries per a emprendre estudis posteriors amb un alt grau d'autonomia.

Inherent transversal

competences:>>Cognitive Instrumental

- **CT.10** : Habilitat per a l'anàlisi i la síntesi. Habilitat per a separar les parts d'un procés d'indagació i habilitat per a recompondre el tot a partir d'unes parts.
- **CT.16** : Habilitat per a manejar informació complexa. Capacitat per a operar en entorns complexos i a partir de situacions d'incertesa.

UA Basic Transversal Competences

- **CT.1** : Capacitat d'ús d'una segona llengua. Capacitat d'utilitzar l'anglès amb fluïdesa per a accedir a la informació tècnica, respondre a les necessitats de la societat i poder ser autosuficient en la preparació de la pròpia vida professional.
- **CT.4** : Capacitat de treball en grup. Capacitat d'èxit en treballs col·lectius i de grup, repartint treball i assumint rols.
- **CT.6** : Capacitat d'adaptar-se a nous conceptes i mètodes. Capacitat d'aprendre i aplicar, autònomament i interdisciplinària, nous conceptes i mètodes.
- **CT.7** : Capacitat d'adaptar-se a nous models tecnològics professionals. Capacitat d'assimilar i adaptar-se a l'evolució contínua de la tecnologia en l'àmbit de desenvolupament professional.

Inherent transversal

competences:>>Methodological Instrumental

- **CT.17** : Habilitat per a resoldre problemes. Capacitat per a orientar la informació i els instruments d'acció cap a la resolució de conflictes prèviament diagnosticats.
- **CT.18** : Habilitat per a prendre decisions. Capacitat per a entendre la complexitat dels contextos en què produïm transformacions i prendre-hi decisions creatives de manera responsable.
- **CT.20** : Habilitat per a integrar els diversos sabers i disciplines. Capacitat d'entendre la dimensió múltiple dels problemes en què s'intervé i habilitat per a

seleccionar i incorporar els arguments més eficaços.

Inherent transversal
Competences:>>Individual
Interpersonal

- **CT.25** : Actuar d'acord amb els propis valors, motivacions i opinions. Capacitat per a crear i proposar contextos operatius propis a partir de la nostra especial manera d'estar en el món, assumint les nostres responsabilitats individuals per a la creació d'un món millor.
- **CT.26** : Habilitat per a emprendre estratègies i processos d'aprenentatge autònoms. Capacitat de generar processos d'autoaprenentatge que, de manera autònoma, complementen l'aprenentatge reglat.

Inherent transversal
Competences:>>Social Interpersonal

- **CT.28** : Habilitat per a dissenyar i gestionar propostes que incorporen responsabilitat social i mediambiental. Capacitat per a entendre el compromís amb l'entorn social i físic que impliquen els processos de transformació d'aquest.

Inherent transversal
Competences:>>Entrepreneurship
Capability System

- **CT.30** : Habilitat per al diagnòstic i l'acció projectiva. Capacitat per a problematitzar la realitat i implementar-hi mecanismes proposatius i sostenibles d'acció.
- **CT.31** : Motivació per la recerca i el difícil art de la innovació. Habilitat per a relacionar-se amb allò desconegut i entendre els mecanismes per a intervenir eficaçment en la construcció del futur.

Inherent transversal
Competences:>>Achievement System

- **CT.33** : Motivació per la superació d'obstacles. Capacitat per a no deixar-se intimidar pels obstacles i saber superar-los sense patir pèrdues personals importants. Capacitat per a optimitzar les nostres energies i orientar-les cap a metes possibles i autoregeneradores.

Specific Competences:>>Technical
Block

- **CE.12T** : Aptitud per a concebre, calcular, dissenyar, integrar en edificis i conjunts urbans i executar solucions de fonamentació.
- **CE.13** : Aptitud per a aplicar les normes tècniques i constructives.
- **CE.15** : Aptitud per a conservar l'obra acabada.
- **CE.17T** : Capacitat per a concebre, calcular, dissenyar, integrar en edificis i conjunts urbans i executar estructures d'edificació.
- **CE.18T** : Capacitat per a concebre, calcular, dissenyar, integrar en edificis i conjunts urbans i executar sistemes de divisió interior, fusteria, escales i altra obra acabada.
- **CE.19T** : Capacitat per a concebre, calcular, dissenyar, integrar en edificis i conjunts urbans i executar sistemes de tancament, coberta i altra obra gruixuda.
- **CE.21** : Capacitat per a conservar l'obra gruixuda.
- **CE.27** : Coneixement adequat dels sistemes constructius industrialitzats.

