Code: 1651 **Environmental Impact Assessment**
Degree: 2nd cycle – Environmental Engineering
Stream: all
Curricular Year: 1st **Semester Course: 1st**
Credits: 6 ECTS **Compulsory**
Language: Portuguese/English
Responsible: Rui Marçal Campos Fernando
Other lecturer(s): José Manuel Osório de Barros de Lima e Santos, José Paulo Mourão de Melo and Abreu e Maria Teresa Marques Ferreira da Cunha Cardoso
Web Site: http://www.isa.utl.pt/home/node/3780

1. Contact hours
Lectures 35 **Lecture/Practicals** 35 **Others** 14 **Total** 84

2. Objectives:

- To explain the concept of material flow in stationary and dynamic systems
- Students must be able to organize and perform an environmental impact study

3. Programme:

I. Introduction to Environmental Systems Analysis (ESA)
Object and objectives of ESA. ESA of policies/programmes, projects, production units (plants), products or chemicals. Legal frame of the diverse ESA procedures and respective goals. Analytical tools: life cycle analysis; environmental audit; environmental impact analysis; cost-benefit analysis; multi-criteria analysis.
Compared appraisal of the diverse tools. Practical casestudies
II. ESA tools: substance, product and companies approaches
Material flow networks. Function analysis. Substance flow analysis. Life cycle assessment. Environmental management system. Environmental auditing.
III. Environmental impact assessment
Concepts and definitions. Organisation and execution environmental impact assessment (EIA) reports. Indicators of environmental impact and transformation functions. Mitigation, enhancement and compensation measures. Environmental auditing and monitoring. Modelling environmental impacts: concepts, type of models, analysis and simulation. Environmental impact of various projects. Analysis and discussion of example of. EIA reports.
IV. The ESA and environmental decision-making
Aggregation of multiple environmental impacts and other decision criteria (profit, jobs, social acceptance ...). Alternative solutions for the aggregation problem: transformation functions (environmental impact analysis); economic valuation (cost-benefit analysis); and trade-off functions (multicriteria analysis).

4. Bibliography:

Main Bibliography

Carroll, B., Turpin, T. 2003. Environmental impact assessment handbook. A practical guide for planners, developers and communities. Thomas Telford, London.
Glasson, J., Therivel, R., Chadwick, A. 2005. Introduction to environmental impact assessment. Routledge, Oxon.
MIT, 2000. Road Maps: a guide to learning system dynamics. System Dynamic Group, MIT, USA. 2000.
Morris, P., Therivel, R. 2004. Methods of environmental impact assessment. Spon Press, London.
Partidário, M.R., Jesus, J., 2003. Fundamentos de Avaliação de Impacte Ambiental, Universidade Aberta.
Salvador, A.G., Alcaide, A.S., Sánchez, C.C. e Salvador, L.G. 2005. Evaluación de Impacto Ambiental. Pearson-Prentice Hall.
Vesilind, P.A., Morgan, S. 2003. Introduction to environmental engineering. Thomson Learning

Other Bibliography

Garcia, J.M. 2006. Theory and practical exercises of system dynamics. Univ. Politénica Catalunya.
Gómez Orea, D. 2003. Evaluación de impacto ambiental. Un instrumento preventivo para la gestion ambiental. Mundi-Prensa. Madrid

5. Assessment:

Evaluation can be done in two ways:
1) continuous assessment: three evaluation sheets and two compulsory papers, integrators matter given as outlined in class and completed at home.
2) Final exam: with a final score from the average of two compulsory papers and testing on the committee evaluated the schedules above.

6. Estimated Workload:	168	Hours
7. Last Update:	20/7/2010	