Universida_{de}Vigo

IDENTIFYING DATA
Systems for data analysis, simulation and validation

Subject	Systems for data analysis, simulation and validation			
Code	V12G380V01933			
Study programme	Grado en Ingeniería Mecánica			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	4th	1st
Teaching language	Spanish			
Department				
Coordinator				
Lecturers				
E-mail				
Web	http://moovi.uvigo.gal/			
General description	Design, calculation and analysis of elements of machines			

Skills

Code	
B1	CG1 Skills for writing, signing and developing projects in the field of industrial engineering, whose purpose, specializing in Mechanics, construction, alteration, repair, maintenance, demolition, manufacturing, installation, assembly or operation of: structures, mechanical equipments, energy facilities, electrical systems and electronic installations and industrial plants, and manufacturing processes and automation.
B3	CG3 Knowledge in basic and technological subjects that will enable students to learn new methods and theories, and provide them the versatility to adapt to new situations.
B4	CG4 Ability to solve problems with initiative, decision making, creativity, critical thinking and the ability to communicate and transmit knowledge and skills in the field of industrial engineering in Mechanical specialty.
C19	CE19 Knowledge and skills to apply the techniques of engineering graphics.
C20	CE20 Knowledge and abilities to calculate, design and test machines.
D2	CT2 Problems resolution.
D9	CT9 Apply knowledge.
D10	CT10 Self learning and work.
D17	CT17 Working as a team.

Learning outcomes

Expected results from this subject	Training and Learning Results		
Know and apply the computational technicians of simulation to the mechanical design.	B1	C19	D2
Know and apply the computational technicians for the classical calculation of design of machines.	B3	C20	D9
Know and apply the computational technicians of numerical analysis in the design of machines.	B4		D10
			D17

Contents

Topic	
Presentation of the matter	-Introduction to the matter, planning and evaluation -previous Knowledges: design of machines; theory of mechanisms; materials
Static and dynamic calculation	-Definition and context -theoretical Calculation -Software of calculation (SolidWorks)

Gears	-Definition and context
	-Theoretical calculation
	-Software of calculation (KISSsoft)
	-Selection of commercial elements from catalogue
Gearboxes	-Definition and context
	-Theoretical calculation and real examples
	-Selection of commercial elements from catalogue
Axes and trees	-Definition and context
	-Theoretical calculation
	-Design of detail (SolidWorks)
	-Software of calculation (KISSsoft)
	-Calculation of unions axis-cube (KISSsoft)
	-Elemementos of axial positioning and selection according to norm
Bearings	-Definition and context
	-theoretical Calculation
	-Software of calculation (KISSsoft and online tools)
	-Selection of commercial elements from catalogue
	-Tolerances of manufacturer according to catalogue
Tolerances of elements of machine	-Dimensional and geometrical tolerances
	-Interpretation of planes of manufacture and setting
Advanced design and integration in machinery	-Pneumatic systems: linear, rotatory and vacuum (tool of on-line calculation)
	-Design and import of elements of machine according to catalogues of manufacturer
	-Module of sheet and welding (SolidWorks)
	-Calculation of pieces and conjoint (SolidWorks)

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	14.5	10	24.5
Problem and/or exercise solving	4	10	14
Laboratory practice	30	40	70
Project	1.5	40	41.5

*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies

	Description
Lecturing	Exhibition of subjects of the subject
	Approach and resolution of practical and real exercises
	Utilisation of software for design and calculation (SolidWorks and KISSsoft)

Personalized assistance

Tests	Description
Problem and/or exercise solving	Personalised attention to the pupil for the resolution of problems and/or exercises proposed.
Project	Personalised attention to the pupil to solve the doubts arisen developing of the works and projects

Assessment

	Description	Qualification	Training and Learning Results		
Problem and/or exercise solving	Resolution of exercises and theoretical short questions and of reasoning	40	B1 B3 B4	C19 C20	D2 D9 D10
Laboratory practice	Questions about the exercises made in the practices of laboratory	10	B3 B4	C19 C20	D2 D9 D10 D17
Project	Resolution of a realistic case proposed.	50	B4		D2 D9 D10 D17

Other comments on the Evaluation

The subject will approve if it obtains an equal qualification or elder that a 5 like final note. For this:

- Exam (40+10%): resolution of exercises and answers to short questions of the contents of theory and practical where it is pretended to evaluate the theoretical knowledges and his application to the resolution of short problems
- Project (50%): realisation of a project in group in where are assesed the capacities of design and calculation with SolidWorks, calculation of elements of machine with KISSsoft, preparation of planes, capacity to relate between himself the different elements that conform a machine, and the capacity to select commercial elements in function of the solution contributed

In any case is necessary to obtain 30% in each one of the three sections exposed previously to approve the subject. Ethical commitment: it expects that the present student a suitable ethical behaviour. In the case to detect a no ethical behaviour (copy, plagiarism, utilisation of unauthorised electronic devices, and others) considers that the student does not gather the necessary requirements to surpass the matter. In this case the global qualification in the current academic course will be of suspense (0.0).

Will not allow the utilisation of any electronic device during the proofs of evaluation except permission expresses. The fact to enter an unauthorised electronic device in the classroom of examination will be considered reason of no *superación of the matter in the present academic course and the global qualification will be of suspense (0.0).

Sources of information

Basic Bibliography
varios autores, **Diseño en Ingeniería Mecánica de Shigley**, 0, McGraw-Hill, 0

Complementary Bibliography
Norton, R., **Diseño de Máquinas**, Pearson, 2000

Mott, R.L., **Diseño de elementos de máquinas**, 0, Pearson, 2006

Larburu, N., **Máquinas prontuario. Técnicas, máquinas, herramientas**, Paraninfo, 1989

Recommendations

Subjects that are recommended to be taken simultaneously
Technical Office/V12G380V01701

Subjects that it is recommended to have taken before
Graphic expression: Graphic expression/V12G380V01101

Resistance of materials/V12G380V01402

Mechanism and machine theory/V12G380V01306

Machine design I/V12G380V01304

Theory of structures and industrial constructions/V12G380V01603

Other comments
The students that want to *cursar these two subjects will have to show sufficient basic knowledges of the reality of the engineering of machines.

Said sufficiency will consider achieved having worked the contents of the following matters:

- Graphic expression
- Resistance of material
- Theory of machines and mechanisms
- Design of machines I
- Theory of structures and industrial constructions

Therefore it would be recommended to have *cursado said matters of previous form in the inferior courses to take advantage of the matter with guarantee.

In case of discrepancies will prevail the version in Spanish of this guide.