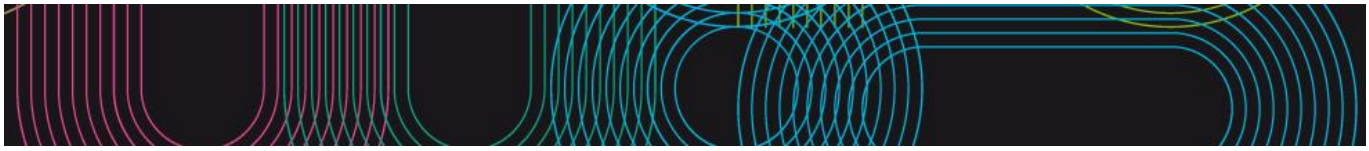
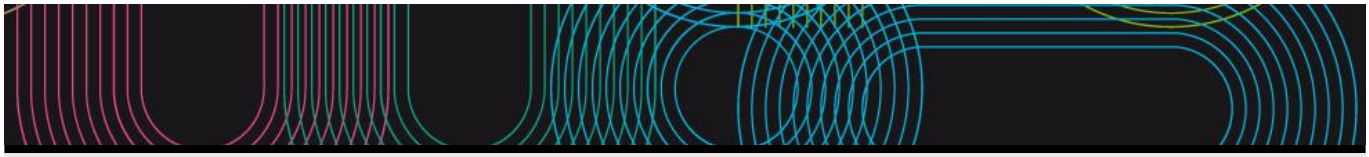


| TABLA DE ERROS | |
|---|---|
| **Lugar do erro** | **Descrición** |
| Apartado de titulación 'Address' | Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20200722-175343/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 223]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=32&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found |
| Apartado de titulación 'Address' | Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20200722-175343/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 231]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=32&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found |
| Apartado de titulación 'Address' | Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20200722-175343/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 223]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=31&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found |
| Apartado de titulación 'Address' | Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20200722-175343/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 231]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=31&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found |
| Apartado de titulación 'Additional information' | Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20200722-175343/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 223]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=36&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found |
| Apartado de titulación 'Additional information' | Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20200722-175343/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 231]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=36&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found |
| Apartado de titulación 'Additional information' | Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20200722-175343/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 223]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=34&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found |
| Apartado de titulación 'Additional information' | Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20200722-175343/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 231]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=34&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found |
| Apartado de titulación 'Additional information' | Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20200722-175343/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 223]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=33&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found |
| Apartado de titulación 'Additional information' | Erro de PHP [Warning, script: /var/www/releases/docnet/docnet-20200722-175343/vendor/mpdf/mpdf/src/Image/ImageProcessor.php, liña: 231]: fopen(https://seix.uvigo.es/docnet_2.2/docencia/admin/fitxer.php?carpeta=fotos_ensenyaments&fitxer=33&nom_any_academic=2010_11) [function.fopen0]: failed to open stream: HTTP request failed! HTTP/1.1 404 Not Found |



# (*)Escola de Enxeñaría Forestal

## Presentation

Welcome to the Forestry Faculty (Campus of Pontevedra - University of Vigo). Detailes information about our faculty can be found in http://www.forestales.uvigo.es

Our faculty offers the Degree in Forest Engineering

The Degree comprises 240 credits ECTS  during four years, maaning an annual distribution of 60 ECTS distributed in 30 ECTS per semester.

## Address

1. Name: Forestry Technical School
2. Degree: Degree in Forestry
3. Postal address: Campus A Xunqueira, 36005 Pontevedra
4. Telephone: 986-801900
5. FAX: 986-801907
6. And-mail: sdeuetf@uvigo.es
7. Web:  http://www.forestales.uvigo.es

## Faculty Management

**Managerial team:**

Director:  D. Enrique Valero Gutiérrez del Olmo

Deputy director:  Dª. Angeles Cancela Carral

Secretary:  D. Juan Picos Martín

**Governing bodies:**

- Faculty Assembly

- Commissions:

- Permanent
- Economic Affairs
- Academic Affairs
- Credit Validation
- Quality

**Departments  in the Centre:**

**(*)Servizo e Infrastructuras do Centro**

(*)

1. Administración: o horario de atención ao público de secretaría é de 9:00 a 14:00 horas.
2. Bibliotecas: http://www.uvigo.es/uvigo_gl/Administracion/Biblioteca/directorio/campus_pontevedra.html
3. Conserxaría: A conserxaría do Centro permanece aberta desde a apertura ao peche do Centro, en dúas quendas: 8:00 a 15:00 horas, e 15:00 a 22:00.
4. Reprografía: Este servizo atópase na Facultade de CC. Sociais e cobre as necesidades do Campus.
5. Cafetería
6. Administrador de Centros
7. Área de Servizos á Comunidade
8. Rexistro
9. LERD
10. Bolsas
11. CAP
12. OSIX

### Aulas e laboratorios:

**Aulas docentes:**

| AULA | Nº DE POSTOS TOTAIS | Nº DE POSTOS EN DISPOSICIÓN DE EXAME |
|---|---|---|
| 1 | 65 | 35 |
| 2 | 65 | 35 |
| 3 | 65 | 35 |
| 4 | 98 | 53 |
| 5 | 104 | 56 |
| 6 | 104 | 56 |
| 7 | 104 | 56 |
| 8 | 104 | 56 |
| 9 | 104 | 56 |
| **SUMA** | **813** | **438** |

**Laboratorios e talleres:**

| ANDAR | LABORATORIO | DOCENTE | | INVEST. | |
|---|---|---|---|---|---|
| | | Superficie | Capacidad Persoas | Superficie | Capac. Persoas |
| Soto | Lab. Hidráulica e Hidroloxía Forestal | 115, 83 $m^2$ | 16 | 35,67 $m^2$ | 3 |
| Soto | Lab. Enxeñería Mecánica /Lab. Termotecnia | 110, 17 $m^2$ | 16 | NO | No |
| Soto | Celulosa Pasta e Papel | 72,04 $m^2$ | 15 | 35,67 $m^2$ | 3 |
| Soto | Taller Enerxías Xiloxeneneradas | 171,51 $m^2$ | 25 | 2º Andar | 2º Andar |
| Soto | Taller de Madeiras | 342,11$m^2$ | 35 | NO | NO |
| P.Baixa | Aula Informática (1) | 108,85 $m^2$ | 24 | NO | |
| P.Baixa | Aula Informática (2) | 107,34 $m^2$ | 24 | NO | |
| P.Baixa | Expresión Gráfica | 168,45 $m^2$ | 48 | NO | |
| P.Baixa | Proxectos | 95,00 $m^2$ | | 6 | |
| 1º | Lab. Física | 112,54 $m^2$ | 16 | 35,67 $m^2$ | 4 |
| 1º | Lab. Ecoloxía | 109,41 $m^2$ | 30 | 36,61 $m^2$ | 4 |
| 1º | Lab. Enxeñería do Medio Ambiente | NO | NO | 34,54 $m^2$ | 4 |
| 1º | Lab. Topografía | 117,57 $m^2$ | 40 | 36,75 $m^2$ | 2 |
| 1º | Lab. Edafoloxía | 109,98 $m^2$ | 16 | 27,40 $m^2$ | 7 |
| 2º | Lab. Silvicultura e Repoboación | 109,60 $m^2$ | 16 | | |
| 2º | Lab. Enerxías Xiloxeneneradas | Soto | Soto | 36,61 $m^2$ | 4 |
| 2º | Lab. Incendios Forestais | 112,11 $m^2$ | 17 | 34,54 $m^2$ | 5 |
| 2º | Lab. Producción Vexetal | 117,57 $m^2$ | 24 | 36,75 $m^2$ | 4 |
| 2º | Lab. de Acuicultura | 112,54 $m^2$ | pendente | NO | NO |

| | | | | | |
|---|---|---|---|---|---|
| 2º | Lab. Enxeñería Eléctrica | 110,73 $m^2$ | 21 | NO | NO |
| 2º | Lab. Enxeñería Química | 109,98 $m^2$ | 15 | 27,40 $m^2$ | 6 |

## Additional information

**STUDENTS OFFICE**:

Number tfno.: 986 801913

And-mail: daeuetf@uvigo.es

## Main Regulations

Rules of interest for the students; we indicate the links where the student can find information of his interest:

**Specific rules of the University of Vigo: www.uvigo.es**

http://www.uvigo.es/uvigo_gl/administración/servicioalumnado

http://extension.uvigo.es

http://webs.uvigo.es/vicoap/normativa_oa.gl.htm

http://www.uvigo.es/uvigo_gl/estudiostitulaciones

http://www.uvigo.es/uvigo_gl/vidauniversitaria/calendarioescolar

http://www.uvigo.es/uvigo_gl/vidauniversitaria/universidadvirtual

http://secxeral.uvigo.es/secxeral_gl/normativa/normativauniversidad/estudaintes/regulamento_estudantes.html

http://www.uvigo.es/uvigo_gl/vidauniversitaria/normativa

**http://www.forestales.uvigo.es**

## Other Information

- **Study Plan: http://www.forestales.uvigo.es**
- **Scholarships: http://193.146.32.123:8080/GestorBecas/user/Becas.do?accion=tiposList**
- **Medical assistance: http://www.uvigo.es/uvigo_gl/vidauniversitaria/salud/centromedico/**
- **Employment Office : http://emprego.uvigo.es/**
- **Canteens and accommodation: http://www.uvigo.es/uvigo_gl/vidauniversitaria/comedores_aloxamento/**
- **Other activities:**

  **http://www.campuspontevedra.uvigo.es/index.php?*id=14 (Sports in the Campus of Pontevedra)**

  **http://deportes.uvigo.es/index.asp (Sport Services).**

  **http://extension.uvigo.es/**

# (*)Grao en Enxeñaría Forestal

## Subjects

**Year 1st**

| Code | Name | Quadmester | Total Cr. |
|---|---|---|---|
| P03G370V01101 | Expresión gráfica: Expresión gráfica e cartografía | 1st | 9 |
| P03G370V01102 | Física: Física I | 1st | 6 |
| P03G370V01103 | Matemáticas: Matemáticas e informática | 1st | 9 |
| P03G370V01104 | Fundamentos de economía da empresa | 1st | 6 |
| P03G370V01201 | Bioloxía: Bioloxía vexetal | 2nd | 6 |
| P03G370V01202 | Física: Física II | 2nd | 6 |
| P03G370V01203 | Matemáticas: Ampliación de matemáticas | 2nd | 9 |
| P03G370V01204 | Química: Química | 2nd | 9 |

**Year 2nd**

| Code | Name | Quadmester | Total Cr. |
|---|---|---|---|
| P03G370V01301 | Matemáticas: Estatística | 1st | 6 |
| P03G370V01302 | Edafoloxía | 1st | 6 |
| P03G370V01303 | Botánica | 1st | 6 |
| P03G370V01304 | Electrotecnia e electrificación rural | 1st | 6 |
| P03G370V01305 | Zooloxía e entomoloxía forestal | 1st | 6 |
| P03G370V01401 | Selvicultura | 2nd | 6 |
| P03G370V01402 | Ecoloxía forestal | 2nd | 6 |
| P03G370V01403 | Topografía, teledetección e sistemas de información xeográfica | 2nd | 9 |
| P03G370V01404 | Hidráulica | 2nd | 9 |

**Year 3rd**

| Code | Name | Quadmester | Total Cr. |
|---|---|---|---|
| P03G370V01501 | Construcións forestais | 1st | 6 |
| P03G370V01502 | Maquinaria forestal | 1st | 6 |
| P03G370V01503 | Proxectos | 1st | 6 |
| P03G370V01504 | Impacto ambiental | 1st | 6 |
| P03G370V01505 | Lexislación e certificación forestal | 1st | 6 |
| P03G370V01601 | Aproveitamentos forestais | 2nd | 6 |
| P03G370V01602 | Dasometría | 2nd | 6 |
| P03G370V01603 | Repoboacións | 2nd | 6 |
| P03G370V01604 | Hidroloxía forestal | 2nd | 6 |
| P03G370V01605 | Ordenación de montes | 2nd | 6 |
| P03G370V01606 | Tecnoloxía da madeira | 2nd | 6 |
| P03G370V01607 | Xiloenerxética | 2nd | 6 |
| P03G370V01609 | Enxeñaría ambiental | 2nd | 6 |

**Year 4th**

| Code | Name | Quadmester | Total Cr. |
|---|---|---|---|
| P03G370V01701 | Planificación física e ordenación territorial | 1st | 6 |
| P03G370V01702 | Xestión de caza e pesca | 1st | 6 |
| P03G370V01703 | Patoloxía e pragas forestais | 1st | 6 |
| P03G370V01704 | Silvopascicultura | 1st | 6 |
| P03G370V01705 | Tecnoloxía do secado e conservación de madeiras | 1st | 6 |
| P03G370V01706 | Industrias de primeira transformación da madeira | 1st | 6 |
| P03G370V01707 | Organización industrial e procesos na industria da madeira | 1st | 6 |
| P03G370V01709 | Innovación e desenvolvemento de produtos na industria forestal | 1st | 6 |
| P03G370V01801 | Xestión de espazos protexidos e biodiversidade | 2nd | 6 |
| P03G370V01802 | Incendios forestais | 2nd | 6 |
| P03G370V01804 | Control de calidade e prevención de riscos laborais na industria forestal | 2nd | 6 |
| P03G370V01805 | Industrias químicas da madeira, celulosa, pasta e papel | 2nd | 6 |
| P03G370V01981 | Prácticas externas: Prácticas en empresas | An | 6 |
| P03G370V01991 | Traballo de Fin de Grao | 2nd | 12 |

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Graphic expression: Graphic expression and cartography** | | | | |
| Subject | Graphic expression: Graphic expression and cartography | | | |
| Code | P03G370V01101 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 9 | Basic education | 1st | 1st |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Armesto González, Julia | | | |
| Lecturers | Armesto González, Julia | | | |
| E-mail | julia@uvigo.es | | | |
| Web | http://http://cursos.faitic.uvigo.es/tema1415/claroline/course/index.php | | | |
| General description | (*)Esta materia ofrece unhas nocions fundamentais sobre os sistemas de representación aplicados ao ámbito da Enxeñería Forestal, con especial atención ao sistema de planos acotados. Asimismo se abordan conceptos fundamentais de cartografía e xeodesia que permitirán ler e interpretar mapas correctamente. Ademais, se amosa a utilización de ferramientas de software que permiten ao alumno xerar os seus propios planos e documentos de expresión gráfica a escala considerando estándares recollidos en normas ISO. | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CE1 | Knowledge of representation techniques. Capacity for spatial vision. Standardization. Topographical drawing. Computer programs of interest in engineering: computer-aided design. |
| CT2 | Ability to communicate orally and written in Spanish or in English |
| CT5 | Capacity for information management, analysis and synthesis |
| CT7 | Skill in the use of IT tools and ICTs. |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | Competences | | |
|---|---|---|---|
| 1R. 2018 Knowledge and understanding of the mathematicians and other inherent basic sciences to the his speciality in engineering, it a level that allow them purchase the rest of the competitions of the qualifications. | CG1 | CE1 | CT2<br>CT5<br>CT7<br>CT8 |
| 5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial. | | | |
| 6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project. | | | |
| 7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering. | | | |
| 9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality. | | | |
| 11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality. | | | |
| 12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality. | | | |
| 13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality. | | | |
| 19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general. | | | |

| Contents |
|---|
| Topic |

| | |
|---|---|
| 1.- Normalisation | Organisms of normalisation<br>Formats, lines and writings normalised.<br>Folded of planes.<br>Scales.<br>Normalisation in the representation: Representation of seen; section, court, break.<br>Acotation. |
| 2.-System of representation diedric system | Descriptive geometry and systems of representation.<br>diedric System: generalities, the point, the line, and the plane |
| 3.- System of bounded planes | System of bounded planes: generalities, the point, the line and the plane.<br>Intersections.<br>Parallelism and perpendicularity. Distances.<br>Representation and resolution of covers. |
| 4.- Topographical drawing | Representation of the terrain.<br>Forms of the terrain.<br>Equidistances and curves of level.<br>Points and singular lines of the terrain.<br>Traced of longitudinal and transversal profiles.<br>Explanations. |
| 5.- Computer-aided design | Drawing of simple entities.<br>Utilities and help to the drawing.<br>Edition and modification of simple entities.<br>Blocks and external references.<br>Presentation of planes.<br>Preparation of Digital Models of Terrain |
| (*)6.- Cartografía | (*)Fundamentos básicos de Geodesia. El concepto de geoide y elipsoide. Concepto de Datum. Datums de referencia. Sistemas de Proyección Cartográfica: fundamentos y clasificación. Sistema de Proyección Cartográfica UTM.<br>Principales fuentes cartográficas: IGN, IET. Otras fuentes de cartografía digital: servidor cartográfico catastral, Google Earth. |

| **Planning** | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Problem solving | 16 | 8 | 24 |
| Laboratory practical | 20 | 36 | 56 |
| Mentored work | 5 | 15 | 20 |
| Lecturing | 24 | 36 | 60 |
| Laboratory practice | 15 | 5 | 20 |
| Problem and/or exercise solving | 5 | 15 | 20 |
| Essay | 2 | 15 | 17 |
| Systematic observation | 8 | 0 | 8 |
| *The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. | | | |

| **Methodologies** | |
|---|---|
| | Description |
| Problem solving | (*)Actividade na que se formulan problemas e/ou exercicios relacionados coa materia. O alumno debe desenvolver as solucións adecuadas ou correctas mediante a exercitación de rutinas, a aplicación de fórmulas e procedementos de transformación da información dispoñible e a interpretación dos resultados. Sirve de complemento da lección maxistral. Desenvolvese en aula con dotacions específicas.<br><br>A docencia poderá impartirse total ou parcialmente en inglés en caso de demanda por parte dos alumnos ou do centro.<br>Se desenvolven as competencias |
| Laboratory practical | (*)Actividades de aplicación dos coñecementos a situacións concretas e de adquisición de habilidades básicas e procedimentais relacionadas coa expresión gráfica e o dibuxo topográfico mediante software específico. Desenvólvense en aula de informática.<br><br>A docencia poderá impartirse total ou parcialmente en inglés en caso de demanda por parte dos alumnos ou do centro.<br>Se desenvolven as competencias |

| | |
|---|---|
| Mentored work | (*)O estudante, de maneira individual ou en grupo, elabora un documento sobre a temática da materia. Inclúe a procura e recollida de información, lectura e manexo de bibliografía, redacción, etc.<br><br>Se desenvolven as competencias |
| Lecturing | (*)Exposición por parte do profesor dos contidos sobre a materia obxecto de estudo, bases teóricas e/ou directrices de traballos, exercicios ou proxectos a desenvolver polo estudante.<br><br>Se desenvolven as competencias |

**Personalized assistance**

| Methodologies | Description |
|---|---|
| Lecturing | |
| Problem solving | |
| Laboratory practical | |
| Mentored work | |

**Assessment**

| | Description | Qualification | Evaluated Competencess | |
|---|---|---|---|---|
| Laboratory practice | (*)Probas para a avaliación que inclúen actividades, problemas ou exercicios prácticos a resolver. Os alumnos deben dar resposta á actividade formulada, aplicando os coñecementos teóricos e prácticos da materia. | 10 | CE1 | CT7<br>CT8 |
| Problem and/or exercise solving | (*)Proba na que o alumno debe solucionar unha serie de problemas e/ou exercicios nun tempo/condicións establecido/as polo profesor. Desta maneira, o alumno debe aplicar os coñecementos que adquiriu. | 60 | CE1 | CT8 |
| Essay | (*)O estudante presenta o resultado obtido na elaboración dun documento sobre a temática da materia, na preparación de seminarios, investigacións, memorias, ensaios, resumos de lecturas, conferencias, etc.<br>Pódese levar a cabo de maneira individual ou en grupo, de forma oral e escrita. | 20 | | CT2<br>CT5<br>CT7<br>CT8 |
| Systematic observation | (*)Técnicas destinadas a recompilar datos sobre a participación do alumno, baseados nun listado de condutas ou criterios operativos que faciliten a obtención de datos cuantificables. | 10 | | |

**Other comments on the Evaluation**

Pass will be achieved with 5 points over 10.

TIMETABLED EXAMS:

December session: 14th January 2020, 9:00 H; First term: Cartographic Engineering Room, second term: Informatics Room II

July session: 1st July 2020  9:00 H; First term: Cartographic Engineering Room, second term: Informatics Room II

Official dates and any modification will be accesible in the official notice board and in the web page http://forestales.uvigo.es/gl/

**Sources of information**

**Basic Bibliography**

Rodríguez de Abajo, F.J.; Álvarez Bengoa, V., **Curso de dibujo geométrico y de croquización**, Editorial Donostiarra, 2005

Rodríguez de Abajo, F. J., **Geometría descriptiva.Tomo II. Sistema de Planos Acotados**, Editorial Donostiarra, 1993

IGN, **http://centrodedescargas.cnig.es/CentroDescargas/index.jsp**,

IET, **http://mapas.xunta.gal/visores/descargas/**,

**Complementary Bibliography**

Fernando Montaño La Cruz, **Autocad 2017 Guia practica**, Anaya multimedia,

**Recommendations**

**Contingency plan**

**Description**

=== EXCEPTIONAL PLANNING ===

Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===

* Teaching on line

Use of institutional on-line teaching platform Campus Remoto in a synchronous way for the theoretical classes including basics, foundations, as well as general guidelines for resolution of problems and practical cases. Specific didactic materials adapted for on line teaching will be prepared e.g. Video or presentations, graphic resources, software, etc. All the resources will be available through FAITIC platform.

* Mechanism face-to-face of attention to the students (tutorials)

Personalized attention. Communication by email or another on-line tool. Tutorials via Campus Remoto platform.

=== ADAPTATION OF The EVALUATION ===

On-line tests and tasks via Campus Remoto and Faitic. The weight of the tests will be maintained as they are described in the main guide.

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Physics: Physics I** | | | | |
| Subject | Physics: Physics I | | | |
| Code | P03G370V01102 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Basic education | 1st | 1st |
| Teaching language | Galician | | | |
| Department | | | | |
| Coordinator | González Fernández, Pio Manuel | | | |
| Lecturers | González Fernández, Pio Manuel<br>Martínez Piñeiro, Manuel<br>Pérez Davila, Sara | | | |
| E-mail | pglez@uvigo.es | | | |
| Web | | | | |
| General description | Didactic aims<br>Dominate the concepts and physical laws of the mechanics, fields and waves.<br>Differentiate the physical appearances *involucrados in the resolution of a problem of engineering.<br>Analyse, interpret and explain daily physical situations.<br>Resolve problems of mechanics, fields and waves applied the engineering.<br>Dominate experimental technicians and the handle of instrumentation for the measure of physical magnitudes.<br>Design and schedule an experimental setting in team related with appearances of the physics applied.<br>Dominate the acquisition of experimental data and his statistical treatment<br>Dominate technicians of graphic representation and calculation of parameters of adjust.<br>Present a report or technical memory (oral and writing) with utilisation of the new technologies. | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CE2 | Understanding and mastery of basic concepts about the general laws of mechanics, fields and waves and their application for the resolution of engineering problems. |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | Competences | | |
|---|---|---|---|
| 1R. 2018 Knowledge and understanding of the mathematicians and other inherent basic sciences to the his speciality in engineering, it a level that allow them purchase the rest of the competitions of the qualifications. | CG1 | CE2 | CT8 |
| 5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial. | | | |
| 10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study. | | | |
| 12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality. | | | |

| Contents | |
|---|---|
| Topic | |
| 1. KINEMATICS | 1.1.KINEMATICS OF THE MATERIAL POINT<br>1.2.KINEMATICS OF THE RIGID SYSTEMS |
| 2. DYNAMICS | 2.1. DYNAMIC OF THE POINT AND THE SYSTEMS<br>2.2. MOMENTS OF INERTIA<br>2.3. DYNAMIC OF THE BEEN USED TO RIGID |
| 3. STATIC | 3.1. LAWS OF STATIC |
| 4. MECHANICAL SYSTEMS | 4.1. FRICTION BETWEEN USED TO<br>4.2. YOU SCHEME SIMPLE<br>4.3. ELASTICITY |
| 5. MECHANICAL SWINGS | 5.1. FREE SWINGS<br>5.2. SWINGS CUISHIONED AND FORCED |

| Planning | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Lecturing | 17 | 33 | 50 |
| Problem solving | 15 | 23 | 38 |
| Laboratory practical | 14 | 28 | 42 |
| Report of practices, practicum and external practices | 1 | 15 | 16 |
| Problem and/or exercise solving | 1.5 | 0 | 1.5 |
| Problem and/or exercise solving | 2.5 | 0 | 2.5 |

*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 by part of the professor of the contents of the matter, foundations and theoretical bases and guidelines of the exercises to develop by the student. |
| Problem solving | The professor gives the general guidelines for the resolution of problems or exercises related with the matter. The student has to develop the suitable or correct solutions by means of the application of formulas and the application of procedures. |
| Laboratory practical | Activities realised in the laboratory of application of the knowledges to concrete situations and of acquisition of basic skills and *procedimentaLEs related with the matter. The *alumnado adopts an active role, developing diverse actions (realisation of an experiment, setting, manipulation of scientific instrumentation and taking of experimental data) to build his knowledge (graphic representation and deduction of the physical law that governs the experiment). |

| Personalized assistance | |
|---|---|
| **Methodologies** | **Description** |
| Lecturing | Resolution of doubts and customized help in tutorial schedule. |
| Laboratory practical | Resolution of doubts and customized help in tutorial schedule. |
| Problem solving | Resolution of doubts and customized help in tutorial schedule. |

| Assessment | | | | | |
|---|---|---|---|---|---|
| | Description | Qualification | Evaluated Competencess | | |
| Report of practices, practicum and external practices | Formative evaluation, made of a continuous way, carried out fundamentally in the classes of laboratory that allows a continuous follow-up and a *realimentación constructive.<br>It will value the presence and active participation in classes and in works *grupales, by means of checklists and by direct observation, and the quality of the works and individual reports and of group. | 20 | CG1 | CE2 | CT8 |
| Problem and/or exercise solving | They will evaluate the theoretical and practical knowledges of the matter using like objective instrument the answer written of several questions of theoretical application-practical. | 35 | CG1 | CE2 | CT8 |
| Problem and/or exercise solving | They will evaluate the theoretical and practical knowledges of the matter (35%) and the purchased in the classes of laboratory (10%) using like objective instrument the resolution written of problems and/or exercises. | 45 | CG1 | CE2 | CT8 |

**Other comments on the Evaluation**

In each methodology (Memories of practices, Proof of short answer and Resolution of problems) requires show a basic and minimum competition, that establishes in Apt=30.

Numerical final qualification on scale of 10 points, according to the valid legislation.
Exam datesFirst date : 14 January 2021 10:00 hoursSecond date: 25 June 2021, 10:00 hours

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

Tipler P.A, **Física**, Barcelona, 1992,
González P., Lusquiños F, **Fundamentos Físicos para Forestais**, Vigo, 2010,
Sears F.W., Zemansky M.W., Young H.D., Freedman R.A, **Física**, México, 1999,
Gettys W.E., Keller F.J., Skove M.J, **Física clásica y moderna**, Madrid, 1992,
González P., Lusquiños F, **Física en imaxes**, Vigo, 2007,

## Recommendations

### Subjects that continue the syllabus

Physics: Physics II/P03G370V01202

### Subjects that are recommended to be taken simultaneously

Mathematics: Mathematics and IT/P03G370V01103

## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===

* Teaching on line
We will use the tools of Remote Campus in synchronous way for the exhibition of contents, foundations, theoretical bases, general guidelines for resolution of problems and practical cases. They will prepare specific didactic materials for the teaching on line that consist in presentations ppt recorded with voice, utilisation of graphic resources, simulators of physical situations. All the didactic material and resources are available in the platform Faitic.

Virtual laboratory
To make the practices of laboratory we will implant a Virtual Laboratory using simulators that allow the taking of data in experimental conditions. It will use the methodology Flipped Classroom where provides to the students a video with indications on the practice and the URL of a simulator to make experimental setting and taking of data. Later it makes the corresponding session in Remote Campus in synchronous way for discussion of results, put in common, explanation of doubts and preparation of technical reports.

* Mechanism face-to-face of attention to the students (titorías)

Personalised attention. Communication by email or another telematic tool. Attention in In virtual Dispatch (Remote Campus).

=== ADAPTATION OF The EVALUATION ===

We will make test on-line (Remote Campus and Faitic) by means of questionnaire of multiple choice that will consist in
a) 10-20 theoretical questions
b) 5-10 short problems or practical cases
We keep the marks distinguished in the educational guide of the matter.

## IDENTIFYING DATA

**Mathematics: Mathematics and IT**

| | | | | |
|---|---|---|---|---|
| Subject | Mathematics: Mathematics and IT | | | |
| Code | P03G370V01103 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 9 | Basic education | 1st | 1st |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Casas Mirás, José Manuel | | | |
| Lecturers | Casas Mirás, José Manuel | | | |
| E-mail | jmcasas@uvigo.es | | | |
| Web | http://http://faitic.uvigo.es/ | | | |
| General description | The subject is programmed so that the student purchase the necessary competitions to resolve problems of mathematical nature that can present in the Forest Engineering, so that it purchase skill in the handle of programs of calculation, basic knowledges of Computing and management of the information, as well as in the handle of TIC. | | | |

## Competencies

| Code | |
|---|---|
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CE3 | Ability to solve mathematical problems that may arise in engineering. Ability to apply knowledge about: linear algebra; geometry; differential and integral calculation. Basic knowledge about computers, operating systems, databases, programming and calculation programs for use in engineering. |
| CT2 | Ability to communicate orally and written in Spanish or in English |
| CT5 | Capacity for information management, analysis and synthesis |
| CT7 | Skill in the use of IT tools and ICTs. |
| CT8 | Ability to solve problems, critical reasoning and decision making |
| CT10 | Autonomous Learning |

## Learning outcomes

| Learning outcomes | Competences | | |
|---|---|---|---|
| 1R. 2018 Knowledge and understanding of the mathematicians and other inherent basic sciences to the his speciality in engineering, it a level that allow them purchase the rest of the competitions of the qualifications.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general.<br>20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines.<br>21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life.<br>22R. 2018 Capacity to be to the day of the scientific and technological news. | CG1 | CE3 | CT2<br>CT5<br>CT7<br>CT8<br>CT10 |

## Contents

| Topic | |
|---|---|
| Subjet 1. The fields of real and complex numbers | Numerical sets. The real numbers. Intervals in R. Absolute value. Extended real line.<br>The field of complex numbers. Representation of complex numbers. Module and argument. Euler's Formula. Operations with complex numbers in polar form: powers (De Moivre's formula), roots, exponentials, logarithms. |
| Subject 2. Vector spaces | The vector space Rn. Vector Subspaces. Linear combination. Linear dependency and independence. Finite-dimensional vector spaces. Basis and dimension. Rank. |
| Subject 3. Linear applications | Linear applications. Properties. Kernel and image of a linear application. Characterization of injectives and surjectives linear applications. Rank of a linear application. Associated matrix to a linear application. |
| Subject 4. Matrices | Definition and types of matrices. Vector space of matrices mxn. Product of matrices. Regular matrix. Rank of a matrix. Calculation of the rank of a matrix and of the inverse matrix by means of elementary operations. |
| Subject 5. Determinants | Determinants of a square matrix of order 2 and of order 3. Properties. Cofators expansion. Calculation of the inverse matrix. Calculation of the rank of a matrix. |
| Subject 6. Systems of linear equations | Systems of linear equations: matrix form. Equivalent systems. Existence of solutions: Rouché-Frobenius' theorem. Homogeneous systems. Resolution of systems of linear equations: resolution by means of Gauss and Gauss-Jordan elimination methods. Resolution of a Cramer's system. Resolution of a general system using the Cramer's rule. |
| Subject 7. Euclidean vector space | Scalar product. Norm. Distance. Orthogonality. Scalar product with respect to a basis. Orthogonal and orthonormal systems. Vector product. Mixed product. Areas and volumes. |
| Subject 8. Geometry | Three-dimensional affine space. The straight lines in the affine space. Equations of the straight line. The plane in the affine space. Equations of the plane. Relations of incidence between straight lines and planes. Angles: of two straight lines, of two planes and of a straight line and a plane. Distances: of a point to a plane, of a straight line to a plane and of two croseed straight lines. Metric study of the conic sections. |
| Subject 9. Diagonalization of endomorphisms and matrices | Eigenvectors and eigenvalues. Eigensubspaces. Characteristic polynomial. Diagonalization: Conditions. Annulator polynomial. Cayley-Hamilton's theorem. Applications. |
| Subject 10. Convergence in R. | Convergent sequences in R. Operations with limits. Calculation of limits: indeterminations, Stolz's rule. |
| Subject 11. Limit and continuity of functions of a real variable | Limit of a function in a point. Sequential limit. Properties of limits. Calculation of limits. Continuity of real functions. Discontinuity: Types. Operations with continuous functions. Theorems relative to the global continuity: continuous image of a closed interval, Bolzano-Weierstrass' theorem, Bolzano's theorem: consequences. Continuity of the reverse function and of the composition of functions. |
| Subject 12. Differential calculus of a variable | Derivative of a function in a point. Geometric interpretation of the concept of derivative. The differential. Derived function. Successive derivatives. Relationship between continuity and derivability. Calculation of derivatives: derivative of the composition of functions and of the inverse function. Theorems relative to derivable functions: Rolle's theorem, consequences; the mean value theorem, consequences; the rule of L'Hôpital, calculation of indeterminate limits. Taylor polynomials of a function. Taylor's theorem. Maximum and minimum Problems. Study of concavity and convexity. Inflection points. Graphical representation of functions |
| Subject 13. Integration of functions of a variable | The Riemann integral: partitions, upper and lower sums, upper and lower integral, integral functions, the integral as sum limit. Properties. Theorem of the mean value. The fundamental theorem of integral calculus. Barrow's rule. Primitives. General methods for the calculation of primitives. Improper integrals. Geometric applications of the integral. |
| Subject 14. Informatics | Operating systems: classification, components, examples. Programming fundamentals. Organization of archives. Methods of sorting and searching. Concept and types of databases. |
| LABORATORY PRACTICE AGENDA | |
| Practice 1. Introduction to the syntax of a computer algebra system. | Basic commands of a computer algebra system. |
| Practice 2. Complex Numbers | Complex arithmetic in cartesian form. Polar form. Arithmetic in polar form |
| Practice 3. Vector Spaces | Operations with vectors. Linear independence of vectors and calculation of bases. Generator systems. Range of a vector system. |

| | |
|---|---|
| Practice 4. Linear Applications | Calculation of the associated matrix. Calculation of the kernel, image and rank |
| Practice 5. Matrices and determinants | Operations with matrices. Calculation of the determinant of a square matrix. Calculation of the rank of a matrix and the inverse matrix |
| Practice 6. Systems of linear equations | Resolution of linear systems. Cramer's Rule and Gauss and Gauss-Jordan Elimination Methods. Applications. |
| Practice 7. Euclidean Vector Space and Geometry | Calculation of the scalar product, vector product and mixed product. Calculation of areas, volumes, angles and distances. |
| Practice 8. Diagonalization | Calculation of the eigenvalues and eigenvectors of a square matrix. Diagonalization of matrices. Applications |
| Practice 9. Convergence | Limit of numerical sequences. |
| Practice 10. Functions | Calculation of the limit of a function at a point. Graphical representation of functions. Study of continuity. |
| Practice 11. Derivatives. | Derivative of functions. Calculation of tangent and normal lines. Problems of relative extremes. Developments in Taylor series. Local study of functions. |
| Practice 12. Integration | Calculation of primitives. Applications: calculation of areas, volumes, arc lengths, etc. |
| Subject 13. Informatics | Programming Fundamentals. Development and management of databases |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Introductory activities | 1 | 0 | 1 |
| Lecturing | 23 | 34.5 | 57.5 |
| Problem solving | 24 | 36 | 60 |
| Laboratory practical | 27 | 15 | 42 |
| ICT suppoted practices (Repeated, Dont Use) | 0 | 10 | 10 |
| Autonomous problem solving | 0 | 14 | 14 |
| Mentored work | 0 | 14 | 14 |
| Essay questions exam | 4 | 0 | 4 |
| Objective questions exam | 0 | 7 | 7 |
| Problem and/or exercise solving | 0 | 8 | 8 |
| Essay | 0 | 7.5 | 7.5 |

*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 | Activities aimed at taking contact, gathering information about the students and presenting the subject. |
| Lecturing | Exhibition of contents of the subject.<br>The blackboard exhibition will be used with the support of audiovisual systems and symbolic package programs. |
| Problem solving | Formulation, analysis, resolution and discussion of problems or exercises related to the topic of the subject. The blackboard exhibition will be used with the support of audiovisual media and symbolic package programs. |
| Laboratory practical | Resolution of problems related to the theoretical contents through the use of a symbolic package program, a database management program and a text editing program. |
| ICT suppoted practices (Repeated, Dont Use) | Available resources will be used online, such as databases, and the TEMA institutional platform will be used for the development and execution of various tasks. |
| Autonomous problem solving | Formulation, analysis, resolution and discussion of problems or exercises related to the theme of the subject, by the students. Problems bulletins corresponding to the scheduled topics will be provided, which the student must solve by himself. |
| Mentored work | Autonomous tasks related to the programmed topics, which will be delivered using the TEMA platform to be evaluated. |

**Personalized assistance**

| Methodologies | Description |
|---|---|
| Problem solving | Tutoring schedules will be used to guide and advise students individually in the resolution of questions or queries. Students will also be tutored electronically (email, videoconference or others) under the arrangement of prior appointment. |
| Laboratory practical | Tutoring schedules will be used to guide and advise students individually in the resolution of questions or queries. Students will also be tutored electronically (email, videoconference or others) under the arrangement of prior appointment. |

| | |
|---|---|
| Mentored work | Tutoring schedules will be used to guide and advise students individually in the resolution of questions or queries. Students will also be tutored electronically (email, videoconference or others) under the arrangement of prior appointment. |
| ICT suppoted practices (Repeated, Dont Use) | Tutoring schedules will be used to guide and advise students individually in the resolution of questions or queries. Students will also be tutored electronically (email, videoconference or others) under the arrangement of prior appointment. |
| Autonomous problem solving | Tutoring schedules will be used to guide and advise students individually in the resolution of questions or queries. Students will also be tutored electronically (email, videoconference or others) under the arrangement of prior appointment. |
| **Tests** | **Description** |
| Objective questions exam | Tutoring schedules will be used to guide and advise students individually in the resolution of questions or queries. Students will also be tutored electronically (email, videoconference or others) under the arrangement of prior appointment. |
| Problem and/or exercise solving | Tutoring schedules will be used to guide and advise students individually in the resolution of questions or queries. Students will also be tutored electronically (email, videoconference or others) under the arrangement of prior appointment. |
| Essay | Tutoring schedules will be used to guide and advise students individually in the resolution of questions or queries. Students will also be tutored electronically (email, videoconference or others) under the arrangement of prior appointment. |

## Assessment

| | Description | Qualification | Evaluated Competencess | | |
|---|---|---|---|---|---|
| Essay questions exam | It has two parts:<br>1. Final exam of theoretical contents.<br>2. Final exam of laboratory practices. | 70 | CG1 | CE3 | CT2<br>CT5<br>CT7<br>CT8<br>CT10 |
| Objective questions exam | Resolution of closed tests consisting of exercises with several alternative answers of which the student must indicate the true one.<br>Resolution of problems in which, using a computer algebra system, they must provide the response of the program to the corresponding exercise. | 10 | CG1 | CE3 | CT7<br>CT8<br>CT10 |
| Problem and/or exercise solving | Resolution of problem bulletins and laboratory practices. | 10 | CG1 | CE3 | CT2<br>CT5<br>CT7<br>CT8<br>CT10 |
| Essay | Realization of open projects in which it is necessary to use different knowledge acquired throughout the course. | 10 | CG1 | CE3 | CT2<br>CT5<br>CT7<br>CT8<br>CT10 |

## Other comments on the Evaluation

The assessment will be carried out in two sections: assessment of theoretical contents and evaluation of laboratory practices.

The assessment of the theoretical contents: will be the sum of the final exam mark of the theoretical contents (that will have a weight of 35% in the overall assessment), continuous assessment evaluation (which will have a 15% weight in the overall evaluation).

The final exam of the theory supposes 70% of the evaluation of the theoretical contents. The continuous assessment will consist of examinations of objective questions (supposes 10% of the mark of the evaluation of the theoretical contents), proposed exercises resolution works (supposes 10% of the note of the evaluation of the theoretical contents) and the works of projects (it supposes 10% of the mark of the evaluation of the theoretical contents).

The evaluation of the laboratory practices (which will have a 50% weight in the overall assessment) will be constituted by the final exam of laboratory practices (will represent 70% of the practical note), the performance during the practical sessions carried out (will represent 10 % of the practical note), the practices delivered (they will represent 10% of the mark of practices) and the complementary works (they will represent 10% of the mark of practices).

The final grade will be the arithmetic mean of the evaluation of the theoretical contents and the evaluation of the laboratory practices. Only the average of both notes will be made if at least 4.0 are obtained in each of them. The subject was considered approved if the final average grade is at least 5.

For the July evaluation, the student will be required to repeat the procedures not obtained during the evaluation of the first call, while maintaining the assessment of the procedures already passed.

Students who duly justify the impossibility of doing to the continuous evaluation or expressly renounce it will be evaluated through the final examinations of theoretical contents and the final exam of laboratory practices.

Exam calendar:

First call: January 26, 2021, 16:30

Second call: June 28, 2021, 16:30

The official dates and possible modifications are set out in the official bulletin board of E. E. Forestal and posted at http://forestales.uvigo.es/gl/docencia/exames

## Sources of information

### Basic Bibliography

### Complementary Bibliography


Grossman, S. I., **Álgebra Lineal con aplicaciones**, 1991,

Rojo, J., **Álgebra Lineal**, 2007,

Burgos, J. de, **Curso de Álgebra y Geometría**, 1980,

Luzarraga, A., **Problemas resueltos de Álgebra Lineal**,

Rojo, J. y Martín, I., **Ejercicios y problemas de Álgebra Lineal**, 2005,

Burgos, J. de, **Cálculo infinitesimal de una variable**, 1994,

Larson, R. E.; Hostetler, R. P. y Edwards, B. H., **Calculo Volumen I**, 2006,

Ayres, F. Jr., **Cálculo**, 2001,

Bradley, G. L. Y Smith, K. J.,, **Cálculo de una variable**, 1998,

Checa, E. y otros, **Álgebra, cálculo y mecánica para Ingenieros**, 1997,

Martínez Salas, J., **Elementos de matemáticas**, 1992,

Franco Brañas, J. R., **Introducción al cálculo: problemas y ejercicios resueltos**, 2003,

García, A.; Gracía, F.; López, A.; Rodríguez, G. y de la Villa, A., **Cálculo I: teoría y problemas de análisis matemático de una variable**, 2007,

Granero, F., **Cálculo integral y aplicaciones**, 2001,

Rodríguez Riotorto, M., **Primeros pasos en Maxima**, 2008,

Cerrada Somolinos, J. A., **Fundamentos de programación con Modula-2**, 2000,

Prieto, A.; Lloris, A. y Torres, J. C., **Introducción a la Informática**, 2006,

Plasencia López, Z., **Introducción a la Informática**, 2006,

Rodríguez Riotorto, M, **Manual de Maxima**, 2005,

Alaminos Prats, J. , Aparicio del Prado, C., Extremera Lizana, J. , Muñoz Rivas, P. y Villena Muñoz, **Prácticas de ordenador con wxMaxima**, 2008,


## Recommendations

### Subjects that continue the syllabus

Mathematics: Overview of mathematics/P03G370V01203

### Subjects that are recommended to be taken simultaneously

Physics: Physics I/P03G370V01102

### Other comments

It is recommended to have studied the mathematics subjects in the Secondary School, although many concepts will be reviewed.

## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee,

at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained
All methodologies are maintained, they will simply be taught telematically through the Remote Campus of the University of Vigo and the FAITIC remote teaching platform, without prejudice to other measures that may be adopted.

* Teaching methodologies modified
All face-to-face teaching methodologies begin to be developed electronically.

* Non-attendance mechanisms for student attention (tutoring)
The tutoring hours will be used to guide and advise students individually in the resolution of doubts or queries electronically. Students will also be tutored electronically (email, videoconference or others) under the arrangement of prior appointment.

* Modifications (if applicable) of the contents
The contents will be maintained to the extent that the situation allows.

* Additional bibliography to facilitate self-learning
No new bibliographic sources are needed.

* Other modifications

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Continuous evaluation works:: [Previous Weight 30%] [Proposed Weight 30%]

* Pending tests that are maintained
Continuous evaluation works:: [Previous Weight 30%] [Proposed Weight 30%]
Final Theory Exam: [Previous weight 70%] [Proposed Weight 40%]
Final Practice Exam: [Previous weight 70%] [Proposed Weight 40%]

* Tests that are modified
There are no modifications in the test.