Specific Competences:>>Project Block

- **CE.35T** : Aptitud per a resoldre el condicionament ambiental passiu, incloent-hi l'aïllament tèrmic i acústic, el control climàtic, el rendiment energètic i la il·luminació natural.

Exclusive skill taught in this course

No data

Learning outcomes (Training objectives)

No data

Specific objectives stated by the academic staff for academic year 2024-25

The course Singular Building Systems [**SCS** in spanish] is positioned in the final years of study, with the aim of organising, summarising, and applying the knowledge acquired by students in their earlier years. The primary objective is to ensure that students become self-sufficient; rather than introducing new content ("*information*"), the course aims for students to achieve the following goals ("*learning*"):

_ Develop **critical and self-critical skills**.

Students must establish processes and create their own protocols to make objective decisions and assess the potential consequences of these decisions in the physical resolution of architecture.

_ Undertake **autonomous learning** strategies and processes.

Students must develop their own working methodology that allows them to seek the information they need, select systems and components in a manner consistent with the initial project idea, and adapt to the continuous evolution of technology.

From this perspective, students must understand that the Industrialised Architecture Project [IAP], the main activity of the course, is a MEANS to develop these skills and competencies, and not an END in itself.

METHODOLOGY and justification of specific objectives

One of the approaches of the EHEA is the transition from teacher-based instruction to student-directed learning. To this end, the SCS course uses an **ACTIVE and PARTICIPATIVE** teaching methodology with techniques for **COOPERATIVE and COLLABORATIVE** learning. This system, an interpretation of pedagogical theories from authors such as R. Wild, L. Malaguzzi, A.S. Neill, H. Gardner, R. Steiner [Waldorf], F. Tonucci, M. Montessori, etc., asserts that students should not be provided with pre-constructed knowledge, but rather the opportunity to learn by themselves through personal activity [J.H. Pestalozzi]. It is the student who must construct the learning, while the teacher adopts the role of facilitator, not content provider [L. Vygotsky]. The model promotes positive interdependence (collaborative learning) through peer correction.

Content and bibliography

Content for academic year 2024-25

1. Singular building systems.

2. Singular building systems of building structures.
Singular building systems of foundation solutions.

3. Singular systems of interior division, carpentry, stairs and other aspects of finished works.
Singular systems of enclosures, roofs and other structural work.

Solving passive environmental conditioning, including thermal and acoustic insulation, climate control, energy efficiency and natural lighting.

4. Apply technical and building rules.

5. Preserve the building structures, foundations and civil work.
Preserve finished work.
Preserve structural work.

6. Singular building systems and their pathology.

7. Projects and singular structural building systems.

Projects and building of singular enclosure.

Projects and building of singular coatings.

Projects and building of urban spaces and roads. Urban projects.

Related links

<http://issuu.com/danisupertramp/docs/csa1>

comentarios sobre arquitectura #1 el actor secundario; el caracter de la arquitectura en relacion a un contexto

<http://issuu.com/danisupertramp/docs/csa2>

comentarios sobre arquitectura #2 relación entre idea y construcción en la prefabricación ligera

<http://issuu.com/danisupertramp/docs/csa3>

comentarios sobre arquitectura #3 procedimiento de montaje en prefabricación ligera: el story-board de la construcción

<http://issuu.com/danisupertramp/docs/csa4>

comentarios sobre arquitectura #4 el mito del "taller" en la construcción prefabricada ligera

<http://issuu.com/danisupertramp/docs/csa5>

comentarios sobre arquitectura #5 el contexto como variable de proyecto: integración vs alienación

<http://issuu.com/danisupertramp/docs/csa6>

comentarios sobre arquitectura #6 proceso proyectual y forma en la arquitectura industrializada

Refugio-Vivac en los Pirineos : el método I+CT : proceso de proyecto en la arquitectura prefabricada ligera

Author(s): Sirvent Pérez, Cesar Daniel

Issue: Alicante : Ingra, 2012;

ISBN: 978-84-9403-241-7

Category: Básico

Nomad architecture with containers : diseño y materialización (I+CT) de arquitecturas efímeras con sistemas modulares agregativos

Author(s): Sirvent Pérez, César Daniel

Issue: [Alicante] : César Daniel Sirvent Pérez, 2015;

