Profitability of Energy Projects

- 1. Course number and name: 020RPEES5 Profitability of Energy Projects
- 2. Credits and contact hours: 4 ECTS credits, 2x1:15 contact hours per week
- 3. Name(s) of instructor(s) or course coordinator(s): Said Chehab
- **4. Instructional Materials:** PowerPoint slides; course handouts

5. Specific course information

a. Catalog description:

The aim of this course is to allow students to understand, using economic tools, the profitability of an energy project: Energy Efficiency Measures, Green Energy versus Gray Energy (Useful, Final, Secondary and Primary). Identification of the energy project and the financial package; Notions of Investment and technical and economic lifetimes; Annual Recipes and Earnings; Calculation of the Simple Return Time and return on investment; The energy return time; Simple cumulative profit in cash flow; Subsidy and financial incentives; Inflation; Cost of Energy Improvement; Cost of kWh in cash flow; Concept of discount and calculation of the discount rate; Present value and acquired value; Updated Return Time; Net Present Value (NPV); Internal Rate of Return (IRR); Annual Gains in Constant Annuity (AGCA); Economized Fuel Cost (EFC); Cost of kWh in cash flow and discounted (LCE); Integration of externalities into energy costs; Case studies.

- **b.** Prerequisite: None.
- **c. Selected Elective** for ME students.

6. Educational objectives for the course

a. Specific outcomes of instruction:

A student who successfully fulfills the course requirements will have demonstrated an ability to:

- Apply abilities of critical and integrative thinking in Energy Efficiency applications.
- Resolve efficiency energy problems, with a special focus on the fields of energy engineering and its components, renewable energy, management of such systems.
- Be competitive in the industrial and technological environment.

b. PI addressed by the course:

PI	1.1	2.1	2.2	2.4	7.1	7.2
Covered	X	X	X	X	X	X
Assessed	X	X	X	X	X	X

7. Brief list of topics to be covered

- Profitability of conventional and renewable energy project.
- Evaluation of the profitability of an investment project.
- Technical and economic lifespan of a project.
- The components of an energy investment.
- Integration of environmental impact into project profitability energy.
- Life Cycle Analysis.
- Energy return time.
- Calculation of the cost of CO2 saved.
- Integration of social impact into project profitability.