* New tests
Continuous Assessment Tests of Theory [Proposed Weight 30%]
Continuous Assessment Tests of Practices [Proposed Weight 30%]

* Additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Basics of business economics** | | | | |
| Subject | Basics of business economics | | | |
| Code | P03G370V01104 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Mandatory | 1st | 1st |
| Teaching language | #EnglishFriendly<br>Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | García-Pintos Escuder, Adela | | | |
| Lecturers | Figueroa Dorrego, Pedro<br>García-Pintos Escuder, Adela | | | |
| E-mail | adelagpe@uvigo.es | | | |
| Web | | | | |
| General description | The aim of this subject is that the students know with a practical and participatory approach, the components and operation of the company. Also it pretends interrelate it with other matters and provide the knowledges, attitudes and necessary skills to develop with efficiency and efficiency, his future professional activity in the world of the companies, and the organisations in general, especially in the forest industry.<br>International students may request from the teachers:<br>a) materials and bibliographic references in English,<br>b) tutoring sessions in English,<br>c) exams and assessments in English. | | | |

| Competencies | |
|---|---|
| Code | |
| CG12 | Capacity for organization and planning of companies and other institutions, with knowledge of the legislative provisions that affect them and the fundamentals of marketing and marketing of forest products. |
| CE4 | Adequate knowledge of the concept of company and the institutional and legal framework of the company. Organization and management of companies. |
| CT2 | Ability to communicate orally and written in Spanish or in English |
| CT5 | Capacity for information management, analysis and synthesis |
| CT6 | Organization and planning capacity |
| CT8 | Ability to solve problems, critical reasoning and decision making |
| CT10 | Autonomous Learning |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering.<br>16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context.<br>17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions<br>18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions.<br>19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general.<br>21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life. | CG12 | CE4 | CT2<br>CT5<br>CT6<br>CT8<br>CT10 |

| **Contents** | |
|---|---|
| Topic | |
| 1.- COMPANY LIKE A COMPLEX SYSTEM | 1.1. The system company: components.<br>1.2. Aims and functions of each component |
| 2.- THE SURROUNDINGS OF THE COMPANY. | 2.1. The general surroundings<br>2.2. The specific surroundings<br>2.3. Study of the forest-wood surrounding |
| 3.- DIAGNOSTIC And BUSINESS STRATEGY. | 3.1 Business strategy<br>3.2. Diagnostic: global, functional and SWOT<br>3.3. Strategic design |
| 4.- THE HUMAN FACTOR IN THE COMPANY. | 4.1. Business culture<br>4.2. Leadership<br>4.3. The power in the organisations<br>4.4. Human resource management |
| 5.- ORGANISATIONAL STRUCTURE IN THE COMPANY | 5.1. Organisational structure<br>5.2. Parameters of design of the structure<br>5.3. The organisation chart<br>5.4. Typology of structural groups<br>5.5. New structural forms |
| 6.- INTRODUCTION TO MARKETING | 6.1. Marketing: basic concepts and decisions of marketing.<br>6.2. Markets investigation.<br>6.3. Segmentation and product positioning<br>6.4. Marketing decisions |
| 7.- ECONOMIC APPEARANCES-FINANCIAL OF THE COMPANY | 7.1. The investment concepts and types<br>7.2. The finance: concepts and types<br>7.3. The countable reflection of the economic facts: the balance and the account of losses and gains<br>7.4. Economic indicators-financial: the tree of profitability and the deadlock |
| 8.- INTRODUCTION PRODUCTION AND LOGISTIC | 8.1. Basic concepts of the system of production and logistical.<br>8.2. Objective of the function of production<br>8.3. Types of productive systems<br>8.4. Production plan |

| Planning | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Introductory activities | 1 | 0 | 1 |
| Lecturing | 32 | 52 | 84 |
| Case studies | 10 | 20 | 30 |
| Problem solving | 5 | 10 | 15 |
| Objective questions exam | 2 | 8 | 10 |
| Problem and/or exercise solving | 0 | 10 | 10 |
| *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 | Activities aimed at making contact and gathering information about the students, as well as presenting the subject. |
| Lecturing | Presentation, in person or through the remote campus, of the contents of the subject matter under study, as well as the theoretical bases. |
| Case studies | The student will develop exercises in the classroom (face-to-face, remote campus and / or through faitic) under the guidance and supervision of the professors.<br>It also includes those activities that the students must carry out independently |
| Problem solving | The student will carry out exercises in the classroom (remote campus and / or through the teledoaching platform) under the guidance and supervision of the professors.<br>It also includes those activities that the students must carry out independently |

| Personalized assistance | |
|---|---|
| **Methodologies** | **Description** |
| Lecturing | Personalized attention will be made preferably by telematic means (email, campus remoto, forums of doubts in FaiTIC). If a student wants, as possible, it can be presencially. They will be indicated at the beginning of course the concrete forms of communication as well as the schedules. |
| Problem solving | Personalized attention will be made preferably by telematic means (email, campus remoto, forums of doubts in FaiTIC). If a student wants, as possible, it can be presencially. They will be indicated at the beginning of course the concrete forms of communication as well as the schedules. |
| Case studies | Personalized attention will be made preferably by telematic means (email, campus remoto, forums of doubts in FaiTIC). If a student wants, as possible, it can be presencially. They will be indicated at the beginning of course the concrete forms of communication as well as the schedules. |

| Assessment | | | | | |
|---|---|---|---|---|---|
| | Description | Qualification | Evaluated Competencess | | |
| Case studies | The student will develop exercises or case studies in the classroom under the guidelines and supervision of the teacher. It also includes those activities that the student must previously carry out independently and its resolution will be debated in the classroom. | 30 | CG12 | CE4 | CT2<br>CT5<br>CT6<br>CT10 |
| Objective questions exam | A final proof at the end of the courseoriented to the application of the concepts developed in the subject | 40 | CG12 | CE4 | CT2<br>CT6<br>CT8 |
| Problem and/or exercise solving | In order to encourage the regular and continuous work of the students in the development of the subject, different activities (exercises, test-type tests) will be valuated. They will be carried out and delivered through the Teaching platform (Faitic). Any delivery after the deadline or sent in any other means than through the FAITIC platform will not be accepted. | 30 | CG12 | CE4 | CT8<br>CT10 |

**Other comments on the Evaluation**

**The subject evaluation system is based on two elements:**

a) Overcoming the practical part, with carrying out the programmed activities. (6 points).

b) Successful completion of the theoretical part, through a proof that will be carried out on the date indicated by the center, in person or, where appropriate, through the remote campus and the teleteaching platform. (4 points)

**It is an essential requirement to add the practical part (case study and exercises** solving ) at least have obtained a 4 out of 10 points in the theoretical exam.

**JULY / EXTRAORDINARY CALL**

1. The form of evaluation in the July and extraordinary call is the same as in January.

a) There is no possibility of improving the mark of the practical part for the July call, since these are activities scheduled throughout the course.

b) If the subject is not passed in this call, the student must take it again adapting to the teaching guide that is in force in the academic year in question and, therefore, will not retain any of the grades obtained in this course .

**EXAM DATES AND PUBLICATION OF NOTES:**

The dates of the exams, according to the official calendar approved by the center, are as follows:

First call: January 11, 2021, 10:00 am.

Second call: June 30, 2021. 12:00 am.

The publication of provisional notes will be made in the Virtual Secretariat and/on the Teaching Platform, and if possible on the center bulletin board.

## Sources of information

### Basic Bibliography


GONZÁLEZ DOMÍNGUEZ, F. J. y GANAZA VARGAS, J. D., **Fundamentos de economía de la empresa**, Pirámide, 2017

Navas López, José Emilio, **Fundamentals of strategic managemen**, Civitas, 2018

GARCÍA-TENORIO RONDA, J.; GARCÍA MERINO, M. T.; PÉREZ RODRÍGUEZ, M. J.; SÁNCHEZ QUIRÓS, I. y SANTOS, **Organización y dirección de empresas**, Thomson, 2006


### Complementary Bibliography


KOTLER, P.; KELLER, K.L., **Dirección de marketing**, Pearson, 2015

PIÑEIRO, P. et al, **Introducción a la economía de la empresa : una visión teórico-práctica.**, Delta, 2010

BUENO CAMPOS, E., **Curso básico de economía de la empresa: un enfoque de organización**, Pirámide, 2005

Rothaermel, Frank T., **Strategic management**, Mcgraw Hill Higher Education, 2019

Castillo Clavero, Ana María, **Dirección de empresas**, Pirámide, 2018


## Recommendations

### Other comments

It is not indispensable to have studied economy , since it will realise a more detailed introduction to the matter.

Later, in fourth course of the Degree recommends to study the following matters that deepen in some appearances:

Industrial organisation and processes in the industry of the wood

Innovation and development of products in the industry of the wood.

It is recommended that the students keep upadte the telematic platform of support to the teaching (FAITIC). They will have to request the high to the start of the course to access to the on-line contents, available in the web: http://faitic.uvigo.es

## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

All

* Teaching methodologies modified
None

* Non-attendance mechanisms for student attention (tutoring)
Remote campus, email and forums on the Teledocencia platform

* Modifications (if applicable) of the contents
None

* Additional bibliography to facilitate self-learning
Students have all the material on the platform, part of it made by the professor, to be able to track the subject.

* Other modifications
None

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Weight is maintained as all activities are adapted to any circumstance

* Pending tests that are maintained
Weight is maintained as all activities are adapted to any circumstance.

* Tests that are modified
None

* New tests
None

* Additional Information
Not necessary

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Biology: Plant Biology** | | | | |
| Subject | Biology: Plant Biology | | | |
| Code | P03G370V01201 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Basic education | 1st | 2nd |
| Teaching language | | | | |
| Department | | | | |
| Coordinator | Souto Otero, José Carlos | | | |
| Lecturers | López de Silanes Vázquez, María Eugenia<br>Souto Otero, José Carlos | | | |
| E-mail | csouto@uvigo.es | | | |
| Web | http://webs.uvigo.es/csouto/ | | | |
| General description | Knowledge of the basic principles of the Vegetal Biology: anatomy, physiology and ecology of the plants. | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG5 | Knowledge of the foundations of forest improvement and capacity for its practical application to plant production and biotechnology. |
| CE8 | Knowledge of the bases and biological foundations of the plant field in engineering. |
| CT2 | Ability to communicate orally and written in Spanish or in English |
| CT8 | Ability to solve problems, critical reasoning and decision making |
| CT10 | Autonomous Learning |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 1R. 2018 Knowledge and understanding of the mathematicians and other inherent basic sciences to the his speciality in engineering, it a level that allow them purchase the rest of the competitions of the qualifications.<br>4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions<br>19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general.<br>20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines.<br>21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life.<br>22R. 2018 Capacity to be to the day of the scientific and technological news. | CG1<br>CG5 | CE8 | CT2<br>CT8<br>CT10 |

**Contents**

| Topic |
|---|
| 1.- Introduction to the vegetal Biology. |
| 2.- General structure of the vegetal cells. |
| 3.- The cellular division. |
| 4.- Introduction to the vegetal anatomy. |
| Meristems. |
| 5.- Parenchyma, collenchyma and sclerenchyma. |
| 6.- Conductive fabrics. The xylem. The phloem. |
| 7.- Epidermis. The peridermis. |
| 8.- General structure of the vascular plants. |
| 9.- The leaf. |
| 10.- The flower. |
| 11.- Alternation of generations in haplodiplontes. |
| 12.- Fecundation. |
| 13.- The plants and the water. |
| 14.- Absorption of nutrients. |
| 15.- The photosynthesis. |
| 16.- The breath. |
| 17.- Growth and development. |
| 18.- Physiology of the seed. |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 20 | 40 | 60 |
| Case studies | 2 | 4 | 6 |
| Autonomous problem solving | 1 | 3 | 4 |
| Presentation | 1 | 5 | 6 |
| Laboratory practical | 25 | 25 | 50 |
| Studies excursion | 10 | 14 | 24 |
| *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 the contents of the *asignatura. They treat the competitions To2, To8, To25 and To61. |
| Case studies | Formulation, analysis, resolution and debate of a problem or exercise related with the thematic of the *asignatura.They treat the competitions To2 and *B6. |
| Autonomous problem solving | Formulation, analysis, resolution and debate of a problem or exercise related with the thematic of the *asignatura, by part of the *alumnado. They treat the competitions To2 and *B6. |
| Presentation | Oral exhibition by part of the *alumnado of a concrete subject or of a work (previous presentation written). They treat the competitions To2, To8, To25 and To61. |
| Laboratory practical | Application to practical level of the theory of Vegetal Biology in the laboratory. They treat the competitions To2, To8, To25 and To61. |
| Studies excursion | Realisation of visits-exits to the field for the observation and study of the plants in his natural surroundings. They treat the competitions To2, To8, To25 and To61. |

**Personalized assistance**

| Methodologies | Description |
|---|---|
| Presentation | |

**Assessment**

| | Description | Qualification | Evaluated Competencess | |
|---|---|---|---|---|
| Lecturing | Examination: proof with questions of short answer and others of long answer. The students have to answer to the questions to show the knowledges purchased on the matter. They evaluate the competitions To2, To8, To25, To61 and *B6. | 60 | CG1 | CE8 |
| Presentation | It evaluates the preparation of the work and his oral exhibition. They evaluate the competitions To2, To8, To25 and To61. | 20 | CG1 | CE8 |
| Laboratory practical | Continuous evaluation of the activities realised in the practices, as well as of the memory that the students have to deliver when finalising the course. They evaluate the competitions To2, To8, To25 and To61. | 20 | CG1 | CE8 |

**Other comments on the Evaluation**

The avaliation of the second announcement will be the same as for the first one

Calendar of examinations:

Announcement end of career: 16-09-2020  10*h

1st announcement: 01-06-2020  10*h

2nd announcement: 06-07-2020 10*h

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**


Raven PH, Evert RF & Eichhorn SE, **Biology of plants**, WH Freeman and CP,

Nabors M.W., **Introducción a la Botánica**, Pearson-Addison Wesley,

Azcón-Bieto J & Talón M, **Fundamentos de Fisiología Vegetal**, Mc Graw Hill,

Paniagua R, **Citología e Histología vegetal y animal**, Mc Graw Hill,

Stern KR, Bidlack JE & Jansky SH, **Introductory plant biology**, Mc Graw Hill,

Taiz L & Zeiger T, **Plant physiology**, 5ª ed.; Sunderland, MA : Sinauer Associates,


**Recommendations**

**Contingency plan**

**Description**

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering

safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

* Teaching methodologies modified

* Non-attendance mechanisms for student attention (tutoring)

* Modifications (if applicable) of the contents

* Additional bibliography to facilitate self-learning

* Other modifications

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Pending tests that are maintained
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Tests that are modified
[Previous test] => [New test]

* New tests

* Additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Physics: Physics II** | | | | |
| Subject | Physics: Physics II | | | |
| Code | P03G370V01202 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Basic education | 1st | 2nd |
| Teaching language | Galician | | | |
| Department | | | | |
| Coordinator | González Fernández, Pio Manuel | | | |
| Lecturers | González Fernández, Pio Manuel<br>Souto Torres, Carlos Alberto | | | |
| E-mail | pglez@uvigo.es | | | |
| Web | | | | |
| General description | Didactic aims<br>Dominate the concepts and physical laws of the thermodynamics and electromagnetism.<br>Differentiate the physical appearances *involucrados in the resolution of a problem of engineering.<br>Analyse, interpret and explain physical situations **cotias.<br>Resolve problems of thermodynamics and electromagnetism applied the engineering.<br>Dominate experimental technicians and handle it of instrumentation for the measure of physical magnitudes.<br>*Design and schedule an experimental setting in team related with appearances of the physics applied.<br>Dominate the acquisition of experimental data and his statistical treatment<br>Dominate technicians of graphic representation and calculation of parameters of adjust.<br>Present a report or technical memory (oral and writing) with utilisation of the new technologies. | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CE6 | Understanding and mastery of the basic concepts about the general laws of thermodynamics and electromagnetism and its application for the resolution of engineering problems. |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | Competences | | |
|---|---|---|---|
| 1R. 2018 Knowledge and understanding of the mathematicians and other inherent basic sciences to the his speciality in engineering, it a level that allow them purchase the rest of the competitions of the qualifications. | CG1 | CE6 | CT8 |
| 5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial. | | | |
| 10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study. | | | |
| 12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality. | | | |

| Contents | |
|---|---|
| Topic | |
| 1.THERMODYNAMICS | 1.1. INTRODUCTION TO THE THERMODINAMICS<br>1.2. THERMODYNAMIC PRINCIPLES<br>1.3. IDEAL GASES |
| 2.ELECTROSTATICS | 2.1. PRINCIPLES OF THE ELECTROSTATICS<br>2.2. CONDENSERS AND DIELECTRIC<br>2.3. CONTINUOUS CURRENT |
| 3.ELECTROMAGNETISM | 3.1. MAGNETOSTATIC<br>3.2. ELECTROMAGNETIC INDUCTION<br>3.3. ALTERNATING CURRENT |

| Planning |
|---|

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 17 | 33 | 50 |
| Problem solving | 15 | 23 | 38 |
| Laboratory practical | 14 | 28 | 42 |
| Report of practices, practicum and external practices | 1 | 15 | 16 |
| Problem and/or exercise solving | 1.5 | 0 | 1.5 |
| Problem and/or exercise solving | 2.5 | 0 | 2.5 |

*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 by part of the professor of the contents of the matter, foundations and theoretical bases and guidelines of the exercises to develop by the student. |
| Problem solving | The professor gives the general guidelines for the resolution of problems or exercises related with the matter. The student has to develop the suitable or correct solutions by means of the application of formulas and the application of procedures. |
| Laboratory practical | Activities realised in the laboratory of application of the knowledges to concrete situations and of acquisition of basic skills and *procedimentaLEs related with the matter. The student adopts an active role, developing diverse actions (realisation of an experiment, setting, manipulation of scientific instrumentation and taking of experimental data) to build his knowledge (graphic representation and deduction of the physical law that governs the experiment). |

## Personalized assistance

| Methodologies | Description |
|---|---|
| Lecturing | Resolution of doubts and customized help in tutorial schedule. |
| Laboratory practical | Resolution of doubts and customized help in tutorial schedule. |
| Problem solving | Resolution of doubts and customized help in tutorial schedule. |

## Assessment

| | Description | Qualification | Evaluated Competencess | | |
|---|---|---|---|---|---|
| Report of practices, practicum and external practices | Formative evaluation, made of a continuous way, carried out fundamentally in the classes of laboratory that allows a continuous follow-up and a *realimentación constructive.<br>It will value the presence and active participation in classes and in works *grupales, by means of checklists and by direct observation, and the quality of the works and individual reports and of group. | 20 | CG1 | CE6 | CT8 |
| Problem and/or exercise solving | It will evaluate the theoretical and practical knowledges of the matter using like objective instrument the answer written of several questions of theoretical application-practical. | 35 | CG1 | CE6 | CT8 |
| Problem and/or exercise solving | It will evaluate the theoretical and practical knowledges of the matter (35%) and the purchased in the classes of laboratory (10%) using like objective instrument the resolution written of problems and/or exercises. | 45 | CG1 | CE6 | CT8 |

## Other comments on the Evaluation

In each methodology (Memory of practices, Proof of short answer and Resolution of problems) requires show a basic and minimum competition, that establishes in Apt=30%.

Numerical final qualification on scale of 10 points, according to the valid legislation.
Exam datesFirst date: 18 May 2020, 10:00 hoursSecond date: 8 Xuly of 2020, 10:00 hours.
The official dates: http://forestales.uvigo.es/*gl/&*lt;&*gt;

## Sources of information

### Basic Bibliography

### Complementary Bibliography


Tipler P.A, **Física**, Barcelona, 1992,

González P., Lusquiños F, **Fundamentos Físicos para Forestais**, Vigo, 2010,

Sears F.W., Zemansky M.W., Young H.D., Freedman R.A, **Física**, México, 1999,

Gettys W.E., Keller F.J., Skove M.J, **Física clásica y moderna**, Madrid, 1992,

González P., Lusquiños F, **Física en imaxes**, Vigo, 2007,

## Recommendations

### Subjects that are recommended to be taken simultaneously

Mathematics: Overview of mathematics/P03G370V01203

### Subjects that it is recommended to have taken before

Physics: Physics I/P03G370V01102
Mathematics: Mathematics and IT/P03G370V01103

## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===

* Teaching on line
We will use the tools of Remote Campus in synchronous way for the exhibition of contents, foundations, theoretical bases, general guidelines for resolution of problems and practical cases. They will prepare specific didactic materials for the teaching on line that consist in presentations ppt recorded with voice, utilisation of graphic resources, simulators of physical situations. All the didactic material and resources are available in the platform Faitic.

Virtual laboratory
To make the practices of laboratory we will implant a Virtual Laboratory using simulators that allow the taking of data in experimental conditions. It will use the methodology Flipped Classroom where provides to the students a video with indications on the practice and the URL of a simulator to make experimental setting and taking of data. Later it makes the corresponding session in Remote Campus in synchronous way for discussion of results, put in common, explanation of doubts and preparation of technical reports.

* Mechanism face-to-face of attention to the students (titorías)

Personalised attention. Communication by email or another telematic tool. Attention in In virtual Dispatch (Remote Campus).

=== ADAPTATION OF The EVALUATION ===

We will make test on-line (Remote Campus and Faitic) by means of questionnaire of multiple choice that will consist in
a) 10-20 theoretical questions
b) 5-10 short problems or practical cases
We keep the marks distinguished in the educational guide of the matter.

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Mathematics: Overview of mathematics** | | | | |
| Subject | Mathematics: Overview of mathematics | | | |
| Code | P03G370V01203 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 9 | Basic education | 1st | 2nd |
| Teaching language | Spanish | | | |
| Department | | | | |
| Coordinator | Casas Mirás, José Manuel | | | |
| Lecturers | Casas Mirás, José Manuel | | | |
| E-mail | jmcasas@uvigo.es | | | |
| Web | http://webs.uvigo.es/fbotana/ | | | |
| General description | | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CE3 | Ability to solve mathematical problems that may arise in engineering. Ability to apply knowledge about: linear algebra; geometry; differential and integral calculation. Basic knowledge about computers, operating systems, databases, programming and calculation programs for use in engineering. |
| CE5 | Ability to solve mathematical problems that may arise in engineering. Ability to apply knowledge about: differential equations and partial derivatives; numerical methods, numerical algorithm, differential geometry; differential and integral calculation. |
| CT1 | Ability to understand the meaning and application of the gender perspective in the different fields of knowledge and in professional practice with the aim of achieving a more just and egalitarian society |
| CT6 | Organization and planning capacity |
| CT7 | Skill in the use of IT tools and ICTs. |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | Competences | | |
|---|---|---|---|
| 1R. 2018 Knowledge and understanding of the mathematicians and other inherent basic sciences to the his speciality in engineering, it a level that allow them purchase the rest of the competitions of the qualifications.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality. | CG1 | CE3<br>CE5 | CT1<br>CT6<br>CT7<br>CT8 |

| Contents |
|---|

| Topic | |
|---|---|
| Differential geometry | Functions of several real variables<br>Curves and surfaces |
| Infinitesimal calculation | Concept of limit in *R^*n<br>Limit and continuity of vectorial functions of several real variables<br>Jacobian Matrix<br>multiple Integration<br>Integrals of line |
| Differential equations | Resolution of ordinary differential equations<br>Resolution of equations in partial derivatives |
| Numerical methods | Interpolation<br>approximate Resolution of equations<br>numerical Integration |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 30 | 46 | 76 |
| Problem solving | 14 | 25 | 39 |
| Presentation | 10 | 16 | 26 |
| Laboratory practical | 15 | 50 | 65 |
| Problem and/or exercise solving | 5 | 5 | 10 |
| Essay questions exam | 4 | 5 | 9 |

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

**Methodologies**

| | Description |
|---|---|
| Lecturing | (*)Clase estándar usando pizarra e medios informáticos por tódolo/as participantes |
| Problem solving | (*)Problemas complementarios dos contidos puramente teóricos |
| Presentation | (*)Voluntarias, en función do nivel e disposición do alumnado |
| Laboratory practical | (*)Resolución de problemas mediante sistemas de cálculo matemático |

**Personalized assistance**

| **Methodologies** | **Description** |
|---|---|
| Problem solving | Tutoring schedules will be used to guide and advise students individually in the resolution of questions or queries. Students will also be tutored electronically (email, videoconference or others) under the arrangement of prior appointment. |
| Lecturing | Tutoring schedules will be used to guide and advise students individually in the resolution of questions or queries. Students will also be tutored electronically (email, videoconference or others) under the arrangement of prior appointment. |
| Laboratory practical | Tutoring schedules will be used to guide and advise students individually in the resolution of questions or queries. Students will also be tutored electronically (email, videoconference or others) under the arrangement of prior appointment. |
| **Tests** | **Description** |
| Problem and/or exercise solving | Tutoring schedules will be used to guide and advise students individually in the resolution of questions or queries. Students will also be tutored electronically (email, videoconference or others) under the arrangement of prior appointment. |

**Assessment**

| | Description | Qualification | Evaluated Competencess | |
|---|---|---|---|---|
| Lecturing | (*)Comprensión específica e global dos contidos | 20 | CE5 | CT1 |
| Problem solving | (*)Uso de técnicas estándar, ideas orixinais | 5 | CE5 | CT6 |
| Presentation | (*)Claridade, verbalización, uso de recursos externos | 15 | CE5 | CT1 |
| Laboratory practical | (*)Destreza, capacidade atopar recursos, | 40 | CE5 | CT6 |
| Problem and/or exercise solving | (*) Uso de técnicas estándar, ideas orixinais | 5 | CE5 | CT6 |
| Essay questions exam | (*)Capacidades de expresión e comprensión | 15 | CE5 | CT1 |

**Other comments on the Evaluation**

The acquisition of the previous competences will be evaluated with 50% of weight in the continuous evaluation (presentations and laboratory practices) and 50% of weight in the completion of the final exam.

Scheduled exam dates:

First Call: May 24, 2021, 10:00 Hours

Second Call: July 5, 2021, 10:00 Hours

The official dates and the possible modifications are exposed on the official board of the EE Forestal and on the web http://forestales.uvigo.es/gl/docencia/exames/

## Sources of information

### Basic Bibliography

### Complementary Bibliography

Arthur Mattuck, **Differential Equations**, http://ocw.mit.edu/OcwWeb/Mathematics/18-03Spring-2006/VideoLectures/index.htm,

Paul Dawkins, **Differential Equations**, http://tutorial.math.lamar.edu/classes/de/de.aspx,

William Stein, **Sage**, http://sagemath.org,

Michael Corral, **Vector Calculus**, http://www.mecmath.net/calc3book.pdf,

Dale Hoffman, William Stein, David Joyner, **Integral Calculus and Sage**, http://sage.math.washington.edu/home/wdj/teaching/calc2-sage/calc2-sage.pdf,

## Recommendations

### Subjects that it is recommended to have taken before

Mathematics: Mathematics and IT/P03G370V01103

## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

The sub-item "Laboratory practices: Problem solving using mathematical calculation systems" is maintained, with the only exception that the practices will be carried out online.
The sub-item "Voluntary Presentation: Presentations depending on the level of student disposition" is maintained, with the only exception that the presentations will be made online.

* Teaching methodologies modified

The sub-item "Master class: Standard class using blackboard and computer media by all the participants." It will be replaced by "Virtual Master Lesson: Standard class using virtual classrooms and/or explanatory videos made by the teacher (FAITIC)".

The sub-item "Problem solving: Complementary problems of purely theoretical content" will be replaced by "Problem solving: Complementary problems of purely theoretical content solved directly in the virtual classroom and/or in explanatory videos prepared by the teacher (FAITIC) "

* Non-attendance mechanisms for student attention (tutoring)

Preferably through the UVIGO virtual dispatch system or UVIGO email under the arrangement of an appointment. If a student were unable to use these methods, the use of other non-institutional channels will be considered: Skype, Google Meet, telephone, ...

* Modifications (if applicable) of the contents

No modifications are contemplated.

* Additional bibliography to facilitate self-learning

The use of additional bibliography to the ordinary is not contemplated. However, the teacher will try to make the most of the resources used available in the FAITIC, with the aim of facilitating student access to content.

* Other modifications

Not contemplate

=== ADAPTATION OF THE TESTS ===
* Tests already carried out

Continuous evaluation: [Previous weight 50%] [Proposed weight 50%]

Since the activities of the face-to-face continuous evaluation can be transferred to the virtual continuous evaluation (laboratory practices, exercise exhibitions, ...), the weight proposed for the continuous evaluation is maintained.

* Pending tests that are maintained

Continuous evaluation: [Previous weight 50%] [Proposed weight 50%]

Since the activities of the continuous face-to-face assessment can be transferred to the virtual continuous assessment (laboratory practices, exercise exhibitions, ...), the weight proposed for the continuous assessment is maintained.

* Evidence that is modified

[Final exam face-to-face] => [Virtual final exam]

If the final face-to-face exam cannot be taken, it will be replaced by a virtual final test at FAITIC, maintaining its weight. The test may include both the virtual delivery of handwritten exercises by students and their response to self-correcting test questions (within a wide battery of questions). In order to verify that the author of the exam is really the student, the teacher can organize a virtual defense session for the exam, where the student must justify their answers in the test. This virtual session will not have an impact on the exam grade, unless a fraud is detected in the performance of the exam, in which case the qualification obtained will be zero points.

* New tests

They are not contemplated.

* Additional Information

If there are any students under exceptional circumstances (such as lack of technological resources) that may limit their participation in the subject on equal terms with their peers, the teacher will try to adapt the assessment to these special needs.

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Chemistry: Chemistry** | | | | |
| Subject | Chemistry: Chemistry | | | |
| Code | P03G370V01204 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 9 | Basic education | 1st | 2nd |
| Teaching language | | | | |
| Department | | | | |
| Coordinator | Cancela Carral, María Ángeles | | | |
| Lecturers | Cancela Carral, María Ángeles | | | |
| E-mail | chiqui@uvigo.es | | | |
| Web | http://faitic.uvigo.es/ | | | |
| General description | (*)Esta materia pretende repasar e homoxenizar os conceptos básicos de química con fin de que sirvan de base para outras materias. | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CE7 | Basic knowledge of general chemistry, organic and inorganic chemistry and its applications in engineering. |
| CT4 | Sustainability and environmental commitment |
| CT7 | Skill in the use of IT tools and ICTs. |
| CT8 | Ability to solve problems, critical reasoning and decision making |
| CT9 | Teamwork skills, skills in interpersonal relationships and leadership. |
| CT10 | Autonomous Learning |

| Learning outcomes | Competences | | |
|---|---|---|---|
| 1R. 2018 Knowledge and understanding of the mathematicians and other inherent basic sciences to the his speciality in engineering, it a level that allow them purchase the rest of the competitions of the qualifications. | CG1 | CE7 | CT4<br>CT7<br>CT8 |
| 3R. 2018 Be conscious of the multidisciplinary context of the engineering. | | | CT9 |
| 4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses. | | | CT10 |
| 5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial. | | | |
| 6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project. | | | |
| 7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering. | | | |
| 8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality. | | | |
| 9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality. | | | |
| 10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study. | | | |
| 12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality. | | | |
| 13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality. | | | |
| 19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general. | | | |
| 21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life. | | | |
| 22R. 2018 Capacity to be to the day of the scientific and technological news. | | | |

| Contents | |
|---|---|
| Topic | |
| 1. Fundamental concepts. | Atoms. Periodic table. Molecules. Mixes. Units of concentration. Chemical reactions and stoichiometry. |
| 2.- Atomic structure and chemical link. | Quantum mechanical description. Periodic properties. Covalent link. Geometry and hybridisation. Polarity. Ionic link and metallic Link. Intermolecular strengths |
| 3. Gases, solids and liquids. Ideal gas, real gas. Liquid state and solid state. | Ideal gas, real gas. Liquid state and solid state. |
| 4. Thermodynamics and Thermochemical | Energy. Enthalpy. Calorimetry. Free energy and spontaneity. |
| 5.- Chemical balances | Balance Gaseous chemical, acid- Base, solubility, balance redox. |
| 6.- Kinetical chemical | Speed of reaction and kinetical equation |
| 7.- Basic concepts of organic chemistry. | Functional groups, isomerism. Reactions and intervals. Mechanisms of reaction |
| 8.- Basic principles of inorganic chemistry | Metallurgy and chemistry of metals |
| 9.- Chemical industrial. | Ways of operation. Processes and basic operations. Diagrams of flow. |
| 10.- Exploitation Of the biomass. Biorefinery | Bioenergy utilization: biopetroleum, biogas, biodiesel and bioethanol<br>Use alimentary: vitamins, mineral and feed.<br>Harnessing Like biomaterials: bioplastics and biopolymers |

| Planning | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Laboratory practical | 14 | 22 | 36 |
| Seminars | 2 | 4 | 6 |
| Presentation | 1 | 3 | 4 |
| Problem solving | 16 | 54 | 70 |
| Lecturing | 45 | 62 | 107 |
| *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 | Sessions of laboratory of two hours in groups of two students, of where will explain the appearances applied of the part of the theoretical contents. Each *prácticatiene incorporated a series of questions that have to be delivered before the realisation of the following practical. |
| Seminars | Group tutoring of compulsory assistance, in where the students explain the work realised on a number reduced of exercises proposed previously. |
| Presentation | Each student will have to realise an oral presentation and written of any of the practices realised in the laboratory. |
| Problem solving | They will explain and/they will resolve it problems in groups reduced of students from a series of billed facilitated by the professor. The students will have to resolve a small number of exercises for each one of the subjects, that will have to deliver in the term indicated for *sua qualification. |
| Lecturing | Classes in the classroom to numerous groups, in where they explain the corresponding contents to each subject. |

| Personalized assistance | |
|---|---|
| **Methodologies** | **Description** |
| Laboratory practical | they are resolution of real cases. |
| Seminars | In the course, there are nine seminars. The first part of the seminar will be made in classroom and the second part will be made at home. |
| Presentation | It is mandatory to present the project in classroom. |
| Problem solving | |

| Assessment | | | |
|---|---|---|---|
| | Description | Qualification | Evaluated Competencess |
| Laboratory practical | (*)Evaluarase o traballo contínuo durante o curso (actitud, implicación e traballo en grupo)<br>Evaluarase a calidade da memoria presentada de forma oral e escrita. | 30 | |
| Problem solving | (*)Evaluarase a resolución dos ejercicios entregados durante o curso. | 20 | |

| | | |
|---|---|---|
| Lecturing | (*)Realizarase un examen final de toda a materia, basado en preguntas tipo test e exercicios numéricos.<br>Asi mesmo poderanse realizar exames de control o largo de todo o curso. | 50 |

**Other comments on the Evaluation**

the matter will be pass if you pass each activities that it constitute, so that it can not approve activities independently. The final note will be the sum of each one of the parts.

EXAMS DATA 2019-2020

First Call: May 25, 2020, 10:00 Hours.

Second Call: May 10, 2020, 10:00 Hours.

The official dates can be found in the official table of the Forest Engineering School and web http://forestales.uvigo.es/gl/

**Sources of information**

**Basic Bibliography**

BROWN, T.L. y otros, **Química: la Ciencia Central**, 7ª, Prentice-Hall, 1998
CHANG, RAYMOND, **Química**, 6ª, McGraw-Hill, 1995
PETRUCCI, HARWOOD, **Química General**, 8ª, Prentice Hall, 2003
Willis, C.J., **Resolucion de problemas de quimica general**, Reverté, 1980

**Complementary Bibliography**

KOTZ, JOHN C.y otros, **Química y Reactividad Química**, International Thomson,

**Recommendations**

**Subjects that are recommended to be taken simultaneously**

Mathematics: Overview of mathematics/P03G370V01203
Mathematics: Mathematics and IT/P03G370V01103

**Other comments**

*Consideranse Necessary previous requirements the following:
- Know the system of units.
- Know realise basic mathematical calculations.
- Know basic concepts of the type: atoms, element, composed, mix, density, composition *porcentual and inorganic basic formulation.

To surpass the *asignatura is necessary to achieve the less 50% of the qualification of each one of the sections *evaluables. The assistance the face-to-face educational activities are compulsory. Absences in the justified, upper 20% of the hours scheduled, suppose a suspense in each one of the sections and in consequence in the matter.

**Contingency plan**

**Description**

Changes in teaching methodology in exceptional circumstances:

In this matter, we will cover all the content included in the teaching guide.

Master classes: They are held at the same time as those established on the center's website, but through online platforms, with the Remote Campus platform and the Faitic platform. Thematic slides, teaching units, and teaching pills are available from Faitic.

Practices: the experimental part of the two blocks of projects will be carried out in the laboratory, will be presented orally through the remote campus and the reports will be sent to the teachers of the subject. If, due to circumstances, you cannot go to the laboratory, the work will be carried out on the basis of bibliographic data.

Seminars: Problems will be explained through the remote campus platform, exercises that students must send by email or will be uploaded to Faitic.

Changes in personalized attention.
The request is answered by email, email or from the remote campus.

Changes in evaluation methodologies:
The Chemistry course will be evaluated in person following the criteria established in the teaching guide. Master class 50%, laboratory practices 30% and problem solving 20%.
The master class will be evaluated with theory tests and problem tests. Theoretical exams are carried out on every two subjects and the test model is used through the Faitic platform. The problem tests will be two partial exams, with the possibility of gradually passing parts of the subject and making the evaluation more continuous. This will be done through the Remote Campus platform (50%).

Work exhibitions (internship projects) take place across the remote campus and correspond to laboratory internships. (30%)

The delivery of the seminars will be done by email and will correspond to the resolution of problems. (20%)

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Mathematics: Statistics** | | | | |
| Subject | Mathematics: Statistics | | | |
| Code | P03G370V01301 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Basic education | 2nd | 1st |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Iglesias Pérez, María Carmen | | | |
| Lecturers | Iglesias Pérez, María Carmen | | | |
| E-mail | mcigles@uvigo.es | | | |
| Web | http://webs.uvigo.es/mcigles/ | | | |
| General description | (*)Esta materia ten como obxectivo proporcionar unha formación estatística básica en descrición de datos, cálculo de probabilidades e inferencia estatística, poñendo o acento nos aspectos aplicados á enxeñaría forestal. | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CE11 | Ability to apply knowledge about statistics and optimization. Statistical computer programs of interest in engineering. |
| CT2 | Ability to communicate orally and written in Spanish or in English |
| CT5 | Capacity for information management, analysis and synthesis |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | Competences | | |
|---|---|---|---|
| 1R. 2018 Knowledge and understanding of the mathematicians and other inherent basic sciences to the his speciality in engineering, it a level that allow them purchase the rest of the competitions of the qualifications.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>4R. 2018 Capacity to analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental relevantes of form relevante and interpret correctly the results of these analyses.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions<br>19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general.<br>21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life. | CG1 | CE11 | CT2<br>CT5<br>CT8 |

| Contents | |
|---|---|
| Topic | |
| 1. Sampling and descriptive statistics | 1.1 Definition and field of application of the Statistics.<br>1.2 Basic concepts of sampling. Methods of random sampling.<br>1.3 Descriptive Statistics: Measures of position, dispersion and shape.<br>1.4 Descriptive Statistics: Tables and graphic representations. |

| | |
|---|---|
| 2. Probability | 2.1 Random Experiment. Sample space. Events.<br>2.2 Probability: concept, properties and methods of determination.<br>2.3 Conditional Probability. Independence of events.<br>2.4 Fundamental theorems: Product rule, total probabilities and Bayes' rule. |
| 3. Random variables and remarkable distributions | 3.1 Concept of random variable (r.v.)<br>3.2 Discrete and continuous random variables.<br>3.3 Characteristics of a r.v.<br>3.4 Models associated to a Bernouilli Process.<br>3.5 Models associated to a Poisson Process.<br>3.6 The Normal distribution.<br>3.7 Other remarkable models. |
| 4. Intervals of confidence | 4.1 Estimator: concept and properties.<br>4.2 The sample mean, sample variance and sample proportion.<br>4.3 Intervals of confidence for the mean, variance and proportion.<br>4.4 Calculation of the size of the sample.<br>4.5 Intervals of confidence for the difference of two means and two proportions. |
| 5. Test of hypothesis | 5.1 Definition and classical methodology of statistical testing: types of hypothesis, type I and type II errors, level of significance, critical region. Power.<br>5.2 Critical level or p-value.<br>5.3 Test on two means and test on two variances (under normality). Test on two proportions.<br>5.4 Test chi-square of independence.<br>5.5 Normality test. |
| 6. Introduction to regression models | 6.1 Linear association measures: covariance and linear correlation coefficient.<br>6.2 The simple linear regression model.<br>6.3 Least squares and the fitted model.<br>6.4 Properties of the least squares estimators and inference.<br>6.5 Analyses of variance and sample coefficient of determination.<br>6.6 Model checking.<br>6.7 Prediction.<br>6.8 Multiple linear regression model.<br>6.9 Methods for model selection. |

| **Planning** | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Lecturing | 15 | 15 | 30 |
| Problem solving | 15 | 15 | 30 |
| Autonomous problem solving | 0 | 32 | 32 |
| Practices through ICT | 14 | 7 | 21 |
| Mentored work | 3 | 12 | 15 |
| Essay questions exam | 2 | 12 | 14 |
| Laboratory practice | 1 | 7 | 8 |
| *The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. | | | |

| **Methodologies** | |
|---|---|
| | Description |
| Lecturing | Explanation by the professor of the theoretical foundations, which should be studied outside of class.<br>At the beginning of each topic, students will be provided with notes and material for a better follow-up of the class.<br>The CG1 and CE11 competences are worked on. |
| Problem solving | Classes in the classroom dedicated to solve exercises, and to propose, solve, analyze or interpret problems.<br>The CG1, CE11, CT8 competences are worked on. |
| Autonomous problem solving | In each subject students should work on a bulletin to know how to solve problems and similar exercises to those in class.<br>It will also be proposed to investigate questions of interest.<br>Also, students will conduct self-assessment questionnaires at the end of the topics or blocks of the subject.<br>There will also be computer exercises related to laboratory practices.<br>All the competences of the subject are worked on. |

| | |
|---|---|
| Practices through ICT | Management of statistical software by each student.<br>Fundamentally, EXCEL or CALC, and R Commander will be used.<br>In each subject, work will be done on the computer following a script to learn the application, calculation and interpretation of basic statistical techniques.<br>Data files related to the field of Forestry Engineering will be analized.<br>All the competences of the subject are worked on. |
| Mentored work | The students will organize themselves in work groups to study a case of real data or a simulation. Each group should choose a problem related to the field of Forest Engineering, obtain or simulate data relative to it, describe and analyze them statistically and draw some relevant conclusions.<br>The work will be done mostly outside the classroom, although some parts of preparation and supervision will be in the classroom.<br>Likewise, the presentation of the work will be face-to-face.<br>All the competences of the subject are worked on. |

## Personalized assistance

| Methodologies | Description |
|---|---|
| Problem solving | The tutorials to resolve any doubt of the subject are in Office 23 of the Escuela de Enxeñería Forestal. |
| Mentored work | Each group must attend a face-to-face tutoring (at least one) before the presentation of the work. |

## Assessment

| | Description | Qualification | Evaluated Competencess | | |
|---|---|---|---|---|---|
| Autonomous problem solving | The activities (problems, questions, computer exercises) given during the course and the self-assessment questionnaires will be evaluated. | 30 | CG1 | CE11 | CT2<br>CT5<br>CT8 |
| Mentored work | Qualification of the content and presentation of the group work. | 10 | CG1 | CE11 | CT2<br>CT5<br>CT8 |
| Essay questions exam | Written exam of problems and small questions of theory.<br>You have to take a minimum to compensate (4 out of 10). | 40 | CG1 | CE11 | CT8 |
| Laboratory practice | Application of statistical software to data analysis in the computer classroom.<br>You have to take a minimum to compensate (4 out of 10). | 20 | CG1 | CE11 | CT5 |

## Other comments on the Evaluation

To pass the subject you must have the two compensable exams and reach a final grade greater than or equal to 5.

In the second call there will be two exams: written and on computer, so that each student retrieves the pending one.
The group work and other activities can not be recovered on second call.

*Exam Data

First announcement: 22 January 2021, 10:00

Second announcement: 1 July 2021, 10:00

The official dates and the possible modifications are avaliable on http://forestales.uvigo.es/gl/

## Sources of information

### Basic Bibliography


Navidi, W., **Estadística para Ingenieros y Científicos**, Mc. Graw Hill,

Cao Abad, R. y otros, **Introducción a la Estadística y sus aplicaciones**, Pirámide,

Peña, D., **Estadística. Modelos y Métodos. Fundamentos**, Alianza Universidad,


### Complementary Bibliography


Alea Riera, V. y otros., **Guía para el análisis estadístico con R Commander**, Barcelona: Universidad de Barcelona,

Pérez López, C., **Estadística aplicada : conceptos y ejercicios a través de Excel**, Madrid : Ibergarceta Publicaciones,

Devore, J., **Probabilidad y estadística para ingeniería y ciencias**, Thomson,

Walpole, R. E. et al., **Probabilidad y estadística para ingeniería y ciencias**, Pearson Educación,

Rodríguez Muñiz, L.J. y otros, **Métodos estadísticos para ingeniería**, Madrid : Garceta,

Framiñán Torres,J.M. y otros, **Problemas resueltos de probabilidad y estadística en la ingeniería**, Universidad de Sevilla,

Susan Milton, J., **Estadística para Biología y Ciencias de la Salud**, McGraw Hill Interamericana,

Ríus, F., Barón, F.J., Sánchez, E. y Parras, L., **Bioestadística: métodos y aplicaciones**, SPICUM (U. Málaga),

**http://www.aulafacil.com/Excel/temario.htm**,
**http://knuth.uca.es/moodle/mod/resource/view.php?id=1126**,
**https://estadisticaorquestainstrumento.wordpress.com/**,

## Recommendations

### Subjects that it is recommended to have taken before

Mathematics: Overview of mathematics/P03G370V01203
Mathematics: Mathematics and IT/P03G370V01103

## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===

*Teaching methodologies that are maintained
All teaching methodologies are maintained with synchronous classes through the Remote Campus and with the support of the Faitic teledoaching platform.

*Teaching methodologies that are modified
None

*Non-attendance mechanism for student attention (tutorials)

The tutorials may be carried out by telematic means:
- Email: mcigles@uvigo.es
- Videoconference in Virtual Office of the Remote Campus (requesting an appointment by email):
https://campusremotouvigo.gal/faculty/993
Mª Carmen Iglesias Pérez: Office 1291

*Modifications (if applicable) of the content to be taught
None

*Additional bibliography to facilitate self-learning
None

*Other modifications
None

=== ADAPTATION OF THE EVALUATION ===

The evaluation is maintained:

Autonomous problem solving (problems, questionnaires and computer exercises): 30%
Supervised work: 10%
Exam of development questions: 40%
Laboratory practice (computer exam): 20%

In each of the exams (written and computer) it is necessary to achieve a minimum grade of 4 out of 10.

In the second call there will be two exams: written and computer, so that each student recovers the one they have pending. Supervised work and the autonomous activities cannot be recovered on second call.

* Additional information

For the final exams the Remote Campus and the Faitic platform will be used.

