GUÍAS DOCENTES

Universidad de Jaén

School of Engineering of Jaén

Applied graphic engineering techniques

2024-2025

Grado en Ingeniería de organización industrial (E.P.S. Jaén)
Doble Grado en Ingeniería mecánica e Ingeniería de organización industrial (E.P.S. Jaén)

Acceso Mayores 40
Guías docentes UJA
Horarios de tutorías
Llamamientos PAU
Movilidad (Coordinador)
P.O.D.
Solicitud bilingüismo

Syllabus 2024-25 - 13013015 - Técnicas de ingeniería gráfica aplicadas (Técnicas de ingeniería gráfica aplicadas)

Caption
- Level 1: Tutorial support sessions, materials and exams in this language
- Level 2: Tutorial support sessions, materials, exams and seminars in this language
- Level 3: Tutorial support sessions, materials, exams, seminars and regular lectures in this language

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DEGREE: Grado en Ingeniería de organización industrial (13013015)
FACULTY: SCHOOL OF ENGINEERING OF JAÉN
DEGREE: Doble grado en Ingeniería mecánica e Ingeniería de organización industrial (13813017)
FACULTY: SCHOOL OF ENGINEERING OF JAÉN
ACADEMIC YEAR: 2024-25
COURSE: Técnicas de ingeniería gráfica aplicadas

SYLLABUS

1. COURSE BASIC INFORMATION

NAME: Técnicas de ingeniería gráfica aplicadas
CODE: 13013015 (*) ACADEMIC YEAR: 2024-25
LANGUAGE: English LEVEL: 1
ECTS CREDITS: 6.0 YEAR: 4 SEMESTER: SC

2. LECTURER BASIC INFORMATION

NAME: GALLEGO ÁLVAREZ, FRANCISCO JAVIER
DEPARTMENT: U113 - INGENIERÍA GRÁFICA, DISENO Y PROYECTOS
FIELD OF STUDY: 305 - EXPRESIÓN GRÁFICA EN LA INGENIERÍA
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ORCID: https://orcid.org/0000-0002-1062-4066
LANGUAGE: - LEVEL: 1

3. CONTENT DESCRIPTION

THEORETICAL/PRACTICAL SYLLABUS

SECTION I.- Graphic design and 3D modelling.

Topic 1.- Introduction to industrial design and CAD modelling.

Introduction to industrial design.
Computer Aided Design. Generalities.
Description of the operations for the creation of solids.
Description of surface creation operations.
Description of the operations for the creation of assemblies.

Topic 2. 2D sketches in parametric design.

Drawing 2D entities in flat sketches.
Modification of 2D entities.
Two-dimensional operations of symmetry, displacement, copy, rotation and matrix. Geometric and dimensional constraints.

Topic 3.- Operations in the design of solids.

Extrusion, Revolution. Sweeping.
Multisection, ribbing.
Casting. Boolean operations.

Topic 4.- Assembly of parts. Assembly and mechanism elaboration.

Assembly infrastructure.
Insertion, manipulation and management of components.
Geometric and dimensional constraints in assemblies.

SECTION II.- Drawing and modelling in the field of industrial infrastructures.

Topic 5.- Technical drawings of the project.

The functions and the general characteristics of the technical drawings.
Standardisation and general principles for the representation of elements.
Types of technical drawings and specific characteristics.

Topic 6.- Generation of models and technical drawings by means of 2D CAD.

Model generation. Advanced editing and management operations.
Generation of technical drawings.

Topic 7.- 3D drawing and modelling using BIM tools.

Basic concepts of BIM and MEP.
Graphical interface of BIM software.
Modelling and visualisation tools.
Architectural, structural and facilities modelling (MEP).
Site modelling and georeferencing.
Generation of technical drawings.

4. COURSE DESCRIPTION AND TEACHING METHODOLOGY

Expository and large group classes will be used for the introductory topics, exposition of theory and general examples as well as in the lectures.

Discussion will be generated between students and teacher. In small group classes; During the academic year, a series of scheduled practices will be carried out in the design and computing laboratory related to the subject's syllabus.

