



IDENTIFYING DATA

(*)Instalacións e procesos de obtención de materiais metálicos

Subject	(*)Instalacións e procesos de obtención de materiais metálicos			
Code	V09G310V01523			
Study programme	(*)Grao en Enxeñaría dos Recursos Mineiros e Enerxéticos			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Optional	3rd	1st
Teaching language	Spanish			
Department				
Coordinator	Cabeza Simo, Marta María			
Lecturers	Cabeza Simo, Marta María			
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Web				
General description				

Competencies

Code	
A37	(*)CEMM2 Metalurxia e tratamento de concentrados minerais, metais e aliaxes: industria metalúrxica férrea e non férrea, aliaxes especiais, ensaios metalotécnicos, etc.
A38	(*)CEMM3 Composición, estruturas, propiedade e aplicacións dos materiais xeolóxicos metalúrxicos.
B1	(*)CG1 Capacidade de interrelacionar todos os coñecementos adquiridos, interpretándoos como compoñentes dun corpo do saber cunha estrutura clara e unha forte coherencia interna.
B2	(*)CG2 Capacidade de desenvolver un proxecto completo en calquera campo desta enxeñaría, combinando de forma adecuada os coñecementos adquiridos, accedendo ás fontes de información necesarias, realizando as consultas precisas e integrándose en equipos de traballo interdisciplinar.
B3	(*)CG3 Propoñer e desenvolver solucións prácticas, utilizando os coñecementos teóricos, a fenómenos e situacións-problema da realidade cotiá propios da enxeñaría, desenvolvendo as estratexias adecuadas.
B4	(*)CG4 Favorecer o traballo cooperativo, as capacidades de comunicación, organización, planificación e aceptación de responsabilidades nun ambiente de traballo multilingüe e multidisciplinar, que favoreza a educación para a igualdade, para a paz e para o respecto dos dereitos fundamentais.
B5	(*)CG5 Coñecer as fontes necesarias para dispoñer dunha actualización permanente e continua de toda a información precisa para desenvolver o seu labor, accedendo a todas as ferramentas, actuais e futuras, de busca de información e adaptándose aos cambios tecnolóxicos e sociais.
B6	(*)CG6 Coñecer e manexar a lexislación aplicable ao sector, coñecer o medio social e empresarial e saber relacionarse coa administración competente integrando este coñecemento na elaboración de proxectos de enxeñaría e no desenvolvemento de calquera dos aspectos do seu labor profesional.
B7	(*)CG7 Capacidade para organizar, interpretar, assimilar, elaborar e xestionar toda a información necesaria para desenvolver o seu labor, manexando as ferramentas informáticas, matemáticas, físicas, etc. necesarias para iso.
B8	(*)CG8 Concibir a enxeñaría nun marco de desenvolvemento sostible con sensibilidade cara temas ambientais.
B9	(*)CG9 Entender a transcendencia dos aspectos relacionados coa seguridade e saber transmitirle esta sensibilidade ás persoas do seu ámbito.
B10	(*)CG10 Tomar conciencia da necesidade dunha formación e mellora continua de calidade, desenvolvendo valores propios da dinámica do pensamento científico, mostrando unha actitude flexible, aberta e ética ante opinións ou situacións diversas, en particular en materia de non discriminación por sexo, raza ou relixión, respecto aos dereitos fundamentais, accesibilidade, etc.

Learning aims

Expected results from this subject	Training and Learning Results	
(*)	A37 A38	
(*)		B1 B2 B3 B4 B5 B6 B7 B8 B9 B10

Contents

Topic	
The Extraction of the Metals.	Generalities and historical evolution: metallurgical Processes. Ores and Metals
Previous operations.	Basic operations of concentration. Calcination. Roasting Agglomeration of raw materials
Pirometalurgy	Physical bases-chemical of fusion operations. Fusion of oxides and sulphides. Slags, refractory and Furnaces Refine operations Pyrometalurgy of Copper
Steelmaking	Introduction and raw materials. Obtaining of pig iron Obtaining of steel from pig iron. Refine operations Casting
Hidrometalurgy	Physical and chemical principles of the hidrometalurgical processes Stages of the hidrometalurgical process Leaching technology Purificación and concentration of the garge licour Recovery of the metal Application of the hidrometalurgy to the metal extraction: Obtaining of gold, uranium, copper, zinc. Bayer Process
Electrometalurgy	Physical and chemical principles, and parameters. Electrolytic recovery. electrolytic refine Hall- Heroult Process
Environmental impact, evaluation and correction.	Pirometalurgy (Concentration of gases in smokes) Hidrometalurgy Standarts