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Edaphology** | | | | |
| Subject | Edaphology | | | |
| Code | P03G370V01302 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Mandatory | 2nd | 1st |
| Teaching language | Galician | | | |
| Department | | | | |
| Coordinator | Marcet Miramontes, Purificación | | | |
| Lecturers | Marcet Miramontes, Purificación | | | |
| E-mail | marcet@uvigo.es | | | |
| Web | | | | |
| General description | | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG3 | Knowledge of degradation processes that affect forest systems and resources (pollution, pests and diseases, fires, etc.) and capacity for the use of forest environment protection techniques, forest hydrological restoration and biodiversity conservation . |
| CE10 | Basic knowledge of geology and terrain morphology and its application in problems related to engineering. Climatology. Ability to know, understand and use the principles of: physical sciences: geology, soil science and climatology. |
| CT2 | Ability to communicate orally and written in Spanish or in English |
| CT4 | Sustainability and environmental commitment |
| CT5 | Capacity for information management, analysis and synthesis |
| CT6 | Organization and planning capacity |
| CT8 | Ability to solve problems, critical reasoning and decision making |
| CT9 | Teamwork skills, skills in interpersonal relationships and leadership. |
| CT10 | Autonomous Learning |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances. | CG1<br>CG3 | CE10 | CT2<br>CT4<br>CT5 |
| 3R. 2018 Be conscious of the multidisciplinary context of the engineering. | | | CT6 |
| 4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses. | | | CT8<br>CT9<br>CT10 |
| 5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial. | | | |
| 8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality. | | | |
| 9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality. | | | |
| 10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study. | | | |
| 12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality. | | | |
| 13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality. | | | |
| 14R. 2018 Capacity to apply norms of engineering in the his speciality. | | | |
| 15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering. | | | |
| 17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions | | | |
| 19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general. | | | |
| 20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines. | | | |
| 22R. 2018 Capacity to be to the day of the scientific and technological news. | | | |

**Contents**

| Topic | |
|---|---|
| 1.Introducción The wool environmental geology | Minerales, cristales and rocks. Geodiynamic Internal. Geodynamic External. Geology of Galicia. Geologycal resources. |
| 2. The soil: Approaches, work and study. | The soil: conceptual approaches. Edafic organizations. Edafology. The Science of the soil. |
| 3. Ecologycal factors of training | Genesis of soils: factors and processes. Spatial variability of the soil. Horizonation. Ecological factors of training of soil. |
| 4. Meteorization of rocks and minerales and edaphogenesis. | Weathering. Type and processes of weathering. Approach general of wool edaphogenesis. Conceptual model: basic processes in him development of the soil. Basic processes and resultant horizons. Weatherization and Deep geochemical |
| 5 .Studio of the soils in him field. Morfology and description of the soils. | Place and pedión. Wool calicata. Morphology of the soil. Studio of wool internal organization of a soil. Interpretation of a profile of a soil. Properties and characteristics of a soil. You work of transferring. Description Of floors. Horizons of the soil: Horizons genetic and horizons of diagnosis |
| 6. Physical properties and comportement of the soil. | The soil how system of three phases. Physical properties of the soil. Composition granulometric. Texture. Color. Structure of the soil: description of wool organization of wools individual particles. Density and porosity |
| 7. Inorganic componencts of the soil | Origin of minerals of soil. The minerals Of wools particles of soil. Minerals Of wool fraction, sand and limo. Minerals Of wool fraction clay |
| 8. Organic components of the soil. | Contributions Of organic subject. Organic subject of the soil and humus. You work of wool organic subject of the soil. Factors that influence in him content, class and evolution of wool organic subject of the soil. Relation C / N. Evolution of wool organic subject of the soil. Importance environmental of wool organic subject of the soil |
| 9. Chemical properties, physical-chemical and behavior of the soil | Chemical of the soils. Forms in that find the chemical elements in the soils: bioavailability. Colloidal properties of the soil and react of surface. Capacity of exchange Cationic.Reaction of soil. Salinity, Sodicity and Alkalinity of soil. Potential of Oxidation-Reduction. Pollution of soils. |
| 10. Ecology Of the soil and cycle of the element | Soil and biodiversity: flows of nutrient and energy. Rhizosphere. You work of the organisms in him soil. Cycles biogeochemicals. |

| | |
|---|---|
| 11. Water Of soil: content, potentials and movement. | Content Of water in him soil. Measure of the content of water in him soil. Energy of water in soil: potential water and its components. Hydraulic conductivity. Infiltration. Classes of drainage |
| 12. Introduction The wool classification of the soils. | Wool classification of soils. Soil Taxonomy. World Reference Base was Soil Resources. |
| 13. Quality and sustainability: Forests and quality of the ecosystem | I have ecosystem forest and I soil. Management or forest management sustainable. Quality of the soil. Indicators Of quality. Evaluation of wool quality of forest soils |
| 14. Climatology | Factors that condition wool expression of a climate. Elements of the climate. Atmospheric circulation. Analysis and prediction Of the time. Wools climatic classifications. |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Laboratory practical | 16 | 14 | 30 |
| Studies excursion | 5 | 2 | 7 |
| Presentation | 3 | 20 | 23 |
| Lecturing | 30 | 60 | 90 |

*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 | Activities of application of the knowledge to concrete situations and of acquisition of basic and procedural skills related to the subject matter of study. They are developed in special spaces with specialized equipment (scientific-technical laboratories, languages, etc.). |
| Studies excursion | Activities of application of the knowledge to concrete situations and of acquisition of basic and procedural skills related to the subject matter of study. They are developed in non-academic outer spaces.<br>Among them we can mention field practices, visits to events, research centers, companies, institutions ... of academic-professional interest for the student |
| Presentation | Exposition by the student to the teacher and / or a group of students of a topic about contents of the subject or the results of a work, exercise, project ... It can be carried out individually or in a group. |
| Lecturing | Teacher presentation of contents on the subject matter of study, theoretical bases and / or guidelines of a work, exercise or project to be developed by the student |

**Personalized assistance**

| Methodologies | Description |
|---|---|
| Laboratory practical | |
| Studies excursion | |
| Presentation | |

**Assessment**

| | Description | Qualification | Evaluated Competencess | |
|---|---|---|---|---|
| Laboratory practical | | 20 | | CT2 |
| | | | | CT6 |
| | | | | CT8 |
| Presentation | | 20 | | CT2 |
| Lecturing | | 60 | CE10 | CT6 |

**Other comments on the Evaluation**

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**


PORTA, J., LÓPEZ-ACEBEDO, M. , ROQUERO DE LABURU, C., **Edafología para la agricultura y el medio ambiente**, 2003,

PORTA, J; LÓPEZ-ACEVEDO, M , POCH, R.M., **Introducción a la Edafología: Uso y Protección del Suelo**, 2008,

PORTA, J. ,LÓPEZ-ACEVEDO M., **Agenda de campo de suelos. Información de suelos para la agricultura y el medio ambiente. del suelo.**, 2005,

BRADY, N. C., **Elements of the Nature and Properties of Soils**, 2010,

WHITE R., **Principles and practice of soil science**, 2007,

CHARMAN P., MURPHY B., **Soils . Their propierties and management**, 2007,

BLANCO H., LAL R., **Principles of soil conservation and management**, 2008,

FUENTES YAGÜE J.L., **Iniciación a la meteorología y climatología agrícola**, 2000,
Ledesma, Manuel, **, "Climatología y meteorología agrícola",**, 2000,
Elías Castillo, Francisco / Castellví Sentís, Francesc,, **"Agrometeorología",**, 2001,

## Recommendations

## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

* Teaching methodologies modified

* Non-attendance mechanisms for student attention (tutoring)

* Modifications (if applicable) of the contents

* Additional bibliography to facilitate self-learning

* Other modifications

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Pending tests that are maintained
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Tests that are modified
[Previous test] => [New test]

* New tests

* Additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Botany** | | | | |
| Subject | Botany | | | |
| Code | P03G370V01303 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Mandatory | 2nd | 1st |
| Teaching language | | | | |
| Department | | | | |
| Coordinator | Paz Bermudez, Maria Graciela | | | |
| Lecturers | Paz Bermudez, Maria Graciela | | | |
| E-mail | graciela@uvigo.es | | | |
| Web | http://http://faitic.uvigo.es/index.php/es/ | | | |
| General description | (*)Coñece-los conceptos básicos e a terminoloxía específica para aprender a diferencia-los grandes grupos de organismos que estuda a Botánica, incidindo nos grupos con maior presencia no ámbito forestal galego. | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG2 | Ability to analyze the ecological structure and function of forest systems and resources, including landscapes. |
| CE15 | Ability to know, understand and use the principles of: forest botany. |
| CE36 | Ability to solve technical problems derived from the management of natural spaces. Conservation of biodiversity. |
| CT2 | Ability to communicate orally and written in Spanish or in English |
| CT3 | Ability to communicate orally and in writing specifically in the Galician language |
| CT4 | Sustainability and environmental commitment |

| Learning outcomes | Competences | | |
|---|---|---|---|
| New | CG1<br>CG2 | CE15<br>CE36 | CT2<br>CT3<br>CT4 |

| Contents | |
|---|---|
| Topic | |
| 1. Concept of Botanist. | Categories and taxonomic unities. Botanic nomenclature. |
| 3. The reproduction | Types of reprodution. Biological cycles. Alternation of generations and his importance. |
| 2. Morphological levels of vegetal organization. | Traffic of Therophytes to Cormophytes. Generalities of the vascular plants and its adaptive advantages. |
| 4. The plants with seed (Spermatophytes). | General characters. Root and cut. Main type and modifications. The leaf, special trainings and philotaxic. Forms of life. |
| 5. The flower. | Concept of flower in gymnosperms and angiosperms. Floral receptacle. Perianth. Androceo. Xineceo. Inflorescences |
| 6. Pollination | Main type and floral syndromes. Evolution of the flower in relation of type of pollination |
| 7. Fertilization | Differences between the fertilization in Gymnosperms and Angiosperms. Training of the seed. Fruits and Infoscences. Dispersion. |
| 8. Gymnosperms | General characters. Reproduction: Vital cycle. Main groups. Division Cycadophyta. Division Ginkgophyta. |
| 9. Division Coniferophyta. General characteristics. Class Coniferopsida | General characteristics. Class Coniferopsida |
| 10. Order Coniferales, Family Pinaceae. | General characteristics. Ecological importance, forestal and economic. Genders more representative. |
| 11. Family Cupressaceae. | General characteristics. Genders more representative. |
| 13. Quotation of the families Podocarpaceae and Cephalotaxaceae. Order Taxales, Family Taxaceae, species more relevants and forestal importes. | (*)Especies máis relevantes e importancia ecolóxica e forestal. |

| | |
|---|---|
| 14. Anxiospermas. Div. Magnoliophyta General characters. | Reproduction: Vital cycle. Differential characters go in the classes Magnoliopsida (Dicotyledonous) and Liliopsida (monocotiledóneas). |
| 15. Magnolipsida Class (dicotyledonous). Subclase 1: Magnoliidae. General characters. | Families: Magnoliaceae, Lauraceae, Ranunculaceae, Berberidaceae. Genders and species more important and examples. |
| 16. Subclass 2: Hamamelididae. | General characters of the families Hamamelidaceae and Platanaceae. Species of forestal and ornamental interest. |
| 17. Special quotation of the families Fagaceae and Betulaceae. | Genders and species more relevants. Ecological and economic interest. |
| 18. Family Juglandaceae. General characters of the families Ulmaceae and Moraceae. | (*)Especies máis relevantes e importancia forestal |
| 20. Subclass 4: Dillenidae. | General characters of the families of main economic and forestall: Theaceae, Tiliaceae, Cistaceae, Salicaceae, Brasicaceae, Ericaceae. |
| 21. Subclass 5: Rosidae. | Families of main forstal interest: Rosaceae, Leguminosaceae, Myrtaceae, Aquifoliaceae, Rutaceae, Anacardiaceae, Hippocastanaceae, Aceraceae, Rhamnaceae, Buxaceae. |
| 22. Subclass 6: Asteridae. | Quotation of the most representative families: Solanaceae, Caprifoliaceae, Lamiaceae, Oleaceae and Asteraceae |
| 23. Class Liliopsida (monocotiledoneas). | Differential characters and families more significant. |
| 24. Concept of Geobotanic | Distribution of the plants and floristic territories. Biogeographic kingdoms. |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Studies excursion | 2 | 0 | 2 |
| Laboratory practical | 16 | 10 | 26 |
| Autonomous problem solving | 4 | 28 | 32 |
| Lecturing | 30 | 60 | 90 |

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

**Methodologies**

| | Description |
|---|---|
| Studies excursion | Activities application of knowledge to specific situations and basic skills acquisition and related procedural matter under study. They thrive in nonacademic outdoor spaces.<br>Among them we can cite practical field visits to events, research centers, companies, institutions ... academic-professional interest to the student. |
| Laboratory practical | Activities application of knowledge to specific situations and basic skills acquisition and related procedural matter under study. Special spaces are developed with specialized equipment (scientific and technical laboratories, languages, etc.). |
| Autonomous problem solving | Actividade in which problems are formulated and / or exercises related to the course. The student must develop the analysis and resolution of problems and / or exercises independently. |
| Lecturing | Presentation by the teacher of the contents on the subject under study, theoretical and / or guidelines for a job, exercise or project to be developed by the student. |

**Personalized assistance**

| Methodologies | Description |
|---|---|
| Laboratory practical | |
| Autonomous problem solving | |

**Assessment**

| | Description | Qualification | Evaluated Competencess |
|---|---|---|---|
| Studies excursion | (*)No exame de laboratorio integraranse os coñecementos adquiridos nas saídas de campo.<br>Avalíase a competencia B20 | 5 | |
| Laboratory practical | (*)Farase unha avaliación continua ó alumnado das actividades plantexadas nas clases prácticas.Ó final do curso o alumnado deberá entregar unha memoria final e/ou realizar unha proba sobre identificación de distintos pliegos de especies forestais.<br>Avalíanse as competencias A10,A18,A20 | 20 | |

| | | | | |
|---|---|---|---|---|
| Autonomous problem solving | (*)No exame da sesión magistral integraranse os coñecementos adquiridos coa resolución de problemas dun xeito autónomo.<br>Ó final do curso o alumnado deberá entregar un herbario formado, principalmente, polas especies forestais tratadas na parte teórica e/ou un traballo bibliográfico ou de investigación. Estes coñecementos poderán integrararse no exame de laboratorio ou valorarse dun xeito independiente<br>Avalíanse as competencias A68,B20 | 5 | | CE15 |
| Lecturing | (*)Proba con preguntas tipo test, de resposta curta e de resposta longa; o alumnado deberá demostrar os coñecementos adquiridos.<br>Avalían-se as competencias A2,A8,A68 | 70 | CG1 | CE15 |

**Other comments on the Evaluation**

Tests dates:

First call: 9th january 2020 at 10.00h (theorical test) and 12.30h (practical test)
Second call: 1th july 2020 at 16.00h (theorical test) and 18.30h (practical test)

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**


Díaz González T. E., Fernández-Carvajal M. C., Fernández Prieto J. A., **Curso de Botánica**, Ed. Trea, Oviedo,

Izco J. (coord.)., **Botánica**, Ed. McGraw- Hill. Interamericana, Madrid.,

Nabors M.W., **Introducción a la Botánica**, Ed. Pearson, Madrid.,

Strasburger, E., **Tratado de Botánica**, Ed. Omega, Barcelona,

Blanco Castro, E. et al., **Los Bosques Ibéricos. Una interpretación Geobotánica.**, Ed. Planeta, Barcelona,

Castro, M.; Prunell, A. & Blanco-Dios, J., **Guía das árbores autóctonas e ornamentais de Galicia.**, Ed. Xerais, Vigo,

Castroviejo,S. (coord.), **Flora iberica: Plantas vasculares de la Península Ibérica e Islas Baleares.**, Real Jardín Botánico, C.S.I.C. Madrid,

García, X.R., **Guía das plantas de Galicia**, Ed. Xerais, Vigo,

López González, G., **Guía de los árboles y arbustos de la península Ibérica y Baleares**, Mundi-Prensa Libros,

Carrión, J.S., **Evolución vegetal**, DM,

Niño Ricoi, H., **Guía das árbores de Galicia**, Bahia,

Polunin, O. & Smythies, B.E,, **Guía de campo de las flores de España, Portugal y Sudoeste de Francia**, Omega,

https://www.arbolesibericos.es/,


**Recommendations**

**Subjects that continue the syllabus**

Biology: Plant Biology/P03G370V01201
Forestry Ecology/P03G370V01402

**Contingency plan**

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Electrotechnology and rural electrification** | | | | |
| Subject | Electrotechnology and rural electrification | | | |
| Code | P03G370V01304 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Mandatory | 2nd | 1st |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Moldes Eiroa, Ángel | | | |
| Lecturers | | | | |
| E-mail | | | | |
| Web | | | | |
| General description | They will study the principles of operation of the electricity and the electrical circuits, as well as the components, the design and the calculation of an electrical installation. | | | |

| Competencies | |
|---|---|
| Code | |
| CG9 | Knowledge of hydraulics, construction, electrification, forest roads, machinery and mechanization necessary both for the management of forest systems and for their conservation. |
| CE14 | Ability to know, understand and use the principles of: electrical engineering and forest electrification. |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | Competences | | |
|---|---|---|---|
| 2**R. 2018 Knowledge and understanding of the disciplines of engineering of his speciality, to the necessary level to purchase the rest of the competitions of the degree, including notions of the last advances.<br>3**R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>4**R. 2018 Capacity to analyse products, processes and complex systems in his field of study; choose and apply analytical methods, of calculation and experimental notable of notable form and interpret properly the results of these analyses.<br>5**R. 2018 Capacity to identify, formulate and resolve problems of engineering in his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognise the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6**R. 2018 Capacity to project, design and develop complex products (pieces, components, products #finish, etc.), processes and systems of his speciality, that fulfil the requirements established, including the knowledge of the social appearances, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7**R. 2018 Capacity of the project using some knowledges advanced of his speciality in engineering.<br>8**R. 2018 Capacity to make bibliographic researches, consult and use databases and other sources of information with discretion, to make simulations and analysis with the aim to make investigations on technical subjects of his speciality.<br>9**R. 2018 Capacity to consult and apply codes of best practices and security of his speciality.<br>10**R. 2018 Capacity and capacity to project and make experimental investigations, interpret results and obtain conclusions in his field of study.<br>11**R. 2018 Understanding of the technicians and methods of analysis, project and applicable investigation and his limitations in the field of his speciality.<br>12**R. 2018 practical Competition to resolve complex problems, make complex projects of engineering and make specific investigations for his speciality.<br>13**R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations in the field of his speciality.<br>15**R. 2018 Knowledge of the social implications, of health and security, environmental, economic and industrial of the practice in engineering. | CG9 | CE14 | CT8 |

| Contents |
|---|
| Topic |
| INTRODUCTION AND AXIOMS |
| CIRCUITS OF CONTINUOUS CURRENT |
| CIRCUITS OF ALTERNATES CURRENT |

| |
|---|
| TRIFÁSIC SYSTEMS BALANCED |
| OPERATION OF THE NATIONAL ELECTRICAL SYSTEM |
| ELEMENTS OF AN ELECTRICAL SYSTEM |
| CALCULATION OF ELECTRICAL INSTALLATIONS |
| ELECTRONIC REGULATION FOR LOW TENSION |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 16 | 16 | 32 |
| Problem solving | 16 | 48 | 64 |
| Laboratory practical | 16 | 0 | 16 |
| Practices through ICT | 12 | 18 | 30 |
| Problem and/or exercise solving | 3 | 0 | 3 |
| Problem and/or exercise solving | 1 | 0 | 1 |
| Essay | 4 | 0 | 4 |

*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 BY PART OF The PROFESSOR OF The THEORETICAL BASES OF The ASIGN#PUT |
| Problem solving | FORMULATION And RESOLUTION OF PROBLEMS RELACCIONED WITH The ASIGN#PUT |
| Laboratory practical | ACTIVITIES OF APPLICATION OF KNOWLEDGES IN SPACES WITH SPECIALIZED EQUIPMENT |
| Practices through ICT | ACTIVITIES OF APPLICATION OF KNOWLEDGES IN CLASSROOM OF COMPUTING |

**Personalized assistance**

| Methodologies | Description |
|---|---|
| Lecturing | |
| Problem solving | |
| Practices through ICT | |
| Laboratory practical | |

**Assessment**

| | Description | Qualification | Evaluated Competences |
|---|---|---|---|
| Laboratory practical | It EVALUATED BY MEANS OF The DELIVERY OF A MEMORY WITH The NUMERICAL RESULTS OBTAINED IN The PRACTICES | 10 | CE14 |
| Problem and/or exercise solving | It EVALUATED BY MEANS OF The APPROACH OF PROBLEMS THAT The STUDENT will HAVE TO ANSWER OF FORM WRITTEN | 40 | CE14 |
| Problem and/or exercise solving | It EVALUATED BY MEANS OF The APPROACH OF QUESTIONS THAT The STUDENT will HAVE TO ANSWER OF FORM WRITTEN | 20 | CE14 |
| Essay | It EVALUATED The QUALITY OF A PROJECT OF ELECTRICAL INSTALLATION CALCULATED BY The STUDENT | 30 | CE14 |

**Other comments on the Evaluation**

Will not conserve any note of previous announcements, except the note of the work and of the practices inside the same academic year. The note obtained in the work in the announcement of January will be valid for the announcement of Julio.

Calendar of examinations:First Announcement: 24 January 2020, 10:00 HoursSecond Announcement: 22 June 2020, 12:00 Hours

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

PARRA, PEREZ, PASTOR, ORTEGA, **TEORÍA DE CIRCUITOS**, 2003,

GONZÁLEZ, GARRIDO, CIDRÁS, **EJERCICIOS RESUELTOS DE CIRCUITOS ELÉCTRICOS**, 1999,

SPITTA, **INSTALACIONES ELÉCTRICAS**, 1980,

MINISTERIO CIENCIA Y TECNOLOGÍA, **R.D. 842/2002 REGLAMENTO ELECTROTÉCNICO PARA BAJA TENSIÓN**, 2002,

MINISTERIO CIENCIA Y TECNOLOGÍA, **R.D.223/2008 REGLAMENTO DE LÍNEAS ELÉCTRICAS DE ALTA TENSIÓN**, 2008,
MINISTERIO CIENCIA Y TECNOLOGÍA, **R.D.337/2014 REGLAMENTO SOBRE CONDICIONES TÉCNICAS Y GARANTÍAS DE SEGURIDAD EN INSTALACIONES ELÉCTRICAS DE ALTA TENSIÓN**, 2014,

## Recommendations

### Subjects that it is recommended to have taken before

Physics: Physics I/P03G370V01102
Physics: Physics II/P03G370V01202
Mathematics: Overview of mathematics/P03G370V01203
Mathematics: Mathematics and IT/P03G370V01103

## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

* Teaching methodologies modified

* Non-attendance mechanisms for student attention (tutoring)

* Modifications (if applicable) of the contents

* Additional bibliography to facilitate self-learning

* Other modifications

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Pending tests that are maintained
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Tests that are modified
[Previous test] => [New test]

* New tests

* Additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Forest entomology and Zoology** | | | | |
| Subject | Forest entomology and Zoology | | | |
| Code | P03G370V01305 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Mandatory | 2nd | 1st |
| Teaching language | | | | |
| Department | | | | |
| Coordinator | Paz Bermudez, Maria Graciela | | | |
| Lecturers | López de Silanes Vázquez, María Eugenia<br>Paz Bermudez, Maria Graciela<br>Souto Otero, José Carlos | | | |
| E-mail | graciela@uvigo.es | | | |
| Web | http://http://faitic.uvigo.es/index.php/es/ | | | |
| General description | (*)Esta materia ensina ó alumnado os fundamentos de zooloxía, con énfase nas especies máis comúns nos nosos bosques. Dada a gran importancia da entomoloxía no medio forestal, unha parte importante da materia adicarase a esta disciplina. Finalmente, outro bloque de temas centrarase en xenética, especialmente na de poboacións, co fin de que o alumno poida adquirir uns coñecementos fundamentais para comprende-la dinámica e a evolución das poboacións animais. | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG3 | Knowledge of degradation processes that affect forest systems and resources (pollution, pests and diseases, fires, etc.) and capacity for the use of forest environment protection techniques, forest hydrological restoration and biodiversity conservation . |
| CE13 | Ability to know, understand and use the principles of: forest zoology and entomology; biological foundations of the animal field in engineering. |
| CT4 | Sustainability and environmental commitment |
| CT5 | Capacity for information management, analysis and synthesis |

| Learning outcomes | Competences | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances. | CG1<br>CG3 | CE13 | CT4<br>CT5 |
| 3R. 2018 Be conscious of the multidisciplinary context of the engineering. | | | |
| 4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses. | | | |
| 8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality. | | | |
| 9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality. | | | |
| 10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study. | | | |
| 12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality. | | | |
| 13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality. | | | |
| 15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering. | | | |
| 17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions | | | |
| 19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general. | | | |
| 21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life. | | | |
| 22R. 2018 Capacity to be to the day of the scientific and technological news. | | | |

| Contents | |
|---|---|
| Topic | |
| I. General zoology | 1. Introduction to the zoology<br>2. Structure of the animal cells<br>3. The cellular division<br>4. The fabrics |
| II. Genetic | 1. Introduction to the mendelism<br>2. Nature of the hereditary material<br>3. Genetic structure of the populations<br>4. Changes of the genic frequencies<br>5. The continuous variation |
| III. Descriptive zoology | 1. General characters of the invertebrates<br>2. Entomology. Characteristic and importance of the insects<br>3. Cordados. Introduction to fishes, amphibious and reptilian<br>4. Birds and mammalian |

| Planning | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 32 | 48 | 80 |
| Laboratory practical | 16 | 26 | 42 |
| Problem solving | 4 | 24 | 28 |

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

| Methodologies | Description |
|---|---|
| Lecturing | Presentation by the teacher of the contents on the subject under study, theoretical and / or guidelines for a job, exercise or project to be developed by the student. |
| Laboratory practical | Activities application of knowledge to specific situations and basic skills acquisition and related procedural matter under study. Special spaces are developed with specialized equipment (scientific and technical laboratories, languages, etc.). |
| Problem solving | Activity which formulated problem and / or exercises related to the course. The student should develop appropriate solutions or right through the exercise routines, application of formulas or algorithms, application processing procedures available information and interpretation of the results. It is often used to complement the lecture. |

| Personalized assistance | |
|---|---|
| **Methodologies** | **Description** |
| Lecturing | |
| Laboratory practical | |

| Assessment | Description | Qualification | Evaluated Competencess | |
|---|---|---|---|---|
| Lecturing | (*)1.-Probas de tipo test<br>2.-Probas de respuesta corta<br>3.-Probas de respuesta larga, de desarrollo | 75 | CG1 | CE13 |
| Laboratory practical | (*)Informes/memorias de prácticas e/ou examen práctico | 20 | | CE13 |
| Problem solving | (*) | 5 | | |

**Other comments on the Evaluation**

Tests dates:

First call:  21th january 2020 at 10hSecond call: 26th june 2020 at 10h

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

Davies RG, **Introdución a la entomología**, 1989,

Falconer DS, Mackay TFC, **Introducción a la genética cuantitativa**, 1996,

Hickman CP, Roberts LS, Keen S, Larson A, I'Anson H, Eisenhour D, **Principios integrales de zoología**, 2009,

Paniagua R (coordinador), **Citología e histología vegetal y animal**, 2007,
Barrientos JA (ed), **Curso práctico de entomología**, 2004,
Carlos de Liñán Vicente (coord), **Entomología agroforestal**, 1998,
Chinery, M., **Guía de campo de los insectos de España y de Europa**, 2005,

## Recommendations

### Subjects that are recommended to be taken simultaneously

Forestry Ecology/P03G370V01402
Mathematics: Statistics/P03G370V01301

## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

* Teaching methodologies modified

* Non-attendance mechanisms for student attention (tutoring)

* Modifications (if applicable) of the contents

* Additional bibliography to facilitate self-learning

* Other modifications

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Pending tests that are maintained
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Tests that are modified
[Previous test] => [New test]

* New tests

* Additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Forestry** | | | | |
| Subject | Forestry | | | |
| Code | P03G370V01401 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Mandatory | 2nd | 2nd |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Picos Martín, Juan | | | |
| Lecturers | Picos Martín, Juan | | | |
| E-mail | jpicos@uvigo.es | | | |
| Web | http://silvicultor.blogspot.com/ | | | |
| General description | The general aims of the *asignatura are:<br>to) Know the bases, object and foundations of the *Selvicultura<br>*b) Know the foundations of the *Selvicultura Static<br>*c) Know the foundations of the *Selvicultura Dynamic<br>*d) Know the cultural characters of the forest species<br>and) That the professional future was able to analyse and interpret the mountain to be able to propose suitable treatments in each case. | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG2 | Ability to analyze the ecological structure and function of forest systems and resources, including landscapes. |
| CG6 | Ability to measure, inventory and evaluate forest resources, apply and develop silvicultural techniques and management of all types of forest systems, parks and recreational areas, as well as techniques for harvesting timber and non-timber forest products |
| CE17 | Ability to know, understand and use the principles of silviculture. |
| CT5 | Capacity for information management, analysis and synthesis |
| CT8 | Ability to solve problems, critical reasoning and decision making |
| CT10 | Autonomous Learning |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 3R. 2018 Be conscious of the multidisciplinary context of the engineering. | CG1 | CE17 | CT5 |
| 4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses. | CG2<br>CG6 | | CT8<br>CT10 |
| 5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial. | | | |
| 6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project. | | | |
| 7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering. | | | |
| 8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality. | | | |
| 9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality. | | | |
| 11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality. | | | |
| 12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality. | | | |
| 13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality. | | | |
| 15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering. | | | |
| 19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general. | | | |
| 20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines. | | | |
| 21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life. | | | |
| 22R. 2018 Capacity to be to the day of the scientific and technological news. | | | |

## Contents

| Topic | |
|---|---|
| I.- Concept and foundations of silviculture | 1. Concept and classes of silviculture<br>2. Static study of forest stands |
| II.- Silvicultural Systems | 3. Dynamic study of forest stands<br>4. Influence of ecological factors.<br>5. Classification of Silvicultural systems and methods<br>6. Clearcutting and Seed Tree system<br>7. Shelterwood systems<br>8. Selection systems<br>9. Tending of forest stands<br>10. Coppice systems<br>11. Transitory systems<br>12. Risk Mitigation and silviculture |
| III.- Silvics | 13. silvics of the main forest species |

## Planning

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 25.5 | 47.5 | 73 |
| Problem solving | 8 | 14 | 22 |
| Studies excursion | 8 | 8 | 16 |
| Project based learning | 1 | 11.5 | 12.5 |
| Case studies | 10.5 | 14 | 24.5 |
| Objective questions exam | 0.5 | 0 | 0.5 |
| Problem and/or exercise solving | 0.5 | 0 | 0.5 |
| Case studies | 1 | 1 | 2 |

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

## Methodologies

| | Description |
|---|---|
| Lecturing | Masterclasses in classroom or vía Campus Remoto (online teaching Platform) |

| | |
|---|---|
| Problem solving | Resolution of problem solving and/or exercises in classroom, laboratory or in field or via the online teaching platform (Faitic-Campus Remoto) |
| Studies excursion | Field Visits to Forest Management Units and to forestry works. |
| Project based learning | - Organization of seminars or specific conferences<br>- Presentations/exhibitions: Presentations by students about an specific subject or about a personal work.<br>- Multimedia sessions: Use od video, computer simulations or on-line materials.<br>- Sessions about previously studied/analysed issues in the field trips |
| Case studies | - Study cases and guided debates: Formulation, analysis, resolution and debate of a problem or exercise. |

**Personalized assistance**

| Methodologies | Description |
|---|---|
| Case studies | |
| Problem solving | |
| Studies excursion | |

**Assessment**

| | Description | Qualification | Evaluated Competencess | | |
|---|---|---|---|---|---|
| Lecturing | . | 0 | CG6 | CE17 | |
| Project based learning | written exam and/or summary of the activities | 20 | CG6 | CE17 | CT5 |
| Case studies | written exam and/or oral disertation about similar cases to those solved in class | 20 | CG6 | CE17 | |
| Objective questions exam | written exam or test about the contants of the lectures given | 30 | CG6 | CE17 | |
| Problem and/or exercise solving | written answer to those exercises suggested | 30 | CG6 | CE17 | |

**Other comments on the Evaluation**

to pass the course the studant must pass the different exams and solve satisfactorily the assignments

Attendance to practical sessions and field excursions are mandatory.

Some of the tests or exams may have eliminatory character.

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

Serrada, R., Montero, G. y Reque, J. Eds, **Compendio de Selvicultura Aplicada en España**, 978-84-7498-521-4, Madrid : INIA - FUCOVASA, 2008

González Molina, José María, **Introducción a la selvicultura general**, 978-84-97732239, León : Universidad, Secretariado de Publicaciones, 2005

Sociedad Española de Ciencias Forestales, **Recursos Abiertos. SECF**, http://secforestales.org/recursos_abiertos, SECF,

Sevilla Martinez, Froilan, **Una Teoria ecologica para los Montes ibericos**, 978-8461248315, Inst.Restauracion Y Medio A., 2012

Serrada Hierro, Rafael, **Apuntes de Selvicultura**, https://distritoforestal.es/images/Apuntes_de_Selvicultura_completo_2011.pdf, 1ª, FuCOVaSA, 2001

**Recommendations**

**Subjects that continue the syllabus**

Use of forests/P03G370V01601
Dasometry/P03G370V01602
Forest management/P03G370V01605
Repopulation/P03G370V01603
Forest and pasture management/P03G370V01704

**Subjects that are recommended to be taken simultaneously**

Botany/P03G370V01303
Forestry Ecology/P03G370V01402

**Subjects that it is recommended to have taken before**

## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
** Teaching methodologies that are maintained
All methodologies but field trips are maintained. They will adapt to a non-face-to-face format using the official on-line teaching platforms.

* Teaching methodologies that are modified
In case of having to cancel field trips, they will be replaced by materials such as:
 Explanatory video pills. /
 Other recommended reading documents.
 External videos, web links, etc.
Some tasks / exercises will be proposed for evaluation. Delivery and review deadlines will be specified in each of the proposed tasks.

* Non-face-to-face service mechanism for students (tutorials)
Weekly an email will be sent to the students with instructions for the weekly session of the subject. Said email will be sent through the FAITIC platform.
A section will be opened in the FAITIC platform forum for the resolution of doubts.
Questions will be answered through email.
Tutorials can be made via the assigned room of the UVIGO REMOTE CAMPUS. For this, it is advised to send an email in advance to define day, time. These tutorials can be collective.

=== ADAPTATION OF THE EVALUATION ===
No changes will be made to the proposed evaluation system. They will only be adapted to be carried out in a on-line mode using the UVIGO Faitic-Remote Campus remote teaching platforms.

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Forestry Ecology** | | | | |
| Subject | Forestry Ecology | | | |
| Code | P03G370V01402 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Mandatory | 2nd | 2nd |
| Teaching language | #EnglishFriendly<br>Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Sobrino Garcia, Maria Cristina | | | |
| Lecturers | Cordero Rivera, Adolfo<br>Sobrino Garcia, Maria Cristina | | | |
| E-mail | sobrinoc@uvigo.es | | | |
| Web | http://ecoevo.uvigo.es | | | |
| General description | Ecology is the science that studies the response of organisms to environmental variations, from the individual level to the ecosystem. This course has as objectives to provide the basic knowledge of Ecology, with special reference to the forest environment. | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG2 | Ability to analyze the ecological structure and function of forest systems and resources, including landscapes. |
| CG3 | Knowledge of degradation processes that affect forest systems and resources (pollution, pests and diseases, fires, etc.) and capacity for the use of forest environment protection techniques, forest hydrological restoration and biodiversity conservation . |
| CE12 | Ability to know, understand and use the principles of: Forest Ecology |
| CT2 | Ability to communicate orally and written in Spanish or in English |
| CT3 | Ability to communicate orally and in writing specifically in the Galician language |
| CT4 | Sustainability and environmental commitment |
| CT5 | Capacity for information management, analysis and synthesis |
| CT7 | Skill in the use of IT tools and ICTs. |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | | | |
|---|---|---|---|
| Learning outcomes | Competences | | |
| New | CG1 | CE12 | CT2 |
| | CG2 | | CT3 |
| | CG3 | | CT4 |
| | | | CT5 |
| | | | CT7 |
| | | | CT8 |

| Contents | |
|---|---|
| Topic | |
| 0. ORGANIZATION OF THE COURSE. FORESTS AND FOREST PLANTATIONS. | Development of the subject. Techniques of evaluation of the student: objectives and methods. Forests and plantations: differences and similitudes. The principles of Forest Ecology. |
| SECTION I.<br>1. INTRODUCTION TO ECOLOGY. | The concept of sustainability. The demographical problem (implications of human growth population on natural resources). Introduction to Ecology. Levels of biological organization and subdivisions of Ecology. The concept of ecosystem. Forest Ecology and the principle of determinism. The scientific method. Introduction to ecological economics (National accounting and the loss of natural resources. The ecospace and the ecological footprint). Ecology and environmentalism. |

| | |
|---|---|
| SECTION II. THE ENVIRONMENT.<br>2. THE MATCH BETWEEN ORGANISMS AND THE ENVIRONMENT. | Genotypic and phenotypic variation. Natural selection. Ecotypes. Concept of resource and ecological factor. Ecological effects of solar radiation (Photosynthesis, index of foliar surface, morphology, shadow tolerance, photoperiodism). The temperature and the organisms (Q10, diapause, physiological time, effects on plants, adaptations of plants to unfavourable temperatures). Atmospheric humidity and vegetal adaptations. Effects of the wind on vegetation (dissemination of reproductive propagules, physiological effects, morphological effects). Adaptations to fire. |
| 3. FOREST IMPLICATIONS OF BIOLOGICAL ADAPTATION. | Implications of evolutionary concepts in the exploitation of forests. Importance of the factor light in forestry. Importance of the factor temperature in forestry. Importance of water in forestry. Importance of the wind in forestry. |
| SECTION III. ECOLOGY OF POPULATIONS.<br>4. DEMOGRAPHY. | Concept of population. Unitary and modular organisms. Construction and analysis of life tables. Survivorship courves. Age pyramids. Populational growth (geometrical growth, mathematical models, intrinsic rate of growth, innate capacity of increase). Populational growth and intraspecific competition: concept of carrying capacity. Analysis of key factors. |
| 5. INTERACTIONS (I): COMPETITION AND PREDATION. | Theory of niche: concept, multidimensional approach. The relationship between niche and habitat. Type of interactions between organisms. Intraspecific competition (exploitation, interferencie, densodependency, population regulation, asymmetry). Allelopathy. Interspecific competition (logistical model, model of Tilman). Principle of competitive exclusion. Character displacement. Type of predators. Model of Lotka-Volterra. Examples in the laboratory and the field. Strategies in the search of food. Functional responses. Coevolution prey-predator. Mechanisms of defence of the prey (physical defences, chemical, crypsis, aposematism, mimicry). Interaction herbivores-plants. |
| 6. INTERACTIONS (II): MUTUALISM AND DETRITIVORY. | Concept of mutualism. Types of mutualism (behaviour, care, polinización, intestinal, symbiosis, mycorhyzes). Lichens. Leguminous plants and Rhizobium. Decomposers: Bacteria and fungi. Soil detritivores (earthworms, insects). Aquatic detritivores. Relative role of microflora and detritivores. Interactions detritivore-resource (vegetal detritus, faeces, carrion). |
| SECTION IV. ESTRUCTURA AND ORGANIZATION OF ECOSYSTEMS.<br>7. THE BIOLOGICAL COMMUNITY. | Concept. Characteristics of the community. Physical structure (stratification, forms of growth, biomas). Seasonality (Temperate zones, tropical zones). Concept of ecotone (effect of border, ecotones between forests and grasslands). Concept of guild. |
| 8. DIVERSITY IN FOREST ECOSYSTEMS. | Concept and type of diversity. Why preserve biodiversity? The measure of the biodiversity (index of Shannon, rank-abundance plots). Latitudinal gradient of biodiversity. Main forest activities and their effect on biodiversity. Techniques for maintaining biodiversity in forest plantations. Principles of eco-forestry. |
| 9. PRIMARY PRODUCTIVITY. | Production and respiration (biomass, net and gross production). Type of photosynthesis (plants C3, C4 and CAM). Methods to measure primary productivity. Quimiosynthesis. Limiting factors of primary productivity (terrestrial and aquatic communities). Relation Productivity:Biomass in natural ecosystems. The productivity of forest ecosystems (factors that affect forest NPP; NPP of forests and monocultures). |
| 10. FLOW OF ENERGY. | Thermodynamics. Trophic levels. Trophic chains and nets. Ecological pyramids. Diagramas of flow of energy. Storage and dynamic of the energy in ecosystems. Effects of the exploitation of forests in the flow of energy. |
| 11. CYCLES DE MATHER. | Circulation of the mather. Biogeochemical cycles (P, N, S, C, the greenhouse effect). Cycles of elements in forest ecosystems (effect of the age of the trees, of the type of ecosystem, of the type of tree, effects over production, additions and losses of nutrients, effects of the extraction of wood on long-term productivity). |
| 12. THE ECOLOGICAL SUCESSION. | The sucession (primary/secondary, alogenic/autogenic/biogenic, degradative). Hypotheses about sucession and the concept of climax. Mechanisms behind sucession (colonization, alteration of the environment, species displacement). Sucessional models (Horn, Tilman). Changes in the functioning of the ecosystems during the sucession. Examples of sucessions (abandoned fields, cyclic sucession). Importance of the sucession in the exploitation of the forests. |
| SECTION V. APPLIED ECOLOGY.<br>13. POLLUTION. | Definition. Types of pollutants. The acid rain (effects of the sulphur compounds on plants and animals: the decline of forest ecosystems). The hole in the layer of ozone. Noise. Watter pollution. Bioindicators of water quality. Eutrophication (Causes, recovery of eutrophic lakes). |

| | |
|---|---|
| 14. EXPLOITATION AND CONTROL OF POPULATIONS. | Concept of maximum sustainable yield. Models of exploitation (fixed quota). Principles about the exploitation of populations (regulation of the effort of exploitation, instability, exploitation of a percentage, dynamic models). The exploitation of the forests. Techniques of pest control (aims, chemical control, biological control, genetic control, integrated control ). |
| 15. BASIC PRINCIPLES OF CONSERVATION BIOLOGY. | The number of species that inhabit the planet. The value of the species and ecosystems (intrinsic, instrumental, peculiarity). Processes and causes of extinction (historic extinctions, antropic effects). Management of ecosystems. Social, economic and political factors. |
| Practicals in the classroom.<br>1. METHODS IN FIELD ECOLOGY: mobile populations. | Methods and devices of sampling (devices for air, plants, soil, and water sampling). Methods of mark-recapture (index of Lincoln, method of Jolly). Relative estimates (selective predation, progressive predation, captures by unity of effort). |
| Practicals in the classroom.<br>2. METHODS OF WORK IN FIELD ECOLOGY: sesile populations. | Quadrats. Transects. Linear interception. Punctual interception. Method of the quadrats centered in a point. Spatial distribution (patterns of distribution). Experiment: sampling of a simulated community of plants. |
| Practicals in the computer room.<br>3. ECOLOGICAL IMPORTANCE OF BODY SIZE: ALLOMETRY. | Variability of body size in different types of organisms. Concept of allometry. Types of allometry. Examples. Study of problems to determine of the existence of allometry. |
| Practicals in the laboratory.<br>4. METHODS DE DETERMINATION OF AGE. | Methods of determination of the age in different type of organisms. Growth of the organisms. Experiment: studio of the growth in different tree species. |
| Field practicals. 1. Forest pests. | Density of Gonipterus scutellatus on Eucalyptus, and biological control by means of its parasitoid Anaphes nitens. |
| Field practices. 2. Estimation of water quality in the river Almofrei by means of biological methods. | The use of bioindicators to study river water quality. |

## Planning

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 30 | 45 | 75 |
| Studies excursion | 9.8 | 14.7 | 24.5 |
| Laboratory practical | 9 | 13.5 | 22.5 |
| Mentored work | 7 | 10.5 | 17.5 |
| Practices through ICT | 3 | 4.5 | 7.5 |
| Problem and/or exercise solving | 2 | 0 | 2 |
| Problem and/or exercise solving | 1 | 0 | 1 |

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

## Methodologies

| | Description |
|---|---|
| Lecturing | Class room lectures. |
| Studies excursion | Field work in forest ecosystems |
| Laboratory practical | Laboratory practical lectures |
| Mentored work | Class room work |
| Practices through ICT | Simulations of ecological systems in the computer room |

## Personalized assistance

| Methodologies | Description |
|---|---|
| Lecturing | It is recommended that the student that wish to be attended in a one-to-one tutorial contact the corresponding professor previously by email. |

## Assessment

| | Description | Qualification | Evaluated Competencess | |
|---|---|---|---|---|
| Lecturing | A final written examination will be used to evaluate the work done over the course. | 70 | CG1 | CE12 |
| Studies excursion | Evaluation included in the written test | 8 | CG1 | CE12 |
| Laboratory practical | Evaluation included in the written test | 6 | CG1 | CE12 |
| Mentored work | Evaluation included in the written test | 10 | CG1 | CE12 |
| Practices through ICT | Evaluation included in the written test | 6 | CG1 | CE12 |

## Other comments on the Evaluation

Participation in the practical lectures and field lessons is compulsory for a positive final evaluation.

Dates of exams:

1ª period: 25 May 2021, 10:00 h

2ª period: 5 July 2021, 16:00 h

The official dates and any subsequent modification are published on the School and in the web http://forestales.uvigo.es/gl/

| **Sources of information** |
|---|
| **Basic Bibliography** |
| **Complementary Bibliography** |
| Kimmins, J. P., **Forest Ecology**, 2, |
| Sevilla Martínez, F., **Una teoría ecológica para los montes Ibéricos**, |
| Cordero Rivera, A. (editor), **Proxecto Galicia: Ecoloxía, vol. 44**, |
| Terradas,J., **Ecología de la Vegetación**, |
| Molles, M.C., **Ecology: concepts and applications**, 6 (only until 4th edition available on the Library), |
| Barnes, B. V., Zak, D. R., Denton, S. R. & Spurr, S. H., **Forest Ecology**, 4, |
| Begon, M., Harper, J. L. & Townsend, C. R., **Ecología**, |
| Rico Boquete, E., **Política Forestal e Repoboacións En Galicia. 1941-1971**, |

| **Recommendations** |
|---|
| **Subjects that continue the syllabus** |
| Management of protected areas and biodiversity/P03G370V01801 |

| **Subjects that it is recommended to have taken before** |
|---|
| Botany/P03G370V01303 |
| Edaphology/P03G370V01302 |
| Mathematics: Statistics/P03G370V01301 |
| Forest entomology and Zoology/P03G370V01305 |

**Contingency plan**

**Description**

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* educational Methodologies that keep :
All the educational methodologies.

* Educational methodologies that modify
In case of a no face-to-face teaching, all the methodologies will be adapted virtually using as main tools the Remote Campus and Faitic platforms. The modifications will not be significant for most of the methodologies excepting thelaboratory practical lessons which will be explained using specific tutorials specific for each subject.

