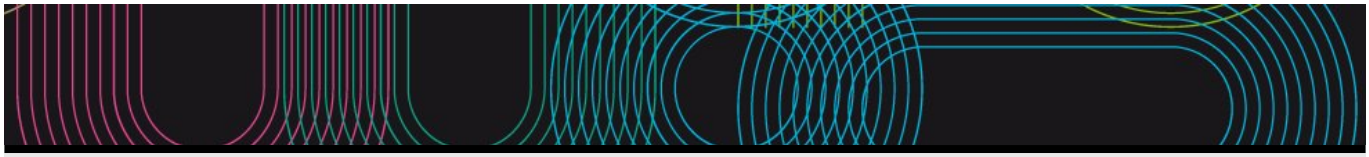

IDENTIFYING DATA				
Manufacturing engineering and dimensional quality				
Subject	Manufacturing engineering and dimensional quality			
Code	V12G380V01604			
Study programme	Degree in Mechanical Engineering			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	3rd	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	Peláez Lourido, Gustavo Carlos			
Lecturers	Areal Alonso, Juan José Hernández Martín, Primo Peláez Lourido, Gustavo Carlos			
E-mail	gupelaez@uvigo.es			
Web	http://faitic.uvigo.es			
General description	First subject of non-generalist curricular content of a student of UVigo in the school of industrial engineering within the degree in mechanical engineering in the area of engineering of manufacturing processes. English Friendly			

Competencies	
Code	
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.
B8	CG8 Ability to apply the principles and methods of quality.
C26	CE26 Applied knowledge of systems and manufacturing processes, metrology and quality control.
D2	CT2 Problems resolution.
D8	CT8 Decision making.
D9	CT9 Apply knowledge.
D10	CT10 Self learning and work.
D17	CT17 Working as a team.
D20	CT20 Ability to communicate with people not expert in the field.

Learning outcomes			
Expected results from this subject	Training and Learning Results		
(*)	B3		D2 D8 D9 D10 D17 D20
New	B3		D2 D8 D9 D10 D20
New	B3 B8	C26	D2 D8 D9 D10 D20

New	B3 B8	C26	D8 D9 D10
New	B3 B8	C26	D2 D8 D9 D10 D17 D20

Contents	
Topic	
0.- Introduction	1. Introduction to the Industrial Production
1.- Manufacturing Engineering	2. Modelling and simulation of processes of mechanical manufacture 3. Analysis, implantation and optimisation of shaping processes 4. Lines and Systems of Mechanical manufacture and its simulation: CAM Systems Transfer Systems . Productio Lines, Manufactruing Flexible Cell & Systems. Integrated Manufacturing. 5. Process Planning: Analysis of the design drawings. Selection of processes and determination of the manufacturing sequence. Process plan definition. Technological management of manufacturing.
2.- Dimensional Quality	6. The field of dimensional metrology. Precision in industry. Measurement errors. Measuring chains 7. Mechanical Manufacturing inspection and verification systems, machines and equipment. 8. Modelling and measurement of surface quality 9. Calibration. The metrological organization. Measurement uncertainty. Traceability and dissemination. Calibration Plan. 10. Statistical control of the process. Graphs of control by variables. Graphs of control by attributes. Machine and process capacity. 11. Quality of measurements in industry. Measurement quality evaluation. Tools and techniques to evaluate dimensional quality and its costs. 12. Techniques and metrological systems. Legal and industrial metrology.

Planning			
	Class hours	Hours outside the classroom	Total hours
Laboratory practical	6	3	9
Computer practices	12	6	18
Lecturing	30	60	90
Objective questions exam	1	10	11
Practices report	0	5.5	5.5
Problem and/or exercise solving	1.5	15	16.5
*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.			

Methodologies	
	Description
Laboratory practical	The practical laboratory classes will be carried out in groups of 20 students maximum, and using the available resources of machines, equipment and instruments, combined with simulations and analysis carried out by computer within the practices in computer classrooms. Note: Due to the budget allocated to the area of manufacturing process engineering, laboratory practices may have to be replaced by slate problem solving classes if there are not sufficient or adequate means.
Computer practices	The practices in computer rooms will be carried out in groups of 20 students maximum and using the available resources of equipment and software, combining them with the workshop experiences of the laboratory practices. Note: If the request for renewal of the "Production Module" software is not met due to lack of budget, the practices related to this software may be replaced by problem solving classes on the blackboard. Translated with www.DeepL.com/Translator
Lecturing	Theoretical classes will be given combining whiteboard explanations with the use of slides, videos and computer presentations. The objective is to complement the content of the notes, interpreting the concepts exposed in them through the representation of examples and exercises.