These practices will aim, on the one hand, at both two-dimensional and three-dimensional representation in CAD and BIM environments. Likewise, a series of both individual and group exercises will be developed on complementary aspects of the subject with the possibility of exposition by the students of the work developed in them. A continuous evaluation will be carried out through partial tests.

Students with special educational needs should contact the Student Attention Service (Servicio de Atención y Ayudas al Estudiante) in order to receive the appropriate academic support

5. ASSESSMENT METHODOLOGY

Aspect S1: Active participation in class, debates, group work, attendance. Competences to be evaluated: CT1,CT2,CT4,CB1R,CB2R,CB3R,CBB3R,CBB5R,CC9R.

Aspect S2: Mastery of the theoretical-practical operational concepts of the subject. Competences to be evaluated: CT1,CT2,CT4,CB1R,CB2R,CB3R,CBB3R,CBB5R,CC9R.

Aspect S3: Structure and quality of the documentation. Competences to be evaluated: CT1,CT2,CT4,CB1R,CB2R,CB3R,CBB3R,CBB5R,CC9R.

Aspect S4: Correct development of the programmed practices: structure, documentation, planning, standardization. Competences to be evaluated: CT1,CT2,CT4,CB1R,CB2R,CB3R,CBB3R,CBB5R,CC9R.

It will be necessary to pass a grade of 5 points in the final theoretical-practical exam (with a weight of 60% of the final grade) and the positive performance of the individual and group exercises and the scheduled practices on the CAD system. The works and/or practices will be carried out in accordance with the criteria established by the professors, and will have to be delivered within the deadlines established by them (results 62,63,64,65,66,67,68,COPT5R). The weighting of the scheduled practices in the design laboratory and of the individual and group work commissioned will be 30% of the final grade. Attendance to class and participation will be graded with 10% of the final grade. The note of the personal work will be maintained during the calls of the academic year.

6. BOOKLIST (Access the bibliography in the Library catalog)

MAIN BOOKLIST:

- AutoCAD 14 bible. Edition: -. Author: Finkelstein, Ellen. Publisher: IDG Books (Library)
- Autodesk Revit 2017 for architecture no experience required Eric Wing.. Edition: 1st edition. Author: Wing, Eric, author.. Publisher: Sybex (Library)
- Dibujo técnico: normas básicas. Edition: 2ª ed. Author: Asociación Española de Normalización y Certificación, , ed.. Publisher: AENOR (Library)
- Normas UNE sobre dibujo técnico AENOR. Edition: 4ª ed. Author: Asociación Española de Normalización y Certificación, ed. Publisher: AENOR (Library)
- Manual of engineering drawing technical product specification and documentation to British and international standards . Edition: 4th ed. Author: Simmons, C. H. (Colin H.). Publisher: Butterworth Heinemann (Library)
- Technical drawing with engineering graphics . Edition: 16th edition.. Author: Giesecke, Frederick E. (Frederick Ernest), 1869-1953, author.. Publisher: Pearson (Library)

ADDITIONAL BOOKLIST:

- Aprender CATIA v5 con ejercicios : alámbricos y superficies Juan Ribas Lagares. Edition: -. Author: Ribas Lagares, Juan. Publisher: Marcombo (Library)
- Applied CATIA V.5 R15 L. Scott Hansen. Edition: -. Author: Hansen, L. Scott. Publisher: Industrial Press (Library)
- Autodesk Revit 2019 architecture Munir M. Hamad.. Edition: -. Author: Hamad, Munir M., author.. Publisher: Mercury Learning and Information (Library)

7. SUSTAINABLE DEVELOPMENT GOALS

Educación de calidad

DETAILED INFORMATION

Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

Substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship.