* Mechanism no face-to-face of attention to the students (*tutorías)
One-to-one tutorials with the professors will be performed by using the virtual offices in Remote Campus platform.

* Modifications (if they proceed) of the contents to give
Contents will not be modified.

* Additional bibliography to facilitate the car-learning
Additional bibliography will not be neccesary

=== ADAPTATION OF THE EVALUATION ===

The final test will be replaced by a written individual report that will include the answers to specific questions provided by the professors about the main contents from both, master classes and practical lessons, of the subject.
* Proofs that modify
[Test] = [Written individual report]

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Topography, remote sensing and geographic information systems** | | | | |
| Subject | Topography, remote sensing and geographic information systems | | | |
| Code | P03G370V01403 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 9 | Mandatory | 2nd | 2nd |
| Teaching language | Galician | | | |
| Department | | | | |
| Coordinator | Lorenzo Cimadevila, Henrique | | | |
| Lecturers | Lorenzo Cimadevila, Henrique | | | |
| E-mail | hlorenzo@uvigo.es | | | |
| Web | http://faitic.uvigo.es/ | | | |
| General description | (*)Trátase dunha materia que versa sobre os instrumentos e métodos utilizados para a realización de medición de precisión sobre o terreo e a súa representación a escala. Se abordan tamén as novas metodoloxías de adquisición e xestión de datos espaciais mediante SIX e Teledetección. | | | |

| Competencies | |
|---|---|
| Code | |
| CG6 | Ability to measure, inventory and evaluate forest resources, apply and develop silvicultural techniques and management of all types of forest systems, parks and recreational areas, as well as techniques for harvesting timber and non-timber forest products |
| CG13 | Ability to design, direct, elaborate, implement and interpret projects and plans, as well as to write technical reports, recognition reports, assessments, appraisals and appraisals. |
| CG14 | Ability to understand, interpret and adopt scientific advances in the forest field, to develop and transfer technology and to work in a multilingual and multidisciplinary environment |
| CE1 | Knowledge of representation techniques. Capacity for spatial vision. Standardization. Topographical drawing. Computer programs of interest in engineering: computer-aided design. |
| CE16 | Ability to know, understand and use the principles of: topography and stakeout. Geographic information systems and remote sensing. Computer programs for spatial data processing. |
| CT5 | Capacity for information management, analysis and synthesis |
| CT6 | Organization and planning capacity |
| CT8 | Ability to solve problems, critical reasoning and decision making |
| CT9 | Teamwork skills, skills in interpersonal relationships and leadership. |
| CT10 | Autonomous Learning |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances. | CG6<br>CG13<br>CG14 | CE1<br>CE16 | CT5<br>CT6<br>CT8 |
| 3R. 2018 Be conscious of the multidisciplinary context of the engineering. | | | CT9 |
| 4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses. | | | CT10 |
| 5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial. | | | |
| 7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering. | | | |
| 8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality. | | | |
| 9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality. | | | |
| 10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study. | | | |
| 11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality. | | | |
| 13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality. | | | |
| 15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering. | | | |
| 20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines. | | | |
| 21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life. | | | |
| 22R. 2018 Capacity to be to the day of the scientific and technological news. | | | |

## Contents

| Topic | |
|---|---|
| Topography | - Introduction to Geodesy and Cartography<br>- Instruments<br>- Methods: radiation, itineraries, intersecting<br>- Stake |
| Remote sensing | - Physical fundamentals<br>- Sensors and Platforms<br>- Digital image processing<br>- Applications |
| Geographic information systems | - SIX concept<br>- Models and Data Structures<br>- Vector GIS<br>- SIG raster<br>- Insert digital terrain modes |

## Planning

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Problem solving | 25 | 50 | 75 |
| Seminars | 3 | 3 | 6 |
| Lecturing | 1 | 1 | 2 |
| Problem solving | 3 | 3 | 6 |
| Laboratory practical | 10 | 20 | 30 |
| Practices through ICT | 16 | 32 | 48 |
| Lecturing | 20 | 40 | 60 |
| Problem and/or exercise solving | 1 | 0 | 1 |
| Laboratory practice | 3 | 0 | 3 |
| Report of practices, practicum and external practices | 10 | 0 | 10 |

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

## Methodologies

| | Description |
|---|---|

| | |
|---|---|
| Problem solving | Activity which formulated problem and / or exercises related to the course. The student should develop appropriate solutions or right through the exercise routines, application of formulas or algorithms, application processing procedures available information and interpretation of the results. It is often used to complement the lecture. |
| Seminars | Activities focused to work on a specific topic, allowing delve or supplement the contents of the field. They can be used to supplement the lectures. |
| Lecturing | Presentation by the teacher of the contents on the subject under study, theoretical and / or guidelines for a job, exercise or project to be developed by the student. |
| Problem solving | Activity which formulated problem and / or exercises related to the course. The student should develop appropriate solutions or right through the exercise routines, application of formulas or algorithms, application processing procedures available information and interpretation of the results. It is often used to complement the lecture. |
| Laboratory practical | Activities application of knowledge to specific situations and basic skills acquisition and related procedural matter under study. Special spaces are developed with specialized equipment (scientific and technical laboratories, languages, etc.). |
| Practices through ICT | Activities application of knowledge to specific situations, and the acquisition of basic skills and procedural matters related to the object of study, which are held in computer rooms. |
| Lecturing | Presentation by the teacher of the contents on the subject under study, theoretical and / or guidelines for a job, exercise or project to be developed by the student. |

## Personalized assistance

| Methodologies | Description |
|---|---|
| Lecturing | . |
| Problem solving | . |
| Seminars | . |
| Laboratory practical | . |
| **Tests** | **Description** |
| Report of practices, practicum and external practices | . |

## Assessment

| | Description | Qualification | Evaluated Competencess | | |
|---|---|---|---|---|---|
| Lecturing | Exame teórico | 20 | CG14 | CE16 | |
| Problem solving | Exame práctico | 30 | | CE16 | CT6 |
| Problem and/or exercise solving | Proba tipo test | 10 | | CE16 | |
| Laboratory practice | Traballo práctico | 40 | CG14 | CE16 | CT6 |
| | | | | | CT8 |
| | | | | | CT9 |

## Other comments on the Evaluation

Primeira Convocatoria: venres, 29 de maio de 2020, 10:00 Horas

Segunda Convocatoria: xoves, 9 de xullo de 2020, 10:00 Horas

## Sources of information

### Basic Bibliography

### Complementary Bibliography


BOSQUE SENDRA, J, **Sistemas de Información Geográfica.**, 2004

CHUVIECO, E., **Fundamentos de Teledetección Espacial.**, Rialp, 2000

MUÑOZ SAN EMETERIO, C, **Problemas básicos de Topografía.**, Ed Bellisco., 2005

SANJOSÉ BLASCO, JJ, **Topografía para estudios de grado.**, Bellisco, 2004

WOLF & BRINKER., **Topografía**, Alfaomega, 2008


## Recommendations

## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

* Teaching methodologies modified

* Non-attendance mechanisms for student attention (tutoring)

* Modifications (if applicable) of the contents

* Additional bibliography to facilitate self-learning

* Other modifications

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Pending tests that are maintained
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Tests that are modified
[Previous test] => [New test]

* New tests

* Additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Hydraulics** | | | | |
| Subject | Hydraulics | | | |
| Code | P03G370V01404 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 9 | Mandatory | 2nd | 2nd |
| Teaching language | Spanish | | | |
| Department | | | | |
| Coordinator | Álvarez Bermúdez, Xana | | | |
| Lecturers | Álvarez Bermúdez, Xana<br>Bartolome Mier, Javier<br>Ortiz Torres, Luis<br>Valero Gutiérrez del Olmo, Enrique María | | | |
| E-mail | xana.alvarez.bermudez@gmail.com | | | |
| Web | | | | |
| General description | (*)1. Hidrostática. Ecuación fundamental de la hidrostática. Centro de presión. Fuerza de presión sobre superficies planas y curvas. Principio de Arquímedes.<br><br>2. Hidrodinámica. Ecuación de continuidad. Ecuación de Bernouilli generalizada. Potencia de una máquina hidráulica. Ecuación de la cantidad de movimiento en régimen permanente.<br><br>3. Transporte de agua en conducciones cerradas: tuberías. Pérdidas de carga continuas y singulares. Ecuación de Darcy-Weissbach. Timbraje en tuberías. Tuberías en serie y en paralelo.<br><br>4. Régimen no estacionario de los líquidos en tuberías. Golpe de ariete. Cálculo de sobrepresiones.<br><br>5. Diseño hidráulico en tuberías especiales para riego. Cálculo de ramales principales y laterales.<br><br>6. Elevación e impulsión de líquidos mediante bombas hidráulicas. Curvas características. Elección de bombas.<br><br>7. El ciclo hidrológico I: precipitación, interceptación y evapotranspiración. | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG9 | Knowledge of hydraulics, construction, electrification, forest roads, machinery and mechanization necessary both for the management of forest systems and for their conservation. |
| CE9 | Ability to know, understand and use the principles of: forestry hydraulics; hydrology and hydrological-forest restoration. |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering. | CG1<br>CG9 | CE9 | CT8 |

| **Contents** | |
|---|---|
| Topic | |
| Subject 1 | Physical properties of liquids. Concept and properties of hydrostatic pressure. Systems of measurements. Units |
| Subject 2. | Basic equation of the hydrostatic. Hydrostatic pressure force on flat and curved surfaces. Pressure center. Archimedes' principle |
| Subject 3. | Design and calculation of dikes in forest hydrology: Forces acting. Conditions of stability. Dimensioning. Design of small dams. Concrete dams and glazed masonry |
| Subject 4. | Current regimes. Concepts used in the definition of movement. Flow and average speed. Continuity equation. Dynamics of perfect liquids. Equation of the amount of movement in steady state. Equation of Bernouilli. Permanent movement. Graphical representation of the Bernouilli equation. Emptying time of a deposit |
| Subject 5. | Generalized Bernoulli equation. Loss of load. Power of liquid current in a section. Extension of the Bernouilli equation to permanent real currents. Hydraulic machines: turbines and pumps. Power of a hydraulic machine. |
| Subject 6. | Measurement of capacity in watercourses: Landfills. Types. Classification. General equation of expenditure. Thin wall dumps. Landfills in thick wall. Flow gauging devices in forest basins. |
| Subject 7. | Water transport in closed pipes. Reynolds number. Boundary layer Laminar and turbulent regimes in pipes. Continuous load losses. Darcy-Weisbach equation. Coefficient of friction. Diagram of Moody. Monomial exponential empirical formulas. Unique or secondary loss of load. Coefficients k for their estimation. Method of length of equivalent pipe. |
| Subject 8. | Calculation of pipelines. General conditions. Calculation of a siphon. Timbre in pipes. Simple piping in series, in parallel. Introduction to the calculation of branched pipes. |
| Subject 9. | Non-stationary regime of liquids in pipes. Water hammer. Description of the phenomenon. Calculation of overpressures. Close quick. Allievi's formula. Slow closing. Michaud's formula. Methods of attenuation. |
| Subject 10. | Hydraulic design in special pipes for irrigation. Characteristic curves of the emitters. Pipes with discrete flow distribution. Criteria and calculation for the dimensioning of a side of sprinklers. Drip irrigation ditto |
| Subject 11. | Lifting and discharge of liquids by hydraulic pumps I. Classification of hydraulic pumps. Centrifugal pumps. Geometric and elevation heights of elevation. Characteristic curve. Powers and yields. Loss of energy. Suction height. NPSH Factor. Non-cavitation condition. |
| Subject 12. | Lifting and flow of liquids using hydraulic pumps II. Characteristic curves of rotodynamic pumps at constant speed. Operating point. Couplings. Formulas of similarity. General characteristics curves at different speeds. Choice of pumps. |
| Subject 13. | Flow in open channels. Permanent and uniform movement. Vertical velocity distribution. Normal draft. Gradually varied permanent movement. Specific energy. Depth, speed and specific energy critical. Hydraulic overhang. |

| | |
|---|---|
| Subject 14. | Hydrological cycle. Forest action on water regulation. Physical parameters of the hydrological basin. Soil and climate. Forest action on water regulation. Hydric balance. Criteria for restoring forest hydrological degraded areas. |
| Subject 15: practical sessions | HEC-RAS and Geographic Information Systems: Hydraulic modeling |

| **Planning** | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Problem solving | 40 | 55 | 95 |
| Autonomous problem solving | 0 | 60 | 60 |
| Lecturing | 20 | 20 | 40 |
| Problem and/or exercise solving | 4 | 26 | 30 |
| *The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. | | | |

| **Methodologies** | |
|---|---|
| | Description |
| Problem solving | Activity which formulated problem and / or exercises related to the course. The student should develop appropriate solutions or right through the exercise routines, application of formulas or algorithms, application processing procedures available information and interpretation of the results. It is often used to complement the lecture. |
| Autonomous problem solving | Actividade in which problems are formulated and / or exercises related to the course. The student must develop the analysis and resolution of problems and / or exercises independently. |
| Lecturing | Presentation by the teacher of the contents on the subject under study, theoretical and / or guidelines for a job, exercise or project to be developed by the student. |

| **Personalized assistance** | |
|---|---|
| **Methodologies** | **Description** |
| Autonomous problem solving | |
| Problem solving | |

| **Assessment** | | | |
|---|---|---|---|
| | Description | Qualification | Evaluated Competences |
| Autonomous problem solving | (*)Planteamiento de problemas que el alumno debe resolver de forma personalizada fuera de clase a lo largo del curso | 30 | CE9 |
| Problem and/or exercise solving | (*)Planteamiento de problemas que el alumno debe resolver en clase en el acto de evaluación | 70 | CE9 |

**Other comments on the Evaluation**

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**


MOTT R.L., **Mecánica de fluidos**, Pearson. Prentice Hill-Mexico,

GILES, R.V., **Mecánica de los fluidos e hidráulica**, McGraw-Hill,

TARJUELO, J. M., **Hidráulica general aplicada**, Serv. Publicaciones E.U. Politécnica de Albacete,

ESCRIBÁ BONAFÉ, **Hidráulica para ingenieros**, Bellisco,

SALDARRIAGA, J, **Hidráulica de tuberías abastecimiento de agua , redes y riegos**, Alfaomega,

AGÜERA SORIANO, J., **Mecánica de fluidos incompresibles y turbomáquinas hidráulicas**, Ciencia,

MATAIX, C., **Mecánica de fluidos y máquinas hidráulicas**, Del Castillo,

WHITE, F. M., **Mecánica de fluidos**, McGraw-Hill,

LUIS A, **Materiales y cálculo de instalaciones. Biblioteca de instalaciones de agua, gas y aire acondicionado**, CEAC,

HERNÁNDEZ, A. y otros, **Manual de saneamiento Uralita**, Thomsosn Paraninfo,

SUAREZ, J. MARTINEZ, F., PUERTAS, J., **Manual de conducciones Uralita**, Thomsosn Paraninfo,

FUENTES YAGUE, **Técnicas de riego**, IRYDA.,

RODRIGO, J. y CORDERO ,L, **Riego localizado**, Mundi prensa,

DAL -RE, R., **Pequeños embalses de uso agricola**, Mundi prensa,

AMIGO, E., y AGUILAR, E., **Manual para el diseño construcción y explotación de embalses impermeabizados con geomembranas**, Gobierno de Canarias,

LLAMAS, J., **Hidrología General**, Servicio editorial. Univ. Pais Vasco,
LOPEZ CADENAS, F., **Restauración hidrológico-forestal de cuencas y control**, Tragsa-Tragsatec/Mº. Medio Ambiente/ Mundi-Prensa,
LOPEZ CADENAS, F. y MINTEGUI J.A., **Hidrología de superficie**, E.T.S.I.M. Madrid,

## Recommendations

### Subjects that continue the syllabus

Forestry hydrology/P03G370V01604

### Subjects that it is recommended to have taken before

Physics: Physics I/P03G370V01102
Physics: Physics II/P03G370V01202
Mathematics: Overview of mathematics/P03G370V01203
Mathematics: Mathematics and IT/P03G370V01103

## Contingency plan

### Description

=== EXCEPTIONAL MEASURES SCHEDULED ===
In front of the uncertain and unpredictable evolution of the sanitary alert caused by the *COVID-19, the University of Vigo establishes an extraordinary planning that will activate in the moment in that the administrations and the own institution determine it attending to criteria of security, health and responsibility, and guaranteeing the teaching in a no face-to-face stage or partially face-to-face. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the teaching of a more agile and effective way when being known in advance (or with a wide *antelación) by the students and the *profesorado through the tool normalised and institutionalised of the educational guides.

=== ADAPTATION OF THE METHODOLOGIES ===
* educational Methodologies that keep : the educational methodology of the practical part keeps . They will substitute the face-to-face classes by on-line classes and through videos by the professor

* educational Methodologies that modify : it changues from face-to-face modality to the on-line

* Mechanism no face-to-face of attention to the students (*tutorías): email and through the virtual dispatches

* Modifications (if they proceed) of the contents to give

* additional Bibliography to facilitate the car-learning

* Other modifications

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Forest constructions** | | | | |
| Subject | Forest constructions | | | |
| Code | P03G370V01501 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Mandatory | 3rd | 1st |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Riveiro Rodríguez, Belén | | | |
| Lecturers | Pece Montenegro, Santiago<br>Riveiro Rodríguez, Belén | | | |
| E-mail | belenriveiro@uvigo.es | | | |
| Web | http://http://faitic.uvigo.es/index.php/es/ | | | |
| General description | (*)Principios, Coñecementos e Normas nos que se fundamentan as Construccións Forestais e o deseño de Vías Forestais | | | |

| Competencies | |
|---|---|
| Code | |
| CG7 | Ability to solve technical problems derived from the management of natural spaces. |
| CG9 | Knowledge of hydraulics, construction, electrification, forest roads, machinery and mechanization necessary both for the management of forest systems and for their conservation. |
| CE18 | Ability to know, understand and use the principles of: forest constructions and forest roads. |
| CT1 | Ability to understand the meaning and application of the gender perspective in the different fields of knowledge and in professional practice with the aim of achieving a more just and egalitarian society |
| CT2 | Ability to communicate orally and written in Spanish or in English |
| CT4 | Sustainability and environmental commitment |
| CT5 | Capacity for information management, analysis and synthesis |
| CT6 | Organization and planning capacity |
| CT7 | Skill in the use of IT tools and ICTs. |
| CT8 | Ability to solve problems, critical reasoning and decision making |
| CT9 | Teamwork skills, skills in interpersonal relationships and leadership. |
| CT10 | Autonomous Learning |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>14R. 2018 Capacity to apply norms of engineering in the his speciality.<br>15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering.<br>16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context.<br>18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions.<br>20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines. | CG7<br>CG9 | CE18 | CT1<br>CT2<br>CT4<br>CT5<br>CT6<br>CT7<br>CT8<br>CT9<br>CT10 |

**Contents**

| Topic | |
|---|---|
| 1.- Previous concepts of mechanics and principles of materials resistance. | 1.- Moment of a force, Balance of a body, Diagram of the Free Body, Reactions, Unions and supports.<br>2.- Centers of gravity, centroid, first-order static moment, moment of inertia, spinning radius.<br>3.- Forces distributed<br>4.- Curtains<br>5.- General principles and definitions of the Resistance of Materials. |
| 2.- The elastic solid | 1.- Tension state of a point, intrinsic components of tension, stress matrix, stresses, strain matrix.<br>2.- Diagrams of solicitations.<br>3.- Introduction to Hyperestaticity, degree of hyperstability, Compatibility Equations of Deformations. |
| 3.- Axial Efforts. Traction-Compression | 1.- Traction test of ductile materials.<br>2.- The elastic regime. Young's Modulus, Poisson's Coefficient.<br>3.- Uniaxial tensile strain.<br>4.- Hyperasticity in bars subjected to axial stress. |
| 4.- Introduction to the Cut | 1.- Cutting voltage, angular distortion, Rigidity module.<br>2.- Joints: screws and rivets.<br>3.- Types of failure in joints by shear stress. |
| 5.- Introduction to Twisting | 1.- Elementary theory of torsion in prisms of circular section.<br>2.- Tension and strain analysis, turning angle. |
| 6.- Introduction to Flexion | 1. Beams: definition and classes. Applied forces<br>2.- Cutting force and bending moment<br>3.- Relations between shear, bending and load<br>4.- Cutting and bending diagrams<br>5.- Types of flexion. Hypothesis and limitations<br>6.- Normal stresses. Law of Navier<br>7.- Concept of resistant module<br>8.- Bending deformations: Differential Equation of the Elastic, Theorems of Mohr.<br>9.- Hyperelastic Flexing |

| | |
|---|---|
| 7- Introduction to Buckling | 1.- Buckling instability.<br>2. Euler's critical load.<br>3.- Limit of application of the formula of Euler, mechanical slenderness, efficient sections. |
| 8.- Introduction to the analysis of structures | 1.- Reticulated structures.<br>2.- Porticos, semipórticos and pictures.<br>3.- Initiation to the matrix calculation.<br>4.- Limit States.<br>5.- Degrees of Freedom. |
| 9.- Constructive elements: metallic, cement, concrete, wood. | 1.- Foundations. Land.<br>2.- Cement and Concrete.<br>3.- Industrial Warehouses. |
| 10.- Obligatory standards in construction. | 1.- Standards obliged to comply. Building Technical Code.<br>2.- Eurocode. |
| 11.- Forest roads | 1.- Land analysis and soil improvement.<br>2.- Planning of Roads |
| 12.- Construction Projects | 1.- Calculation Systems and Budget.<br>2.- Systems of contracting and control of works. Pert, Gant.<br>3.- Quality control of buildings.<br>4.- Prevention Plan.<br>5.- Principles of Maintenance. |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Introductory activities | 1 | 1 | 2 |
| Lecturing | 21 | 42 | 63 |
| Problem solving | 11 | 22 | 33 |
| Practices through ICT | 9 | 27 | 36 |
| Essay | 1 | 8 | 9 |
| Objective questions exam | 1 | 2 | 3 |
| Essay questions exam | 2 | 2 | 4 |
| *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 | Efforts to make contact and gather information about the students, and to present the subject. |
| Lecturing | Presentation by the teacher of the contents on the subject under study, theoretical and / or guidelines for a job, exercise or project to be developed by the student. |
| Problem solving | Activity which formulated problem and / or exercises related to the course. The student should develop appropriate solutions or right through the exercise routines, application of formulas or algorithms, application processing procedures available information and interpretation of the results. It is often used to complement the lecture. |
| Practices through ICT | Activities application of knowledge to specific situations, and the acquisition of basic skills and procedural matters related to the object of study, which are held in computer rooms. |

**Personalized assistance**

| **Methodologies** | **Description** |
|---|---|
| Problem solving | The students will come to the teachers to clarify the concepts necessary to perform the problems and / or exercises performed in the classroom, as well as to clarify / discuss any doubts that may appear after the end of the sessions. |
| **Tests** | **Description** |
| Essay | Students will be able to use face-to-face tutoring, or teledocence tools for correct tutoring by teachers in terms of carrying out work / projects. |

**Assessment**

| | Description | Qualification | Evaluated Competencess |
|---|---|---|---|
| Essay | Along the course students will develop small projects where they will tackle exercises and cases of study that complement the practical sessions. They will serve to verify the acquisition of the competitions CE-18, CG7, CT5, CT6, CT7, CT8, CT9 and CT10. | 15 | |
| Objective questions exam | Several tests will take place along the course to verify that the student is acquiring the competences CE-18 and CG9. | 10 | |

| | | | |
|---|---|---|---|
| Essay questions exam | Final written exam to verify competences CT5, CT6, CT7, CT8,CT9, CT10. | CE-18, CG7, CG9, CT1, CT2, CT4, | 75 |

**Other comments on the Evaluation**

The evaluation tests corresponding to "Essays", as well as "Objective questions exam" are framed within the continuous evaluation tests of the subject, whose weight on the total of the subject is 25%. All students must complete a "Final Exam", with a weight on the overall evaluation of 75%. It will be necessary to reach a minimum grade of 4.5 points out of 10 in the exam, so that the continuous assessment grade is added. The student must obtain a final grade equal to or greater than 5 points out of 10 in order to pass the subject.

Those students who officially renounce continuous assessment, will be evaluated in a single final written exam, assuming in this case 100% of the score.
The final evaluation will be held on the official dates approved by the Forest Engineering School. There will be two evaluation opportunities: 1st opportunity, on 01.13.2020 at 16:00h; 2nd opportunity, on 06/24/2020, at 16:00h. Also, students who enroll in the call for "Final de Carrera", will have the final evaluation on 23/09/2019, at 9:00 am.
The official dates and potential changes are published in the main board of the School and at the website http://forestales.uvigo.es/gl/

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

M. Vázquez, **RESISTENCIA DE MATERIALES**, 4,
P. Jiménez Montoya, **HORMIGÓN ARMADO**, 1,
Rafael Dal-Ré Tenreiro, **CAMINOS RURALES. PROYECTO Y CONSTRUCCIÓN**, 1,
MINISTERIO DE FOMENTO, **CODIGO TECNICO DE EDIFICACION**, 1,
Ferdinand P. Beer, **MECÁNICA DE MATERIALES**, 1,

**Recommendations**

**Subjects that continue the syllabus**

Hydraulics/P03G370V01404
Use of forests/P03G370V01601
Environmental Impact/P03G370V01504
Forest Fires/P03G370V01802
Primary wood processing industries/P03G370V01706

**Subjects that are recommended to be taken simultaneously**

Forest certification and legislation/P03G370V01505
Forestry machinery/P03G370V01502
Projects/P03G370V01503

**Subjects that it is recommended to have taken before**

Graphic expression: Graphic expression and cartography/P03G370V01101
Physics: Physics II/P03G370V01202
Mathematics: Overview of mathematics/P03G370V01203
Mathematics: Mathematics and IT/P03G370V01103
Chemistry: Chemistry/P03G370V01204
Topography, remote sensing and geographic information systems/P03G370V01403

**Contingency plan**

**Description**

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

* Teaching methodologies modified

* Non-attendance mechanisms for student attention (tutoring)

* Modifications (if applicable) of the contents

* Additional bibliography to facilitate self-learning

* Other modifications

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Pending tests that are maintained
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Tests that are modified
[Previous test] => [New test]

* New tests

* Additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Forestry machinery** | | | | |
| Subject | Forestry machinery | | | |
| Code | P03G370V01502 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Mandatory | 3rd | 1st |
| Teaching language | Spanish | | | |
| Department | | | | |
| Coordinator | Diz Montero, Rubén | | | |
| Lecturers | Diz Montero, Rubén | | | |
| E-mail | rubendiz@uvigo.es | | | |
| Web | | | | |
| General description | In this **asignatura pretends that he student *purchase *the *essential *knowledges that reads allow to comprise he *operation of wools machines *employed in wools forest *industries, that *know *the types of machines and *installations *more important *and *his *components. *His *knowledge results basic for him *analysis of him *operation, *design *and *construction of wools machines *and of *the teams associated the same *wools, *and in *general wools *industrial *applications in that they are used. | | | |

| Competencies | |
|---|---|
| Code | |
| CG9 | Knowledge of hydraulics, construction, electrification, forest roads, machinery and mechanization necessary both for the management of forest systems and for their conservation. |
| CG11 | Ability to characterize the anatomical and technological properties of wood and non-timber forest raw materials, as well as the technologies and industries of these raw materials. |
| CE20 | Ability to know, understand and use the principles of forestry machinery and mechanization. |
| CT2 | Ability to communicate orally and written in Spanish or in English |
| CT5 | Capacity for information management, analysis and synthesis |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines.<br>21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life.<br>22R. 2018 Capacity to be to the day of the scientific and technological news. | CG9<br>CG11 | CE20 | CT2<br>CT5<br>CT8 |

| **Contents** | |
|---|---|
| Topic | |
| 1. Thermal machines. Generalities | Classification, theoretical appearances and principles of operation.<br>Types of engines employed in forest machines. |
| 2. Study of Thermal Engines | Engines of lit caused.<br>Engines of lit by compression. |
| 3. Study of compressors | Types of compressors.<br>Installations of compression of air and pneumatic circuit. |
| 4. Machinery used in forestry explotatrions. | Types of machines.<br>Hydraulic circuits.<br>Bombs and hydraulic engines |
| 5. Machinery used in forestry industries | Installations and circuits |

| **Planning** | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Lecturing | 29 | 86 | 115 |
| Presentation | 2 | 10 | 12 |
| Laboratory practical | 14 | 6 | 20 |
| Objective questions exam | 1 | 0 | 1 |
| Problem and/or exercise solving | 2 | 0 | 2 |
| *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 by part of the professor of the contents of the matter object of study. Resolution of problems and/or exercises related with the *asignatura |
| Presentation | Realisation of works in groups on thematic specific and presentation of the same in the classroom |
| Laboratory practical | Work with real machines in the laboratory to complement the contents of the matter, completed with some practice with specific software. Preparation of memories of practices. |

| **Personalized assistance** | |
|---|---|
| **Methodologies** | **Description** |

| | | |
|---|---|---|
| Lecturing | | |
| Laboratory practical | | |
| Presentation | | |

| Assessment | | | | |
|---|---|---|---|---|
| | Description | Qualification | Evaluated Competencess | |
| Lecturing | Participation in the class. Proposal of **cuestions of theory justified on the content given. | 0 | CE20 | |
| Presentation | Realisation of works on the content of the **asignatura. Exhibition in the classroom. | 20 | CE20 | CT5 |
| Laboratory practical | Realisation of practices of laboratory and delivery of memories on the same. | 20 | CE20 | CT5 |
| Objective questions exam | Resolution of questionnaire of theory type test. | 25 | CE20 | CT5 |
| Problem and/or exercise solving | Resolution of problems and/or exercises related with the *temario of the **asignatura. | 35 | CE20 | CT5 |

**Other comments on the Evaluation**

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**


Moran J and Shapiro H, **Fundamentos de Termodinámica Técnica**, 2004,

Çengel Y. y Boles M., **Termodinámica**, 7ª edicion (2011),

Payri F. y Desantes J.M., **Motores de combustión interna alternativos**, 2011,

Agüera Soriano J., **Termodinámica Lógica y Motores Térmicos**, 1993,

Creus Solé A., **Neumática e Hidráulica**, 2010,

IDAE, **Biomasa : maquinaria agrícola y forestal**, 2007,


**Recommendations**

**Subjects that continue the syllabus**

Primary wood processing industries/P03G370V01706

**Subjects that it is recommended to have taken before**

Physics: Physics I/P03G370V01102
Physics: Physics II/P03G370V01202
Mathematics: Mathematics and IT/P03G370V01103
Hydraulics/P03G370V01404

**Contingency plan**

**Description**

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

* Teaching methodologies modified

* Non-attendance mechanisms for student attention (tutoring)

* Modifications (if applicable) of the contents

* Additional bibliography to facilitate self-learning

* Other modifications

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Pending tests that are maintained
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Tests that are modified
[Previous test] => [New test]

* New tests

* Additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Projects** | | | | |
| Subject | Projects | | | |
| Code | P03G370V01503 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Mandatory | 3rd | 1st |
| Teaching language | Spanish | | | |
| Department | | | | |
| Coordinator | Valero Gutiérrez del Olmo, Enrique María | | | |
| Lecturers | Valero Gutiérrez del Olmo, Enrique María | | | |
| E-mail | evalero@uvigo.es | | | |
| Web | http://http://faitic.uvigo.es/index.php/es/ | | | |
| General description | (*)Esta materia é de carácter eminentemente aplicado e co obxectivo de que os alumnos adquiran os coñecementos básicos mediante a aprendizaxe dos conceptos, terminoloxía, teoría, e metodoloxía necesarios para ser capaz de entender, formular e resolver un proxecto. | | | |

| Competencies | |
|---|---|
| Code | |
| CG13 | Ability to design, direct, elaborate, implement and interpret projects and plans, as well as to write technical reports, recognition reports, assessments, appraisals and appraisals. |
| CG14 | Ability to understand, interpret and adopt scientific advances in the forest field, to develop and transfer technology and to work in a multilingual and multidisciplinary environment |
| CE22 | Ability to know, understand and use the principles of: methodology, organization and project management. |
| CE42 | Ability to do an original work to be presented and defended before a university court, consisting of a project in the field of specific technologies of Forest Engineering, of a professional nature in which the competences acquired in the teachings and subjects of the career. |
| CT2 | Ability to communicate orally and written in Spanish or in English |
| CT4 | Sustainability and environmental commitment |
| CT5 | Capacity for information management, analysis and synthesis |
| CT6 | Organization and planning capacity |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | Competences | | |
|---|---|---|---|
| 3R. 2018 Be conscious of the multidisciplinary context of the engineering. | CG13 | CE22 | CT2 |
| 4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses. | CG14 | CE42 | CT4<br>CT5<br>CT6 |
| 5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial. | | | CT8 |
| 6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project. | | | |
| 7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering. | | | |
| 9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality. | | | |
| 11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality. | | | |
| 12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality. | | | |
| 13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality. | | | |
| 14R. 2018 Capacity to apply norms of engineering in the his speciality. | | | |
| 15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering. | | | |
| 16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context. | | | |
| 18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions. | | | |

| Contents | |
|---|---|
| Topic | |
| Theme I. The project as a concept | - Definition and philosophy of the project<br>- The project cycle |
| Theme II. The project as a method. Project engineering | - Project methodology. Reliability study<br>- Preliminary project or preliminary project<br>-Project detailed<br>-Project planning<br>- Socio-economic evaluation of projects<br>-Evaluation of projects<br>-Analysis of risk in the evaluation of projects. |
| Theme III. The project as document | - Content of project documents<br>-Memory<br>-Blueprints<br>-Technical specifications<br>-Budget<br>-Health and Safety issues |
| Theme IV. The professional activity and the project | - The contracting of technical assistance for the drafting of projects.<br>-The contest of projects and execution of works<br>-The activity of project engineer<br>-The rates of fees. |
| Theme V. Forestry projects | - Forest projects<br>- Projects in Forest Industry<br>-Silvicultural and Forest Management Projects<br>-Forest infrastructures<br>- Hunting projects<br>-Fishing projects.<br>-Projects for recreation and public use<br>-Projects for the management of protected areas. |

| Planning | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Presentation | 75 | 0 | 75 |
| Project based learning | 38 | 0 | 38 |
| Discussion Forum | 12 | 0 | 12 |
| Debate | 13 | 0 | 13 |
| Objective questions exam | 2 | 0 | 2 |
| Essay | 0 | 10 | 10 |
| *The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. | | | |

| Methodologies | |
|---|---|
| | Description |
| Presentation | Exhibition by the students to the teacher and / or a group of students of a subject matter or content of the results of a job, exercise, project ... It can be done individually or in groups. |
| Project based learning | Performing activities that allow the cooperation of various subjects and students face, working together, to open problems. Allow coaching, among others, the cooperative learning skills, leadership, organizational, communication and strengthening relationships. |
| Discussion Forum | Activity within a virtual environment in which they discussed various topics related to the academic and / or professional. |
| Debate | Open discussion between a group of students. You can focus on a topic of subject content, the analysis of a case, the outcome of a project, exercise or problem previously developed a keynote address ... |

| Personalized assistance | |
|---|---|
| **Methodologies** | **Description** |
| Presentation | |
| Project based learning | |
| Discussion Forum | |
| Debate | |

| Assessment |
|---|

| | Description | Qualification | Evaluated Competencess |
|---|---|---|---|
| Presentation | (*)<br>Exames finais, ou por escrito de tipo redacción ou desenvolvemento dun ou varios temas, ou ben de tipo test, ou combinados ou ben, no seu caso exames orais | 0 | |
| Project based learning | (*)Realización dun anteproxecto técnico de carácter semi-profesional | 40 | CT2<br>CT6<br>CT8 |
| Objective questions exam | (*)Exames finais, ou por escrito de tipo redacción ou desenvolvemento dun ou varios temas, ou ben de tipo test, ou combinados ou ben, no seu caso exames orais | 40 | |
| Essay | (*)Avaliación continua do alumno a través da súa asistencia e participación, tanto nas clases como en debates e foros de discusión | 20 | CT6<br>CT8 |

**Other comments on the Evaluation**

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**


BERGILLOS MADRID, J.M, **Metodología de diseño de proyectos**, 1989.,

DE COS CASTILLO, M, **Teoría general del proyecto. Dirección de proyectos**, 1995,

GÓMEZ SENENT, E, **Introducción al proyecto**, 1989,

PEÑA, A., **Apuntes de Proyectos: Proyectos de Ingeniería y Documento Proyecto.**, 1997,

GÓMEZ SENENT, E., **Las fases del proyecto y su metodología.**, 1992,

HEREDIA, R., **Dirección integrada de proyecto. Segunda edición**, 1995,

CORZO, M.A., **Introducción a la ingeniería de proyectos**, 2002,

TRUEBA, Y., A. CAZORLA y J.J. DE GRACIA, **Proyectos empresariales. Formulación y Evaluación**, 1995,

ROMERO, C, **Teoría de la decisión multicriterio: conceptos, técnicas y aplicaciones.**, 2005,

PIQUER, J.S, **El proyecto en ingeniería y arquitectura**, 2003,

ESCRIVA, I.V., J.L.. PEREZ-SALAS y V. SEGURA, **Cuadro de precios. Ingeniería agronómica y alimentaria**, 1996,

SAPAG CHAIN, N, **Fundamentos de Preparación y Evaluación de Proyectos**, 2005,

MORRILLA ABAD, IGNACIO, **Guía metodológica y práctica para la realización de proyectos.**, 1998,


**Recommendations**

**Subjects that are recommended to be taken simultaneously**

Use of forests/P03G370V01601
Forest constructions/P03G370V01501
Forestry hydrology/P03G370V01604
Forest management/P03G370V01605
Repopulation/P03G370V01603

**Subjects that it is recommended to have taken before**

Physics: Physics I/P03G370V01102
Physics: Physics II/P03G370V01202
Mathematics: Overview of mathematics/P03G370V01203
Mathematics: Mathematics and IT/P03G370V01103
Botany/P03G370V01303
Electrotechnology and rural electrification/P03G370V01304

**Contingency plan**

**Description**

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===

* Teaching on line
Use of institutional on-line teaching platform Campus Remoto in a synchronous way for the theoretical classes including basics, foundations, as well as general guidelines for resolution of problems and practical cases. Specific didactic materials adapted for on line teaching will be prepared e.g. Video or presentations, graphic resources, software, etc. All the resources will be available through FAITIC platform.
* Mechanism face-to-face of attention to the students (tutorials)
Personalized attention. Communication by email or another on-line tool. Tutorials via Campus Remoto platform.
=== ADAPTATION OF The EVALUATION ===
On-line tests and tasks via Campus Remoto and Faitic. The weight of the tests will be maintained as they are described in the main guide.

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Environmental Impact** | | | | |
| Subject | Environmental Impact | | | |
| Code | P03G370V01504 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Mandatory | 3rd | 1st |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Álvarez Bermúdez, Xana | | | |
| Lecturers | Álvarez Bermúdez, Xana<br>Valero Gutiérrez del Olmo, Enrique María | | | |
| E-mail | xana.alvarez.bermudez@gmail.com | | | |
| Web | | | | |
| General description | (*)(*)En esta materia se trata de compatibilizar la actividad humana con el medio ambiente de tal manera que se puedan prever y prevenir los impactos que sobre los diversos factores del medio provocan determinadas actuaciones y/o actividades, tratando de minimizarlos o reducirlos. | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG2 | Ability to analyze the ecological structure and function of forest systems and resources, including landscapes. |
| CG3 | Knowledge of degradation processes that affect forest systems and resources (pollution, pests and diseases, fires, etc.) and capacity for the use of forest environment protection techniques, forest hydrological restoration and biodiversity conservation . |
| CG4 | Ability to evaluate and correct the environmental impact, as well as apply the techniques of auditing and environmental management. |
| CE19 | Ability to know, understand and use the principles of: evaluation and correction of environmental impact; recovery of degraded spaces. |
| CT4 | Sustainability and environmental commitment |
| CT5 | Capacity for information management, analysis and synthesis |
| CT6 | Organization and planning capacity |
| CT8 | Ability to solve problems, critical reasoning and decision making |
| CT10 | Autonomous Learning |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances. | CG1<br>CG2<br>CG3 | CE19 | CT4<br>CT5<br>CT6 |
| 3R. 2018 Be conscious of the multidisciplinary context of the engineering. | CG4 | | CT8 |
| 4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses. | | | CT10 |
| 5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial. | | | |
| 6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project. | | | |
| 7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering. | | | |
| 12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality. | | | |
| 14R. 2018 Capacity to apply norms of engineering in the his speciality. | | | |
| 15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering. | | | |
| 17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions | | | |
| 20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines. | | | |

| **Contents** | |
|---|---|
| Topic | |
| MODULE I: GENERAL FRAME | The Environmental System |
| Subject 1 | Introduction<br>The environmental system<br>environmental Problems<br>sustainable Development and the environmental management |
| MODULE I: GENERAL FRAME | Basic principles of the environmental politics |
| Subject 2 | Antecedents:<br>The protocol of Kioto<br>The forests in his paper of carbon sink |
| MODULE I: GENERAL FRAME | Environmental programmes of action of the European Union |
| Subject 3 | 1º Program (1973-1976)<br>2º Program (1977-1981)<br>3º Program (1982-1986)<br>4º Program (1987-1992)<br>5º Program (1992-2000)<br>6º Program (2001-2010)<br>7º Program (2014-2020) |
| MODULE I: GENERAL FRAME | Environmental management and his Instruments |
| Subject 4 | Definition<br>general Principles of the environmental management<br>Instruments of environmental management<br>environmental Management in the public sector<br>Systems of Environmental Management |
| MODULE II: INTRODUCTION To THE ENVIRONMENTAL IMPACT | Legal and institutional frame |
| Subject 5 | Antecedents<br>Community Legislation on Normative environmental<br>evaluation Spaniard in the national field<br>autonomic Rule<br>sectorial Rule |

| | |
|---|---|
| MODULE II: INTRODUCTION To THE ENVIRONMENTAL IMPACT<br><br>Subject 6 | Analysis and environmental value of the geographic space<br><br>environmental<br>Variable Introduction<br>Differentiation of environmental units<br>Phases |
| MODULE II: INTRODUCTION To THE ENVIRONMENTAL IMPACT<br><br>Subject 7 | Environmental impact<br><br>Introduction<br>Hit associated to the human activities<br>Relation causes effect<br>Classes of impacts<br>Attributes of the environmental impact |
| MODULE II: INTRODUCTION To THE ENVIRONMENTAL IMPACT<br><br>Subject 8 | Indicators of Environmental Impact<br><br>Concept<br>Classification of indicators<br>Models of indicators<br>Environmental Indicators in the field of the European Union<br>Environmental Indicators in Spain |
| MODULE III: EVALUATION OF ENVIRONMENTAL IMPACT<br><br>Subject 9 | Evaluation of environmental impact. Strategic evaluation<br><br>strategic environmental Evaluation ordinary<br>strategic environmental Evaluation simplified<br>Evaluation of ordinary environmental impact<br>Evaluation of environmental impact simplified<br>environmental Evaluation of activities |
| Module IV: CORRECTION OF ENVIRONMENTAL IMPACTS<br><br>Subject 10 | Corrector measures, protective and compensatory |
| Module IV: CORRECTION OF ENVIRONMENTAL IMPACTS<br><br>Subject 11 | Program of Environmental Surveillance<br>Document of Synthesis |
| Module IV: CORRECTION OF ENVIRONMENTAL IMPACTS<br><br>Subject 12 | environmental impact assessment and eco-audits (comparison) |
| Module V: PRACTICAL CASES<br><br>Subject 13 | Practical cases |

| **Planning** | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Mentored work | 37 | 0 | 37 |
| Laboratory practical | 20 | 0 | 20 |
| Case studies | 30 | 0 | 30 |
| Mentored work | 60 | 0 | 60 |
| Objective questions exam | 1 | 0 | 1 |
| Essay | 2 | 0 | 2 |
| *The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. | | | |

| **Methodologies** | |
|---|---|
| | Description |
| Mentored work | The student, individually or in groups, prepares a paper on the subject of matter or prepare seminars, research, memoirs, essays, summaries of readings, lectures, etc.. Generally it is an autonomous activity / of the student / s that includes finding and collecting information, reading and literature management, writing ... |
| Laboratory practical | Activities application of knowledge to specific situations and basic skills acquisition and related procedural matter under study. Special spaces are developed with specialized equipment (scientific and technical laboratories, languages, etc.). |
| Case studies | Analysis of an event, issue or actual event in order to know, interpret, solve, generate hypotheses, comparing data, reflect, complete knowledge, diagnose and training in alternative dispute resolution procedures. |

| | |
|---|---|
| Mentored work | Students develop exercises or classroom projects under the guidance and supervision of the teacher. May link autonomous development of student activities. |

**Personalized assistance**

| Methodologies | Description |
|---|---|
| Mentored work | |
| Mentored work | |
| Laboratory practical | |
| Case studies | |

| Tests | Description |
|---|---|
| Objective questions exam | |
| Essay | |

**Assessment**

| | Description | Qualification | Evaluated Competencess |
|---|---|---|---|
| Mentored work | (*)Valórase por parte do profesor a dedicación do alumno, o interese e o desenvolvemento dos traballos, a súa valoración realízase o a avaliación final do estudo de casos presentado<br>Avalíanse as competencias básicas CB1 e CB2, as xerais CG6, CG7, CG8, CG9, CG13, CG14, CG17, CG18 e CG19, a específica CE19 (CE 19.1 a 19.19) e as transversais CT1, CT2, CT11, CT14, CT15 e CT20 | 0 | |
| Laboratory practical | (*)Valórase a asitencia e participación de forma conxunta cos traballos de aula<br>Avalíanse as competencias básicas CB1 e CB2, as xerais CG6, CG7, CG8, CG9, CG13, CG14, CG17, CG18 e CG19, a específica CE19 (CE 19.1 a 19.19) e as transversais CT1, CT2, CT11, CT14, CT15 e CT20 | 0 | |
| Case studies | (*)O traballo é valorado e avaliado polos propios compañeiros tras a presentación do mesmo e polo profesor quen terá en consideración todos os factores sinalados no apartado de traballos tutelados<br>Avalíanse as competencias básicas CB1 e CB2, as xerais CG6, CG7, CG8, CG9, CG13, CG14, CG17, CG18 e CG19, a específica CE19 (CE 19.1 a 19.19) e as transversais CT1, CT2, CT11, CT14, CT15 e CT20 | 0 | |
| Mentored work | (*)Valórase a asistencia e participación con seguimento individual dos alumnos<br>Avalíanse as competencias básicas CB1 e CB2, as xerais CG6, CG7, CG8, CG9, CG13, CG14, CG17, CG18 e CG19, a específica CE19 (CE 19.1 a 19.19) e as transversais CT1, CT2, CT11, CT14, CT15 e CT20 | 0 | |
| Objective questions exam | (*)Realízase unha proba tipo test e de resposta longa ao final da materia a modo de exame final sobre o contido do temario que se desenvolveron no curso e sobre as materias das visitas e prácticas<br>Avalíanse as competencias básicas CB1 e CB2, as xerais CG6, CG7, CG8, CG9, CG13, CG14, CG17, CG18 e CG19, a específica CE19 (CE 19.1 a 19.19) e as transversais CT1, CT2, CT11, CT14, CT15 e CT20 | 70 | |
| Essay | (*)O traballo presentado deberá ter unha parte importante de contido técnico e valorarase a súa innovación en canto a temática e desenvolvemento, A súa avaliación será incluída no estudo de casos.<br>A valoración adicional será consecuencia da obtención dos obxectivos expostos inicialmente avalíanse as competencias básicas CB1 e CB2, as xerais CG6, CG7, CG8, CG9, CG13, CG14, CG17, CG18 e CG19, a específica CE19 (CE 19.1 a 19.19) e as transversais CT1, CT2, CT11, CT14, CT15 e CT20 | 30 | |

**Other comments on the Evaluation**

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

**Recommendations**

**Contingency plan**

**Description**

=== EXCEPTIONAL MEASURES SCHEDULED ===
In front of the uncertain and unpredictable evolution of the sanitary alert caused by the *COVID-19, the University of Vigo establishes an extraordinary planning that will activate in the moment in that the administrations and the own institution determine it attending to criteria of security, health and responsibility, and guaranteeing the teaching in a no face-to-face stage or partially face-to-face. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the teaching of a more agile and effective way when being known in advance (or with a wide *antelación) by the students and the *profesorado through the tool normalised and institutionalised of the educational guides.