Personalized assistance

Methodologies	Description
Laboratory practical	The development of each practice is individually monitored, checking that the expected achievements are adequate in each execution phase so that the evolution in learning is structured. The deliverables are evaluated individually and the student is informed, where appropriate, of the shortcomings and needs for rectification of the documents or files requested.
Computer practices	The development of each practice is individually monitored, checking that the expected achievements are adequate in each execution phase so that the evolution in learning is structured. The deliverables are evaluated individually and the student is informed, where appropriate, of the shortcomings and needs for rectification of the documents or files requested.
Tests	**Description**
Objective questions exam	The competencies acquired are evaluated through a multiple-choice test, described in detail in the evaluation section
Practices report	The deliverables are evaluated individually and the student is informed, where appropriate, of the shortcomings and needs for rectification of the documents or files requested.
Problem and/or exercise solving	The competencies acquired are evaluated individually through a written test of problem solving and/or exercises, described in the section of evaluation.

Assessment

	Description	Qualification	Training and Learning Results		
Objective questions exam	(*)Esta proba valora os coñecementos adquiridos nas clases de aula e de prácticas e o traballo persoal do alumno a estas asociado. Resultados de aprendizaxe: - Coñecer a base tecnolóxica e aspectos básicos dos procesos de fabricación. - Comprender os aspectos básicos dos sistemas de fabricación - Adquirir habilidades para a selección de procesos de fabricación e elaboración da planificación de fabricación - Aplicación de tecnoloxías CAQ	25	B3 B8	C26	D2 D8 D9 D10 D17 D20
Practices report	(*)Os informes ou memorias de prácticas servirán para a avaliación, só se o alumno opta pola avaliación continua e, sempre que sexa na primeira convocatoria, tal como explícase na sección outros comentarios. Resultados de aprendizaxe: - Adquirir habilidades para a selección de procesos de fabricación e elaboración da planificación de fabricación - Desenvolver habilidades para a fabricación de conxuntos e elementos en contornas CADCAM - Aplicación de tecnoloxías CAQ	20	B3 B8	C26	D2 D8 D9 D10 D17 D20
Problem and/or exercise solving	(*)Probas obxectivas de avaliación do proceso de aprendizaxe a través da formulación de problemas e/ou exercicios de aplicación para que o estudante desenvolva de forma teórico-práctica solucións adecuadas a cada problema e/ou exercicio exposto. Resultdos do parendizaxe: - Coñecer a base tecnolóxica e aspectos básicos dos procesos de fabricación - Adquirir habilidades para a selección de procesos de fabricación e elaboración da planificación de fabricación Aplicación de tecnoloxías CAQ	55	B3 B8	C26	D2 D8 D9 D10 D17 D20

Other comments on the Evaluation

Ethical commitment: The student is expected to exhibit appropriate ethical behavior. If unethical behavior is detected (copying, plagiarism, use of unauthorized electronic devices, for example), the student will not be considered to meet the requirements necessary to pass the subject. In this case, the overall grade for the current academic year will be a fail (0.0).The use of any electronic device will not be allowed during the evaluation tests unless expressly authorized. The fact of introducing an unauthorized electronic device in the examination room will be considered as a reason for not passing the subject in the present academic year and the overall grade will be of fail (0.0).

FIRST CALL:

Students can choose between two evaluation systems:

A. Without Continuous Assessment The assessment is based on a Final Exam consisting of two parts (a+b):

a. Test of up to 20 questions, which can be both classroom teaching and practice. The test will be made up of multiple choice and single answer questions in which each wrong answer subtracts the probability of guessing (i.e. if there are four possible answers, the error would subtract 1/4 from the value of the question). The value of the test is 35% of the test.

b.- Problems and/or exercises that can be both classroom teaching and practical. The value of this part of the exam is 65%.

