Universitat de Lleida

DEGREE CURRICULUM
PHYSICS

Academic year 2015-16

Subject's general information

Subject name	Physics
Code	101402
Semester	1r Q Avaluació Continuada
Typology	Troncal
ECTS credits	9
Theoretical credits	0
Practical credits	0
Office and hour of attention	A concretar
Department	Medi Ambient i Ciències del Sòl
Modality	Presencial
Important information on data processing	Consult this link for more information.
Language	Catalan: 30% Spanish: 70%
Degree	Degree in Architectural Technology
Office and hour of attention	A concretar
E-mail addresses	daniel.chemisana@macs.udl.cat jbarrufet@macs.udl.cat

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Jordi Barrufet Barque

Subject's extra information

The subject is in the 1st semester of the 1st year of teaching. It belongs to the module of "Basic Training", specifically in the field "Scientific Fundamentals".

Learning objectives

See competences

Competences

University of Lleida strategic competences

- Correctness in oral and written language.
    - Interpreting the data obtained in an experiment and draw conclusions
    - Derive and determining a requirement set forth in the problems

Degree-specific competences

- Aptitude to use applied knowledge tied with numeric and infinitesimal calculus, lineal algebra, analytical and differential geometry and the probabilistic and stadistical analysis probabilistic techniques and methods.
    - Set the basic mathematical models out of solid and fluid mechanics, electrical and thermal circuits
    - Interpreting the data obtained in an experiment and draw conclusions
    - Apply appropriate mathematical tools to solve numerical problems
    - Reasoning the numerical results of the issues by applying physical concepts

- Applied knowledge of the principles of general mechanics, static mechanics of structural systems, geometry of masses, principles and methods of the analysis of the elastic behaviour of solids.
    - Extract and understand the basic content of a problem in terms of the fundamental principles of mechanics

Degree-transversal competences

- Ability to reunite and interpret relevant data, inside an area of study, to express reasons which include reflecting upon relevant subjects of a social, scientific or ethical nature.
    - Reasoning the numerical results of the issues by applying physical concepts
    - Derive and determining a requirement set forth in the problems
    - Extract and understand the basic content of a problem in terms of the fundamental principles of mechanics

- Ability for abstraction and critical, logical and mathematical reasoning.
    - Using different mathematical approaches to solve physical problems

- Ability to analyse and synthesise.
    - Interpreting the data obtained in an experiment and draw conclusions

- Reasoning the numerical results of the issues by applying physical concepts
- Derive and determining a requirement set forth in the problems
- Extract and understand the basic content of a problem in terms of the fundamental principles of mechanics

- Ability to resolve problems and elaborate and defend arguments inside an area of study.
  - Reasoning the numerical results of the issues by applying physical concepts
  - Derive and determining a requirement set forth in the problems
  - Extract and understand the basic content of a problem in terms of the fundamental principles of mechanics

Subject contents

Topic 0. Systems of Units and Vectors

Topic 1. - Systemsof forces.

-Moment of forces.

-Torque.

-Resultant of a system of forces.

Topic 2. - DistributedForces.

-Center of gravity and center of mass.

-Moment of inertia.

Topic 3. - Statics.

-Types of support.

-Conditions of equilibrium.

-Analysis of Structures.

-Internal Forces

Topic 4. - Elasticity.

-Elastic properties of solids.

-Deformation bands.

-Hooke's law.

-Strain-rates andtheir calculation.

Topic 5. – Fluid statics.

-Fundamental equation of fluid statics.

-Forces on submerged surfaces.

-Principle of Archimedes.

-Balancing submerged and floating bodies.

Topic 6. - FluidDynamics.

-Continuity equation.

-Bernoulli Theorem.

-Applications and consequences.

-Real fluids.

-Viscosity.Pouseuille-equation.

Topic 7. Direct Current (DC).

-Electricity. Current density.

-Ohm's Law. Electrical resistance.

-Generators and receivers. And counter electromotive electromotive force.

-Association of resistance.

Methods-resolution grids. Leies Kirchhoff.

-Measuring instruments. Voltmeter,ammeter, multimeter.

Topic 8. Altern Corrent (AC).

-Resistors, inductors and capacitorsin AC

-Impedance complex. Phasor diagram. Generalized Ohm's law.

-Parallel and series RLC circuit

-Electrical engineering

Topic 9. Heat andheat transfer

-Temperature, heat and internalenergy

-Thermal expansion

-Conduction, convection and radiation

-Thermal-Circuits

Evaluation

Exámenes:

1er parcial (25%), se realizará en el periodo ordinario.
2° parcial (40%), se realizará en el periodo ordinario.
Recuperación (65%), se realizará en el periodo ordinario.

Prácticas (15%), se realizarán en horario de grupo mediano. Es necesario haber aprobado las prácticas para poder superar la asignatura.

Trabajo (20%). Se realizará en parejadas y se entregará/expondrá al final del curso.

SERÁ NECESARIA UNA NOTA FINAL PROMEDIO DE LOS EXÁMENES DE 3 PARA PODER APROVAR LA ASIGNATURA

Bibliography

BASIC BIBLIOGRAPHY

BEER, F.P., E. RUSELL JOHNSTON,1997: Mecánica vectorial para ingenieros: Estática. Ed.McGraw-Hill.

GERE, J.M,TIMOSHENKO, S.P,1988. Mecánica de materiales. Iberoamérica 4ed.

GILES,R.V., EVETT, J.B., LIU, C., 1994. Mecánica de los fluidos e hidráulica. Ed. Schaum

KLEIN,S.A., 2004. Engineering Equation Solver Manual. F-Chart Software.

MERIAN, I.- 1998 - Estática – Reverté

RAMOS,M.C. , IBAÑEZ, M. 2003. Mecánica para Ingeniería. Problemas. Ediciones de la Universidad de Lleida.Eines 43.

RILEY,W.F., STURGES, L.D. - 1995 - Ingeniería mecánica: Estática - Reverté

CASTELLVÍ,F. et al.,1994: Pràctiques de física - Ediciones UdL.

RECOMMENDED BIBLIOGRAPHY

GONZÁLEZ,F. - 1995 - La física en problemas - Ed. Tebar Flores.

JACKSON,J.H., WIRTZ, H.G. - 1985 - Estática y resistencia de materiales – McGraw Hill

MATAIX, C.1982. Mecància de fluidos y máquinas hidráulicas. Ed. Castillo, 1982

WELLS,D.H., SLUSHER, H.S. - 1984 - Física para ingeniería y ciencias – McGraw Hill

VÁZQUEZ,M., E. LÓPEZ, 1988: Mecánica para ingenieros: Estática. Universidad Politécnicade Madrid. EUIT

Obras Públicas.

TIPLER P.A- 1994: FÍSICA - Ed. Reverté.

SERWAY,W.A., JEWET, J.W. 2003. - 1997: Física - Ed. McGraw-Hill.

SOFTWARE

Dr. Frame2.0. Dr. Software LTD.

Equation engineering solver (EES). F-chart software LTD.