8. VIRTUAL / CLASSROOM TEACHING SCENARIO

1) TEACHING METHODOLOGY AND TRAINING ACTIVITIES:

Formation Activities	**Format (Face-to-Face/online)***	**Teaching methodology Description**
A1 - Expository classes in a large group	On-site 100% (*)	Class to all students in the group at the assigned time and classroom. 16 sessions of participatory master classes or seminars, each lasting two hours, held in the classroom
A2 - Small group classes	On-site 100% (**)	Class to all students in the group at the assigned time and classroom. There will be 15 practical sessions carried out in the classroom and broadcast by videoconference to the rest of the group
A3 - Collective tutorials	Online	There will be 1 collective online tutoring session, lasting two hours, for the resolution of general doubts
A3 - Individual tutorials	Face-to-face + Online	Some personalized tutorial sessions will be held in person and others online (synchronous via videoconference and asynchronous via email)

(*) The Center may establish a different percentage of attendance depending on the number of students and capacity of the classroom/laboratory

(**) The Center may establish rotating attendance depending on the number of students and capacity of the classroom/laboratory (class on the schedule and classroom/laboratory assigned to one part of the group and retransmission by videoconference to the rest, with periodic rotation of students, as determined by the Center).

2) EVALUATION SYSTEM::

The evaluation system will continue to be face-to-face. The percentages of the criteria of the face-to-face scenario are preserved:

Ordinary call

Evalutation test	Format	Description	Percentage
Observation and teacher's notes	On-site	Active participation in class	10
Theoretical-practical exam	On-site	Mastery of theoretical and operational knowledge of the subject	60

Realization of Practices and Works, corrected and evaluated by the teacher	On-site	Carrying out practices and assignments, individually or in groups, in a timely manner, assessing the work structure, regulatory and technical rigor and the difficulty of completion. Participation in CAD/BIM practices Realization of handling tests of 3D Computer Aided Design / BIM Software.	30

E **xtraordinary call**

Evaluation test	Format	Description	Percentage
Observation and teacher's notes	On-site	Active participation in class	10
Theoretical-practical exam	On-site	Mastery of theoretical and operational knowledge of the subject	60
Realization of Practices and Works, corrected and evaluated by the teacher	On-site	Carrying out practices and assignments, individually or in groups, in a timely manner, assessing the work structure, regulatory and technical rigor and the difficulty of completion. Participation in CAD/BIM practices Realization of handling tests of 3D Computer Aided Design / BIM Software	30

In the Multimodal Scenario, the evaluation does not change with respect to the Face-to-Face Scenario. The final exam will be face-to-face and will be held on the officially established date.

During the course, a series of individual exercises and scheduled practices will be carried out based on the rotation established by the center on the CAD/BIM system. The works and/or practices will be carried out in accordance with the criteria established by the professors, and will have to be delivered within the deadlines established by them.

3) RESOURCES:

PLATEA virtual teaching platform, Google Meet video conference, Google forms and other resources offered by the University itself.

9. VIRTUAL TEACHING SCENARIO

1) TEACHING METHODOLOGY AND TRAINING ACTIVITIES:

Formation activities	**Format (Face-to-Face/online)***	**Teaching Methodology Description**
A1 - Expository classes in a large group	No presential	The 16 sessions of participatory master classes or seminars, lasting two hours each, are adapted to the synchronous virtual modality through videoconference
A2 - Small group classes	No presential	The 15 practice sessions are adapted to the synchronous virtual modality through videoconference
A3 - Collective tutorials	No presential	There will be 1 collective online tutoring session, lasting two hours, for the resolution of general doubts
A3 - Individual tutorials	No presential	All personalized tutoring sessions will be carried out remotely (synchronous by videoconference and asynchronous by email)

2) EVALUATION SYSTEM:

Face-to-face exams are replaced by activities, tests and works proposed during the teaching period of the subject and the evaluation system becomes Continuous Evaluation. The student will deliver the set of tasks and works carried out electronically, through the PLATEA platform, always within the deadlines and requirements established by the teaching staff. In the Extraordinary call II, the face-to-face exams will be replaced in the same way by activities, tests and works proposed by the teaching staff of the subject. Likewise, the student will deliver the set of tasks and works carried out electronically, through the PLATEA platform, always within the deadlines and requirements established by the teaching staff

