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.