ISBN: 978-84-606-9876-0

Category: Básico

Construyendo ideas : unidades habitacionales de emergencia en la trama urbana de La Habana vieja

Author(s): SIRVENT PÉREZ, Cesar Daniel

Issue: Alicante : Universidad de Alicante, Servicio de Publicaciones, 2008;

ISBN: 978-84-7908-961-0

Category: Complementario

Construction and design manual : prefabricated housing

Author(s): Meuser, Philipp

Issue: Berlin : DOM, 2020;

ISBN: 978-3-86922-021-5

Category: Complementario

Prefab prototypes : site-specific design for offsite construction

Author(s): ANDERSON, Mark

Issue: New York : Princeton Architectural press, 2007;

ISBN: 978-1-56898-560-2

Category: Complementario

Home delivery : fabricating the modern dwelling

Author(s): BERGDOLL, Barry ; CHRISTENSEN, Peter

Issue: New York : The Museum of Modern Art, 2008;

ISBN: 978-0-87070-733-9

Category: Complementario

Prefab houses

Author(s): Cobbers, Arnt

Issue: Köln : Taschen, 2010;

ISBN: 978-3-8365-2184-0

Category: Complementario

Constructing architecture : materials, processes, structures : a handbook

Author(s): DEPLAZES, Andrea

Issue: Basel : Birkhäuser, 2010;

ISBN: 978-3-7643-8631-3

Category: Complementario

Container and modular buildings : construction and design manual

Author(s): Dörries, Cornelia

Issue: Berlin : DOM Publishers, 2019;

ISBN: 978-3-86922-301-8

Category: Complementario

Construir con células tridimensionales : análisis de un método constructivo

Author(s): HUTH, Steffen

Issue: Barcelona : Gustavo Gili, 1977;

ISBN: 84-252-0666-9

Category: Complementario

Design in modular construction

Author(s): LAWSON, mark ; OGDEN, Ray; GOODIER, Chris

Issue: Boca Raton : CRC press, 2014;

ISBN: 978-0-415-55450-3

Category: Complementario

Prefab Architecture: a guide to modular design and construction

Author(s): SMITH, Ryan E.

Issue: Hoboken : John Wiley & Sons, 2011;

ISBN: 978-0-470-27561-0

Category: Complementario

Components and systems : modular construction : design, structure, new technologie

Author(s): STAIB, Gerald ; DÖRHÖFFER, Andreas ; ROSENTHAL, Markus

Issue: München : Birkhäuser, 2008;

ISBN: 978-3-7643-8656-6

Category: Complementario

Modern modular : the prefab houses of Resolution : 4 Architecture

Author(s): Tanney, Joseph; Luntz, Robert

Issue: New York : Princeton Architectural Press, 2014;

ISBN: 978-1-61689-051-3

Category: Complementario

Hacia una formalización de la Ciudad en el Espacio

Author(s): BOFILL, Ricardo. Taller de arquitectura

Issue: Barcelona : Blume, 1968;

ISBN: 978-84-7031-311-0

Category: Complementario

Redes y ritmos espaciales

Author(s): LEOZ, Rafael

Issue: Madrid : Blume, 1969;

ISBN: 978-84-7214-006-6

Category: Complementario

Archigram : the book

Author(s): COOK, Peter

Issue: London : Circa Press, 2018;

ISBN: 978-1-911422-04-4

Category: Complementario

Metabolism in Architecture

Author(s): KUROKAWA, Kisho

Issue: London : Littlehampton Book Services Ltd, 1977;

ISBN: 978-0289707333

Category: Complementario

For everyone a garden

Author(s): SAFDIE, Moshe

Issue: Cambridge : MIT press, 1974;

ISBN: 0-262-19108-3

Category: Complementario

La idea construida : la arquitectura a la luz de las palabras

Author(s): Campo Baeza, Alberto

Issue: Madrid : Colegio Oficial de Arquitectos de Madrid, 1996;

ISBN: 84-7740-083-0

Category: Complementario

Assessment

Assessment procedures and criteria 2024-25

To achieve the educational objectives of this course, and in accordance with the current Curriculum, students are required to undertake personal work over one semester equivalent to 6 credits: 60 hours of in-person classes plus 90 hours of home study.