Ordinary call

Evaluation test	Format	Description	Percentage
Observation and teacher's notes	Synchronous Online	Active participation in class.	10
Theoretical-practical exams	Synchronous Online	Mastery of theoretical and operational knowledge of the subject. The minimum grade for this test will be 4 points out of 10	60
Realization of Practices and Works, corrected and evaluated by the teacher	Asynchronous Online	arrying out practices and assignments, individually or in groups, in a timely manner, assessing the work structure, regulatory and technical rigor and the difficulty of completion. Participation in C.A.D. practices Realization of handling tests of 3D Computer Aided Design Software	30

Extraordinary Call

Evaluation test	Format	Description	Percentage
Observation and teacher's notes	Synchronous Online	Active participation in class.	10
Theoretical-practical exams	Synchronous Online	Mastery of theoretical and operational knowledge of the subject. The minimum grade for this test will be 4 points out of 10	60
Realization of Practices and Works, corrected and evaluated by the teacher	Asynchronous Online	arrying out practices and assignments, individually or in groups, in a timely manner, assessing the work structure, regulatory and technical rigor and the difficulty of completion. Participation in C.A.D. practices Realization of handling tests of 3D Computer Aided Design Software	30

3) RESOURCES:

PLATEA virtual teaching platform, Google Meet video conference, Google forms and other resources offered by the University itself.

DATA PROTECTION CLAUSE (on line exams)

Institution in charge of data processing: Universidad de Jaén, Campus Las Lagunillas, s/n, 23071 Jaén

Data Protection Delegate: dpo@ujaen.es

Purpose: In accordance with the Universities Law and other national and regional regulations in force, carrying out exams and assessment tests corresponding to the courses students are registered in. In order to avoid frauds while sitting the exam, the exam will be answered using a videoconference system, being able the academic staff of the University of Jaén to compare and contrast the image of the person who is answering the exam with the student's photographic files. Likewise, in order to provide the exam with evidential content for revisions or claims, in accordance with current regulation frameworks, the exam will be recorded and stored.

Legitimacy: compliance with legal obligations (Universities Law) and other national and regional regulations currently in force.

Addressees: service providers who are the owners of the platforms where the exams are carried out and with whom the University of Jaén has signed the corresponding data access contracts.

Storage periods: those established in current in force regulations. In the specific case of exam videoconference recordings, not before the examination records and transcripts are closed or the exam can still be reviewed or challenged.

Rights: you can exercise your right of access, amendment, cancellation, opposition, suppression, limitation and portability by sending a letter to the postal or electronic address indicated above. In the

event that you consider that your rights have been violated, you may submit a complaint to the Andalusian Council for Transparency and Data Protection www.ctpdandalucia.es

CLASS RECORDING CLAUSE PERSONAL DATA PROTECTION

Person in charge: Universidad de Jaén, Paraje Las Lagunillas, s/n; Tel.953 212121; www.ujaen.es

Data protection delegate (DPO): TELEFÓNICA, S.A.U. ; Email: dpo@ujaen.es

Procedure aim: To manage proper recordings of teaching sessions with the aim of facilitating learning process under a multimodal and/or online teaching

Period for record storage: Images will be kept during legal term according to regulations in force

Legitimacy: Data will be managed according to legal regulations (Organic Law 6/2001, December 21, on Universities) and given consent provided by selecting corresponding box in legal admission documents

Data recipients (transfers or assignments): Any person allowed to get access to every teaching modality

Rights: You may exercise your rights of access, rectification, cancellation, portability, limitation of processing, deletion or, where appropriate, opposition. To exercise these rights, you must submit a written request to the Information, Registration and Electronic Administration Service of the University of Jaen at the address above, or by e-mail to the address above. You must specify which of these rights you are requesting to be satisfied and, at the same time, you must attach a photocopy of your ID card or equivalent identification document. In case you act through a representative, legal or voluntary, you must also provide a document that proves this representation and identification. Likewise, if you consider that your right to personal data protection has been violated, you may file a complaint with the Andalusian Data Protection and Transparency Council www.ctpdandalucia.es