=== ADAPTATION OF THE METHODOLOGIES ===
* educational Methodologies that keep
The educational methodology will be the same, simply that will change the *face to face class by the virtual modality.

* Educational methodologies that modify :
In the schedules established in the official calendars of the centre, will give sessions through the platform of the University of Vigo (remote campus)

* Mechanism no face-to-face of attention to the students (*tutorías):
The individual sesions will make through the virtual office of each professor (Xana Álvarez: room 71). The student will send a mail previously to agree the day and time

* Modifications (if they proceed) of the contents to give: they keep

* additional Bibliography to facilitate the car-learning: it will leave available in faitic

* Other modifications

=== ADAPTATION OF THE EVALUATION ===
* Test already made
Tests type test: [previous Weight 70%] [Weight Proposed 70%]
weekly Exposition: [previous Weight 70%] [Weight Proposed 70%]
...

* Pending proofs that keep
Tests type test: [previous Weight 70%] [Weight Proposed 70%]
weekly Expositions: [previous Weight 70%] [Weight Proposed 70%]
...

* Proofs that modify : they do not modify , only they will make of virtual form in place of face-to-face
[previous Proof] =&*gt; [new Proof]

* New proofs: no

* additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Forest certification and legislation** | | | | |
| Subject | Forest certification and legislation | | | |
| Code | P03G370V01505 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Mandatory | 3rd | 1st |
| Teaching language | | | | |
| Department | | | | |
| Coordinator | Álvarez Bermúdez, Xana | | | |
| Lecturers | Álvarez Bermúdez, Xana<br>Picos Martín, Juan | | | |
| E-mail | xana.alvarez.bermudez@gmail.com | | | |
| Web | http://www.faitic.uvigo.es | | | |
| General description | (*)Los futuros técnicos forestales deben conocer la legislñación que les afecta y para ello deben conocer desde el inicio los procesos de tramitación y los Organismos que legislan y ejecutan las leyes. | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG2 | Ability to analyze the ecological structure and function of forest systems and resources, including landscapes. |
| CG10 | Ability to apply the techniques of forest management and land planning, as well as the criteria and indicators of sustainable forest management within the framework of forest certification procedures. |
| CE25 | Ability to know, understand and use the principles of: forest legislation and certification; sociology and forestry policy. |
| CT4 | Sustainability and environmental commitment |
| CT5 | Capacity for information management, analysis and synthesis |
| CT6 | Organization and planning capacity |
| CT8 | Ability to solve problems, critical reasoning and decision making |
| CT9 | Teamwork skills, skills in interpersonal relationships and leadership. |
| CT10 | Autonomous Learning |

| Learning outcomes | Competences | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances. | CG1<br>CG2<br>CG10 | CE25 | CT4<br>CT5<br>CT6 |
| 3R. 2018 Be conscious of the multidisciplinary context of the engineering. | | | CT8 |
| 5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial. | | | CT9<br>CT10 |
| 6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project. | | | |
| 12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality. | | | |
| 14R. 2018 Capacity to apply norms of engineering in the his speciality. | | | |
| 15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering. | | | |
| 17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions | | | |
| 20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines. | | | |
| 21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life. | | | |
| 22R. 2018 Capacity to be to the day of the scientific and technological news. | | | |

| Contents |
|---|

| Topic | |
|---|---|
| BASIC LEGISLATION I | 1.- Right: The concept of law, Classification, sources and basic principles in Spanish legal framework.<br>2.- Spanish Constitution: Study as a whole,<br>Principles, spanish constitution, reform<br>constitutional.<br>3.- Congress and Senate: Elaboration of laws,<br>Electoral law, prerogatives of Members and<br>Senators, the congress of deputies (Composition, election, mandate, duration, Functions, etc.), the senate (composition, election, Mandate, duration, functions, etc.).<br>4.- Galician Parliament: Background, Parliamentary study as a whole, initiative Legislation, competition from Galicia, Galicia, sources of autonomic law.<br>5.- The European Union: Objectives of the U.E.,<br>Evolution, institutions, sources and principles.<br>6.- Organization of the state: Municipalities,<br>Provinces and autonomous communities.<br>7.- Judicial branch and other institutions: Introduction, division of powers, defender of<br>Town, general council of the judiciary, Courts, hearing and other institutions.<br>8.- Relations between citizens and Public administrations: Introduction, law Administrative, administrative act, classes, phases Of the procedure, administrative remedies. The<br>Law of administrative procedure. |
| LEGISLATION II | 9.- Contracts Law: Classes, forms of contracting,<br>Content and effects of contracts Administrative, compliance with contracts Administrative, resolution, termination and resignation.<br>10.- Forest property: Concept of property,<br>Legal concept of the hill, classification of the hill.<br>11.- Law of mountains: Complete study of the Law<br>Forest fires (43/2003 and 10/2006).<br>12.- Development of the law at the regional level:<br>Proposed draft of the new Mountains of Galicia.<br>13.- Neighborhood forests in common hand:<br>Legislation, concept, characteristics, process<br>Legalization, organization, statutes, administration.<br>14.- Other forest-related laws:<br>Fires. Law of the land bank of Galicia,<br>Decree of the Units of Forest Management.<br>15.- Hunting and fishing legislation. Law of<br>Conservation of biodiversity. Legislation of<br>Natural spaces and conservation of<br>Nature (Natura 2000 Network) and environment.<br>Law of landscape, etc. |
| FOREST CERTIFICATION | 16.- The protection of forests in the world<br>After the 1992 Rio Summit.<br>17.- International Management Initiatives<br>Sustainable Forestry.<br>18.- Ministerial Conferences for the Protection of forests in Europe.<br>19.- Other global processes: Montreal, Tarapoto, dry Africa, etc.<br>20.- Sustainable Forest Management.<br>21.- Forest certification: Processes and Initiatives.<br>22.- Criteria and indicators.<br>23.- UNE 162,000 standards in Spain<br>24.- Current systems more implemented: PEFC and FSC.<br>25.- Practical forms of forest certification. |

| **Planning** | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Mentored work | 30 | 0 | 30 |
| Mentored work | 66 | 0 | 66 |
| Case studies | 30 | 0 | 30 |
| Objective questions exam | 1 | 0 | 1 |
| Laboratory practice | 1 | 0 | 1 |
| Case studies | 1 | 0 | 1 |

| | | | |
|---|---|---|---|
| Problem and/or exercise solving | 1 | 0 | 1 |

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

## Methodologies

| | Description |
|---|---|
| Mentored work | The student, individually or in groups, prepares a paper on the subject of matter or prepare seminars, research, memoirs, essays, summaries of readings, lectures, etc.. Generally it is an autonomous activity / of the student / s that includes finding and collecting information, reading and literature management, writing ... |
| Mentored work | Students develop exercises or classroom projects under the guidance and supervision of the teacher. May link autonomous development of student activities. |
| Case studies | Analysis of an event, issue or actual event in order to know, interpret, solve, generate hypotheses, comparing data, reflect, complete knowledge, diagnose and training in alternative dispute resolution procedures. |

## Personalized assistance

| Methodologies | Description |
|---|---|
| Case studies | |
| Mentored work | |
| Mentored work | |

| Tests | Description |
|---|---|
| Objective questions exam | |
| Laboratory practice | |
| Case studies | |
| Problem and/or exercise solving | |

## Assessment

| | Description | Qualification | Evaluated Competencess |
|---|---|---|---|
| Mentored work | (*)Valórase por parte do profesor a dedicación do alumno, o interese e o desenvolvemento dos traballos, a súa valoración realízase o a avaliación final do estudo de casos presentado<br>Se evaluan as competencias básicas CB1 e CB2, as xerais CG08, CG09 e CG3, a específicas CE25 (CE 25.1 a 25.19) e as transversais CBI1, CBI2, CBP4, CBS2, CBS3 e CBS 8. | 0 | |
| Mentored work | (*)Valórase a asistencia e participación con seguimento individual dos alumnos<br>Se evaluan as competencias básicas CB1 e CB2, as xerais CG08, CG09 e CG3, a específicas CE25 (CE 25.1 a 25.19) e as transversais CBI1, CBI2, CBP4, CBS2, CBS3 e CBS 8. | 0 | |
| Case studies | (*)Realizaranse exposicións orais semanais sobre o tema asignado por grupos ou de forma individual e estas serán avaliadas.<br>Se evaluan as competencias básicas CB1 e CB2, as xerais CG08, CG09 e CG3, a específicas CE25 (CE 25.1 a 25.19) e as transversais CBI1, CBI2, CBP4, CBS2, CBS3 e CBS 8. | 30 | |
| Objective questions exam | (*)Realízase unha proba tipo test ao final da materia a modo de exame final sobre o contido do temario que se desenvolveron no curso e sobre as materias das visitas e prácticas.<br>Se evaluan as competencias básicas CB1 e CB2, as xerais CG08, CG09 e CG3, a específicas CE25 (CE 25.1 a 25.19) e as transversais CBI1, CBI2, CBP4, CBS2, CBS3 e CBS 8. | 70 | |
| Laboratory practice | (*)Consistirá en traballos de discusión sobre materias do temario que se exporán para debate.<br>Se evaluan as competencias básicas CB1 e CB2, as xerais CG08, CG09 e CG3, a específicas CE25 (CE 25.1 a 25.19) e as transversais CBI1, CBI2, CBP4, CBS2, CBS3 e CBS 8. | 0 | |
| Case studies | (*)O traballo é valorado e avaliado polos propios compañeiros tras a presentación do mesmo e polo profesor quen terá en consideración todos os factores sinalados no apartado de traballos tutelados.<br>Se evaluan as competencias básicas CB1 e CB2, as xerais CG08, CG09 e CG3, a específicas CE25 (CE 25.1 a 25.19) e as transversais CBI1, CBI2, CBP4, CBS2, CBS3 e CBS 8. | 0 | |

| | | |
|---|---|---|
| Problem and/or exercise solving | (*)Resolución de casos prácticos relacionados coas materias do programa. Se evaluan as competencias básicas CB1 e CB2, as xerais CG08, CG09 e CG3, a específicas CE25 (CE 25.1 a 25.19) e as transversais CBI1, CBI2, CBP4, CBS2, CBS3 e CBS 8. | 0 |

**Other comments on the Evaluation**

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

**Recommendations**

**Contingency plan**

**Description**

=== EXCEPTIONAL MEASURES SCHEDULED ===
In front of the uncertain and unpredictable evolution of the sanitary alert caused by the *COVID-19, the University of Vigo establishes an extraordinary planning that will activate in the moment in that the administrations and the own institution determine it attending to criteria of security, health and responsibility, and guaranteeing the teaching in a no face-to-face stage or partially face-to-face. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the teaching of a more agile and effective way when being known in advance (or with a wide *antelación) by the students and the *profesorado through the tool normalised and institutionalised of the educational guides.

=== ADAPTATION OF THE METHODOLOGIES ===
* educational Methodologies that keep
keeps the subjects and the methodology of weekly exposition by students
* educational Methodologies that modify
will changue from the face-to-face modality to the virtual through the virtual campus.
* Mechanism no face-to-face of attention to the students (*tutorías): through email and of the virtual dispatch of the professor

* Modifications (if they proceed) of the contents to give: without modifications

* additional Bibliography to facilitate the car-learning: without modifications

* Other modifications

=== ADAPTATION OF THE EVALUATION ===
* Test already made: they keep
Proof XX: [previous Weight 00%] [Weight Proposed 00%]
...

* Pending proofs that keep : all are supported by the same weight
Tests XX: [previous Weight 00%] [Weight Proposed 00%]
...

* Proofs that modify : there are not modifications
[previous Proof] =&*gt; [new Proof]

* New proofs: they will not make new test

* additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Use of forests** | | | | |
| Subject | Use of forests | | | |
| Code | P03G370V01601 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Mandatory | 3rd | 2nd |
| Teaching language | Spanish | | | |
| Department | | | | |
| Coordinator | Ortiz Torres, Luis | | | |
| Lecturers | Ortiz Torres, Luis | | | |
| E-mail | lortiz@uvigo.es | | | |
| Web | http://http://dasometriaweb.blogspot.com.es/ | | | |
| General description | (*)Se analizarán los fundamentos básicos de los aprovechamientos forestales madereros para aprender su planificación básica. Asimismo se estudiarán los principales sistemas de aprovechamiento usados en Galicia así como sus rendimientos, costes y normas de seguridad.<br><br>En la enseñanza de la materia, tres aspectos son fundamentales a desarrollar, según nuestro punto de vista, en la enseñanza de la ciencia forestal: intuición, rigor y creación. La intuición ubica al alumno en el tipo de problemas que se quiere atacar (a través de ejemplos), crea una perspectiva (a menudo a través de la propia historia del problema) y en definitiva genera un interés. El segundo nivel formaliza todas esas intuiciones y las despoja de lo accesorio hasta desentrañar lo esencial. El rigor necesita de la abstracción y es fundamental en la transmisión de conocimientos técnicos. La creación permite construir soluciones propias, prácticas, cuanto antes tenga un contacto forestal y más aprenda de ello, más motivado va a continuar el estudio de la asignatura. | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG6 | Ability to measure, inventory and evaluate forest resources, apply and develop silvicultural techniques and management of all types of forest systems, parks and recreational areas, as well as techniques for harvesting timber and non-timber forest products |
| CE23 | Ability to know, understand and use the principles of forest exploitation and supply of raw materials in the forest industry. |
| CT4 | Sustainability and environmental commitment |
| CT5 | Capacity for information management, analysis and synthesis |
| CT6 | Organization and planning capacity |
| CT8 | Ability to solve problems, critical reasoning and decision making |
| CT10 | Autonomous Learning |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>14R. 2018 Capacity to apply norms of engineering in the his speciality.<br>15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering.<br>17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions<br>20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines. | CG1<br>CG6 | CE23 | CT4<br>CT5<br>CT6<br>CT8<br>CT10 |

| **Contents** | |
|---|---|
| Topic | |
| General information on forestry and its market in the world | Definition and types of use<br>The Forest Products Market<br>The demanada and the companies<br>The supply of forest products in the world |
| Marketing of wood | Main procedures for the sale and sale of wood<br>Auction and drafting |
| Techniques, means and procedures of logging | Wood felling and processing<br>Manual tools<br>The chainsaw and other portable machines<br>Automotive Fodder and Processing Machinery<br>Waste treatment machinery (chippers and balers)<br>Pull out of the wood (skider and autoloader)<br>Adapted agricultural tractor<br>Unblocking cables, helicopter and other methods<br>Transport of wood (river, rail, sea and land)<br>Parks for wood storage |
| Timber harvesting planning | Factors influencing planning<br>Main systems of exploitation<br>Organization of the uses<br>Control systems in the harvests |
| Prevention of occupational hazards in forestry | The risk assessment<br>Loss in the forestry sector |
| The environmental impact of harvesting | Main impacts of forestry activity<br>Methodological guide |
| The use of bark | Cork Ecology<br>The cork market |
| The use of resins | The use of resins<br>The resin market |

| **Planning** | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Lecturing | 26 | 63 | 89 |
| Problem solving | 3 | 11 | 14 |

| | | | |
|---|---|---|---|
| Case studies | 6 | 12 | 18 |
| Studies excursion | 10 | 18 | 28 |
| Problem and/or exercise solving | 1 | 0 | 1 |

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

## Methodologies

| | Description |
|---|---|
| Lecturing | Presentation by the teacher of the contents on the subject under study, theoretical and / or guidelines for a job, exercise or project to be developed by the student. |
| Problem solving | Activity which formulated problem and / or exercises related to the course. The student should develop appropriate solutions or right through the exercise routines, application of formulas or algorithms, application processing procedures available information and interpretation of the results. It is often used to complement the lecture. |
| Case studies | Analysis of an event, issue or actual event in order to know, interpret, solve, generate hypotheses, comparing data, reflect, complete knowledge, diagnose and training in alternative dispute resolution procedures. |
| Studies excursion | Activities application of knowledge to specific situations and basic skills acquisition and related procedural matter under study. They thrive in nonacademic outdoor spaces.<br>Among them we can cite practical field visits to events, research centers, companies, institutions ... academic-professional interest to the student. |

## Personalized assistance

| Methodologies | Description |
|---|---|
| Problem solving | It is a question of performing a practical work corresponding to a gap in the topics included in the agenda and publicly presenting said work. |
| Studies excursion | It is a series of practical visits to facilities and mountains |

## Assessment

| | Description | Qualification | Evaluated Competencess |
|---|---|---|---|
| Lecturing | (*)Asistencia e desempeño dedicado ás clases da materia.<br>Se *evaluan as competencias básicas *CB1 e *CB2, as xerais *CG8, *CG18, *CG23, *CG38, *CG39, *CG40 e *CG41, a específicas CE23 (CE 23.1 a 23.10) e as transversais *CBI1, *CBI2, *CBI4, *CBI5, *CBI6, *CBI7, *CBP4, *CBS1, *CBS7. | 10 | |
| Case studies | (*)Resolución dun suposto práctico de planificación que o alumno deberá realizar e entregar<br>Se *evaluan as competencias básicas *CB1 e *CB2, as xerais *CG8, *CG18, *CG23, *CG38, *CG39, *CG40 e *CG41, a específicas CE23 (CE 23.1 a 23.10) e as transversais *CBI1, *CBI2, *CBI4, *CBI5, *CBI6, *CBI7, *CBP4, *CBS1, *CBS7. | 20 | CT5<br>CT6 |
| Studies excursion | (*)Asistencia ás saídas e práctica de campo organizadas. | 10 | |
| Problem and/or exercise solving | (*)Resposta a preguntas relacionadas co temario<br>Se *evaluan as competencias básicas *CB1 e *CB2, as xerais *CG8, *CG18, *CG23, *CG38, *CG39, *CG40 e *CG41, a específicas CE23 (CE 23.1 a 23.10) e as transversais *CBI1, *CBI2, *CBI4, *CBI5, *CBI6, *CBI7, *CBP4, *CBS1, *CBS7. | 60 | CT6 |

## Other comments on the Evaluation

## Sources of information

### Basic Bibliography

### Complementary Bibliography


TOLOSANA, E. et al, **El aprovechamiento maderero**, Ediciones Mundi-Prensa,

DALLA-PRIA, E et al, **Manuel d´exploitation forestière. Tome I.et II**, CTBA y ARMEF,

MONTOYA, J. M., **Los alcornocales**, M.A.P.A. Madrid,

ZAMORANO, J. L, **Resinar de forma rentable**, I.N.I.A. Madrid,

ACEMM, **Manual de prevención de riesgos laborales en el sector forestal**, Fundación para la prevención de riesgos laborales. Gobierno de Cantabria,

AAEF, **Manual de prevención de riesgos laborales en el sector forestal**, Junta de Andalucía,


## Recommendations

### Subjects that continue the syllabus

Forestry machinery/P03G370V01502

**Subjects that are recommended to be taken simultaneously**

Dasometry/P03G370V01602

**Subjects that it is recommended to have taken before**

Forestry/P03G370V01401

## Contingency plan

**Description**

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching on line
Use of institutional on-line teaching platform Campus Remoto in a synchronous way for the theoretical classes including basics, foundations, as well as general guidelines for resolution of problems and practical cases. Specific didactic materials adapted for on line teaching will be prepared e.g. Video or presentations, graphic resources, software, etc. All the resources will be available through FAITIC platform.
* Mechanism face-to-face of attention to the students (tutorials)
Personalized attention. Communication by email or another on-line tool. Tutorials via Campus Remoto platform.
=== ADAPTATION OF The EVALUATION ===
On-line tests and tasks via Campus Remoto and Faitic. The weight of the tests will be maintained as they are described in the main guide.

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Dasometry** | | | | |
| Subject | Dasometry | | | |
| Code | P03G370V01602 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Mandatory | 3rd | 2nd |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Fernández Alonso, José María | | | |
| Lecturers | Fernández Alonso, José María | | | |
| E-mail | josemfernandez@uvigo.es | | | |
| Web | | | | |
| General description | The *asignatura of *Dasometría consists of two big blocks: *Dasometría and Inventory.<br><br>The first a forest basic science part of the *Dasonomía and very related with the *Selvicultura that centres in the study of the volumes and growths of the forest masses.<br><br>The second is a group of technicians that allow to the technician in his professional work apply the sciences (*Dasometría) for *recopilar data on the masses and possible future evolution.<br><br>In the education of the matter, three appearances are fundamental to develop, according to our point of view, in the education of the forest science: intuition, rigour and creation. The intuition situates to the student in the type of problems that wants to attack (through examples), creates a perspective (often through the own history of the problem) and in definite generates an interest. The second level formalises all these intuitions and undresses them of the accessory until *desentrañar the essential. The rigour needs of the abstraction and is fundamental in the transmission of technical knowledges. The creation allows to build own solutions, practical, what before have a forest contact and more learn of this, more motivated goes to continue the study of the *asignatura. | | | |

| Competencies | |
|---|---|
| Code | |
| CG6 | Ability to measure, inventory and evaluate forest resources, apply and develop silvicultural techniques and management of all types of forest systems, parks and recreational areas, as well as techniques for harvesting timber and non-timber forest products |
| CE24 | Ability to know, understand and use the principles of: dasometry and forest inventory, forest management. |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>22R. 2018 Capacity to be to the day of the scientific and technological news. | CG6 | CE24 | CT8 |

| **Contents** | |
|---|---|
| Topic | |
| 0. Introduction to the Dasometry | 1. Why measure?<br>2. Why measure trees and forest masses?<br>3. Dasometry and affine sciences.<br>4. Units of measure.<br>5. Normalisation of symbols used in dasometry.<br>6. Significant figures.<br>7. Precision, bias and accuracy of the data.<br>8. Errors.<br>9. Weight or volume?<br>10. Components of the tree.<br>11. The form of the tree.<br>12. Measurement by trip of fluid.<br>13. Differences between quantity, value and price. |
| 1. Measurement of Trees: Diameters | 1.1. Important terms.<br>1.2. Basic dasometric parameters.<br>1.3. Measurement of diameters of the trees.<br>1.4. Measurement of the thickness of bark, diametral growth and age of the tree.<br>1.5. Marked and designation of trees.<br>1.6. Measurement of distances. |
| 2. Measurement of Trees: Heights | 2.1. Measurement of slopes.<br>2.2. Measurement of heights.<br>2.3. Recommendations for the measurement of heights.<br>2.4. Relascopio Of Bitterlich.<br>2.5. Other devices of the inventory.<br>2.6. Price devices dasometrycs. |
| 3. Cubiculation By trozas. | 3.1. Cubiculation Of trees.<br>3.2. Types dendrométricos.<br>3.3. Procedures for cubages of trees.<br>3.4. Formulas for cubages by trozas.<br>3.5. Rules madereras. |
| 4. Cubages Complete trunks. | 4.1. Graphic method.<br>4.2. Function of profile.<br>4.3. Formula of Pressler or of the point guideline.<br>4.4. Cubages Of trees in foot. Pressler-Bitterlich.<br>4.5. Parameters related with form: coefficients of form and mórphics..<br>4.6. Height reduced. |

| | |
|---|---|
| 5. Cubiculation Of masses. | 5.1. Stereometry.<br>5.2. Function of distribution diametric.<br>5.3. Half parameters of a mass.<br>5.4. Cubification Of forest masses.<br>5.5. Prices or tables of cubiculation.<br>5.6. Tables of mass.<br>5.7. Trees Type or modular values. |
| 6. Wooden measurement stacked. | 6.1. Quantification of the wood stacked. Definition of stereo.<br>6.2. Other units of apparent volume.<br>6.3. Coefficient of stacked.<br>6.4. Methods to calculate the coefficient of stacked. |
| 7. Epidometry | 7.1. Definition of epidometry<br>7.2. Diametral growth and age of the tree.<br>7.3. Analysis epidometric of trunks.<br>7.4. Definitions of growth.<br>7.5. Relation between growths.<br>7.6. Methods of obtaining of growths.<br>7.7. Definitions of growth of a mass. |
| 8. Forest inventory | 8.1. Definition of inventory.<br>8.2. Parts of the inventory.<br>8.3. Types of inventory.<br>8.4. Planning of the inventory.<br>8.5. Design of the inventory.<br>8.6. Units of sampling.<br>8.7. Methods of sampling.<br>8.8. Number, size and form of the plots of sampling.<br>8.9. Methods of realisation of the inventory.<br>8.10. Determination of the number of sample for a determinate error.<br>8.10. Estadillos Of taking of data in field. |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 26 | 52 | 78 |
| Problem solving | 4 | 10 | 14 |
| Case studies | 6 | 12 | 18 |
| Studies excursion | 14 | 24 | 38 |
| Problem and/or exercise solving | 1 | 0 | 1 |
| Report of practices, practicum and external practices | 1 | 0 | 1 |

*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 by part of the professor of the contents on the matter supporting some presentations of images, diagrams and videos that the student can see/download in the web indicated by the professor |
| Problem solving | I complement of the master lessons in which they expose practical exercises that the student has to develop applying the algorithms seen in the subject. |
| Case studies | Study of real cases with examples of different Inventories realised analysing his memory and methodology. With special attention to the solutions of planning employed and the computer applications. |
| Studies excursion | They will realise three practical exits for the execution of a forest inventory previously designed in the classroom like practical case. The students will have of the material of necessary inventory for the take down of plots and his processed back in cabinet. It will have to present a memory of the inventory realised. |

**Personalized assistance**

| Methodologies | Description |
|---|---|
| Problem solving | |
| Studies excursion | |

**Assessment**

| | Description | Qualification | Evaluated Competences |
|---|---|---|---|
| Lecturing | Assistance and participation in the theoretical classes of the *asignatura (7.5 points). Delivery of exercises realised during the classes or of realisation out of the classroom (10 points) . | 20 | CE24 |
| Problem and/or exercise solving | Realisation of an examination in which they will evaluate the theoretical and practical concepts of the *asignatura, by means of questions type test, and of theoretical development, as well as practical exercises. | 60 | CE24 |
| Report of practices, practicum and external practices | COMPULSORY assistance to the practical classes of the *asignatura, that realise usually in field. In exceptional cases, in which the assistance continued of the student was not possible, will realise a practical examination in field. COMPULSORY assistance to trip of practices of the *asignatura. | 20 | CE24 |

**Other comments on the Evaluation**

The student has to approve the practical part and the theoretical part separately. The assistance to the practices and to the trip of practices is of compulsory character to approve the *asignatura.

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

DIEGUEZ, U. et al., **Dendrometría**, Mundi Prensa  Fundación Conde del Valle de Salazar,

MARTÍNEZ CHAMORRO, et al., **Manual para a cubicación, taxación e venda de madeira en pe e biomasa forestal**, Universidade de Vigo,

MADRIGAL, A.; ÁLVAREZ, J.G.; RODRÍGUEZ, R.; ROJO, A., **Tablas de producción para los montes españoles**, Fundación Conde del Valle de Salazar,

DIEGUEZ, U. et al., **Herramientas Selvícolas para la Gestión Forestal Sostenible en Galicia**, Xunta de Galicia,

PRIETO RODRÍGUEZ, A.; LÓPEZ QUERO, M., **Dasometría. Versión española de Dendrométrie de L´ecole national du génie rural des aux et des forêts**, Editorial Paraninfo,

ACEMM, **Manual de prevención de riesgos laborales en el sector forestal**, Fundación para la prevención de riesgos laborales. Gobierno de Cantabria,

**Recommendations**

**Subjects that continue the syllabus**

Forest management/P03G370V01605
Physical planning and land management/P03G370V01701

**Subjects that are recommended to be taken simultaneously**

Projects/P03G370V01503

**Subjects that it is recommended to have taken before**

Mathematics: Statistics/P03G370V01301
Forestry/P03G370V01401
Use of forests/P03G370V01601

**Contingency plan**

**Description**

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

* Teaching methodologies modified

* Non-attendance mechanisms for student attention (tutoring)

* Modifications (if applicable) of the contents

* Additional bibliography to facilitate self-learning

* Other modifications

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Pending tests that are maintained
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Tests that are modified
[Previous test] => [New test]

* New tests

* Additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Repopulation** | | | | |
| Subject | Repopulation | | | |
| Code | P03G370V01603 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 3rd | 2nd |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | González Prieto, Óscar | | | |
| Lecturers | González Prieto, Óscar<br>Ortiz Torres, Luis | | | |
| E-mail | oscargprieto@uvigo.es | | | |
| Web | | | | |
| General description | (*)Los objetivos generales de la asignatura son:<br>a) Conocer las bases, objeto y fundamentos de las Repoblaciones Forestales<br>b) Conocer las caractaristicas, métodos y medios necesarios para llevar a cabo las distintas opreaciones relacionadas con las repoblaciones forestales<br>c) Conocer los principios generales de la obtención de semilla forestal y producción de planta forestal en vivero. | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG2 | Ability to analyze the ecological structure and function of forest systems and resources, including landscapes. |
| CE20 | Ability to know, understand and use the principles of forestry machinery and mechanization. |
| CE21 | Ability to know, understand and use the principles of: reforestation. Gardening and nurseries. Forest improvement |
| CT5 | Capacity for information management, analysis and synthesis |
| CT8 | Ability to solve problems, critical reasoning and decision making |
| CT10 | Autonomous Learning |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances. | CG1<br>CG2 | CE20<br>CE21 | CT5<br>CT8<br>CT10 |
| 3R. 2018 Be conscious of the multidisciplinary context of the engineering. | | | |
| 4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses. | | | |
| 5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial. | | | |
| 6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project. | | | |
| 7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering. | | | |
| 8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality. | | | |
| 9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality. | | | |
| 11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality. | | | |
| 12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality. | | | |
| 13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality. | | | |
| 14R. 2018 Capacity to apply norms of engineering in the his speciality. | | | |
| 15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering. | | | |
| 16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context. | | | |
| 19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general. | | | |
| 20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines. | | | |

**Contents**

Topic

| | |
|---|---|
| Module I *Planificacion and *ejecucion of *repoblaciones forest | Subject 1. Concept and election of species<br>Lesson 1.1. Concept of *repoblacion forest and comment<br>Lesson 1.2. Antecedents and need of the *repoblacion forest<br>Lesson 1.3. Aims of the *repoblacion forest<br>Lesson 1.4. Election of species<br><br>Fear 2. Methods of *repoblacion<br>Lesson 2.1. Types of methods<br>Lesson 2.2. Selection of the method<br><br>Fear 3. Treatment of the pre-existing vegetation<br>Lesson 3.1. Justification and objective<br>Lesson 3.2. Classification of the procedures of *desbroce<br>Lesson 3.3. Description of the procedures of *desbroce<br><br>Subject 4. Preparation of the am used to<br>Lesson 4.1. Justification and objective<br>Lesson 4.2. Classification of the procedures of preparation of the am used to<br>Lesson 4.3. Description of the procedures of preparation of the am used to<br>Lesson 4.4. Hydrological appearances of the *desbroces and of the preparation of the floor<br><br>Fear 5. Introduction of the new species<br>Lesson 5.1. Density of introduction<br>Lesson 5.2. You seed<br>Lesson 5.3. Plantations<br><br>Fear 6. Back cares of the *repoblaciones and complementary works<br>Lesson 6.1. Back cares of the *repoblaciones<br>Lesson 6.2. Complementary works<br><br>Subject 7. Environmental impact of the *repoblaciones forest<br>Lesson 7.1. Introduction and normative<br>Lesson 7.2. Considerations on the environmental impact of the *R. Forest<br>Lesson 7.3. Factors affected<br>Lesson 7.4. Evaluation of impacts<br>Lesson 7.5. Methodological conclusion |
| Module II Seeds | Subject 8. Generalities on forest seeds<br>Lesson 8.1. *Recolección<br>Lesson 8.2. Extraction and cleaning<br>Lesson 8.3. Storage<br>Lesson 8.4. Treatments of conservation<br>Lesson 8.5. Analysis<br>Lesson 8.6. Treatments of germination<br>Lesson 8.7. It seeds |
| Module III Nurseries | Subject 9. Generalities on forest nurseries<br>Lesson 9.1. Definition and classes<br>Lesson 9.2. It waters<br>Lesson 9.3. I am used to<br>Lesson 9.4. Location, form and size<br>Lesson 9.5. Crop of plant to nude root<br>Lesson 9.6. Crop of plant in container<br>Lesson 9.7. *Estaquillado<br>Lesson 9.8. Quality of the forest plant<br>Lesson 9.9. *Micorrizacion |
| Module IV Security, Hygiene and Prevention of labour Risks in the *repoblaciones forest | Element 10 *PRL in *Repoblaciones Forest<br>*Leccion 10.1 Risks related with the spaces of work<br>*Leccion 10.2 manual Tools<br>*Leccion 10.3 portable Machines<br>*Leccion 10.4 forest Machinery<br>*Leccion 10.5 Manipulation of phytosanitary products and *fertilizantes |

| **Planning** | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Lecturing | 25.5 | 47.5 | 73 |

| | | | |
|---|---|---|---|
| Problem solving | 8 | 14 | 22 |
| Studies excursion | 8 | 8 | 16 |
| Project based learning | 1 | 11.5 | 12.5 |
| Case studies | 10.5 | 14 | 24.5 |
| Objective questions exam | 0.5 | 0 | 0.5 |
| Problem and/or exercise solving | 0.5 | 0 | 0.5 |
| Laboratory practice | 1 | 0 | 1 |

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

| **Methodologies** | |
|---|---|
| | Description |
| Lecturing | The lesson *magistral is the common form of development of the function *expositiva, in that the professor develops a series of concepts related with the contents of the Subject, and the student adopts a paper *receptivo of said information.<br><br>The employment of audiovisual means (slides, transparencies, videos, cannon of video, etc.) goes to be constant in these classes since the retention of information is very upper when they combine oral and visual stimuli.<br><br>The lesson *magistral serves to develop conceptually a subject, give global versions, develop a methodology of work. Etc.<br><br>In function of the advance of the course, the content of each didactic unit given will go facilitating previously and by writing, well as you aim or like bibliography, what makes possible to the student that assist to the classes with the previous reading of the subject. On the other hand, if the student knows that what gives will be able to find it in a book to the hour to study it, his attitude in class will be headed to to comprise the explanation, having to take only notice *marginales of what expands .<br><br>In the case of the present subject, the employment of audiovisual means like digital presentations, multimedia, transparencies, *retroproyección, etc. has to speed up the exhibition of subjects with a marked descriptive character, or in which they require drawings and diagrams of complicated execution.<br><br>The classes of discussion directed, will make at least one along the course and consists in the exhibition of a subject, that has to gather characteristics of real problem, wealth in contradictions or reasons of controversy, has to be of interest for the students, that have to know the activity with *antelación sufficient and be the quite qualified to issue opinions about the same.<br><br>The technician orients to the *superación of the memorisation *acrítica, the promotion of the participation in the group and the *verbalización of ideas like half that favours his assimilation. Besides, it ascertains in an important part of the students a difficulty of expression and editorial, that can contribute to win by means of this didactic resource. The paper of the professor like driver or *moderador of the discussion is fundamental allowing all type of opinions on the subject.<br><br>Besides, and of complementary form to the lesson *magistral, after the exhibition of controversial subjects or of special interest for the students, results interesting the organisation of debates of extension reduced, turns of questions, etc. Such activity, of realisation simpler that the previous, can consider more like a resource of preparation and control inside the lesson *magistral, that like a technician of extraneous nature to the same.<br><br>Other tools that contribute to reinforce the included contents in the lessons *magistrales are.<br>- Study of cases/analysis of situations /discussion directed: Formulation, analysis, resolution and debate of a problem or exercise related with the thematic of the subject.<br>- Resolution of problems and/or exercises of autonomous form: Formulation, analysis, resolution and debate of a problem or exercise related with the thematic of the subject, by part of the students.<br>- Presentations/exhibitions: oral Exhibition by part of the students of a concrete subject or of a work (generally previous presentation written).<br>- Multimedia sessions: Employment of material *videográfico / on-line on appearances of the subject<br>- Gone out of practical/study of field: Realisation of visits-exits to the field for the observation and study of appearances previously studied/analysed |
| Problem solving | Formulation, analysis,<br>resolution and debate of a problem or exercise related with the thematic of<br>the subject, by part of the students.<br>Will carry out exercises and problems on subjects as, static study of forest masses, dynamic study of the forest masses, etc. |

| | |
|---|---|
| Studies excursion | The practice of the technicians, learnt theoretically, has to carry out in contact with the professional practice that only can obtain by means of the real practice of the technicians (or his direct observation) there where these carry out (industry, forest masses, etc.).<br>Have to make the maximum number of practices of field or trips of practices, without which the theoretical educations result insufficient to achieve the educational aims.<br>The practices of field pretend therefore achieve fix the concepts of the subject, give to the students the opportunity to put in contact with the professional world and boost the relations between students and professor student out of the centre. The realisation of trips of practices have felt when really they contribute new knowledges that they are impossible to purchase in the own School. The exit of field will not make in the case of teaching no face-to-face or *semi-face-to-face. In this case of *substituirá by the practical observation of audiovisual material of works and field of *repoblaciones forest. |
| Project based learning | - *Organizacvión Of seminars *ou specific conferences<br>- Presentations/exhibitions: oral Exhibition by part of the students of a concrete subject or of a work (generally previous presentation written).<br>- Multimedia sessions: Employment of material *videográfico / on-line on appearances of the subject<br>- Days of study of appearances previously studied/analysed in the exits of field |
| Case studies | - Study of cases/analysis of situations or discussion directed: Formulation, analysis, resolution and debate of a problem or exercise related with the thematic of the subject. |

**Personalized assistance**

| Methodologies | Description |
|---|---|
| Case studies | The *tutorías will make preferably by telematic means (email, remotecampus, forums of doubts in *FaiTIC). For that student or student that request it will be able to make , inthe measure of the possible, *presencialmente. They will indicate to beginning of course the concrete forms ofcommunication as well as the schedules. |
| Problem solving | The *tutorías will make preferably by telematic means (email, remotecampus, forums of doubts in *FaiTIC). For that student or student that request it will be able to make , inthe measure of the possible, *presencialmente. They will indicate to beginning of course the concrete forms ofcommunication as well as the schedules. |
| Studies excursion | The *tutorías will make preferably by telematic means (email, remotecampus, forums of doubts in *FaiTIC). For that student or student that request it will be able to make , inthe measure of the possible, *presencialmente. They will indicate to beginning of course the concrete forms ofcommunication as well as the schedules. |

**Assessment**

| | Description | Qualification | Evaluated Competences |
|---|---|---|---|
| Lecturing | Proof written on the teaching given in sessions *magistrales | 0 | |
| Project based learning | Proof on learning based in projects | 0 | |
| Case studies | Proof written and/or oral on the similar cases to the resolved in class | 30 | CE21 |
| Objective questions exam | Proof written on the teaching given in sessions *magistrales | 30 | CE21 |
| Problem and/or exercise solving | Proof written on the teaching given in sessions *magistrales | 40 | CE21 |

**Other comments on the Evaluation**

To approve the matter have to surpass the common examinations and make satisfactorily the works that *eventualmente commission . The presence in practise and trips is compulsory. They will not save classifications of the theoretical notes, further of the announcements regulated of the academic year.

Calendar of examinations:

official Dates collected in informative documentation of the School.&*nbsp;http://forestales.uvigo.es/gl/docencia/exames/

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

R. Serrada, **SERRADA, R. 2000. Apuntes de Repoblaciones Forestales.**, FUCOVASA. Madrid.,

**Recommendations**

**Subjects that are recommended to be taken simultaneously**

Botany/P03G370V01303
Forestry Ecology/P03G370V01402

**Subjects that it is recommended to have taken before**

Biology: Plant Biology/P03G370V01201

## Contingency plan

**Description**

=== EXCEPTIONAL MEASURES SCHEDULED ===
In front of the uncertain and unpredictable evolution of the sanitary alert caused by the *COVID-19, the University of Vigo establishes an extraordinary planning that will activate in the moment in that the administrations and the own institution determine it attending to criteria of security, health and responsibility, and guaranteeing the teaching in a no face-to-face stage or partially face-to-face. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the teaching of a more agile and effective way when being known in advance (or with a wide *antelación) by the students and the *profesorado through the tool normalised and institutionalised of the educational guides.

* Educational methodologies that keep
introductory Activities
Lesson *magistral
Resolution of problems
Work *tutelado
* educational Methodologies that modify
The exit of practices scheduled will not make in the case of teaching no face-to-face or in the case that it do not allow with teaching *semi-face-to-face. *substituirá By practical observation of audiovisual material of processes of manufacture of industries of the wood (videos and digital information)
* Mechanism no face-to-face of attention to the students (*tutorías)
virtual Dispatch, email and habilitation of forums in the platform *FaiTIC
* Modifications (if they proceed) of the contents to give
The exit of practices scheduled will not make in the case of teaching no face-to-face or in the case that it do not allow with teaching *semi-face-to-face. *substituirá By practical observation of audiovisual material of processes of manufacture of industries of the wood (videos and digital information)
* additional Bibliography to facilitate the car-learning
is not necessary, since they facilitate it to him materials in the platform of *teledocencia, many of them of own preparation by part of the professors, to be able to make a follow-up of the matter
* Other modifications
is not necessary
=== ADAPTATION OF THE EVALUATION ===
* Test already made
keeps the weight when being adapted all the proofs to any circumstance
* Test slopes that keep
keeps the weight when being adapted all the proofs to any circumstance
* Test that they modify
is not necessary
* New proofs
is not necessary
* additional Information
does not require

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Forestry hydrology** | | | | |
| Subject | Forestry hydrology | | | |
| Code | P03G370V01604 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 3rd | 2nd |
| Teaching language | | | | |
| Department | | | | |
| Coordinator | Álvarez Bermúdez, Xana | | | |
| Lecturers | Álvarez Bermúdez, Xana | | | |
| E-mail | xana.alvarez.bermudez@gmail.com | | | |
| Web | http://http://www.forestales.uvigo.es/ | | | |
| General description | Description of the elements that influence in the hydrological cycle. Characterisation of hydrographic basins and quantification of the erosion. Technicians of control and management of the hydrographic basins | | | |

| Competencies | |
|---|---|
| Code | |
| CG3 | Knowledge of degradation processes that affect forest systems and resources (pollution, pests and diseases, fires, etc.) and capacity for the use of forest environment protection techniques, forest hydrological restoration and biodiversity conservation . |
| CE9 | Ability to know, understand and use the principles of: forestry hydraulics; hydrology and hydrological-forest restoration. |
| CT4 | Sustainability and environmental commitment |

| Learning outcomes | Competences | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>14R. 2018 Capacity to apply norms of engineering in the his speciality.<br>15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering.<br>16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context.<br>17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions<br>18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions. | CG3 | CE9 | CT4 |

| Contents |
|---|
| Topic |

| | |
|---|---|
| Subject1 Introduction and generalities | Hydrological cycle.<br>The hydrological basin.<br>Physical parameters of the basin.<br>Soil and climate.<br>Actions of the forest on the water regulation.<br>Hydrological subsystems.<br>Hydrological models.<br>legal framework . |
| Subject 2 Precipitation | Training and types.<br>Measured atmospheric humidity.<br>Terminal Speed drops rain.<br>Size drops and kinetical energy.<br>Measure and distribution of the precipitation. Methods of work with rainfall data.<br>Half precipitation on an area |
| Subject 3 Evaporation | Solar radiation<br>Profiles of wind in vegetation<br>Evaporation and evapotranspiration<br>Empirical methods<br>Interception and transpiration in forests |
| Subject 4 Infiltration | Measure of humidity and potential water in the floor<br>influential Factors<br>instantaneous and accumulated Infiltration<br>Flow in saturated means. Law of Darcy<br>Models of infiltration<br>Measured of the hydraulic conductivity |
| Subject 5 Runoff | Generation and classification of the flow of runoff<br>Coefficient of runoff. Number Of Curve<br>Methods of Green-Ampt<br>Methods of estimate of runoff monthly<br>Water balance and Thornthwaite |
| Subject 6 Hydrographs | Separation of basic flow<br>Unitary and synthetic hydrographs<br>Maximum Discharge of runoff |
| Subject 7 Surface water and groundwater | Aquifers<br>hydrogeological variables<br>Equations of subterranean flow |
| Subject 8 hydrological Measurements | Discharge<br>Measurements of speed of flow<br>Measurements with sensors of pressure<br>Types of control of relation level and discharge |
| Subject 9 Driving of avenues of water | Introduction<br>Traffic of aggregated systems<br>hydrological Traffic in rivers<br>Traffic distributed of increasing<br>cinematic Wave |
| Subject 10 hydrological Statistics | Concepts.<br>Analysis of frequency.<br>Work of distribution.<br>Period of return.<br>Theory of adjust statistical.<br>Analysis of frequency for extreme values . |
| Subject 11 hydrological Restoration forest | Action of the forest on water regulation.<br>Distribution of the the precipitation in forest masses. Intercept.<br>Translocation.<br>Trunk runoff<br>Hydrological techniques reforestation |
| Subject 12: Water erosion | Types of erosion.<br>Parametric models<br>Models of analytical solution .<br>Stabilization and rehabilitation techniquesn of areas with risk of erosion |
| Subject 13: Restoration of banks and rivers | Main pressures and impacts of the Spanish rivers<br>Environmental Assessment of the rivers<br>Features and banks<br>Performances for the improvement and restoration of rivers<br>Development projects<br>Ecological restoration of rivers and banks |

| | |
|---|---|
| Subject 14: transversal Works in the course | Dams of consolidation<br>Dams of retention<br>Planning and technical criteria of execution<br>Act longitudinal in margines rivers<br>Design of breakwaters<br>Pavers background<br>Deflectors |
| Subject 15: practical sessions | Hydrological modeling with HEC-HMS.<br><br>Configuration of projects in HEC-HMS and its capabilities for basin modeling through the introduction of the different components of the basin, as well as the meteorological model and control specifications.<br><br>Direct runoff hydrograph calculation<br>produced by a precipitation event and analysis of results. |

| **Planning** | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Practices through ICT | 10 | 10 | 20 |
| Autonomous problem solving | 30 | 30 | 60 |
| Studies excursion | 3 | 3 | 6 |
| Lecturing | 30 | 30 | 60 |
| Problem and/or exercise solving | 3 | 0 | 3 |
| Problem and/or exercise solving | 1 | 0 | 1 |
| *The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. | | | |

| **Methodologies** | |
|---|---|
| | Description |
| Practices through ICT | I handle of software draw computer-aided for treatment of watershed.<br>By means of this methodology develop the competitions A19 and A62 |
| Autonomous problem solving | They will explain and/or they will resolve problems in group from a series of billed facilitated by the professor.<br>The students will have to resolve a small number of exercises for each one of the subjects, that will have to deliver in the term indicated for his qualification.<br>By means of this methodology develop the competitions A19 and A62 |
| Studies excursion | It will realise visit to a place of interest hydrological to observe the hydrological conditions of the same and infrastructures and techniques of restoration employed.<br>By means of this methodology develop the competitions A19 and A62 |
| Lecturing | Classes in the classroom to the groups, where explain the corresponding contents to each subject.<br>By means of this methodology develop the competitions A19 and A62 |

| **Personalized assistance** | |
|---|---|
| **Methodologies** | **Description** |
| Autonomous problem solving | |

| **Assessment** | | | |
|---|---|---|---|
| | Description | Qualification | Evaluated Competencess |
| Problem and/or exercise solving | Practical supposition for his resolution.<br>By means of this methodology evaluate the competitions A19 and A62 | 30 | CE9 |
| Problem and/or exercise solving | Proof with questions type test and of short answer, where the student will have to show the knowledge purchased.<br>By means of this methodology evaluate the competitions A19 and A62 | 70 | CE9 |

**Other comments on the Evaluation**

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

**Recommendations**

## Contingency plan

### Description

=== EXCEPTIONAL MEASURES SCHEDULED ===
In front of the uncertain and unpredictable evolution of the sanitary alert caused by the *COVID-19, the University of Vigo establishes an extraordinary planning that will activate in the moment in that the administrations and the own institution determine it attending to criteria of security, health and responsibility, and guaranteeing the teaching in a no face-to-face stage or partially face-to-face. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the teaching of a more agile and effective way when being known in advance (or with a wide *antelación) by the students and the *profesorado through the tool normalised and institutionalised of the educational guides.