B. Continuous Evaluation. It consists of two parts:

a.- Examination (8 points out of 10 of the total of the subject) that consists of two parts:

Questionnaire Test (2,5) points out of 8 of the total of the examination) of a maximum of 20 questions, which may be from the part of classroom teaching or practice. The test questions may include closed-ended questions with different alternative answers (true/false, multiple choice, pairing of elements,...). Each wrong answer of the test will subtract the probability of right (i.e. if there are four possible answers and a single answer would subtract 1/4 of the value of the question, and in an equivalent way to the other types of questions of the test).

Problem solving and/or exercises (5.5 points out of 8 of the total of the exam), which may be from the classroom teaching or practice part.
b.- Justification of Practices through memory or report (2 points out of 10 of the total of the subject) To pass the subject a minimum grade of 40% must be obtained in each evaluable part, that is to say: For case A: a minimum of 4 must be obtained in the test as well as in the part of problems if each one of those parts of the exam is evaluated on 10. If this minimum is not passed in each part, the student will not be able to obtain more than 4.9 in the final overall grade. For case B: a minimum grade of 4 must be obtained in each of the three evaluable parts: practices, test and problems/exercises. If the student does not reach the minimum of 4 out of 10 in each evaluable part he will not be able to obtain more than 4.9 in the global final grade of all the subject.

SECOND AND SUBSEQUENT CALLS: In the second call and in subsequent calls, in this latter case in which the teaching given in the immediately preceding course is evaluated, the Evaluation System is limited only to option A of those explained in the case of First Call. In no case will any part of the subject or content evaluated in previous courses be recognized.

Sources of information

Basic Bibliography

Serope Kalpakjian, Steven R. Schmid, **Manufactura, ingeniería y tecnología**, 7ª, Pearson Education, 2014

Complementary Bibliography

Alting, Leo, **Procesos para Ingeniería de Manufactura**, 1ª, Alfaomega, 1990
Todd, Robert H., **Fundamental principles of manufacturing processes**, 1ª, Industrial Press, 1994
Pfeifer, Tilo, **Manual de gestión e ingeniería de la calidad**, 1ª ed. español, Mira Editores, 1999
Barrentine, Larry, **Concepts for R&R studies**, 2nd., ASQ Quality Press, 2003
William F. Hosford and Robert M. Caddell, **Metal forming : mechanics and metallurgy**, 2nd., Prentice Hall, 1993

Recommendations

Subjects that continue the syllabus

Materials and technologies in mechanical manufacturing/V12G380V01912
Materials selection, tools and manufacturing resources/V12G380V01932
Advanced manufacturing technologies/V12G380V01935

Subjects that it is recommended to have taken before

Graphic expression: Graphic expression/V12G380V01101
Fundamentals of manufacturing systems and technologies/V12G380V01305
Resistance of materials/V12G380V01402

Other comments

Use of FAITIC for the follow-up of the Continuous Evaluation.
Communications with students will be made through the Faitic Remote Teaching Platform, so it is necessary for the student to access the subject space on the platform prior to the start of teaching. Before carrying out the practices for carrying out the practices, problem solving and/or exercises, it is recommended to consult the FAITIC Platform in order to have regulations, manuals or any other necessary material that should specifically be used and/or allowed.

The student who accedes to third of the degree of mechanics, and concretely to this matter, should at this level have minimum capacity for:
- Use measurement instruments and dimensional verification in the laboratory/workshop.

- Use statistics in Quality Control.
- To delimit and define tolerances in an adequate and precise way to mechanical elements.
- Representation of basic parts and assemblies by means of 3D CAD
- Use and know the manual machine tools and their basic operations.
- Elborar basic NC programs on lathe and milling machine, and select the tools.
- Plan machining, deformation and welding processes to produce basic parts and/or assemblies.
- Apply the theory of Elasticity and know how to represent stress states through Mohr circles.

If the student accesses without these competences, he will not be able to have an optimal learning process and he will need a longer time for the acquisition and updating in his capacities so that the final formation is the expected one.

In order to enroll in this subject it is necessary to have passed or to be enrolled in all the subjects of the courses lower than the course in which this subject is located.