Planning

	Class hours	Hours outside the classroom	Total hours
Introductory activities	0.5	0	0.5
Master Session	27.5	41.25	68.75
Laboratory practises	3	0	3
Troubleshooting and / or exercises	12	12	24
Forum Index	0	3	3
Autonomous troubleshooting and / or exercises	0	15	15
Practice in computer rooms	4	0.75	4.75
Integrated methodologies	0	15	15
Outdoor study / field practices	5	0	5
Autonomous practices through ICT	0	6	6
Reports / memories of practice	0	1	1
Reports / memories of internships or practicum	0	2	2

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

Methodologies	
	Description
Introductory activities	It includes here the introduction to the subject, program, methodologies employed to reach the aims fixed and the evaluation way Bibliography
Master Session	Exhibition by part of the professor of the complexes contentof the subject, as well as the theoretical bases and guidelines of work. It will be participatory classes. Peer Instruction.
Laboratory practises	To level of laboratory will analyse some of the chemical bases of the metallurgical processes.
Troubleshooting and / or exercises	Exercies and problems in class. They will be solve by the students with help of the professor.
Forum Index	Discusion by ICT.
Autonomous troubleshooting and / or exercises	The student will solve at home some exercices.
Practice in computer rooms	Use of a compute program. The program have some examples of metallurgy thermodynamic. They will have to solve some cases in the computer laboratory
Integrated methodologies	Here they will do groups LBP (learning based in projects). They will have to do a web page to describe a recovery metal process .
Outdoor study / field practices	Visit to a Metallurgical plant
Autonomous practices through ICT	Several exercices and questions to solve at web page of the subject.

Personalized attention

Methodologies	Description
Forum Index	The proffesor will help the student by the network or in schedule of tution to solve some problem in the methodologies employed.
Autonomous troubleshooting and / or exercises	The proffesor will help the student by the network or in schedule of tution to solve some problem in the methodologies employed.
Integrated methodologies	The proffesor will help the student by the network or in schedule of tution to solve some problem in the methodologies employed.

Assessment

	Description	Qualification
Master Session	2 parcial controls during the master sesion. They will not be eliminatory. The two together will be 10% of the mark, the rest until 30% will be in the date of the final examination	30
Troubleshooting and / or exercises	In the date of the examination will realise an assessment of the problems realised during the course.	25
Forum Index	(*)Participación no foro.	3
Autonomous troubleshooting and / or exercises	They will have to do some exercices during the course as homework.	10
Practice in computer rooms	In the examination will do a small simple question of the computer program.	5
Integrated methodologies	Assessment by the professor 5% Assessment by the others groups 5% Assessment of each student to the members of his group 5%	15
Autonomous practices through ICT	Questions in the web platform TEMA	5
Reports / memories of practice	Individual report of the practices at the laboratory	2
Reports / memories of internships or practicum	Report of the visit the plant.	5

Other comments on the Evaluation

The above qualification is only for January opportunity. The exam in July has two parts: theory (50%) and practice (50%).

Exams datas:

8/01/2014 First opportunity

23/06/2014 Second opportunity

Sources of information

Ballester,A., Verdeja, L.F. , Sancho, J.,, **Metalurgia Extractiva Volumen 1 - Fundamentos.**, 1,
Rosenqvist, T.,, **Fundamentos de Metalurgia Extractiva**, Limusa,
UNESID (Unión de Empresas Siderúrgicas)., **La fabricación del Acero**.,

Recommendations

Subjects that are recommended to be taken simultaneously

(*)Degradación e reciclaxe de materiais/V09G310V01624
(*)Tratamento e conformado de materiais/V09G310V01522

Subjects that it is recommended to have taken before

(*)Física: Física I/V09G310V01102
(*)Química/V09G310V01105
(*)Física: Sistemas térmicos/V09G310V01302
(*)Seguridade e saúde/V09G310V01403
(*)Mineralurxia/V09G310V01521