=== ADAPTATION OF THE METHODOLOGIES ===
* educational Methodologies that keep : all

* educational Methodologies that modify : it will changue from the face-to-face modality to the on-line modality through the virtual campus of the university of Vigo.

* Mechanism no face-to-face of attention to the students (*tutorías): through the email and of the virtual dispatch of the professor

* Modifications (if they proceed) of the contents to give: without modification

* additional Bibliography to facilitate the car-learning: without modification

* Other modifications

=== ADAPTATION OF THE EVALUATION ===
* Test already made: they keep
Proof XX: [previous Weight 00%] [Weight Proposed 00%]
...

* Pending proofs that keep : they keep
Proof XX: [previous Weight 00%] [Weight Proposed 00%]
...

* Proofs that modify : without modification. They will become on-line examinations if the circumstances do not allow face-to-face examinations
[previous Proof] =&*gt; [new Proof]

* New test

* additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Forest management** | | | | |
| Subject | Forest management | | | |
| Code | P03G370V01605 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 3rd | 2nd |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Fernández Alonso, José María | | | |
| Lecturers | Fernández Alonso, José María | | | |
| E-mail | josemfernandez@uvigo.es | | | |
| Web | | | | |
| General description | During it study of #Ordination of Hills will #analyze the different methods stop the organisation and management of the *aproveitamento of the forest natural resources. The education will base in the *repaso of the European forest history and of the parallel evolution of the methods of #ordination. The presentation of problems will allow to enter the distinct solutions and the learning of the same by part of the student. | | | |

| Competencies | |
|---|---|
| Code | |
| CG6 | Ability to measure, inventory and evaluate forest resources, apply and develop silvicultural techniques and management of all types of forest systems, parks and recreational areas, as well as techniques for harvesting timber and non-timber forest products |
| CG10 | Ability to apply the techniques of forest management and land planning, as well as the criteria and indicators of sustainable forest management within the framework of forest certification procedures. |
| CG13 | Ability to design, direct, elaborate, implement and interpret projects and plans, as well as to write technical reports, recognition reports, assessments, appraisals and appraisals. |
| CE24 | Ability to know, understand and use the principles of: dasometry and forest inventory, forest management. |
| CE25 | Ability to know, understand and use the principles of: forest legislation and certification; sociology and forestry policy. |
| CT4 | Sustainability and environmental commitment |
| CT6 | Organization and planning capacity |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>14R. 2018 Capacity to apply norms of engineering in the his speciality.<br>15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering.<br>16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context.<br>17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions<br>18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions.<br>20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines. | CG6<br>CG10<br>CG13 | CE24<br>CE25 | CT4<br>CT6<br>CT8 |

| **Contents** | |
|---|---|
| Topic | |
| Introduction to the #Ordination of Hills | Definitions and concept<br>Conditions and objective minima<br>historical Evolution of the hills and of the Objective<br>#ordination of the Forest Management |
| Strategic and legislative frame of the *planifiación forest | Planning: international agreements, state and autonomic plans<br>Legislation basic and complementary. Decrees<br>Instructions of #ordination |
| Content of the instruments of #ordination | Classical structure of a *P.The<br>Typology of instruments<br>minimum Contents |
| Bases *selvicolas of the #ordination of hills | Relation with the minimum objectives<br>Studio *estático of the hills<br>dynamic Studio of the hills<br>global Structures and conceptual base |
| Economic bases of the #ordination of hills | Criteria stop the determination of the turn, age of maturity or diameter of *cortabilidade<br>technical Criteria, physical or financial |
| Methods of #Ordination | Introduction to the practical methods<br>Division by fit<br>Methods of stretches<br>irregular Masses<br>Management by *rodais |
| Certification of the forest management | Process, diagrams and modalities |

| **Planning** |
|---|

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 26 | 52 | 78 |
| Problem solving | 4 | 10 | 14 |
| Case studies | 6 | 12 | 18 |
| Scientific events | 4 | 6 | 10 |
| Studies excursion | 10 | 18 | 28 |
| Problem and/or exercise solving | 1 | 0 | 1 |
| Report of practices, practicum and external practices | 1 | 0 | 1 |

*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 by part of the professor of the contained envelope to subject object of study, theoretical bases and/or guidelines of one work, exercise or project to develop pole student. |
| Problem solving | Activity in the that formulate problems and/or exercises related with the subject. The student owes to develop the suitable or correct solutions by means of it *exercitación of routines, the application of formulas or algorithms, the application of procedures of transformation of the available information and the interpretation of the resulted. It usually employ how supplement of the lesson *maxistral. |
| Case studies | Analysis of a done, problem or real event with the aim to know it, interpreted, resolved, generate hypothesis, contrast data, *reflexionar, complete knowledges, diagnosed and trained in alternative procedures of solution. |
| Scientific events | Conferences, talks, exhibitions, round tables, debates... Realized by settings of prestige, that allow *afondar or supplement the contents of the subject. |
| Studies excursion | Activities of application of the knowledges to concrete situations and of acquisition of basic skills and *procedimentais related with the subject object of study. They develop in spaces no academic outsides.<br>It go in they can be quoted practices of field, visits to events, centres of investigation, companies, institutions... Of academic interest-professional stop the student. |

**Personalized assistance**

| Methodologies | Description |
|---|---|
| Problem solving | |
| Studies excursion | |

**Assessment**

| | Description | Qualification | Evaluated Competencess |
|---|---|---|---|
| Problem and/or exercise solving | Evaluation by means of proof of theoretical concepts | 60 | CG6 |
| Report of practices, practicum and external practices | Continuous evaluation of the individual work. Resolution put student of practical cases and manufacture of report on case of study | 40 | CG6 |

**Other comments on the Evaluation**

**Sources of information**

**Basic Bibliography**

MADRIGAL, A, **Ordenación de Montes Arbolados**, ICONA,

**Complementary Bibliography**

GONZALEZ MOLINA, et al., **Manual de Ordenación por Rodales**, Centre Tecnologic Forestal de Catalunya,

DAVIS, L. S.; JOHNSON, K. N.; BETTINGER, P. S.; HOWARD, T. E, **Forest Management (4th ed.)**, McGraw Hill Publishing Co.,

MADRIGAL, A.; ÁLVAREZ, J.G.; RODRÍGUEZ, R.; ROJO, A., **Tablas de producción para los montes españoles**, Fundación Conde del Valle de Salazar,

DÍAZ-MAROTO, I., **Evolución de los métodos de ordenación de montes en España. Situación actual.**, Escuela Politécnica Superior, Lugo,

ACEMM, **Manual de prevención de riesgos laborales en el sector forestal**, Fundación para la prevención de riesgos laborales. Gobierno de Cantabria,

DIEGUEZ, U. et al., **Herramientas Selvícolas para la Gestión Forestal Sostenible en Galicia**, Xunta de Galicia,

MARTÍNEZ CHAMORRO, et al., **Manual para a cubicación, taxación e venda de madeira en pe e biomasa forestal**, Universidade de Vigo,

**Manual de ordenación de montes de Andalucía**, Junta de Andalucía,

Saura Martínez de Toda, Santiago, **Ordenación Forestal. Ejercicios resueltos**, 978-84-8409-269-8, Edicions de la Universitat de Lleida, 2008

## Recommendations

### Subjects that continue the syllabus

Physical planning and land management/P03G370V01701

### Subjects that are recommended to be taken simultaneously

Projects/P03G370V01503

### Subjects that it is recommended to have taken before

Mathematics: Statistics/P03G370V01301
Forestry/P03G370V01401
Use of forests/P03G370V01601
Dasometry/P03G370V01602

## Contingency plan

### Description

=== EXCEPTIONAL MEASURES SCHEDULED ===
In front of it uncertain and unpredictable evolution of the sanitary alert caused by the COVID- 19, the University establishes join extraordinary planning that will actuate in the moment in that the administrations and the @propio institution determine it attending to criteria of security, health and responsibility, and guaranteeing the *docencia in a @escenario no *presencial or no totally *presencial. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the *docencia of a way but *áxil and effective when being known beforehand (or with a wide advance) pole students and the teaching staff through the tool normalized and institutionalized of the teaching guides DOCNE*T.

=== ADAPTATION OF The METHODOLOGIES ===
* teaching Methodologies that keep : all except visit of studies

* teaching Methodologies that modify : the visit of studies would be deleted and *substituida by a case of study

* Mechanism no *presencial of attention to the students (*titorías): *email, remote campus and *faitic

* Modifications ( proceed) of the contained to impart

* additional Bibliography to facilitate to car-learning

* Other modifications

=== ADAPTATION OF The EVALUATION ===
* Proofs already realized
Test XX: [previous Weight 00%] [Weight Proposed 00%]
...

* Pending proofs that keep
Exercise final evaluation: [previous Weight 60%] [Weight Proposed 40%]
Works of continuous evaluation: [previous Weight 40%] [Weight Proposed 60%]

* Proofs that modify
[previous Proof] => [new Proof]

* New proofs

* additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Wood technology** | | | | |
| Subject | Wood technology | | | |
| Code | P03G370V01606 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 3rd | 2nd |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | González Prieto, Óscar | | | |
| Lecturers | González Prieto, Óscar | | | |
| E-mail | oscargprieto@uvigo.es | | | |
| Web | http://www.forestales.uvigo.es | | | |
| General description | *Asignatura In which it studies the wood like industrial prime matter, his characteristics and properties | | | |

| Competencies | |
|---|---|
| Code | |
| CG11 | Ability to characterize the anatomical and technological properties of wood and non-timber forest raw materials, as well as the technologies and industries of these raw materials. |
| CE28 | Ability to know, understand and use the principles of: internal anatomical structure and macroscopic properties of wood. |
| CT4 | Sustainability and environmental commitment |

| Learning outcomes | Competences | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>14R. 2018 Capacity to apply norms of engineering in the his speciality.<br>17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions | CG11 | CE28 | CT4 |

| Contents | |
|---|---|
| Topic | |
| Macroscopic structure of the wood | Albura, heartwood, marrow<br>longitudinal and radial Fabrics<br>Growth in rings<br>Anisotropy of the wood<br>Texture, grain and design |
| Microscopic structure of the wood | Microscopic structure of the wood of coniferous<br>microscopic Structure of the wood of leafy |
| Structure submicroscopic | Submicroscopic structure<br>Chemical composition of the wood |

| | |
|---|---|
| Anomalies and defects of the wood | Knots<br>juvenile Wood<br>Anomalies of the growth of the layer cambial<br>Fends<br>Wood of reaction<br>internal Tensions of growth<br>Stock exchanges of resin<br>Other defects of the wood |
| Properties of the wood | Physical properties of the wood<br>mechanical Properties of the wood |
| Industrial classification of the wood in roll | Classification in function of the characteristics of the wood and his aptitude for the different industrial applications |

| **Planning** | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Lecturing | 29 | 72 | 101 |
| Laboratory practical | 10 | 20 | 30 |
| Studies excursion | 4 | 8 | 12 |
| Introductory activities | 1 | 0 | 1 |
| Problem and/or exercise solving | 2 | 0 | 2 |
| Report of practices, practicum and external practices | 0 | 4 | 4 |
| *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 aims and contents and importance of the same inside the group of competitions of the subject |
| Laboratory practical | Delivery by heart individual or in group of practices made. In case of teaching no face-to-face or *semi-face-to-face, memory of audiovisual material worked. |
| Studies excursion | Explanation in situ of industrial and technical processes of laboratory. Presentation of a memory of the visits made. In the case of teaching no face-to-face<br>or *semi-face-to-face, will evaluate memory elaborated employing audiovisual material of processes of manufacture of industries of the wood (videos and digital information). |
| Introductory activities | Initial explanation of the aims and development of the subject |

| **Personalized assistance** | |
|---|---|
| **Methodologies** | **Description** |
| Laboratory practical | The *tutorías will make preferably by telematic means (email, remotecampus, forums of doubts in *FaiTIC). For that student or student that request it will be able to make , inthe measure of the possible, *presencialmente. They will indicate to beginning of course the concrete forms ofcommunication as well as the schedules. |

| **Assessment** | | | |
|---|---|---|---|
| | Description | Qualification | Evaluated Competencess |
| Lecturing | Continuous evaluation through the assistance to the classes of classroom. In case of teaching no face-to-face or *semi-face-to-face, will value the active participation in the debate that pose in the classroom/remote campus on the theoretical concepts. Also it will value the participation in the forums that enable in the platform *FaiTIC | 20 | |
| Laboratory practical | Continuous evaluation through the assistance to the practices of laboratory. In case of teaching no face-to-face or *semi-face-to-face, will value the active participation in the debate that pose in the classroom/remote campus on<br>the theoretical concepts. Also it will value the participation in the forums that enable in the platform *FaiTIC . | 5 | |
| Problem and/or exercise solving | Realisation of partial proofs and finals. Proofs written on the theoretical and practical contents of the subject. Some<br>proofs will be scheduled along the course and will be delivered through the platform of *Teledocencia. | 70 | |

| | | |
|---|---|---|
| Report of practices, practicum and external practices | Realisation and presentation of the memories of the practices of laboratory. In the case of teaching no face-to-face or *semi-face-to-face, will value memories of audiovisual material with which work . | 5 |

**Other comments on the Evaluation**

Calendar of examinations:

according to official information of the School.&*nbsp;http://forestales.uvigo.es/gl/docencia/exames/

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

Santiago Vignote Peña, **TECNOLOGIA DE LA MADERA (3ª ED.)**, Muni Prensa,

**Recommendations**

**Subjects that continue the syllabus**

Primary wood processing industries/P03G370V01706
Wood preservation and drying technology/P03G370V01705

**Subjects that it is recommended to have taken before**

Physics: Physics I/P03G370V01102
Physics: Physics II/P03G370V01202
Botany/P03G370V01303

**Other comments**

Eligible subject for dual training projects as established by the memory of the degree.

**Contingency plan**

**Description**

=== EXCEPTIONAL MEASURES SCHEDULED ===
In front of the uncertain and unpredictable evolution of the sanitary alert caused by the *COVID-19, the University of Vigo establishes an extraordinary planning that will activate in the moment in that the administrations and the own institution determine it attending to criteria of security, health and responsibility, and guaranteeing the teaching in a no face-to-face stage or partially face-to-face. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the teaching of a more agile and effective way when being known in advance (or with a wide *antelación) by the students and the *profesorado through the tool normalised and institutionalised of the educational guides.

* Educational methodologies that keep
introductory Activities
Lesson *magistral
Resolution of problems
Work *tutelado
* educational Methodologies that modify
The exit of practices scheduled will not make in the case of teaching no face-to-face or in the case that it do not allow with teaching *semi-face-to-face. *substituirá By practical observation of audiovisual material of processes of manufacture of industries of the wood (videos and digital information)
* Mechanism no face-to-face of attention to the students (*tutorías)
virtual Dispatch, email and habilitation of forums in the platform *FaiTIC
* Modifications (if they proceed) of the contents to give
The exit of practices scheduled will not make in the case of teaching no face-to-face or in the case that it do not allow with teaching *semi-face-to-face. *substituirá By practical observation of audiovisual material of processes of manufacture of industries of the wood (videos and digital information)
* additional Bibliography to facilitate the car-learning
is not necessary, since they facilitate it to him materials in the platform of *teledocencia, many of them of own preparation by part of the professors, to be able to make a follow-up of the matter
* Other modifications
is not necessary
=== ADAPTATION OF THE EVALUATION ===
* Test already made

keeps the weight when being adapted all the proofs to any circumstance
* Test slopes that keep
keeps the weight when being adapted all the proofs to any circumstance
* Test that they modify
is not necessary
* New proofs
is not necessary
* additional Information
does not require

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Xylo energy** | | | | |
| Subject | Xylo energy | | | |
| Code | P03G370V01607 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 3rd | 2nd |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Ortiz Torres, Luis | | | |
| Lecturers | Ortiz Torres, Luis | | | |
| E-mail | lortiz@uvigo.es | | | |
| Web | http://www.webs.uvigo.es/lortiz | | | |
| General description | (*)procesos de transformación física y conversión energética de biomasa | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG6 | Ability to measure, inventory and evaluate forest resources, apply and develop silvicultural techniques and management of all types of forest systems, parks and recreational areas, as well as techniques for harvesting timber and non-timber forest products |
| CG11 | Ability to characterize the anatomical and technological properties of wood and non-timber forest raw materials, as well as the technologies and industries of these raw materials. |
| CE26 | Ability to know, understand and use the principles of: xiloenergetic industrial processes |
| CT2 | Ability to communicate orally and written in Spanish or in English |
| CT9 | Teamwork skills, skills in interpersonal relationships and leadership. |
| CT10 | Autonomous Learning |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>14R. 2018 Capacity to apply norms of engineering in the his speciality.<br>15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering.<br>17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions<br>19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general.<br>21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life.<br>22R. 2018 Capacity to be to the day of the scientific and technological news. | CG1<br>CG6<br>CG11 | CE26 | CT2<br>CT9<br>CT10 |

| **Contents** | |
|---|---|
| Topic | |
| Topic 1.- INTRODUCTION: BIOMASS AS A SOURCE OF ENERGY | 1.1.- Concept and forms of BIOMASS<br>1.2.- Historical evolution of the energy utilization of Biomass ..<br>1.3.- Sources of Biomass<br>1.4.- Characteristics of the biomass from the energetic point of view<br>1.5.- Advantages presented by the energy use of the Phytomass<br>1.6.- Technologies for energy conversion of biomass<br>1.6.1.- Chemical methods of conversion<br>1.6.2.- Thermochemical conversion methods<br>1.6.3.- Biochemical conversion methods<br>1.6.4.- Efficiency of the different methods of energy conversion.<br>1.7.- Products derived from biomass<br>1.7.1.- Macroeconomic aspects of the production and use of biofuels |
| 2.- XILOGENERATED ENERGIES | 2.- XILOGENERATED ENERGIES |
| 3. COLLECTION AND OBTAINMENT OF RESIDUAL BIOMASS | 3.1 systems for collecting residual forest biomass<br>3.1.1 Forest machines |
| 4. PRETRATING PROCESSES (PHYSICAL TRANSFORMATION) OF RESIDUAL PHYTOMASE | 4.1 Chipping and packaging<br>4.1.1 Problems of large chipping<br>4.2 Natural Drying<br>4.3 Forced drying grind 4.4<br>4.4.- Sieving<br>4.5.- densification |
| Topic 5. DEHYDRATION OF RESIDUAL PHYTOMASE | 5.1 Water in wood<br>5.1.1 Humidity Equilibrium<br>5.1.2 Influence of moisture content on calorific<br>5.2 thermogenesis<br>5.2.1 dynamic drying full of wood waste chips<br>5.2.2 Dry matter losses<br>5.3 Practical experiences of natural drying<br>5.3.1 Forced ventilation<br>5.3.2 Experiences in Spain |

| | |
|---|---|
| Topic 6. COMPACTION OF RESIDUAL PHYTOMASE | 6.1 Historical evolution<br>6.2 Background to research and development<br>6.2.1 laboratory experimentation<br>6.2.2 Experimentation in industrial presses<br>6.2.3 Studies of theoretical models<br>6.3 Prospects for the future<br>6.4 Problems and densification technologies on an industrial scale<br>6.4.1 manufacture of briquettes<br>6.4.2 pelletizing |
| Topic 7. CURRENT SITUATION OF THE FUEL PRODUCTION SECTOR IN SPAIN | 7.1 The raw materials used<br>7.2 The equipment used<br>7.2.1 Sizing companies<br>7.3 Products obtained<br>7.3.1 Packaging<br>7.4.- Consumer sectors<br>7.4.1.- prices |
| Topic 8. CURRENT SITUATION OF THE COMBUSTIBLE PELLET MANUFACTURING SECTOR IN SPAIN | 8.1 Characteristics of fuel pellets<br>8.2 prices |
| Topic 9.- THERMOCHEMICAL PROCESSES OF ENERGY CONVERSION OF PHYTOMASE. | 9.1.- Combustion<br>9.2.- Gasification<br>9.3.- Pyrolysis<br>9.4.- Liquefaction |
| Topic 10. THE COMBUSTION | 10.1 The Theory of Combustion<br>10.1.1.- types of combustion<br>10.1.2.- minimum combustion air<br>10.1.3.- Combustion fumes<br>10.2.- Combustion equipment<br>10.2.1.- Fluidized combustion (FBC) |
| Topic 11.GASIFICATION | 11.1.- Types of gasifiers<br>11.2.- Gasification with air<br>11.3.- Gasification with oxygen and / or steam<br>11.4.- Gasification with Hydrogen<br>11.5.- Gasification with catalysts |
| Topic 12. PIROLISIS | 12.1.- Products obtained<br>12.2.- Carbonization (charcoal) |
| Topic 13.- ELECTRICAL ENERGY GENERATION EQUIPMENT AND SYSTEMS | |
| Topic 14.- ENERGY CROPS OF SHORT ROTATION | 14.1.- Prospects of intensive cultivation of biomass in the European Union before the new Community Agricultural Policy (CAP)<br>14.2.- Types of energy crops<br>14.2.1.- Agroelectrical crops<br>14.2.2.- Bioalcohol<br>14.2.3.- Bio-fuels |
| PRACTICE Nº 1 | SAMPLES OF WASTE<br>LABORATORY ANALYSIS<br>PLACE: E. XILOGENERADAS LABORATORY |
| PRACTICE Nº2 | PILOT PLANT FOR SLIPPING-MILLING-DENSIFICATION<br>PLACE: E. XILOGENERADAS WORKSHOP |
| PRACTICE Nº 3 | ASTILLADO<br>DESCORTEZADO<br>COMBUSTION<br>COGENERATION<br><br>PLACE: ENCE (PONTEVEDRA)<br>DEPARTURE FROM THE EIF - 10h |
| PRACTICE Nº 4 | MOLIENDA<br>DRYING<br>PELETIZED<br>COGENERATION<br><br>PLACE: PÉLET FACTORY (BASTAVALES)<br>EIF OUTPUT - 10 h |
| PRACTICE Nº 5 | Visit to an installation with forest biomass boiler.<br><br>Location: Campus de Pontevedra |
| PRACTICES Nº 6-7 | Resolution of energy calculation exercises |

## Planning

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Practicum, External practices and clinical practices | 18 | 36 | 54 |
| Laboratory practical | 5 | 10 | 15 |
| Lecturing | 26 | 52 | 78 |
| Essay questions exam | 1 | 0 | 1 |

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

## Methodologies

| | Description |
|---|---|
| Practicum, External practices and clinical practices | These are views of industrial installations |
| Laboratory practical | These are lab work and pilot plant of xylenogenic energies |
| Lecturing | These are classroom classes |

## Personalized assistance

| Methodologies | Description |
|---|---|
| Lecturing | It refers to the theory classes held in the classroom |
| Practicum, External practices and clinical practices | These are visits to industrial facilities |
| Laboratory practical | Laboratory work and pilot plant of xylogen energies |

## Assessment

| | Description | Qualification | Evaluated Competencess |
|---|---|---|---|
| Practicum, External practices and clinical practices | (*)Valorarase a asistencia ás clases presenciais e visitas/prácticas de campo | 20 | CE26 |
| Laboratory practical | (*)Valoraranse os traballos/exercicios realizados durante as mesmas. | 20 | CE26 |
| Essay questions exam | (*)Avaliarase mediante un exame final | 60 | CE26 |

## Other comments on the Evaluation

the student must approve a practical part and a theoretical part separately. Exam dates 28 DE MAIO 10h 10 DE XULIO 12h

## Sources of information

### Basic Bibliography

### Complementary Bibliography

## Recommendations

### Other comments

Eligible subject for dual training projects as established by the memory of the degree.

## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

* Teaching methodologies modified

* Non-attendance mechanisms for student attention (tutoring)

* Modifications (if applicable) of the contents

* Additional bibliography to facilitate self-learning

* Other modifications

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Pending tests that are maintained
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Tests that are modified
[Previous test] => [New test]

* New tests

* Additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Environmental Engineering** | | | | |
| Subject | Environmental Engineering | | | |
| Code | P03G370V01609 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 3rd | 2nd |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Ortiz Torres, Luis | | | |
| Lecturers | Álvarez Bermúdez, Xana<br>Ortiz Torres, Luis | | | |
| E-mail | lortiz@uvigo.es | | | |
| Web | http://www.webs.uvigo.es/lortiz | | | |
| General description | (*)metodos e sistemas de xestión medioambiental | | | |

| Competencies |
|---|
| Code |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| Contents | |
|---|---|
| Topic | |
| A. ATMOSPHERIC POLLUTION | A.1. ENVIRONMENTAL POLLUTANTS<br>A.2. EFFECTS OF ATMOSPHERIC POLLUTION<br>A.3.DESTRUCTION OF THE OZONE LAYER<br>A.4.GLOBAL QUALITY<br>A.4.1. Greenhouse gases<br>A.4.2. The Kyoto Protocol<br>TO 5. ACID RAIN<br>A.6. OTHER CONTAMINANTS<br>A.7.RIGHTS CORRUPTION OF POLLUTION<br>A.8. ALTERNATIVE SOURCES OF ENERGY TO REDUCE ATMOSPHERIC EMISSIONS<br>A.9. THE COGENERATION OF HEAT AND ELECTRICITY |
| B. RESIDUAL WATERS B.1. WATER | B.2. MANAGEMENT SYSTEMS:<br>B.3. PHYSICO-CHEMICAL WATER PARAMETERS<br>B.4. RESIDUAL WATER CONTAMINANTS<br>B.5. RESIDUAL WATER PURIFICATION SYSTEMS<br>B.5.2. Primary treatment<br>B.5.2.1. Physical and Chemical Treatments<br>B.5.3. Secondary treatment<br>B.5.3.1. Biological Treatments<br>B.5.4. Tertiary treatment<br>B.5.5. Miscellaneous Treatments<br>B.6. THE ANAEROBIA DIGESTION PROCESS<br>B.7. FLOOR TREATMENT<br>B.8. CASE STUDY |
| C. URBAN SOLID WASTE | C.1. LOS R.S.U.<br>C.2. TREATMENT SYSTEMS<br>C.2.2. CONTROLLED SHIFT<br>C.2.2.1. Landfill with controlled use<br>C.2.3. COMPOUND<br>C.2.4. INCINERATION<br>C.2.5. PYROLYSIS<br>C.2.6. COMPARISON BETWEEN MANAGEMENT SYSTEMS |

| | |
|---|---|
| D. COMPOSITION | D.1. THE COMPOUND PROCESS<br>D.1.1. PHYSICAL PARAMETERS<br>D.1.2. COMPOUND SYSTEMS<br>D.1.2.1. Indoor composting systems<br>D.1.3. DEPURATION OF COMPOST<br>D.1.4. COMPOST CHARACTERISTICS<br>D.1.5. USING THE COPOST<br>D.2. CROPS OF INTENSIVE TYPE |
| E. THE ANAEROBIA DIGESTION | E.1. THE ANAEROBIA DIGESTION<br>E.2. PARAMETERS OF OPERATION AND CONTROL OF THE ANAEROBIC PROCESSES<br>E.3. ANAEROBIA DIGESTION TECHNOLOGY<br>E.3.1. Discontinuous digesters<br>E.3.2. Continuous digesters<br>E.3.2.1. Digesters with suspended biomass<br>E.3.3. Two Phase Digester<br>E.4. CONTROLLED VERTEDERO<br>E.5. ANAEROBIA DIGESTION FACILITIES<br>E.5.1. DESCRIPTION OF AN ANAEROBIA DIGESTION PLANT<br>E.6. EXAMPLE OF INDUSTRIAL FACILITIES |
| F. THE RECYCLING | F.1. INTRODUCTION<br>F.2. RECYCLED THEORY<br>F.3. RECYCLING SYSTEMS<br>F.4. PROBLEM OF THE RECYCLING PROCESS<br>F.5. ADVANTAGES CONCERNING RECYCLING<br>F.6. RECYCLING OF PAPER AND CARDBOARD<br>F.6.1. PRODUCTION OF PASTE AND PAPER<br>F.6.2. RECYCLING PAPER<br>F.6.2.1. PREPARATION OF PAPER PASTE FROM PAPELOTE<br>F.6.2.2.- DISFRANCED<br>F.6.2.3.-DEPURATION<br>F.6.3.4. UNLOCKED<br>F.6.3.5. REFINE<br>F.6.3.6. DIVISION<br>F.6.3.7. IT'S HEAVY<br>F.6.3.8. DISPERSION<br>F.6.3.9. DESTINED |
| G. TOXIC AND DANGEROUS WASTE | G.1. IDENTIFICATION AND QUANTIFICATION OF RTP.<br>G.2. PRODUCTION MANAGER RELATIONSHIP<br>G.1.1. Obligations of the RPT Producer<br>G.1.1.1. Authorization request<br>G.2.1.2. Packaging and Labeling of Hazardous Wastes<br>G.2.1.3. Storage of hazardous waste<br>G.2.1.4. Annual statement<br>G.2.2. OBLIGATIONS OF SMALL PRODUCERS OF HAZARDOUS WASTE |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Studies excursion | 20 | 40 | 60 |
| Case studies | 10 | 0 | 10 |
| Autonomous problem solving | 9 | 20 | 29 |
| Lecturing | 17 | 33 | 50 |
| Essay questions exam | 1 | 0 | 1 |

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

**Methodologies**

| | Description |
|---|---|

| | |
|---|---|
| Studies excursion | Practices Practice 1.-<br>Waste water treatment plant (EDAR - Pontevedra)<br><br>Practice 2.-<br>MSW treatment plant (SOGAMA - Cerceda)<br><br>Practice 3.-<br>Cogeneration and treatment of effluents (ENCE)<br><br>Practice 4.-<br>Cogeneration and waste management (ECOWARM- Bastabales)<br><br>The A91 competition will be developed in the field of industrial facilities visits. |
| Case studies | Individual or paired an individual chosen within the contents of the program for the elaboration of a situation or concrete case that will be presented publicly. |
| Autonomous problem solving | This is to present flow diagrams of the facilities visited during the course |
| Lecturing | These are theoretical classes in the classroom |

**Personalized assistance**

| Methodologies | Description |
|---|---|
| Studies excursion | These are views of industrial facilities |
| Case studies | It is a practical work and present it publicly |

**Assessment**

| | Description | Qualification | Evaluated Competencess |
|---|---|---|---|
| Studies excursion | (*)Valórase a asistencia dos alumnos ás saídas prácticas | 10 | |
| Case studies | (*)O traballo é valorado e avaliado polos propios compañeiros tras a presentación do mesmo e polo profesor quen terá en consideración todos os factores sinalados no apartado de traballos tutelados | 20 | |
| Lecturing | (*)Valorarase a asistencia ás clases. | 10 | |
| Essay questions exam | (*)Avaliaranse os coñecementos adquiridos durante o desenvolvemento da materia. | 60 | |

**Other comments on the Evaluation**

**Sources of information**

**Basic Bibliography**


Sánchez, Antoni, **De residuo a recurso**, 1, Mundi Prensa, 2014

Gil, Manuel, **Depuración de aguas residuales**, 1, CSIC, 2013

Seoanez, Mariano, **Manual de aguas residuales industriales**, 1, Mac Graw Hill, 2012

Picoraio, Simona, **Gestión de residuos Urbanos**, 1, CEYSA, 2016

Seoanez, Mariano, **Tratado de la contaminación atmosférica**, 1, Mundi Prensa, 2012


**Complementary Bibliography**

**Recommendations**

**Other comments**

Eligible subject for dual training projects as established by the memory of the degree.

**Contingency plan**

**Description**

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in

advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

* Teaching methodologies modified

* Non-attendance mechanisms for student attention (tutoring)

* Modifications (if applicable) of the contents

* Additional bibliography to facilitate self-learning

* Other modifications

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Pending tests that are maintained
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Tests that are modified
[Previous test] => [New test]

* New tests

* Additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Physical planning and land management** | | | | |
| Subject | Physical planning and land management | | | |
| Code | P03G370V01701 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 4th | 1st |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Valero Gutiérrez del Olmo, Enrique María | | | |
| Lecturers | Valero Gutiérrez del Olmo, Enrique María | | | |
| E-mail | evalero@uvigo.es | | | |
| Web | | | | |
| General description | | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG2 | Ability to analyze the ecological structure and function of forest systems and resources, including landscapes. |
| CG10 | Ability to apply the techniques of forest management and land planning, as well as the criteria and indicators of sustainable forest management within the framework of forest certification procedures. |
| CE32 | Ability to know, understand and use the principles of: planning and planning of the territory. Forest landscaping. |
| CT4 | Sustainability and environmental commitment |
| CT5 | Capacity for information management, analysis and synthesis |
| CT6 | Organization and planning capacity |
| CT7 | Skill in the use of IT tools and ICTs. |
| CT8 | Ability to solve problems, critical reasoning and decision making |
| CT9 | Teamwork skills, skills in interpersonal relationships and leadership. |
| CT10 | Autonomous Learning |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>14R. 2018 Capacity to apply norms of engineering in the his speciality.<br>15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering.<br>16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context.<br>17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions<br>18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions.<br>19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general.<br>20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines.<br>21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life.<br>22R. 2018 Capacity to be to the day of the scientific and technological news. | CG1<br>CG2<br>CG10 | CE32 | CT4<br>CT5<br>CT6<br>CT7<br>CT8<br>CT9<br>CT10 |

| **Contents** | |
|---|---|
| Topic | |
| Topic I: GENERAL THEORY OF PLAN. PHYSICS | Concept of Physical Planning.<br>Physical Planning in Engineering<br>Background of Physical Planning<br>Environmental and integrated inventories<br>Evolution of Physical Planning studies<br>Definitions of Physical Planning<br>Ecologically based physical planning |
| Topic II: PHYSICAL PLANNING PROCESS | Typology and Purposes of Planning<br>Operational techniques<br>Levels of application<br>Fundamental relationships<br>General scheme<br>Definition of objectives<br>Inventory<br>Modeling<br>Spatial classification<br>Choice of Alternatives<br>Decision making<br>Contrast of Planning<br>Planning follow-up |
| Topic III: THE TOOLS FOR PHYSICAL PLANNING | Introduction to Geographic Information Systems.<br>The S.I.G. Applied to Physical Planning and Territorial Planning. |

| **Planning** |
|---|

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Mentored work | 0 | 30 | 30 |
| Presentation | 25 | 30 | 55 |
| Case studies | 21 | 23 | 44 |
| Objective questions exam | 1 | 0 | 1 |
| Essay | 0 | 20 | 20 |

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

## Methodologies

| | Description |
|---|---|
| Mentored work | The student, individually or in groups, prepares a paper on the subject of matter or prepare seminars, research, memoirs, essays, summaries of readings, lectures, etc.. Generally it is an autonomous activity / of the student / s that includes finding and collecting information, reading and literature management, writing ... |
| Presentation | Exhibition by the students to the teacher and / or a group of students of a subject matter or content of the results of a job, exercise, project ... It can be done individually or in groups. |
| Case studies | Analysis of an event, issue or actual event in order to know, interpret, solve, generate hypotheses, comparing data, reflect, complete knowledge, diagnose and training in alternative dispute resolution procedures. |

## Personalized assistance

| Methodologies | Description |
|---|---|
| Mentored work | |

## Assessment

| | Description | Qualification | Evaluated Competencess |
|---|---|---|---|
| Mentored work | (*). | 30 | |
| Presentation | (*). | 70 | |

## Other comments on the Evaluation

## Sources of information

## Basic Bibliography

## Complementary Bibliography

## Recommendations

## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

==== ADAPTATION OF THE METHODOLOGIES ===
* Teaching on line
Use of institutional on-line teaching platform Campus Remoto in a synchronous way for the theoretical classes including basics, foundations, as well as general guidelines for resolution of problems and practical cases. Specific didactic materials adapted for on line teaching will be prepared e.g. Video or presentations, graphic resources, software, etc. All the resources will be available through FAITIC platform.
* Mechanism face-to-face of attention to the students (tutorials)
Personalized attention. Communication by email or another on-line tool. Tutorials via Campus Remoto platform.
=== ADAPTATION OF The EVALUATION ===
On-line tests and tasks via Campus Remoto and Faitic. The weight of the tests will be maintained as they are described in the main guide.

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Hunting and fishing management** | | | | |
| Subject | Hunting and fishing management | | | |
| Code | P03G370V01702 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 4th | 1st |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Valero Gutiérrez del Olmo, Enrique María | | | |
| Lecturers | Valero Gutiérrez del Olmo, Enrique María | | | |
| E-mail | evalero@uvigo.es | | | |
| Web | http://http://faitic.uvigo.es/index.php/es/ | | | |
| General description | (*)Preténdese que o alumno adquira os coñecementos necesarios para a realización de Inventarios poboacionais, redacción de proxectos de xestión da caza e da pesca, avaliación e medidas correctoras dos hábitats e para a realización de repoboacións cinexéticos e piscícolas | | | |

| Competencies | |
|---|---|
| Code | |
| CG8 | Ability to manage and protect forest fauna populations, with special emphasis on hunting and fish populations. |
| CE33 | Ability to know, understand and use the principles of: hunting and fishing management. Aquaculture systems. |
| CT4 | Sustainability and environmental commitment |
| CT5 | Capacity for information management, analysis and synthesis |
| CT6 | Organization and planning capacity |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances. | CG8 | CE33 | CT4<br>CT5<br>CT6 |
| 3R. 2018 Be conscious of the multidisciplinary context of the engineering. | | | CT8 |
| 4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses. | | | |
| 5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial. | | | |
| 6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project. | | | |
| 8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality. | | | |
| 9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality. | | | |
| 10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study. | | | |
| 11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality. | | | |
| 13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality. | | | |
| 14R. 2018 Capacity to apply norms of engineering in the his speciality. | | | |
| 15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering. | | | |
| 16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context. | | | |
| 17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions | | | |
| 18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions. | | | |
| 19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general. | | | |
| 20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines. | | | |

**Contents**

| Topic | |
|---|---|
| BLOCK I: HUNTING AND KINETIC RESOURCES | MODULE I: BASIC CONCEPTS OF CINEGÉTICAL MANAGEMENT<br>MODULE II: TECHNIQUES FOR IMPROVING THE CONDITIONS OF REPRODUCTION AND CREATION<br>MODULE III: IMPROVEMENT TECHNIQUES COND. OF SHELTER AND FOOD<br>MODULE IV: SUSTAINABLE APPROVAL METHODS<br>MODULE V: HUNTING IN THE CONTEXT OF RURAL DEVELOPMENT |
| BLOCK 2: AQUACULTURE | MODULE I. INTRODUCTION TO AQUACULTURE IN THE FLUVIAL HABITAT:<br>MODULE II. AQUACULTURE AND FLUVIAN FISHERIES:<br>MODULE III. FISH SPECIES: -SMALMIDS<br>MODULE IV. FISH SPECIES: -CYPRINESIS:<br>MODULE V. FISH SPECIES: -MOTHER SPECIES:<br>MODULE VI.- METHODS OF MANAGEMENT<br>MODULE VII.- METHODS OF USE<br>MODULE VIII.-CONTINESAL WATER MANAGEMENT PROJECTS |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 45 | 0 | 45 |
| Studies excursion | 20 | 10 | 30 |
| ICT suppoted practices (Repeated, Dont Use) | 10 | 23 | 33 |
| Objective questions exam | 30 | 0 | 30 |
| Problem and/or exercise solving | 2 | 0 | 2 |
| Systematic observation | 10 | 0 | 10 |

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

| Methodologies | |
|---|---|
| | Description |
| Lecturing | (*)Impartiranse leccións en clase dos temas de desenvolvemento |
| Studies excursion | (*)Organizaranse saídas de campo relacionadas coa materia, que posteriormente serán avaliadas cun informe das prácticas realizadas. |
| ICT suppoted practices (Repeated, Dont Use) | It will be the development of the subject through the new ICT known as tele-training or e-learning, not limited to mere written expositions, but making them of a sharply participatory nature with the development of animations and simulations, in complex situations, that oblige the Student to interact with the subject matter.<br>All the competences are treated and developed in the autonomous practical sessions through ICT as well as in the master sessions and the field trips. |

| Personalized assistance | |
|---|---|
| **Methodologies** | **Description** |
| ICT suppoted practices (Repeated, Dont Use) | |
| **Tests** | **Description** |
| Objective questions exam | |

| Assessment | | | |
|---|---|---|---|
| | Description | Qualification | Evaluated Competencess |
| ICT suppoted practices (Repeated, Dont Use) | (*)Avaliaranse as saídas de campo (20%) e as probas a través de TIC (40%) | 60 | |
| Objective questions exam | (*)Diferentes preguntas sobre a materia vista nas sesións maxistrais así como nas prácticas realizadas. | 40 | |

**Other comments on the Evaluation**

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**


ARRIGNON, J.., **Ecología y piscicultura de aguas dulces.**, (1979),

BARNABE, G, **Acuicultura**, 1989,

BEVERIDGE, M., **Acuicultura en jaulas**, 1984,

BLANCO CACHAFEIRO, M. C, **La trucha. Cría industial.**, 1995,

DOADRIO, I., B. ELVIRA y. Y. BERNAT, **Peces continentales españoles. Inventario y clasificación de zonas fluviales**, 1991,

DRUMOND, S., **Cría de la trucha**, 1988,

ESPINOSA, J. y LABARTA, U., **Reproducción en Acuicultura.**, 1987,

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GARCÍA-BADELL, J. J, **Tecnología de las explotaciones piscícolas**, 1985,

GARCÍA DE JALÓN, D.; G. PRIETO y F. HERRERUELA, **Peces ibéricos de agua dulce**, 1989,

GUEGUEN, J. y PROUZET, **Le saumon atlantique**, 1994),

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ROBERTS, R. J, **Patología de los peces**, 1981,

SEDWICK, S.D., **Cría de l trucha**, 1987,

SHEPHERD, J. C. & BROMAGE, R. N., **Cultivo intensivo de peces.**, 2008,

STREBLE, H. y D. KRAUTER, **Atlas de los Microorganismos de Agua Dulce**, 2007,

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AUDEBERT, Tristan (Henri Béraud), **La caza de la becada**, 1997,

BERTON, Jean, **El mundo de las armas de caza**, 2003,

ALBENTOS, Marqués de, **Arte general de cacerías y monterías.**, Ed. Clan, Sevilla,

BOZA, Moisés D, **El trampeo y demás artes de caza tradicionales en la península Ibérica.**, 2003,


**Recommendations**

**Subjects that continue the syllabus**

Projects/P03G370V01503

Physical planning and land management/P03G370V01701

**Subjects that are recommended to be taken simultaneously**

Forestry Ecology/P03G370V01402
Use of forests/P03G370V01601
Forestry hydrology/P03G370V01604

**Subjects that it is recommended to have taken before**

Hydraulics/P03G370V01404
Forest entomology and Zoology/P03G370V01305

## Contingency plan

**Description**

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching on line
Use of institutional on-line teaching platform Campus Remoto in a synchronous way for the theoretical classes including basics, foundations, as well as general guidelines for resolution of problems and practical cases. Specific didactic materials adapted for on line teaching will be prepared e.g. Video or presentations, graphic resources, software, etc. All the resources will be available through FAITIC platform.
* Mechanism face-to-face of attention to the students (tutorials)
Personalized attention. Communication by email or another on-line tool. Tutorials via Campus Remoto platform.
=== ADAPTATION OF The EVALUATION ===
On-line tests and tasks via Campus Remoto and Faitic. The weight of the tests will be maintained as they are described in the main guide.