GENERAL assessment system

ORDINARY session. The course follows a structured in-person methodology that facilitates continuous assessment. Each week, non-recoverable activities [NRA] are assigned, linked to professional performance, enabling students to develop skills useful for their future careers. These activities are considered intermediate phases or partial milestones of the Industrialised Architecture Project [IAP], which students must submit on the dates specified in the course schedule. Students must attend each full in-person session, participate actively, and submit all weekly NRA during class time, although up to 20% of absences or tardiness are permitted (provided they are justified in advance).

EXTRAORDINARY session. Failure to comply with the aforementioned conditions, or obtaining a grade below 4.00 in the NRAs, will result in exclusion from the continuous assessment system and necessitate a final exam [FEX] in place of the non-recoverable activities [NRA], on the officially set dates. It is important to note that the progressive acquisition of knowledge and skills is achieved through the proposed pedagogical methodology (continuous assessment of various formative activities), and cannot be replaced by a single exam. Therefore, students are informed that this 'final exam' route does not guarantee effective learning, which will negatively impact higher-level courses and their professional future.

The final grade in both cases will be calculated as follows:

_ 50% non-recoverable activities [NRA] or final exam [FEX]

_ 50% Industrialised Architecture Project [IAP]

Description	Criteria	Type	Weighting system
Non-Recoverable Activities [NRA]	<p>The weekly Non-Recoverable In-Person Activities may include:</p> <ul style="list-style-type: none"> _ L 'lectures', interactive theoretical classes _ M 'masterclass', lectures given by specialists _ I 'interaction', consultations with other teachers _ P 'practicing', partial phases of the Final Project _ E 'exercises', short assignments, analyses, and presentations _ W 'workshop', themed workshops _ V 'site-visit', visits to construction sites and/or industries _ K 'pecha-kucha', public presentation of work <p>The grade for this section will correspond to the arithmetic mean of all activities considered for scoring, or the final exam in case of non-compliance with the continuous assessment conditions (incomplete attendance at in-person sessions, non-participative attitude, submission of less than 80%).</p> <p>Completing the [NRA] allows students to acquire the following competencies:</p> <ul style="list-style-type: none"> _ General: CG4, CG5 _ Skills and Abilities: CB2, CB3 _ Specific Transversal: CT6, CT7, CT17, CT18, CT25, CT26, CT30, CT31 _ Specific: CE12T, CE17T, CE18T, CE19T, CE35T _ English group: CT1 	ACTIVITIES OF EVALUATION DURING THE SEMESTER	50

Industrialised Architecture Project [IAP]	<p>The Industrialised Architecture Project is a MEANS to achieve the main objectives of the course (developing critical and self-critical skills, and undertaking autonomous learning strategies and processes), and not an END in itself.</p> <p>While the Project can be worked on in groups, it is important to note that the grade will be awarded to the individual student, not to the Project. Each student is responsible for a specific part of the Project, and their name and signature will appear in the index and on the plans they are in charge of, even if all team members worked on them. The student must understand and be accountable for all parts of the Project, even those they are not directly responsible for.</p> <p>Projects that are incomplete, or not submitted within the predefined deadlines and/or formats, will not be accepted and will be marked as 'not submitted' in the final grade.</p> <p>Completing the [IAP] allows students to acquire the following competencies:</p> <ul style="list-style-type: none"> _ General: CG6, CG7 _ Skills and Abilities: CB4, CB5 _ Specific Transversal: CT10, CT16, CT4, CT20, CT28, CT33 _ Specific: CE13, CE15, CE21, CE27 _ English group: CT1 	ACTIVITIES OF EVALUATION DURING THE SEMESTER	50
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Official exam dates for academic year 2024-25

Exam session	Date	Time	Group - Classroom(s) allocated	Comments
(C2) Periodo ordinario para asignaturas de primer semestre	17/01/2025			Teoría
(C4) Pruebas extraordinarias para asignaturas de grado y máster	02/07/2025			Teoría

Academic staff



SIRVENT PEREZ, CESAR DANIEL

Lecturer responsible

TALLER: Groups: 1 , 2


Groups

TALLER

Group	Semester	Morning or afternoon session	Language	No. of enrolled students
Gr. 1 (TALLER) : 1 (ENG)	1S	Afternoon	English	25
Gr. 2 (TALLER) : 2	1S	Morning	Spanish	52

Timetables

TALLER

Group	Start date	End date	Day	Start time	End time	Lecture room
1	09/09/2024	20/12/2024	JUE	15:00	19:00	0039PS014 
2	09/09/2024	20/12/2024	JUE	09:00	13:00	0039PS014 