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Pathology and forest pests** | | | | |
| Subject | Pathology and forest pests | | | |
| Code | P03G370V01703 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 4th | 1st |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | López de Silanes Vázquez, María Eugenia | | | |
| Lecturers | López de Silanes Vázquez, María Eugenia | | | |
| E-mail | esilanes@uvigo.es | | | |
| Web | http://http://webs.uvigo/esilanes/index.htm | | | |
| General description | (*)Comprender e aprender os conceptos básicos e a terminoloxía específica, para coñecer e diferenciar as enfermidades e pragas máis importantes, resaltando as que afectan ao ámbito forestal do noso territorio | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG3 | Knowledge of degradation processes that affect forest systems and resources (pollution, pests and diseases, fires, etc.) and capacity for the use of forest environment protection techniques, forest hydrological restoration and biodiversity conservation . |
| CE34 | Ability to know, understand and use the principles of: forest diseases and pests. |
| CT4 | Sustainability and environmental commitment |
| CT7 | Skill in the use of IT tools and ICTs. |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances. | CG1<br>CG3 | CE34 | CT4<br>CT7<br>CT8 |

3R. 2018 Be conscious of the multidisciplinary context of the engineering.
4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.
5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.
6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.
7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.
8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.
9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.
10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study.
11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.
13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.
14R. 2018 Capacity to apply norms of engineering in the his speciality.
15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering.
17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions
20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines.
21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life.
22R. 2018 Capacity to be to the day of the scientific and technological news.

| Contents | |
|---|---|
| Topic | |
| Topic 1. Concept of Disease and Phytopathology. Classification of diseases. | |
| Topic 2. Symptomatology of diseases. Types of symptoms. | |
| Topic 3. Concept of pathogen and parasite. Stages of disease development. | |
| Topic 4. Types of attacks from pathogens to plants. | |
| Topic 5. How plants are defended by pathogens. | |
| Topic 6. Means of control against pathogens: preventive and curative. Control methods: regulators (legislative), cultural, biological, physical and chemical. | |
| Topic 7. Generalities of fungi. Important groups in Forest Pathology. | |
| Topic 8. Rotting, drowning or damping-off in seedbeds. | |
| Topic 9. Diseases of leaves in conifers | 9.1 Red band (Mycosphaerella pini and M. dearnessii)<br>9.2 Blight of pine needles (Lophodermium pinastri).<br>9.3 Mention of Meloderma desmazieri |
| Topic 10. Diseases of leaves in angiosperms | 10.1 Oidium or odium of the oak, Erysiphe alphitoides.<br>10.2 Spotting of eucalyptus leaves, Mycosphaerella sp.<br>10.3 Gray mold, Botryotinia fuckeliana = Botrytis cinerea |
| Topic 11. Diseases of trunk and branches of conifers. | 11.1 Cancers: Sphaerospsis sapinea = Granulodiplodia sapinea; Nectria cinnabarina = Tubercularia vulgaris.<br>11.2 Royas: Cronartium flaccidum or white rust of pine.<br>11.3 Resinous pineal cancer Gibberella circinata = Fusarium circinatum. |

| | |
|---|---|
| Topic 12. Diseases of trunk and branches in Angiosperms. | 12.1 Chestnut brown, Cryphonectria parasitica.<br>12.2 Carbon or carbonaceous disease, Biscogniauxia mediterranea = Hypoxylon mediterraneum.<br>12.3 Grafiosis of elm. Ophiostoma ulmi, O. novo-ulmi |
| Topic 13. Root diseases. | 13.1 Chestnut ink, Phytophthora cinnamomi.<br>13.2 In conifers, Heterobasidion annosum.<br>13.3 Pathogen of numerous species. Armillaria sp. |
| Topic 14. Diseases caused by nematode viruses and bacteria. | 14.1 Pine wood nematode, Bursaphelenchus xylophilus |
| Topic 15. General ideas about insects. Classification: Apterygota. Exopterygota. Endopterygota. | |
| Topic 16. Biological balance and plague phenomenon. | |
| Topic 17. Methods of pest control. | |
| Topic 18. Conifer pests | 18.1 Defoliator insects: Thaumetopoea pityocampa.<br>18.2 Insect borers, most representative species: scythes (Ips sexdentatus) cerambícidos (Monochamus galloprovincialis), etc.<br>18.3 Most representative taxa of sucking insects. |
| Topic 19. Eucalyptus pests. | 19.1 Deflating insects, Gonipterus scutellatus<br>19.2 Insect borers, Phoracantha semipunctata.<br>19.3 Sucking insects, Ctenarytaina spatulata |
| Topic 20. Review some of the most representative pests of garden trees. Mention of the plagues of the chestnut fruit. | |
| (*) Tema 21. Mención de algunhas pragas en frondosas autoctonas. | (*)21.1 Insectos defoliadores<br>21.2 Insectos perforadores<br>21.3 Insectos chupadores |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 30 | 70 | 100 |
| Laboratory practical | 20 | 20 | 40 |
| Studies excursion | 10 | 0 | 10 |
| *The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. | | | |

**Methodologies**

| | Description |
|---|---|
| Lecturing | Exposition, by the teacher, of the contents of the subject, theoretical bases and / or guidelines of a work to be developed by the students |
| Laboratory practical | Application of the knowledge of the subject. Learning and handling of basic techniques. |
| Studies excursion | Realization of exits to forest ecosystems and / or visits to research centers or companies related to the subject studied. |

**Personalized assistance**

| Methodologies | Description |
|---|---|
| Laboratory practical | Students will be guided to choose the right literature for the full or to make their own subjects. To help solve problems and concerns that students encounter in laboratories. |
| Lecturing | Provide tools they need to solve for themselves the question to appear after they have studied the topics dealt with in the opening sessions in the tutoring hours practices. In, indicate the appropriate literature so that they can resolve the question doubts. |

**Assessment**

| | Description | Qualification | Evaluated Competencess | |
|---|---|---|---|---|
| Lecturing | (*)Exame escrito.- O alumnado debe responder a diferentes cuestións para demostrar os seus coñecementos sobre conceptos teóricos e cuestións prácticas da materia. Constará de preguntas de reposta curta e outras de resposta longa.<br>Exposición por parte do alumnado dun dos temas do programa. | 70 | CG1 | CE34 |

| | | | |
|---|---|---|---|
| Laboratory practical | (*)Avaliación continua das actividades desenvolvidas nas prácticas, así como da memoria ou entrega de exemplares de patoloxía de plantas e/ou un exame práctico que o alumnado deben realizar ao final do curso. | 30 | CE34 |

**Other comments on the Evaluation**

Exam dates

First Call: January 10, 2020, 10:00 Hours

Second Call: June 25, 2020 12:00 Hours

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**


AGRIOS, G.N., **Plant pathology.**, 5ª Ed. Elsevier Academic Press,

ANDRÉS, M. FE DE, **Patógenos de plantas descritos en España.**, Ministerio de Agricultura, Pesca y Alimentación,,

BARBAGALLO S., CRAVEDI P., PASQUELINI E. & PATTI I., **Pulgones de los principales cultivos frutales**, Bayer/Mundi-Prensa,

CARRERO, J.M., **Lucha integrada contra las plagas agrícolas y forestales**, Mundi-Prensa.,

DAJOZ R., **Entomología forestal. Los insectos y el bosque: papel y diversidad de los insectos en el medio foresta**, Mundi-Prensa,

JARVIS W.R, **Control de las enfermedades en cultivos de invernadero**, Mundi-Prensa,

LIÑÁN , C, **Vademecum de productos fitosanitarios y nutricionales.**, Mundi Prensa,

Lombardero M.J. & Fernández de Ana F.J., **A Procesionaria do piñeiro en Galicia.**, Consellería de Agricultura, Gandería e Montes,. Xunta de Galicia,

MALOY O.C. & MURRAY T.D. (eds), **Encyclopedia of plant pathology**, New York, [etc.] : John Wiley,

Mansilla J.P., Pérez R., Pintos C., Salinero C. & Iglesias C., **Plagas y enfermedades del castaño en Galicia**, 2ª ed. Xunta de Galicia. Consellería de Agricultura, Ganadería e Política Agroalimentaria.,

MUÑOZ LÓPEZ C., PÉREZ FORTEA V., COBOS SUÁREZ P., HERNÁNDEZ ALONSO R., SÁNCHEZ PEÑA G, **Sanidad forestal: guía en imágenes de plagas, enfermedades y otros agentes presentes en los montes**, Mundi-Prensa 3ª ed,

ROMANYK, N. & CADAHIA, D., **Plagas de insectos en las masas forestales**, Mundi-Prensa,

TAINTER, F.H. & BAKER, F.A, **Principles of forest pathology**, John Wiley & Sons,

TORRES JUAN, J., **Patología Forestal.Principales enfermedades de nuestras especies forestales**, Mundi Prensa.,

VILLALVA, S., **Plagas y enfermedades de jardines**, 2ª Ed. Mundi-Prensa,

http://www.infoagro.com/agrovademecum/, **Agrovademecum**,

Robert N. Trigiano, Mark T. Windham, Alan S. Windham (Eds.), **Plant pathology concepts and laboratory exercises**, Boca Raton (Florida): CRC,,

Molina G., Zaldúa S., González G., Sanfuentes E., **Selección de hongos antagonistas para el control biológico de Botrytis cinerea en viveros forestales en Chile**, http://www.scielo.cl/pdf/bosque/v27n2/art07.pdf, Bosque 27(2): 126-134., 2006

Remacha-Gete, A., **Agentes Bioticos que atacan la madera. Ciclo biológico, tipo de ataque y control del mismo**, AITiM. Madrid,

Otero L., Aguín O., M. J. Sainz M.J., Mansilla J.P., **El género Mycosphaerella en plantaciones de Eucalyptus en Galcia**, www.magrama.es/ministerio/pags/biblioteca/revistas/pdf_Plagas/BSVP_33_04_503_516.pdf, Bol. San. Veg. Plagas, _33: 503-516, 2007

http://www.efa-dip.org/es/Publicaciones/FTecnicas/FichaListaTIPO.htm, **Índice de Fichas Técnicas disponibles en la Estación Fitopatológica**, Diputación de Pontevedra,

ZÚBRIK M., KUNCA A. & CSÓKA G. (Eds)., **Insects and Diseases damaging trees and shrubs of Europe**, NAP Editions, 2013


**Recommendations**

**Subjects that it is recommended to have taken before**

Biology: Plant Biology/P03G370V01201
Botany/P03G370V01303
Forestry Ecology/P03G370V01402
Forestry/P03G370V01401
Forest entomology and Zoology/P03G370V01305

**Contingency plan**

**Description**

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

* Teaching methodologies modified

* Non-attendance mechanisms for student attention (tutoring)

* Modifications (if applicable) of the contents

* Additional bibliography to facilitate self-learning

* Other modifications

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Pending tests that are maintained
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Tests that are modified
[Previous test] => [New test]

* New tests

* Additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Forest and pasture management** | | | | |
| Subject | Forest and pasture management | | | |
| Code | P03G370V01704 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 4th | 1st |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Valero Gutiérrez del Olmo, Enrique María | | | |
| Lecturers | Valero Gutiérrez del Olmo, Enrique María | | | |
| E-mail | evalero@uvigo.es | | | |
| Web | http://http://webs.uvigo.es/mchamorro/ | | | |
| General description | (*)Coñecer as bases ecolóxicas que rexen o funcionamento natural dos diversos sistemas pastorais e silvopastorais. Analizar a estructura, manexo e xestión dos devanditos sistemas silvopastorais | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG11 | Ability to characterize the anatomical and technological properties of wood and non-timber forest raw materials, as well as the technologies and industries of these raw materials. |
| CE8 | Knowledge of the bases and biological foundations of the plant field in engineering. |
| CE15 | Ability to know, understand and use the principles of: forest botany. |
| CE17 | Ability to know, understand and use the principles of silviculture. |
| CE27 | Ability to know, understand and use the principles of: prevention and fight against forest fires. |
| CE35 | Ability to know, understand and use the principles of: pasciculture and agroforestry systems. |
| CT5 | Capacity for information management, analysis and synthesis |
| CT6 | Organization and planning capacity |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.<br>10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>14R. 2018 Capacity to apply norms of engineering in the his speciality.<br>15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering.<br>16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context.<br>17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions<br>18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions.<br>19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general. | CG1<br>CG11 | CE8<br>CE15<br>CE17<br>CE27<br>CE35 | CT5<br>CT6<br>CT8 |

| **Contents** | |
|---|---|
| Topic | |
| INTRODUCTION TO PASTORING SYSTEMS. CONDITIONING AND IMPROVEMENT OF PASTURES | SUBJECT 1: General silvipastoral concepts. Basic pastoral management.<br><br>SUBJECT 2: The vegetal component of the grazing system. Pastoral classification systems<br><br>SUBJECT 3: Packaging and improvement of pastures. I Rozas. The burning. Enclosures.<br><br>SUBJECT 4: Packaging and improved pastures II: Limestone amendments. Fertilization. Irrigation and drainage. |
| PASTURE USE. PASCICOLOGICAL SPECIES | SUBJECT 5: Basic concepts: grazing. Sega. Nutritional value: Quantity. Bromatoloxico value and palatability.<br><br>SUBJECT 6: Management of grazing systems and livestock. The quantification of production and storage<br><br>SUBJECT 7: Control of livestock density. Grazing and control of plant fuels. Masses of trees and pastures. Ecological effects.<br><br>SUBJECT 8: Classification of silvopastoral systems.<br><br>SUBJECT 9: Main pasture species. |

| | |
|---|---|
| THEME OF LABORATORY PRACTICES | SUBJECT 1P: recognition of plant species of the main genera of grasses and legumes of pastoral interest.<br><br>SUBJECT 2P: Description of species of pastoral interest using transparencies and slides.<br><br>SUBJECT 3P: Classification of plant species with taxonomic keys. |

| **Planning** | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Mentored work | 10 | 25 | 35 |
| Studies excursion | 25 | 10 | 35 |
| Lecturing | 40 | 35 | 75 |
| Objective questions exam | 3 | 0 | 3 |
| Report of practices, practicum and external practices | 1 | 0 | 1 |
| Systematic observation | 1 | 0 | 1 |
| *The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. | | | |

| **Methodologies** | |
|---|---|
| | Description |
| Mentored work | 1. Formulation and resolution of exercises on real situations.<br>2. Simulation of management over the territory.<br><br>To make a herbarium with the main purpose of the herbarium is to serve to study the main grasses and legumes of our environment |
| Studies excursion | Collect and identify grasses and legumes. |
| Lecturing | Identify Grasses and legumes of silvopastoral interest |

| **Personalized assistance** | |
|---|---|
| **Methodologies** | **Description** |
| Lecturing | |
| Mentored work | |
| Studies excursion | |
| **Tests** | **Description** |
| Objective questions exam | |

| **Assessment** | | | |
|---|---|---|---|
| | Description | Qualification | Evaluated Competencess |
| Mentored work | (*)(*) Confeción dun Herbario | 10 | |
| Studies excursion | (*)(*) Recoñocemento e identificacion en campo de especies de interese pascicola | 10 | |
| Lecturing | (*) (*) Recoñocemento de especies pascicolas | 10 | |
| Objective questions exam | (*)Recoñocer os coñecementos adquiridos | 70 | |

| **Other comments on the Evaluation** |
|---|

| **Sources of information** |
|---|
| **Basic Bibliography** |
| **Complementary Bibliography** |
| SAN MIGUEL, A., **Pastizales Naturales Españoles**, |
| RIGUEIRO,A., **Pastoreo controlado en los bosques gallegos**, |
| SAN MIGUEL, A, **La dehesa Española**, |
| ETIENNE,M., **Western European Silvopastoral Systems**, |
| GONZALEZ HERNANDEZ,P, **Estudio de las formaciones arboladas y arbustivas como base para su aprovechamiento cinegético**, Tesis doctoral inédita, |
| RIGUEIRO,A, **La utilización del ganado en el monte arbolado gallego, un paso hacia el uso integral del monte**, En:Estudios sobre prevención y efectos ecológicos de los incendios forestales,61-78, |
| MONTOYA, J. M., **Pastoralismo Mediterráneo**, |
| SILVA,F.J, **Prácticas agroforestales en pinares y eucaliptales atlánticos**, |

KNOWLES,R.L. & CUTLER,T.R, **. Integration of Forestry and Pastures in New Zealand**,

## Recommendations

### Subjects that continue the syllabus

Biology: Plant Biology/P03G370V01201
Forestry Ecology/P03G370V01402

### Subjects that are recommended to be taken simultaneously

Forestry/P03G370V01401
Forest management/P03G370V01605

### Subjects that it is recommended to have taken before

Botany/P03G370V01303
Edaphology/P03G370V01302

## Contingency plan

### Description

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=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching on line
Use of institutional on-line teaching platform Campus Remoto in a synchronous way for the theoretical classes including basics, foundations, as well as general guidelines for resolution of problems and practical cases. Specific didactic materials adapted for on line teaching will be prepared e.g. Video or presentations, graphic resources, software, etc. All the resources will be available through FAITIC platform.
* Mechanism face-to-face of attention to the students (tutorials)
Personalized attention. Communication by email or another on-line tool. Tutorials via Campus Remoto platform.
=== ADAPTATION OF The EVALUATION ===
On-line tests and tasks via Campus Remoto and Faitic. The weight of the tests will be maintained as they are described in the main guide.

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Wood preservation and drying technology** | | | | |
| Subject | Wood preservation and drying technology | | | |
| Code | P03G370V01705 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 4th | 1st |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | González Prieto, Óscar | | | |
| Lecturers | González Prieto, Óscar | | | |
| E-mail | oscargprieto@uvigo.es | | | |
| Web | http://www.forestales.uvigo.es | | | |
| General description | (*)Asignatura que trata las dos tecnologías básicas para el uso industrial de la madera | | | |

| Competencies | |
|---|---|
| Code | |
| CG11 | Ability to characterize the anatomical and technological properties of wood and non-timber forest raw materials, as well as the technologies and industries of these raw materials. |
| CE31 | Knowledge for the calculation and design of carpentry facilities. Drying, debarking and crushing of wood. |
| CT5 | Capacity for information management, analysis and synthesis |
| CT6 | Organization and planning capacity |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.<br>10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>14R. 2018 Capacity to apply norms of engineering in the his speciality.<br>15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering.<br>16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context.<br>18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions. | CG11 | CE31 | CT5<br>CT6<br>CT8 |

| **Contents** | |
|---|---|
| Topic | |
| Technology of the conservation of the wood | Introduction: Pathologies of the wood<br>natural Durability of the wood and *impregnabilidad<br>Classes of use: *CU 1, *CU 2, *CU3, *CU4 and *CU5<br>protective Products and systems of application<br>Wood modified: processes and products<br>Systems of application of protective<br>Treatments of the different wood to the employment of chemical products<br>technical Report on pathology<br>Measured of constructive design for the protection of the wood<br>Reinforcements of wooden structures |
| Technology of the dried of the wood | Introduction: physical Principles of the dried<br>Dried natural<br>Dried artificial<br>Phases of the dried artificial<br>*Presecaderos<br>Tunnels of dried<br>Cameras of dried<br>Dried of the wood by special methods<br>Defects originated in the dried<br>Programming and design of *secaderos |

| **Planning** | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Lecturing | 28 | 80 | 108 |
| Problem solving | 8 | 18 | 26 |
| Studies excursion | 4 | 6 | 10 |
| Laboratory practical | 2 | 0 | 2 |

| | | | |
|---|---|---|---|
| Introductory activities | 1 | 0 | 1 |
| Problem and/or exercise solving | 2 | 0 | 2 |
| Problem and/or exercise solving | 1 | 0 | 1 |

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

## Methodologies

| | Description |
|---|---|
| Lecturing | Lesson *magistral. Exhibition of aims and contents and importance of the same inside the group of competitions of the subject |
| Problem solving | Seminars of resolution of problems type and oral presentation |
| Studies excursion | Explanation "in situ" of industrial processes of dried and conservation of wood. In the case of teaching no face-to-face or *semi-face-to-face, without possibility to make exits of study, will evaluate memory of analysis of digital didactic material |
| Laboratory practical | Explanation of the handle of *secaderos. In the case of teaching no face-to-face or *semi-face-to-face, will make memory of audiovisual material employee. |
| Introductory activities | Presentation of the aims and development of the subject |

## Personalized assistance

| Methodologies | Description |
|---|---|
| Problem solving | The *tutorías will make preferably by telematic means (email, remotecampus, forums of doubts in *FaiTIC). For that student or student that request it will be able to make , inthe measure of the possible, *presencialmente. They will indicate to beginning of course the concrete forms ofcommunication as well as the schedules. |
| Laboratory practical | The *tutorías will make preferably by telematic means (email, remotecampus, forums of doubts in *FaiTIC). For that student or student that request it will be able to make , inthe measure of the possible, *presencialmente. They will indicate to beginning of course the concrete forms ofcommunication as well as the schedules. |

## Assessment

| | Description | Qualification | Evaluated Competencess |
|---|---|---|---|
| Lecturing | Continuous evaluation through the assistance to the sessions given. Active participation in the debate that pose in the classroom/remote campus on the theoretical concepts. Also it will value the participation in the forums that enable in the platform *FaiTIC | 10 | |
| Problem solving | Continuous evaluation through the assistance to the practical classes given. Active participation in the debate that pose in the classroom/remote campus on the theoretical concepts. Also it will value the participation in the forums that enable in the platform *FaiTIC. Some proofs will be scheduled along the course and will be delivered through the platform of *Teledocencia | 10 | |
| Studies excursion | Presentation of a memory of the visits made. In the case of teaching no face-to-face or *semi-face-to-face, without possibility to make exits of study, will evaluate memory of analysis of digital didactic material | 5 | |
| Problem and/or exercise solving | Evaluation of the proof of evaluation on the theoretical contents of the subject | 55 | |
| Problem and/or exercise solving | Evaluation of the proofs of realisation of exercises | 20 | |

## Other comments on the Evaluation

Information detailed of examinations in to official web of the School. The here contemplated dates, can suffer modifications in the official web. It recommends check&*nbsp;the official dates.&*nbsp; &*nbsp;General:&*nbsp;http://forestales.uvigo.es/gl/docencia/exames/Specific:&*nbsp;http://forestales.uvigo.es/images/docs/docencia/exames/exames_gef_1c_2020-21.pdf1º Announcement: 13/01/2021 - 16:00 *h.&*nbsp;2º Announcement: 30/06/2021 - 16:00 *h.The dates of delivery of the distinct activities will be communicated with sufficient *antelación so that the&*nbsp;students can schedule his realisation.

## Sources of information

**Basic Bibliography**

**Complementary Bibliography**

Oscar González-Prieto, **Patoloxía da Madeira Estrutural**, Xunta,

F. Arriaga, **Intervención en estructuras de madera**, AITIM,

Fernando Peraza, **Protección Preventiva de la Madera**, AITIM,

J.I. Fernández-Golfín Seco, **Manual de secado de La Madera**, AITIM,

León M. Fiske, **Manual del Secado de Maderas**, Muni Prensa,

## Recommendations

**Subjects that continue the syllabus**

Quality control and prevention of occupational hazards in the forestry industry/P03G370V01804

**Subjects that are recommended to be taken simultaneously**

Primary wood processing industries/P03G370V01706
Industrial organisation and processes in the wood industry/P03G370V01707

**Subjects that it is recommended to have taken before**

Wood technology/P03G370V01606

**Other comments**

Eligible subject for dual training projects as established by the memory of the degree.

## Contingency plan

**Description**

=== EXCEPTIONAL MEASURES SCHEDULED ===
In front of the uncertain and unpredictable evolution of the sanitary alert caused by the *COVID-19, the University of Vigo establishes an extraordinary planning that will activate in the moment in that the administrations and the own institution determine it attending to criteria of security, health and responsibility, and guaranteeing the teaching in a no face-to-face stage or partially face-to-face. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the teaching of a more agile and effective way when being known in advance (or with a wide *antelación) by the students and the *profesorado through the tool normalised and institutionalised of the educational guides.

=== ADAPTATION OF THE METHODOLOGIES ===
* educational Methodologies that keep

introductory Activities
Lesson *magistral
Resolution of problems

* educational Methodologies that modify

No necessary

* Mechanism no face-to-face of attention to the students (*tutorías)

virtual Dispatch, email and habilitation of forums in the platform *FaiTIC

* Modifications (if they proceed) of the contents to give

The exit of practices scheduled will not make in the case of teaching no face-to-face or in the case that it do not allow with teaching *semi-face-to-face. *substituirá By practical observation of audiovisual material of processes of manufacture of industries of the wood (videos and digital information)

* additional Bibliography to facilitate the car-learning

is not necessary, since they facilitate it to him materials in the platform of *teledocencia, many of them of own preparation by part of the professors, to be able to make a follow-up of the matter

* Other No necessary

modifications

=== ADAPTATION OF THE EVALUATION ===
* Test already made

keeps the weight when being adapted all the proofs to any circumstance

* Test slopes that keep

keeps the weight when being adapted all the proofs to any circumstance

* Test that they modify

No necessary

* New proofs

No necessary

* additional Information

No precise

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Primary wood processing industries** | | | | |
| Subject | Primary wood processing industries | | | |
| Code | P03G370V01706 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 4th | 1st |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Bartolome Mier, Javier | | | |
| Lecturers | Bartolome Mier, Javier<br>González Prieto, Óscar | | | |
| E-mail | jbartolome@uvigo.es | | | |
| Web | http://www.forestales.uvigo.es | | | |
| General description | *Asignatura In which they study the technologies of manufacture of the basic products of forest origin: wood sawed and boards | | | |

| Competencies | |
|---|---|
| Code | |
| CG11 | Ability to characterize the anatomical and technological properties of wood and non-timber forest raw materials, as well as the technologies and industries of these raw materials. |
| CG12 | Capacity for organization and planning of companies and other institutions, with knowledge of the legislative provisions that affect them and the fundamentals of marketing and marketing of forest products. |
| CE29 | Ability to know, understand and use the basic principles of the processes of first transformation of wood and the principles of: non-wood forest raw materials; industrial processes of non-wood products: cork, resin, essential oils. |
| CT4 | Sustainability and environmental commitment |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | Competences | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances. | CG11<br>CG12 | CE29 | CT4<br>CT8 |
| 4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses. | | | |
| 6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project. | | | |
| 7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering. | | | |
| 8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality. | | | |
| 9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality. | | | |
| 11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality. | | | |
| 12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality. | | | |
| 13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality. | | | |
| 14R. 2018 Capacity to apply norms of engineering in the his speciality. | | | |
| 15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering. | | | |
| 16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context. | | | |
| 17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions | | | |
| 18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions. | | | |

| Contents | |
|---|---|
| Topic | |
| Introduction to the subject. | Presentation of the sector of first transformation of the wood in Galicia, Spain and Europe |
| Technology of the sawed of the wood | Wooden section in roll<br>Section of court of the trunk<br>Section of manipulation of the wood sawed<br>Machinery of sawed<br>Systems of sawed of the wood<br>Lines of processed |
| The cut of the wood | Characteristics of the tool<br>Preparation and conservation of tools of court<br>Parameters of court<br>Definition of the tool of court |
| Manufacture of wooden sheet to the flat | Definition and use of the wooden sheet to the flat<br>Process of manufacture of the wooden sheet to the flat |
| Manufacture of boards plywoods | Definition, properties and types of board plywood<br>Process of manufacture of the board plywood |
| Manufacture of boards of particles and wooden fibres | Boards of particles. Properties, uses and process of manufacture<br>Boards of hard fibre. Properties, uses and process of manufacture<br>Boards of fibre of half density. Properties, uses and process of manufacture |
| Properties and employment of the main wooden species of industrial use | Physical characteristics, mechanical and applications of the main wooden species of conifers, leafy and tropical |

| Planning | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Lecturing | 34 | 87 | 121 |
| Studies excursion | 4 | 2 | 6 |
| Laboratory practical | 6 | 0 | 6 |
| Introductory activities | 1 | 0 | 1 |
| Problem and/or exercise solving | 1 | 0 | 1 |
| Report of practices, practicum and external practices | 0 | 2 | 2 |
| Laboratory practice | 1 | 0 | 1 |
| *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 aims and contents and importance of the same inside the group of the competitions of the subject |
| Studies excursion | Explanation "in situ" of industrial processes in factories of first transformation of the wood |
| Laboratory practical | Macroscopic recognition of commercial wooden species in Spain |
| Introductory activities | Exhibition of the aims and development of the subject |

| Personalized assistance |
|---|

| Assessment | | | |
|---|---|---|---|
| | Description | Qualification | Evaluated Competences |
| Lecturing | Continuous evaluation through the assistance to the classes of classroom | 7 | CE29 |
| Studies excursion | Presentation of a memory of the visits realised | 10 | CE29 |
| Laboratory practical | (*)Reconocimiento macroscópico de las maderas comerciales en España | 20 | CE29 |
| Introductory activities | (*). | 0 | |
| Problem and/or exercise solving | Evaluation of the theoretical knowledges through proofs of short answer | 60 | CE29 |
| Report of practices, practicum and external practices | *Elaboarciión Of guide of the commercial wooden species in Spain | 3 | CE29 |
| Laboratory practice | | 0 | |

**Other comments on the Evaluation**

Calendar of examinations:

First Announcement: 22 of jan of 2020, 16.00 Second
Hours Announcement: 22 of juneof 2020 16.00 Hours

The official dates and the possible modifications are exposed in the official board of the Forest EE and in the web #http://forestales.uvigo.es/*gl/

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

**Recommendations**

**Subjects that continue the syllabus**

Quality control and prevention of occupational hazards in the forestry industry/P03G370V01804

**Subjects that are recommended to be taken simultaneously**

Industrial organisation and processes in the wood industry/P03G370V01707
Wood preservation and drying technology/P03G370V01705

**Subjects that it is recommended to have taken before**

Wood technology/P03G370V01606

**Other comments**

Eligible subject for dual training projects as established by the memory of the degree.

**Contingency plan**

**Description**

=== EXCEPTIONAL MEASURES SCHEDULED ===
In front of the uncertain and unpredictable evolution of the sanitary alert caused by the *COVID-19, the University of Vigo establishes an extraordinary planning that will activate in the moment in that the administrations and the own institution determine it attending to criteria of security, health and responsibility, and guaranteeing the teaching in a no face-to-face stage or partially face-to-face. These already scheduled measures guarantee, in the moment that was prescriptive, the development of the teaching of a more agile and effective way when being known in advance (or with a wide *antelación) by the students and the *profesorado through the tool normalised and institutionalised of the educational guides.

=== ADAPTATION OF THE METHODOLOGIES ===
* educational Methodologies that *mantienenno modify . They will substitute the face-to-face classes by the *teledocencia on-line. In the case of the practices will handle audiovisual material.

* Educational methodologies that modify : it will happen to the *teledocencia on-line

* Mechanism no face-to-face of attention to the students (*tutorías): Through email and virtual dispatches enabled for the *profesorado

* Modifications (if they proceed) of the contents to give: no *modiificarán

* additional Bibliography to facilitate the car-learning: it does not apply

* Other modifications

=== ADAPTATION OF THE EVALUATION ===
* Test already made
Proof XX: [previous Weight 00%] [Weight Proposed 00%]
...

* Pending proofs that keep
Proof XX: [previous Weight 00%] [Weight Proposed 00%]
...

* Proofs that modify
In the case of teaching no face-to-face or *semi-face-to-face, only will value the assistance of face-to-face class that have been able to give, if there was not face-to-face teaching the punctuation of this *epigafre will deliver between the theoretical and practical part. The presentation of a memory of the visit to factory will substitute by the presentation of a memory summary of audiovisual material *empregado.
* New test

* additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Industrial organisation and processes in the wood industry** | | | | |
| Subject | Industrial organisation and processes in the wood industry | | | |
| Code | P03G370V01707 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 4th | 1st |
| Teaching language | #EnglishFriendly<br>Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | García-Pintos Escuder, Adela<br>González Prieto, Óscar | | | |
| Lecturers | García-Pintos Escuder, Adela<br>González Prieto, Óscar | | | |
| E-mail | adelagpe@uvigo.es<br>oscargprieto@uvigo.es | | | |
| Web | http://www.forestales.uvigo.es | | | |
| General description | Matter that treats on the industrial processes of transformation of the wood, especially those that carry out in the manufacture of the final products, as well as the technicians of management and continuous improvement of the production. | | | |

| Competencies | |
|---|---|
| Code | |
| CG12 | Capacity for organization and planning of companies and other institutions, with knowledge of the legislative provisions that affect them and the fundamentals of marketing and marketing of forest products. |
| CE30 | Ability to know, understand and use the principles of: knowledge of the basic principles of the second transformation processes of wood. |
| CE31 | Knowledge for the calculation and design of carpentry facilities. Drying, debarking and crushing of wood. |
| CT5 | Capacity for information management, analysis and synthesis |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>4R. 2018 Capacity to analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental relevantes of form relevante and interpret correctly the results of these analyses.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 Capacity to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and industrial of the practice in engineering.<br>16R. 2018 Ideas general on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context.<br>18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions. | CG12 | CE30<br>CE31 | CT5<br>CT8 |

| **Contents** | |
|---|---|
| Topic | |
| The sector of second transformation of the wood | The carpentry and furniture industry in:<br>· Galicia<br>· Spain<br>· Europe |
| Industrial operations on wood and boards<br>Mechanization of wood and boards | Industry 4.0<br>Adhesives and gluing techniques in the wood industry<br>Application of edges on boards<br>Application of decorative surfaces on boards<br>Sanding practices in carpentry and furniture<br>Finishing technology on wood and boards |
| Basic principles and production management tools | Basic concepts<br>Tools for supply chain management, purchasing and inventory<br>Mathematical tools and models for the optimization of production |
| Inventory management | Introduction<br>Inventory management: basic concepts<br>Inventory management tools |
| Aggregate planning | Introduction<br>Aggregate planning: basic concepts<br>Aggregate planning strategies |
| Materials requirements planning | Introduction<br>MRP elements<br>Methods |
| Basic principles and tools for continuous improvement in the organization of industrial production | Lean management basics and production excellence<br>Application of Lean management to the wood industry<br>Other tools: JIT, six-sigma |

| **Planning** | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Introductory activities | 1 | 0 | 1 |

| | | | |
|---|---|---|---|
| Lecturing | 17 | 44 | 61 |
| Problem solving | 11 | 30 | 41 |
| Mentored work | 7 | 20 | 27 |
| Studies excursion | 8 | 10 | 18 |
| Problem and/or exercise solving | 2 | 0 | 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 | Introduction to the objectives and development of the subject |
| Lecturing | Structured exposition of objectives, theoretical contents and examples of the themes and subtopics that make up the program of the subject. This exhibition will be held in the classroom in person or through the remote campus. Students will have all the material to be able to follow the classes in person. |
| Problem solving | Active participation in the resolution of problems and / or exercises |
| Mentored work | Resolution of small practical exercises that accompany a theoretical explanation. Seminars of approach and resolution of type problems with oral presentation |
| Studies excursion | Explanation "in situ" of the organization and industrial processes in carpentry and furniture industries. The studies excursion will not be carried out in the case of non-face-to-face teaching or in the case that it is not allowed with semi-face-to-face teaching. It will be replaced by practical observation of audiovisual material from manufacturing processes of the wood industries (videos and digital information). |

| **Personalized assistance** | |
|---|---|
| **Methodologies** | **Description** |
| Lecturing | Personalized attention will make preferably by telematic means (email, campus remoto, forums of doubts in FaiTIC). If a student wants, as possible, it can be presencially. They will be indicated at the beginning of course the concrete forms of communication as well as the schedules. |
| Mentored work | Personalized attention will make preferably by telematic means (email, campus remoto, forums of doubts in FaiTIC). If a student wants, as possible, it can be presencially. They will be indicated at the beginning of course the concrete forms of communication as well as the schedules. |
| Problem solving | Personalized attention will make preferably by telematic means (email, campus remoto, forums of doubts in FaiTIC). If a student wants, as possible, it can be presencially. They will be indicated at the beginning of course the concrete forms of communication as well as the schedules. |

| **Assessment** | | | |
|---|---|---|---|
| | Description | Qualification | Evaluated Competences |
| Lecturing | Active participation in the debate that arises in the remote classroom / campus about theoretical concepts. Participation in forums that are enabled on the FaiTIC platform will also be valued. | 10 | CE30<br>CE31 |
| Mentored work | Active participation in the seminars for solving exercises and case studies / analysis of situations, with constructive criticism of the resolutions of other colleagues and timely delivery of the assigned tasks. | 5 | CE30<br>CE31 |
| Studies excursion | Presentation of a memory of the visits made. In the case of teaching no face-to-face or semi-face-to-face, will evaluate memory elaborated employing audiovisual material of processes of manufacture of industries of the wood (videos and digital information). | 5 | CE30<br>CE31 |
| Problem and/or exercise solving | Written exercises on the theoretical and practical contents of the subject. Some exercises will be planned throughout the course and will be delivered through the Teleteaching platform | 80 | CE30<br>CE31 |

**Other comments on the Evaluation**

The delivery dates of the different activities will be communicated sufficiently in advance so that the students can plan their implementation

**EXAM DATES AND PUBLICATION OF NOTES:**

The dates of the exams, according to the official calendar approved by the center, are as follows:

First call: January 15, 2021, 4:00 p.m.

Second call: July 2, 2021, 4:00 p.m.

The publication of provisional notes will be made in the Virtual Secretary and on the Teleteaching platform, and as possible on the center bulletin board

## Sources of information

### Basic Bibliography

Jay Heizer, Barry Render, **Dirección de la producción y de operaciones : decisiones tácticas**, 11, Pearson Educación, 2015

### Complementary Bibliography

Carlos Rodrigo Illera, María Pilar Alberca Oliver, **Dirección de la producción**, Sanz y Torres, 2015

Lluis Cuatrecasas Arbós, **Organización de la producción y dirección de operaciones : sistemas actuales de gestión eficiente y competitiva**, Diaz de Santos, 2011

Tony Crespo Franco, Pilar Piñeiro García, **Produción : planificación, programación e control : exercicios resoltos**, Universidade de Vigo, Servizo de Publicacións, 2005

Daniel Arias Aranda, Beatriz Minguela Rata (directores), **Dirección de la producción y operaciones : decisiones operativas**, Pirámide, 2018

Javier Santos, Richard A. Wysk, José Manuel Torres, **Mejorando la producción con lean thinking**, 2, Pirámide, 2015

## Recommendations

### Subjects that are recommended to be taken simultaneously

Primary wood processing industries/P03G370V01706

### Subjects that it is recommended to have taken before

Wood technology/P03G370V01606

### Other comments

Eligible subject for dual training projects as established by the memory of the degree.

## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained
Introductory activities
Lecturing
Problem solving
Mentored work

* Teaching methodologies modified
Studies excursion: The planned exit of practices will not be carried out in the case of non-face-to-face teaching or in the case that it is not allowed with semi-face-to-face teaching. It will be replaced by practical observation of audiovisual material from the manufacturing processes of the wood industries (videos and digital information)

* Non-attendance mechanisms for student attention (tutoring)
Remote campus, email and forums on the Teledocencia platform

* Modifications (if applicable) of the contents
The planned exit of practices will not be carried out in the case of non-face-to-face teaching or in the case that it is not allowed with semi-face-to-face teaching. It will be replaced by practical observation of audiovisual material from the manufacturing processes of the wood industries (videos and digital information)

* Additional bibliography to facilitate self-learning
It is not necessary, since materials are provided on Faitic, many of them made by the teachers, in order to track the subject

* Other modifications

It is not necessary

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Weight is maintained as all activities are adapted to any circumstance

* Pending tests that are maintained
Weight is maintained as all activities are adapted to any circumstance

* Tests that are modified
Weight is maintained as all activities are adapted to any circumstance

* New tests
It is not necessary

* Additional Information
It is not necessary

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Innovación e desenvolvemento de produtos na industria forestal** | | | | |
| Subject | Innovación e desenvolvemento de produtos na industria forestal | | | |
| Code | P03G370V01709 | | | |
| Study programme | Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 4 | 1c |
| Teaching language | Castelán<br>Galego | | | |
| Department | Enxeñaría dos recursos naturais e medio ambiente<br>Organización de empresas e márketing | | | |
| Coordinator | Bartolome Mier, Javier<br>García-Pintos Escuder, Adela | | | |
| Lecturers | Bartolome Mier, Javier<br>García-Pintos Escuder, Adela | | | |
| E-mail | adelagpe@uvigo.es<br>jbartolome@uvigo.es | | | |
| Web | | | | |
| General description | Materia que trata sobre os procesos industriais de transformación da madeira, especialmente os que se levan a cabo na fabricación dos produtos finais, así como as técnicas de xestión e mellora continua de a produción | | | |

| Competencias | |
|---|---|
| Code | |
| CE31 | Coñecementos para o cálculo e deseño de instalacións de carpintería. Secado, descortizado e trituración da madeira. |
| CT4 | Sostenibilidade e compromiso ambiental |
| CT6 | Capacidade de organización e planificación |
| CT10 | Aprendizaxe autónoma. |

| Resultados de aprendizaxe | |
|---|---|
| Learning outcomes | Competences |

| | | |
|---|---|---|
| 2R. 2018 Coñecemento e comprensión das disciplinas de enxeñaría da súa especialidade, ao nivel necesario para adquirir o resto das competencias da titulación, incluíndo nocións dos últimos avances. | CE31 | CT4<br>CT6<br>CT10 |
| 3R. 2018 Ser consciente do contexto multidisciplinar da enxeñaría. | | |
| 4R. 2018 Capacidade para analizar produtos, procesos e sistemas complexos no seu campo de estudo; elixir e aplicar métodos analíticos, de cálculo e experimentais relevantes de forma relevante e interpretar correctamente os resultados destas análises. | | |
| 5R. 2018 Capacidade para identificar, formular e resolver problemas de enxeñaría na súa especialidade; escoller e aplicar métodos analíticos, de cálculo e experimentos adecuadamente establecidos; Recoñecer a importancia das restricións sociais, de saúde e seguridade, ambientais, económicas e industriais. | | |
| 7R. 2018 Capacidade do proxecto utilizando algúns coñecementos avanzados da súa especialidade en enxeñería. | | |
| 9R. 2018 Capacidade para consultar e aplicar códigos de boas prácticas e seguridade da súa especialidade. | | |
| 11R. 2018 Comprensión das técnicas e métodos de análise, proxecto e investigación aplicables e as súas limitacións no ámbito da súa especialidade. | | |
| 13R. 2018 Coñecemento da aplicación de materiais, equipos e ferramentas, procesos tecnolóxicos e de enxeñería e as súas limitacións no ámbito da súa especialidade. | | |
| 14R. 2018 Capacidade para aplicar normas de enxeñaría na súa especialidade. | | |
| 15R. 2018 Coñecemento das implicacións sociais, de saúde e seguridade, ambientais, económicas e industriais da práctica en enxeñaría. | | |
| 16R. 2018 Ideas xerais sobre cuestións económicas, organizativas e de xestión (como xestión de proxectos, xestión de riscos e cambio) no contexto industrial e empresarial. | | |
| 18R. 2018 Capacidade para xestionar actividades ou proxectos técnicos ou profesionais complexos da súa especialidade, asumindo a responsabilidade da toma de decisións. | | |
| 19R. 2018 Capacidade para comunicar de xeito eficaz información, ideas, problemas e solucións no campo da enxeñaría e coa sociedade en xeral. | | |
| 20R. 2018 Capacidade para funcionar eficazmente en contextos nacionais e internacionais, individualmente e en equipo, e cooperar cos enxeñeiros e persoas doutras disciplinas. | | |
| 21R. 2018 Capacidade para recoñecer a necesidade dunha formación continua e realizar esta actividade de xeito independente durante a súa vida profesional. | | |
| 22R. 2018 Capacidade para estar ao día das novas científicas e tecnolóxicas. | | |

| **Contidos** | |
|---|---|
| Topic | |
| 1.- Materiais tecnificados de madeira | 1.1.Taboleiros derivados de madeira<br>1.2 Perfís lamelados de madeira<br>1.3 Madeira microlaminada (LVL)<br>1.4 Madeira reconstituida con tiras (PSL)<br>1.5 Madeira reconstituida con virutas (LSL)<br>1.6 Madeira reconstituida con pequenas virutas (OSL)<br>1.7 Madeira plástico |
| 2.- Compoñentes de madeira | 2.1 Cercos e precercos<br>2.2 Tapajuntas<br>2.3 Molduras decorativas<br>2.4 Madeiras torneadas<br>2.5. Madeira curvada<br>2.6 Perfís lamelados |
| 3.- Herraxes | 3.1 Patas, pés e elementos de apoio- nivelación.<br>3.2 Elementos de unión e ensamblaxe.<br>3.3 Bisagras.<br>3.4 Sistemas de guiado.<br>3.5 Elementos de instalación e montaxe.<br>3.6 Cerraduras e pechaduras |
| 4.-Recubrimientos de taboleiros e cantos de madeira. | 4.1 Recubrimientos de cantos.<br>4.1.1 A base de listones de madeira maciza.<br>4.1.2 A base de chapas de madeira.<br>4.1.3 A base de láminas de PVC.<br>4.1.4 A base de papel decorativo.<br>4.2.- Recubrimientos de taboleiros.<br>4.2.1 A base de chapa de madeira.<br>4.2.2 A base de papeis impregnados.<br>4.2.3 Lamelados.<br>4.2.4 Lacados. |

| | |
|---|---|
| 5.- Acabados en carpintería e mobles | 5.1 Introdución.<br>5.2 Clasificación de os acabados.<br>5.2.1 Pola función de o verniz.<br>5.2.2 Pola composición química de o verniz.<br>5.3 Compoñentes dun acabado.<br>5.3.1 Disolventes.<br>5.3.2 Resinas.<br>5.3.3 Tintes e aditivos.<br>5.3.4 Cargas.<br>5.4 Vernices secado uv |
| 6.- Portas de madeira | 6.1 Introdución.<br>6.2 Clasificación das portas.<br>6.2.1 Pola súa constitución.<br>6.2.2 Polo aspecto das súas caras.<br>6.2.3 Pola forma do canto.<br>6.2.4 Pola aparencia do canto.<br>6.3 Medidas e tolerancias dunha porta.<br>6.4 Características da madeira.<br>6.5 Puertas en función da súa constitución<br>6.5.1 Puertas á plana.<br>6.5.2 Puertas de carpintería.<br>6.5.3 portas de carpintería en relevo.<br>6.6 Portas especiais<br>6.6.1 Puertas a resistentes a o lume.<br>6.6.2 Portas acústicas.<br>6.6.3 Puertas de seguridade |
| 7.- Fiestras de madeira | 7.1 Introdución.<br>7.2 Elementos que constitúen unha fiestra.<br>7.2.1 Elementos do oco da fiestra.<br>7.2.2 Elementos da fiestra.<br>7.3 Características dunha fiestra de madeira.<br>7.3.1 Permeabilidad ao aire.<br>7.3.2 Resistencia ao vento.<br>7.3.3 Estanqueidad á auga.<br>7.3.4 Acristalamiento |
| 8.- Chans de madeira | 8.1 Entablados<br>8.2 Tarimas<br>8.3 Lamparquet<br>8.4 Parquet multicapa<br>8.5 Paneis<br>8.5.1 Parquet taraceado<br>8.5.2 Parquet industrial<br>8.5.3 Paneis de deseños históricos<br>8.5.4 Paneis multicapa<br>8.6 Entarugado<br>8.7 Pavimentos de de taboleiro rechapado<br>8.8 chans lamelados<br>8.9 Chans madeira plástico (pwc) |
| 9.- Escaleiras de madeira | 9.1 Introdución<br>9.2 Definicións<br>9.3 Tipoloxía de escaleiras<br>9.3.1 Tipoloxía estruturais<br>9.3.2 Tipoloxía por trazado<br>9.4 Aspectos técnicos no deseño dunha escaleira |
| 10.- Ergonomía e moble | 10.1 Conceptos xerais<br>10.2 Bases científicas na ergonomía<br>10.3 Implicacións no deseño de mobiliario da postura sedente.<br>10.4 Táboas antropométricas. |
| 11.- Mobles modulares | 11.1 Conceptos xerais<br>11.2 Materiais mobles modulares<br>11.3 Compoñentes dos mobles modulares<br>11.4 Despiece dos mobles modulares |
| 12.- Mobles de madeira maciza. | 12.1 Conceptos xerais<br>12.2 Materiais mobles modulares<br>12.3 Compoñentes dos mobles modulares<br>12.4 Despiece dos mobles modulares |

| | |
|---|---|
| 13.- Mobles atamborados e outros | 13.1 Conceptos xerais<br>13.2 Materiais mobles modulares<br>13.3 Compoñentes dos mobles modulares<br>13.4 Despiece dos mobles modulares |
| 14.- Introdución á innovación e novos produtos | 14.1 Conceptos básicos sobre innovación<br>14.2 A xestión da innovación e a I+D<br>14.3 Tipos de innovación |
| 15.- Técnicas de traballo en equipo e creatividade | 15.1 Creatividade e procesos<br>15.2 Técnicas para a creación e xestión de innovación de produtos |
| 16.- Fases dun proxecto de desenvolvemento de novos produtos | 16.1 Fases dun proxecto de desenvolvemento de novos produtos |

**Planificación**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lección maxistral | 23 | 70 | 93 |
| Prácticas con apoio das TIC | 6 | 10 | 16 |
| Prácticas de laboratorio | 4 | 6 | 10 |
| Traballo tutelado | 11 | 18 | 29 |
| Resolución de problemas e/ou exercicios | 2 | 0 | 2 |
| *The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. | | | |

**Metodoloxía docente**

| | Description |
|---|---|
| Lección maxistral | Explicación de conceptos teóricos e exemplificaciones. Farase de forma presencial, a través do campus remoto e/ou plataforma de teledocencia |
| Prácticas con apoio das TIC | Resolución de casos prácticos de deseño de mobles modulares. Farase de forma presencial, a través do campus remoto e/ou plataforma de teledocencia |
| Prácticas de laboratorio | Actividades de aplicación dos coñecementos a situacións concretas e de adquisición de habilidades básicas e procedimentais relacionadas coa materia obxecto de estudo.<br>Desenvolverase nun espazo especial co equipamento adecuado.<br>En caso de non ser posible a súa realización, facilitaranse os materiais para o seu asimilación e serán substituídas pola realización dun traballo |
| Traballo tutelado | O estudante realizará un proxecto de desenvolvemento dun novo produto tanto na aula (de forma presencial, a través do campus remoto e/ou plataforma de teledocencia) como de maneira autónoma baixo as directrices e a supervisión do profesor.<br>O traballo poderá realizarse de forma individual e/ou grupal |

**Atención personalizada**

| Methodologies | Description |
|---|---|
| Lección maxistral | As titorías realizaranse preferentemente por medios telemáticos (correo electrónico, campus remoto, foros de dúbidas en FaiTIC). Para aquel alumno ou alumna que o solicite poderanse realizar, na medida do posible, presencialmente. Indicaranse ao comezo do curso as formas concretas de comunicación así como os horarios. |
| Prácticas con apoio das TIC | As titorías realizaranse preferentemente por medios telemáticos (correo electrónico, campus remoto, foros de dúbidas en FaiTIC). Para aquel alumno ou alumna que o solicite poderanse realizar, na medida do posible, presencialmente. Indicaranse ao comezo do curso as formas concretas de comunicación así como os horarios. |
| Traballo tutelado | As titorías realizaranse preferentemente por medios telemáticos (correo electrónico, campus remoto, foros de dúbidas en FaiTIC). Para aquel alumno ou alumna que o solicite poderanse realizar, na medida do posible, presencialmente. Indicaranse ao comezo do curso as formas concretas de comunicación así como os horarios. |

**Avaliación**

| | Description | Qualification | Evaluated Competencess | |
|---|---|---|---|---|
| Lección maxistral | Asistencia e participación activa nas sesións maxistrais | 10 | CE31 | CT4<br>CT6 |
| Prácticas de laboratorio | Actividades de aplicación dos coñecementos a situacións concretas e de adquisición de habilidades básicas e procedimentais relacionadas coa materia obxecto de estudo. | 5 | CE31 | CT4<br>CT6<br>CT10 |
| Traballo tutelado | O ou a estudante realizará un proxecto de desenvolvemento dun novo produto. A súa entrega farase a través da plataforma de teledocencia, non admitíndose entregas a través de ningunha outra vía | 50 | | CT6<br>CT10 |

| | | | | |
|---|---|---|---|---|
| Resolución de problemas e/ou exercicios | Proba escrita a final de curso (presencial, campus remoto e/ou plataforma de teledocencia) para a avaliación das competencias adquiridas ao longo do curso | 35 | CE31 | CT4<br>CT6<br>CT10 |

**Other comments on the Evaluation**

**A Materia consta de dous partes:**

a) Lección maxistral, prácticas de laboratorio e resolución de problemas e/ou exercicios (5 puntos)

b) Traballo tutelado (5 puntos)

É necesario obter polo menos un 3,5 sobre 10 en cada parte para poder proceder a realizar a suma. En caso contrario, a materia considerarase non superada e cualificarase coa menor das notas obtidas.

**DATAS EXAMES E PUBLICACIÓN DE NOTAS:**

As datas dos exames, segundo o calendario oficial aprobado polo centro, son as seguintes:

Primeira convocatoria: 21 de xaneiro de 2021, 16:00 horas.

Segunda convocatoria: 28 de xuño de 2021. 10:00 horas.

A publicación das notas provisionais farase na Secretaría Virtual e na plataforma de Teledocencia, e se é posible no taboleiro do centro

**Bibliografía. Fontes de información**

**Basic Bibliography**

**Complementary Bibliography**


Morales Nieto, E., **Innovar o morir : Cómo obtener resultados excepcionales con poca inversión : Innovación, internacionalización, redes comerciale**, Starbok, 2010

Philip Kotler, Gary Armstrong, **Fundamentos de marketing**, 13, Pearson Educación de México, 2017

Francisco Serrano Gómez, César Serrano Domínguez, **Gestión, dirección y estrategia de productos**, ESIC, 2005

Andrés Fernández Romero, **Creatividad e innovación en empresas y organizaciones : técnicas para la resolución de problemas**, Diaz de Santos, 2005

Alexander Osterwalder, Yves Pigneur, **Generación de modelos de negocio : un manual para visionarios, revolucionarios y retadores**, 12, Deusto, 2014


**Recomendacións**

**Subjects that continue the syllabus**

Impacto ambiental/P03G370V01504

**Subjects that are recommended to be taken simultaneously**

Control de calidade e prevención de riscos laborais na industria forestal/P03G370V01804

**Subjects that it is recommended to have taken before**

Fundamentos de economía da empresa/P03G370V01104
Tecnoloxía da madeira/P03G370V01606
Tecnoloxía do secado e conservación de madeiras/P03G370V01705

**Other comments**

Materia Ele¡ixible para proxectos de formación dual segundo o establecido pola memoria da titulación.

**Plan de Continxencias**

**Description**

=== MEDIDAS EXCEPCIONAIS PLANIFICADAS ===
Ante a incerta e imprevisible evolución da alerta sanitaria provocada polo COVID-19, a Universidade de Vigo establece unha planificación extraordinaria que se activará no momento en que as administracións e a propia institución determíneno atendendo a criterios de seguridade, saúde e responsabilidade, e garantindo a docencia nun escenario non presencial ou parcialmente presencial. Estas medidas xa planificadas garanten, no momento que sexa preceptivo, o desenvolvemento da docencia dun modo máis áxil e eficaz ao ser coñecido de antemán (ou cunha ampla antelación) polo alumnado e o profesorado a través da ferramenta normalizada e institucionalizada das guías docentes.

=== ADAPTACIÓN DAS METODOLOXÍAS ===
* Metodoloxías docentes que se manteñen
Lección maxistral
Resolución de problemas e exercicios
Traballo tutelado
Prácticas con apoio do TIC

* Metodoloxías docentes que se modifican
Prácticas de laboratorio
Esta actividade modificaranse, en caso de non ser posible realizala ou continuala, pola realización dun traballo

* Mecanismo non presencial de atención ao alumnado (titorías)
Campus remoto, plataforma de teledocencia e/ou correo electrónico

* Modificacións (si proceden) dos contidos a impartir
Non é necesario

* Bibliografía adicional para facilitar o auto-aprendizaxe
O alumnado posúe todo o material na plataforma, parte del de elaboración propia por parte dos profesores, para poder realizar un seguimento da materia.

* Outras modificacións
Non é necesario

=== ADAPTACIÓN DA AVALIACIÓN ===
* Probas xa realizadas
Mantense o peso de todas as probas xa realizadas

* Probas pendentes que se manteñen
Mantense o peso de todas as probas pendentes e que se poidan realizar (Resolución de problemas e exercicios, Traballo tutelado)

* Probas que se modifican
Lección maxistral
Prácticas de laboratorio

* Novas probas
Realización dun traballo. O alumnado realizará un traballo de forma individual cuxa temática e características será proposta polos profesores no momento oportuno. O seu peso será en función do número de actividades de asistencia e participación nas sesións maxistrais e prácticas de laboratorio que non se puidesen realizar.
Cubrirá o peso destas actividades non realizadas até alcanzar entre o tres o 15 % da avaliación da materia

* Información adicional
Non é preciso

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Management of protected areas and biodiversity** | | | | |
| Subject | Management of protected areas and biodiversity | | | |
| Code | P03G370V01801 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 4th | 2nd |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Cordero Rivera, Adolfo | | | |
| Lecturers | Cordero Rivera, Adolfo | | | |
| E-mail | adolfo.cordero@uvigo.es | | | |
| Web | http://ecoevo.uvigo.es | | | |
| General description | (*)Introdución aos principios da Bioloxía da Conservación aplicados á Xestión de Espazos protexidos e Conservación da Biodiversidade | | | |

| Competencies |
|---|
| Code |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| Contents | |
|---|---|
| Topic | |
| 1. The science of conservation. | The origins and brief history of conservationist movements. Principles of conservation biology. Ecology and Environmentalism. Importance of science in conservation. |
| 2. The ecological values and functions of biodiversity. | Genetic, species and ecosystem diversity: the concept of biodiversity. Why we should conserve the species? The intrinsic value of species and their conservation status. The instrumental values and rarity of the species. Ecosystemic values. |
| 3. Biodiversity and stability. | The concept of stability. The diversity-stability debate (a history of this controversy, current studies, compartmentalization, diversity and global change, implications for conservation biology). Retrogression. |
| 4. Ecological principles in the exploitation of natural resources. | The concept of maximum sustainable yield. Principles for the exploitation of resources. Genetic changes in exploited populations. The exploitation of forests. Forest certification (FSC, PEFC). |
| 5. Extinction | The number of species that inhabit the planet. The causes of the rarity of the species. IUCN classification. Estimation of extinction rates. Processes and causes of extinction. Degradation and destruction of habitats. Metapopulation dynamica. Population Viability Analysis (PVA). |
| 6. Management of species and populations. | Management units. In situ and ex situ conservation. Limioting resources. Control of threats. Translocations and artificial breeding. Role of zoos, botanical gardens and museums. Importance of ethology in conservation. Case study: the example of the black-footed ferret. |
| 7. Management and restoration of ecosystems | Principles of ecosystem management. Modified ecosystems (forest exploitation, agricultural ecosystems, aquatic ecosystems). Restoration of ecosystems. |
| 8. Social factors in conservation. | Description of etic values. Valuation of priorities. Cultural changes. Environmental education. |
| 9. The economics of conservation. | Economic evaluation of biodiversity (types of sustainability, decision models in ecological economics, the value of biodiversity). Costs of conservation (method of cost of travel, the method of revealed preferences, an economic and ecological perspective of market). The tragedy of the commons. |
| 10. Political action and conservation. | International organizations (IUCN MAB program). Government agencies: The Spanish strategy for sustainable development. Spanish strategy for the conservation of biodiversity. Non-governmental organizations (NGOs). Companies and individuals. Scientific research, policy and conservation. Ecologism as a political ideology. |

| | |
|---|---|
| 11. Reserves and protected parks. | Objectives of the creation of reserves (the problem of fragmentation). Representation of biodiversity. The main features of reserve design: size, dynamism, spatial context, connectivity, buffer zones. Protected natural areas of Galicia. |
| 12. Conservation legislation | International Biodiversity Agreements (Bern, Ramsar, Washington (CITES), Bonn, Biodiversity (Rio de Janeiro). European legislation (Birds Directive, Habitats Directive) State legislation (Law 42/2007 on Natural Heritage, Decree 139 / 2011 Catalog endangered species, Decree 1628/2011 Catalog of alien invasive species) Legislation of Galicia: Galician law of conservation of nature. |
| 13. Management plans for endangered species. | Guidelines, objectives and feasibility. Examples: the management plan for the European turtle (Emys orbicularis) in Galicia; management plan of the odonate populations of European interest; Reproductive biology and management of Corema album in the Cíes Islands. |
| Practical 1. Design of Reserves: Testing the species-area relationship. | (*) |
| Practical 2. Taxonomic principles and characteristics of communities. Its use in the decision-making process on conservation. | (*) |
| Practical 3. Contingent assessment | Discussion about the social attitudes on conservation issues and valuation of emblematic species |
| Practical 4. Analysis of the viability of populations: using the vortex program. | (*) |
| Practical 5. Field lesson. Visit to the Center of Zoogenetic Resources of Galicia. | Study of the systems of conservation of germoplasm of autochthonous cattle breeds. |
| Practical 6. Field lesson. Visit to the Natural Park of Fragas do Eume. | Contact with the managers of the protected area, to discuss its specific characteristics and problems. |
| Practical 7. Field lesson. Visit to the National Park of the Atlantic Islands of Galicia. | Given the peculiarities of the Park, with its insularity, the visit will be to the reception center of visitors in Vigo, if the climatic conditions do not allow visiting the islands. |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 30 | 52.5 | 82.5 |
| Studies excursion | 11 | 16.5 | 27.5 |
| Mentored work | 5 | 10 | 15 |
| Practices through ICT | 4 | 4 | 8 |
| Problem and/or exercise solving | 2 | 0 | 2 |
| Essay | 5 | 10 | 15 |

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

**Methodologies**

| | Description |
|---|---|
| Lecturing | Lectures in the classroom |
| Studies excursion | Field lessons |
| Mentored work | Personal work under supervision |
| Practices through ICT | Practical lessons in the computers room |

**Personalized assistance**

| Tests | Description |
|---|---|
| Essay | A sand county almanac, Aldo Leopold. Monographic work on the book |

**Assessment**

| | Description | Qualification | Evaluated Competencess |
|---|---|---|---|
| Lecturing | They will be evaluated through short answer exams. | 65 | |
| Studies excursion | They will be evaluated in the examination of the subject through specific questions. | 5 | |
| Mentored work | It will be evaluated in the exam of the subject through specific questions or through written reports. | 10 | |
| Practices through ICT | They will be evaluated in the exam of the subject through specific questions or through written reports. | 10 | |

| | | |
|---|---|---|
| Problem and/or exercise solving | They are part of the written exam of the course. | 0 |
| Essay | Delivery of a monographic work on the book "A sand county almanac", by Aldo Leopold. The essay must be submitted one month before the exam date. It must consist of a summary of the book and a section of personal analysis of it. | 10 |

## Other comments on the Evaluation

The competences of the subject will be evaluated in the written exam.

The attendance to the practicals is compulsory.

The unjustified absence of more than one practical implies a negative evaluation. The monographic work on the book by Aldo Leopold is an essential condition for the evaluation, and must be submitted at the most one month before the exam.

Dates of exams:

1st period: 21 May 2020, 12 h

2nd period: 9 July 2020, 16 h

The official dates and any subsequent modification are available on the web http://forestales.uvigo.es/gl/

## Sources of information

### Basic Bibliography

Leopold, Aldo, **A sand county almanac (versión española: Una ética de la tierra)**, Oxford University Press, 1949

### Complementary Bibliography

Primack, R.B. & J. Ros, **Introducción a la Biología de la Conservación**, Ariel, 2002

Cordero Rivera, A. (Editor), **Proxecto Galicia, Ecoloxía. Volumen 45. Conservación I.**, Hércules de Ediciones, 2005

Hunter, M.L., **Fundamentals of Conservation Biology**, Blackwell Science, 2002

Sutherland, W.J., **The Conservation Handbook: Research, Management and Policy**, Blackwell Science, 2000

Shafer, C. L., **Nature Reserves**, Smithsonian Institution Press, 1990

James P. Gibbs, Malcolm L. Hunter, Jr., Eleanor J. Sterling, **Problem-solving in conservation biology and wildlife management: exercises for class, field, and laboratory**, 2, Blackwell Science, 2008

## Recommendations

### Subjects that it is recommended to have taken before

Forestry Ecology/P03G370V01402

## Contingency plan

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Forest Fires** | | | | |
| Subject | Forest Fires | | | |
| Code | P03G370V01802 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 4th | 2nd |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Fernández Alonso, José María | | | |
| Lecturers | Fernández Alonso, José María<br>Ortiz Torres, Luis | | | |
| E-mail | josemfernandez@uvigo.es | | | |
| Web | | | | |
| General description | Technicians of prevention *and extinction of forest *fires | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG3 | Knowledge of degradation processes that affect forest systems and resources (pollution, pests and diseases, fires, etc.) and capacity for the use of forest environment protection techniques, forest hydrological restoration and biodiversity conservation . |
| CG13 | Ability to design, direct, elaborate, implement and interpret projects and plans, as well as to write technical reports, recognition reports, assessments, appraisals and appraisals. |
| CE9 | Ability to know, understand and use the principles of: forestry hydraulics; hydrology and hydrological-forest restoration. |
| CE27 | Ability to know, understand and use the principles of: prevention and fight against forest fires. |
| CT4 | Sustainability and environmental commitment |
| CT7 | Skill in the use of IT tools and ICTs. |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions<br>18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions.<br>19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general.<br>20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines.<br>21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life.<br>22R. 2018 Capacity to be to the day of the scientific and technological news. | CG1<br>CG3<br>CG13 | CE9<br>CE27 | CT4<br>CT7<br>CT8 |

| **Contents** | |
|---|---|
| Topic | |
| 1. Forest fires. | Definition. General characteristics. Causality. Socioeconomic implications. Statistics. Repercussion throughout the world, the Mediterranean and Spain. |
| 2. Flammability and combustibility. | Heat transfer. Phases of combustion in case of fire. The temperature during forest fires. |
| 3 forest fuels. | Typology. The physical-chemical behavior with influence in the world. Models of fuel. |
| 4 Influence of meteorological and topographic factors on the spread of fire. | Relative humidity and temperature. Precipitation. Winds. Heat inversion. Electric storms. Atmospheric stability. |
| 5 Variables of basic behavior of forest fires. | Empirical physical and empirical models of propagation. Prediction systems. The dynamics of high intensity fires. The factors they cause. Fires of glasses. Fires of points. |
| 6 Fire Prevention. | Analysis of the causes. Determining sites. The educational legislation. Coercive work.<br>The rates of fire hazard. Spanish system. Systems from America, Canada and Australia. |
| 7 Preventive forestry. Activities related to forest fires. | Influence of problems in the planning of forest fires. Firewall and firewall areas.<br>Preventive forestry techniques. Amendments arborea vegetation. Scrub fuel control techniques. The prescribed burning schedule. Ignition techniques. Execution. Evaluation. |
| 8 Organization of a permanent fire protection structure. | Operations.<br>Extinction techniques. Basic principles. Lines.Lineas control lines. Direct attack The indirect attack. |
| 9. Hand tools and equipment for security personnel. | Means of aerial combat in it fires. Characteristics general types, advantages and use limitacións.El auga.Retardantes: types, effects and applications. |

| | |
|---|---|
| 10 Influence of forest fires on ecosystems. | Adaptations of vegetation fires. Fire regimes. Post-secondary world. Impact of fire on the ground.<br>Erosive effects of forest fires. Change the fire hydrologicos.Repelencia after the infiltration of water. Changes in the PTO. |
| 11 Restoration of burned areas. | Actions to control erosion. Revegetación: Techniques, spices, advantages and limitations |

| **Planning** | | | |
|---|---|---|---|
| | Class hours | Hours outside the classroom | Total hours |
| Laboratory practical | 10 | 20 | 30 |
| Lecturing | 30 | 30 | 60 |
| Practices through ICT | 6 | 6 | 12 |
| Autonomous problem solving | 2 | 20 | 22 |
| Studies excursion | 6 | 6 | 12 |
| Problem and/or exercise solving | 1 | 3 | 4 |
| Problem and/or exercise solving | 5 | 5 | 10 |
| *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 | Resolution of practical cases by students with educational orientation and the use of specific laboratory of materials and equipment |
| Lecturing | Exposition of the content of the subject, the theoretical bases and / or guidelines for the realization of<br>A work, the exercise or project to be developed by students |
| Practices through ICT | Practices in computer classrooms Present practice in computer rooms to solve practical assumptions of students with the orientation and use of specific programs and resources of the teaching team |
| Autonomous problem solving | Problem solving and / or autonomous problem solving exercises that students must solve in a personalized way outside the class throughout the course |
| Studies excursion | Practical exercise management tools and fire fighting equipment<br><br>All competences are type A, which they learn in all methodologies |

| **Personalized assistance** | |
|---|---|
| **Methodologies** | **Description** |
| Laboratory practical | |
| Lecturing | |
| Practices through ICT | |
| Studies excursion | |
| Autonomous problem solving | |
| **Tests** | **Description** |
| Problem and/or exercise solving | |
| Problem and/or exercise solving | |

| **Assessment** | | | | |
|---|---|---|---|---|
| | Description | Qualification | Evaluated Competencess | |
| Autonomous problem solving | *Approach of problems that he student has to resolve of personalised form *out of class to *the wide of him course | 40 | CE27 | CT7 |
| Problem and/or exercise solving | *Approach of questions of *brief answer that he student has to resolve in class in him act of evaluation | 42 | CE27 | |
| Problem and/or exercise solving | *Approach of problems that he student has to resolve in class in him act of evaluation | 18 | CE27 | |

| **Other comments on the Evaluation** |
|---|
| All wools competitions are of type To *and evaluate * of conjoint *form **segun *the *procedures described previously. |

| **Sources of information** |
|---|

**Basic Bibliography**

Juli G. Pausas, **¿QUÉ SABEMOS DE...? Incendios forestales**, CSIC e Catarata, 2012

Vega, J.A. e outros, **Acciones urgentes contra la erosión en áreas forestales quemadas. Guía para su planificación en Galicia. Xunta de Galicia**, 1, Fuegored, 2013

Ricardo Vélez Muñoz, **LA DEFENSA CONTRA INCENDIOS FORESTALES. FUNDAMENTOS Y EXPERIENCIAS**, 5, MCGRAW-HILL, 2009

Stephen J. Pyne e outros, **Introduction to Wildland Fire: Fire Management in the United States**, 9780471549130, 2, John Wiley & Sons Inc, 1996

**Complementary Bibliography**

Arellano, S. e outros, **Foto-Guía de combustibles forestales de Galicia. Versión I**, 1, Andavira, 2016

J.A. Vega, **Manual de queimas prescritas para matogueiras de Galicia**, 1, CMA- Xunta de Galicia, 2001

## Recommendations

**Subjects that it is recommended to have taken before**

Physics: Physics I/P03G370V01102
Physics: Physics II/P03G370V01202
Edaphology/P03G370V01302
Forestry/P03G370V01401

## Contingency plan

**Description**

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

* Teaching methodologies modified

* Non-attendance mechanisms for student attention (tutoring)

* Modifications (if applicable) of the contents

* Additional bibliography to facilitate self-learning

* Other modifications

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Pending tests that are maintained
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Tests that are modified
[Previous test] => [New test]

* New tests

* Additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Quality control and prevention of occupational hazards in the forestry industry** | | | | |
| Subject | Quality control and prevention of occupational hazards in the forestry industry | | | |
| Code | P03G370V01804 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 4th | 2nd |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Bartolome Mier, Javier | | | |
| Lecturers | Bartolome Mier, Javier | | | |
| E-mail | jbartolome@uvigo.es | | | |
| Web | http://www.forestales.uvigo.es | | | |
| General description | Introduction to the systems of guarantee of the quality and of management of labour risks. Methods of continuous improvement | | | |

| Competencies | |
|---|---|
| Code | |
| CE39 | Ability to know, understand and use the principles of quality control in the forest industry. |
| CE40 | Ability to know, understand and use the principles of industrial safety and hygiene. |
| CT5 | Capacity for information management, analysis and synthesis |
| CT8 | Ability to solve problems, critical reasoning and decision making |

| Learning outcomes | | |
|---|---|---|
| Learning outcomes | | Competences |
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>14R. 2018 Capacity to apply norms of engineering in the his speciality.<br>15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering.<br>16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context.<br>17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions<br>18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions. | CE39<br>CE40 | CT5<br>CT8 |

| Contents | |
|---|---|
| Topic | |
| 1.- Forest industry and quality | 1.1. General concepts |

| | |
|---|---|
| 2.- General concepts of the quality | 2.1 Definition of quality<br>2.2. Definition of Systems of quality<br>2.3.-Evolution of the systems of quality<br>2.4. Profits of the quality<br>2.5. Organisational model of the quality<br>2.6. Commitment of the direction<br>2.7. Human team |
| 3.- Norms ISO 9001: 2008 and ISO 9004: 2009 | 3.1 Aims<br>3.2. Scope<br>3.3. Approach<br>3.4. Points of norm |
| 4.- As implant a system of quality | 4.1. Phases of the implantation of a system of management<br>4. 2. Process of the certification<br>4.3. Orientation to the management by processes<br>4.4. Management of the improvement of a process |
| 5.- Audits of Quality | 5.1. Definition of audit<br>5.2. Types of audit<br>5.3. Process of audit<br>5.4.Team of audit<br>5.5. Preparation of the audit<br>5.6. Development of the audit.<br>5.7. Report of audit |
| 6.- The marked CE of wooden products for employment in the construction | 6.1. Realisation of the marked CE of products. Phases of the process |
| 7.- Foundation of the technicians of improvement of the conditions of work. | 7.1.- Technical of prevention of labour risks.<br>7.2.- Norma and signaling in security.<br>7.3.- Collective and individual protection<br>7.4.- Plans of emergency and autoprotection.<br>7.5.- Toxic and dangerous waste<br>7.6.- Installations against foresty fire. |
| 8.- Security in the work | 8.1.- Accidents of Work<br>8.2.- Analysis and general evaluation of the risk of accident. |
| 9.- Industrial hygiene. | 9.1.- Concepts and aims.<br>9.2.- Normative legal specific.<br>9.3.- Physical agents; noise, vibrations<br>9.4.- Biological agents<br>9.5.- Medicine of the work: Pathologies of labour origin.<br>9.6.- first aid And first helps.<br>9.7.-.- Ergonomics and psicosycology |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Case studies | 6 | 10 | 16 |
| Studies excursion | 4 | 2 | 6 |
| Lecturing | 34 | 72 | 106 |
| Problem and/or exercise solving | 2 | 20 | 22 |

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

**Methodologies**

| | Description |
|---|---|
| Case studies | Seminars of approach and resolution of practical cases with oral presentation |
| Studies excursion | Knowledge of the implantation of systems of quality in companies of transformation of the wood |
| Lecturing | Explanation Of theoric concepts and exemplifications |

**Personalized assistance**

| Methodologies | Description |
|---|---|
| Lecturing | |
| Case studies | |

**Assessment**

| | Description | Qualification | Evaluated Competencess |
|---|---|---|---|
| Case studies | *Participacion Active in the *resolucion of the supposed *practicos that pose | 10 | CE39<br>CE40 |

| | | | |
|---|---|---|---|
| Studies excursion | Presentation of the memory of the visits realised | 10 | CE39<br>CE40 |
| Lecturing | *Paricipacion Active in the debates that pose | 10 | CE39<br>CE40 |
| Problem and/or exercise solving | *Valoracion Of the knowledge of the matter in *funcion to the questions realised | 70 | CE39<br>CE40 |

**Other comments on the Evaluation**

Calendar of examinations:

First Announcement: 20 May 2020, 16.00 Hours
Second Announcement: 10 July 2020 16.00 Hours

The official dates and the possible modifications are exposed in the official board of the *EE Forest and in the web

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

**Recommendations**

**Subjects that continue the syllabus**

Environmental Engineering/P03G370V01609

**Subjects that are recommended to be taken simultaneously**

Primary wood processing industries/P03G370V01706

**Other comments**

Eligible subject for dual training projects as established by the memory of the degree.

**Contingency plan**

**Description**

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
* Teaching methodologies maintained

* Teaching methodologies modified

* Non-attendance mechanisms for student attention (tutoring)

* Modifications (if applicable) of the contents

* Additional bibliography to facilitate self-learning

* Other modifications

=== ADAPTATION OF THE TESTS ===
* Tests already carried out
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Pending tests that are maintained
Test XX: [Previous Weight 00%] [Proposed Weight 00%]
...

* Tests that are modified
[Previous test] => [New test]

* New tests

* Additional Information

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Chemical industries of the wood, cellulose, pulp and paper** | | | | |
| Subject | Chemical industries of the wood, cellulose, pulp and paper | | | |
| Code | P03G370V01805 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 4th | 2nd |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Lorenzo Fouz, David | | | |
| Lecturers | Valero Gutiérrez del Olmo, Enrique María | | | |
| E-mail | davidlorenzofouz@gmail.com | | | |
| Web | | | | |
| General description | | | | |

| Competencies | |
|---|---|
| Code | |
| CG1 | Ability to understand the biological, chemical, physical, mathematical and representation systems necessary for the development of professional activity, as well as to identify the different biotic and physical elements of the forest environment and renewable natural resources susceptible to protection, conservation and exploitations in the forest area. |
| CG11 | Ability to characterize the anatomical and technological properties of wood and non-timber forest raw materials, as well as the technologies and industries of these raw materials. |
| CE37 | Knowledge of the basic principles of the chemical transformation of wood and its industrial processes, in particular cellulose and paper. |
| CT2 | Ability to communicate orally and written in Spanish or in English |
| CT5 | Capacity for information management, analysis and synthesis |
| CT10 | Autonomous Learning |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | | | |
|---|---|---|---|
| 2R. 2018 Knowledge and understanding of the disciplines of engineering of the his speciality, to the necessary level to purchase the rest of the competitions of the qualifications, including notions of the last advances.<br>3R. 2018 Be conscious of the multidisciplinary context of the engineering.<br>4R. 2018 Capacity to #analyze products, processes and complex systems in the his field of study; choose and apply analytical methods, of calculation and experimental *relevantes of form *relevante and interpret correctly the results of these analyses.<br>5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; choose and apply analytical methods, of calculation and experiments properly established; Recognize the importance of the social restrictions, of health and security, environmental, economic and industrial.<br>6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality.<br>9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.<br>10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>14R. 2018 Capacity to apply norms of engineering in the his speciality.<br>17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions<br>20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines. | CG1<br>CG11 | CE37 | CT2<br>CT5<br>CT10 |

**Contents**

Topic

| | |
|---|---|
| 1º Part: chemical Industry of the wood: Industry of the paste and of the paper | 1. Paste, paper and cardboard. Requests and sources of fibres *papeleras. Chemical composition of the wood. Behaviour of the fibres *celulósicas.<br>2. Characteristics of the wood. Effect of the morphology of the fibres on the properties of the paper. Identification of wooden species.<br>3. The resources of the wood. Measure of the wood for paste. Preparation of the wood for the manufacture of cellulose. Control of quality of the *astillas.<br>4. Processes of obtaining of pastes. Mechanical pastes, chemical, *semiquímicas and pastes to dissolve. Comparison of pastes and applications of the same.<br>5. The process to the sulphate. Definition of terms and description of the process *kraft. System of recovery of the chemical products. Chemistry of the process *kraft and variables that affect to the cooking to the sulphate.<br>6. Teams of cooking. Discontinuous and continuous digesters. *Deslignificación Widespread.<br>7. Treatment of the pastes: *Desfibrado, elimination of knots, wash, classification of pastes, thickened, pumping, stored, mixed, dried, cut and *apilado.<br>8. Recovery of the bleaches of cooking. Evaporation. Boiler of recovery. *Caustificación. Calcination. Recovery of by-products.<br>9. Bleaching of pastes. Sequences *ECF and *TCF. Stages of bleaching. Closing of circuits.<br>10. Economy and strategy of operation of a factory of pastes. Control of costs.<br>11. Preparation of the paste for the manufacture of the paper: Disintegration, *refinado, measure and mix of the composition.<br>12. Utilisation of secondary fibres. Disintegration of the *papelote and *destintado.<br>13. Additives no fibrous in the manufacture of the paper.<br>14. Manufacture of the paper  splits humid and dry part.<br>15. Reduction of the aqueous and atmospheric pollution in the industry *celulósica and *papelera |
| 2º Part: Other forest chemical industries | 16. Derived of the cellulose.<br>17. Extracts of the wood and his applications.<br>18. Resinación. Resin.<br>19. Sacarificación Of the wood. *Bioetanol.<br>20. Biorefinerías. |

**Planning**

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Lecturing | 26 | 54 | 80 |
| Laboratory practical | 23 | 20 | 43 |
| Studies excursion | 4 | 10 | 14 |
| Case studies | 1 | 5 | 6 |
| Problem solving | 1 | 5 | 6 |

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

**Methodologies**

| | Description |
|---|---|
| Lecturing | *impartira Teaching *magistral with exercises type |
| Laboratory practical | They made you practise and it presented memory of the same |
| Studies excursion | They made visit to company |
| Case studies | *hara Study of cases |
| Problem solving | *resolveran Problems out of the classroom |

**Personalized assistance**

| Methodologies | Description |
|---|---|
| Lecturing | |
| Laboratory practical | |
| Studies excursion | |
| Case studies | |

**Assessment**

| | Description | Qualification | Evaluated Competencess | | |
|---|---|---|---|---|---|
| Lecturing | | 70 | CG1<br>CG11 | CE37 | |
| Laboratory practical | | 10 | CG11 | CE37 | |
| Studies excursion | | 10 | CG11 | | CT2<br>CT5<br>CT10 |
| Problem solving | | 10 | | | CT2<br>CT5 |

**Other comments on the Evaluation**

**Sources of information**

**Basic Bibliography**

**Complementary Bibliography**

**Recommendations**

**Other comments**

Eligible subject for dual training projects as established by the memory of the degree.

**Contingency plan**

**Description**

=== EXCEPTIONAL PLANNING ===

Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===

* Teaching on line

Use of institutional on-line teaching platform Campus Remoto in a synchronous way for the theoretical classes including basics, foundations, as well as general guidelines for resolution of problems and practical cases. Specific didactic materials adapted for on line teaching will be prepared e.g. Video or presentations, graphic resources, software, etc. All the resources will be available through FAITIC platform.

* Mechanism face-to-face of attention to the students (tutorials)

Personalized attention. Communication by email or another on-line tool. Tutorials via Campus Remoto platform.

=== ADAPTATION OF The EVALUATION ===

On-line tests and tasks via Campus Remoto and Faitic. The weight of the tests will be maintained as they are described in the main guide.

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Internships: Internships** | | | | |
| Subject | Internships: Internships | | | |
| Code | P03G370V01981 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 6 | Optional | 4th | An |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Picos Martín, Juan | | | |
| Lecturers | Picos Martín, Juan | | | |
| E-mail | jpicos@uvigo.es | | | |
| Web | http://http://transferencia.uvigo.es/transferencia_gl/practicas/ | | | |
| General description | http://transferencia.uvigo.es/opencms/export/sites/transferencia/transferencia_gl/documentos/instrucion_curriculares.pdf | | | |

| Competencies | |
|---|---|
| Code | |
| CE41 | Ability to carry out the professional tasks of the degree in the field of individual and team work, applying, according to the practice in question, some of the techniques and skills that, by way of example and without being exclusive, they are cited in the verification memory. |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |
| 6R. 2018 Capacity to project, design and develop complex products (pieces, component, products finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project.<br>7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering.<br>9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality.<br>11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality.<br>12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality.<br>13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality.<br>14R. 2018 Capacity to apply norms of engineering in the his speciality.<br>15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering.<br>16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context.<br>17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions<br>18R. 2018 Capacity to manage activities or technical projects or complex professionals of the his speciality, assuming the responsibility of the takes of decisions.<br>19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general.<br>20R. 2018 Capacity to work effectively in national and international contexts, individually and in team, and cooperate with the engineers and people of other disciplines.<br>21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life. | CE41 |

| Contents | |
|---|---|
| Topic | |
| The contents of the practical will be posed in each particular case by the School of Forest Engineering and the organisation and will attend to the acquisition by part of the student practitioner of some general and specific competitions related in this description of matter. | They developed any practical activity related with the degree |

| | |
|---|---|
| Professional activity of the student by the respective organisation that offer the practice. | They will be able to in practice the competitions purchased in the degree |

## Planning

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Practicum, External practices and clinical practices | 0 | 150 | 150 |

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

## Methodologies

| | Description |
|---|---|
| Practicum, External practices and clinical practices | The contents of the practical will be posed in each particular case by the School of Forest Engineering and the organisationand will attend to the acquisition by part of the student practitioner of some general and specific competitions related in this description of matter. |

## Personalized assistance

| Methodologies | Description |
|---|---|
| Practicum, External practices and clinical practices | The student will have a tutor in the centre and one in the company |

## Assessment

| | Description | Qualification | Evaluated Competencess |
|---|---|---|---|
| Practicum, External practices and clinical practices | | 100 | CE41 |

## Other comments on the Evaluation

The positive evaluation of the realisation of the practice will take place on the base of a favourable report issued by the organisation of received of the student practitioner. Anyway the student will have to present to the Direction of the School of Forest Engineering a memory summary of the practice realised

## Sources of information

### Basic Bibliography

### Complementary Bibliography

## Recommendations

### Other comments

The fixed competition worked is the *CE41, apart from this the tutor marked the others competitions worked that will depend on the practices realised and will be able to be in the group of the general, transversal and specify.
GENERAL COMPETITIONS: *CG1-*CG14
TRANSVERSAL COMPETITIONS: *CT1-*CT10
SPECIFIC COMPETITIONS: *CE1-*CE40

Eligible subject for dual training projects as established by the memory of the degree.

## Contingency plan

### Description

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION ===
In case of activation of health alert periods, internships will be subject to the prescriptions of health and academic authorities. If it is possible to carry out totally or partially activities in on-line mode (remote work) it will be taken into account to be poteltially applied during health alert periods.

| IDENTIFYING DATA | | | | |
|---|---|---|---|---|
| **Final Year Dissertation** | | | | |
| Subject | Final Year Dissertation | | | |
| Code | P03G370V01991 | | | |
| Study programme | (*)Grao en Enxeñaría Forestal | | | |
| Descriptors | ECTS Credits | Type | Year | Quadmester |
| | 12 | Mandatory | 4th | 2nd |
| Teaching language | Spanish<br>Galician | | | |
| Department | | | | |
| Coordinator | Valero Gutiérrez del Olmo, Enrique María | | | |
| Lecturers | Valero Gutiérrez del Olmo, Enrique María | | | |
| E-mail | evalero@uvigo.es | | | |
| Web | http://www.forestales.uvigo.es/sites/default/files/Reg%20TFG%20Enx%20Forestal%20APROBADO%20comisi%C3%B3n%20Permanente%207_3_13.pdf | | | |
| General description | The Final Dissertation (FD) is a personal and original work that each student has to elaborate under supervision, and is meant to show an integrated achievement of the knowledge and competences associated to the studies.<br>1) Ability to develop the methodology of a project and formulate a plan of work related with any of the fields of the Forestry / Forestry Engineering;<br>2) Ability to execute the work projected;<br>3) Ability to present and defend publicly the FD<br>The Academic Commission of the Faculty is the body in charge of approving the assignments and to program the FD defense | | | |

| Competencies | |
|---|---|
| Code | |
| CB1 | That students possess and understand knowledge that provides a basis or opportunity to be original in the development and / or application of ideas, often in a research context |
| CB2 | That students know how to apply acquired knowledge and their capacity to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study |
| CB3 | That students are able to integrate knowledge and face the complexity of making judgments based on information that, being incomplete or limited, includes reflections on social and ethical responsibilities linked to the application of their knowledge and judgments |
| CB4 | That the students know how to communicate their conclusions -and the knowledge and ultimate reasons that sustain them- to specialized and non-specialized audiences in a clear and unambiguous way |
| CB5 | That students have the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous. |

| Learning outcomes | |
|---|---|
| Learning outcomes | Competences |

| | |
|---|---|
| 5R. 2018 Capacity to identify, formulate and resolve problems of engineering in the his speciality; | CB1 |
| choose and apply analytical methods, of calculation and experiments properly established; | CB2 |
| Recognize the importance of the social restrictions, of health and security, environmental, | CB3 |
| economic and industrial. | CB4 |
| 6R. 2018 Capacity to project, design and develop complex products (pieces, component, products | CB5 |
| finished, etc.), processes and systems of the his speciality, that fulfil the requirements established, including the knowledge of the social aspects, of health and environmental security, economic and industrial; as well as select and apply methods of appropriate project. | |
| 7R. 2018 Capacity of the project using any knowledges advanced of the his speciality in engineering. | |
| 8R. 2018 Capacity to realize bibliographic researches, consult and use databases and other sources of information with discretion, to realize @simulación and analysis with the objective to realize investigations on technical subjects of the his speciality. | |
| 9R. 2018 Capacity to consult and apply codes of good practices and security of the his speciality. | |
| 10R. 2018 Capacity and capacity to project and realize experimental investigations, interpret results and obtain conclusions in the his field of study. | |
| 11R. 2018 Understanding of the techniques and methods of analysis, project and applicable investigation and his limitations within the scope of the his speciality. | |
| 12R. 2018 practical Competition to resolve complex problems, realize complex projects of engineering and realize specific investigations stop his speciality. | |
| 13R. 2018 Knowledge of the application of materials, teams and tools, technological processes and of engineering and his limitations within the scope of the his speciality. | |
| 14R. 2018 Capacity to apply norms of engineering in the his speciality. | |
| 15R. 2018 Knowledge of the social implications, of health and security, environmental, economic and @industrial of the practice in engineering. | |
| 16R. 2018 general Ideas on economic questions, organisational and of management (how management of projects, management of risks and change) in the industrial and entrepreneurial context. | |
| 17R. 2018 Capacity to collect and interpret data and handle complex concepts inside the his speciality, to issue judgements that involve a reflection on ethical and social questions | |
| 19R. 2018 Capacity to communicate of effective way information, ideas, problems and solutions in the field of the engineering and with the society in general. | |
| 21R. 2018 Capacity to recognize the need of a continuous training and realize this activity of independent way during his professional life. | |

## Contents

| Topic | |
|---|---|
| The student will have to present in the term of 15 skillful days from dates it of ending of the term of enrollment corresponding to the second semester a Proposal of TFG. | Said proposal will have to include like minimum:<br><br>a) An explanatory memory of the project that pretends realise, that include Title, antecedents, justification of the need that tries cover or solution to the problem posed, aims, technology to employ and results expected.<br><br>b) Methods, systems or mechanical tools, electronic the computer, material, machinery or other resources, foreseen in the realisation of the TFG.<br><br>c) In its case, graphic or cartographic support of the place where pretends realise the TFG.<br><br>d) Time estimated or schedule for the realisation of the TFG.<br><br>e) Proposal of Tutor |

## Planning

| | Class hours | Hours outside the classroom | Total hours |
|---|---|---|---|
| Mentored work | 0 | 300 | 300 |

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

## Methodologies

| | Description |
|---|---|
| Mentored work | See Regulation TFG |

## Personalized assistance

## Assessment

| Description | Qualification | Evaluated Competencess |
|---|---|---|

## Other comments on the Evaluation

## Sources of information

**Basic Bibliography**

**Complementary Bibliography**

## Recommendations

## Contingency plan

**Description**

=== EXCEPTIONAL PLANNING ===
Given the uncertain and unpredictable evolution of the health alert caused by COVID-19, the University of Vigo establishes an extraordinary planning that will be activated when the administrations and the institution itself determine it, considering safety, health and responsibility criteria both in distance and blended learning. These already planned measures guarantee, at the required time, the development of teaching in a more agile and effective way, as it is known in advance (or well in advance) by the students and teachers through the standardized tool.

=== ADAPTATION OF THE METHODOLOGIES ===
The remote defense of the FD via the Campus Remoto platform will be available, particularily during health alert periods.