



UNIVERSIDAD SAN FRANCISCO DE QUITO
SCHOOL: CIENCIAS E INGENIERÍAS
COURSE: INA 4082E - Renewable Energy

COURSE DETAILS:

Credits: 3

Prerequisites: Verify prerequisites in Banner academic system.

Co requirements: The course does not have Co requirements

COURSE DESCRIPTION:

The course imparts specific knowledge of the use of renewable energy and the role of renewable energy resources in actual society. The different resources of renewable energy (hydrogen fuel cells, wind turbines, solar power, hydropower, geothermal power, biomass, ocean, and nuclear fission power plants) are analyzed, both the current state of the technologies and their possible energy contribution in a system. We will briefly discuss some of the consequences of using fossil fuels, such as climate change, air pollution, water pollution and human health and its importance as global energy sources as well as existing and new methods for extracting fossil fuels to produce energy. This course is designed to introduce students to the production and use of energy by humans and how this impacts the environment, human health and Earth's ecosystems. We will discuss energy production and utilization from the biology, engineering, economics, climate science, and social science perspectives.

COURSE LEARNING OUTCOMES:

#	Learning Outcomes	Level
1	Identify differences between existing energy resources, understand their procurement and utilization, and understand their impacts on society and the environment.	Medio
2	Describe the existing and potential future sources of renewable energy, and be able to intelligently analyze reported aspects of the energy and renewable energy fields.	Medio
3	Explain the importance of developing energy efficient and sustainable methods of production as well as how these new technologies can contribute to replacing the diminishing supplies of fossil fuels and our dependence on them.	Medio
4	Describe the food-energy nexus as well as the social and economic impacts of our present energy, food production and use.	Medio



COURSE CONTENTS:

- Energy and Nonrenewable Energy Sources
- Renewable Energy Sources
- Hydrogen fuel cells
- Solar energy / electric vehicles
- Wind power
- Biological energy sources
- Ocean energy
- Hydropower
- Geothermal Energy
- Nuclear Energy
- Climate change politics and renewable energy

METHODOLOGY FOR THE INTEGRATION OF THEORETICAL AND PRACTICAL CONTENTS:

The teaching methodology used to teach all the course at USFQ follow the liberal arts philosophy: encourage dialogue and enable the learning construction through providing opportunities for ideas exchange among teachers and students. It is expected that all the theoretical content courses explore potential applications to the professional practice and work context where students are anticipated to perform through the integration of diverse activities and simulations that foster the contextualized understanding of concepts using reality and professional practice as frames of reference.

HOURS DESCRIPTION OF APPLIED PRACTICE

If this course has declared applied practice hours (laboratories, exercises, field trips, practicums, etc.); the instructor for the theoretical element is responsible for describing how the applied practices hours will be fulfilled and assessed during the semester.

Students must pass or fail both the theoretical and application practice components simultaneously.

All courses with declared applied practice hours must provide students with a written guide detailing the requirements for fulfilling the application practice component.



COURSE ASSESSMENT:

Each instructor is responsible for creating an evaluation scheme that corresponds to the learning outcomes declared for each course. The assessment scheme should be presented in a clear and direct manner, such as a chart that indicates the assessment categories and the elements included in each category; it must indicate the total weight that each category will have on the final grade. Category weights may vary, but under no circumstance can an individual element weigh more than 25% of the final grade. For example, it is acceptable for a "Homework" category to weigh 30% if it includes three tasks that weight 10% each. However, a "Final Exam" category that weighs 30% and only includes one element would be unacceptable.

Some academic areas or specific courses have pre-established assessment parameters. In these cases, all instructors assigned to these courses must follow the pre-determined scheme.

If this course has declared applied practice hours (laboratories, exercises, field trips, practicums, etc.) the assessment of these hours must be incorporated within the course's general assessment scheme.

#	Category	Description	Percentage of final grade

MAIN BIBLIOGRAPHY:

[The main bibliography must be in library in physical or digital format]

- Guerrero-Lemus, Ricardo. author. ZDB-2-ENG Renewable Energies and CO2[electronic resource] :Cost Analysis, Environmental Impacts and Technological Trends- 2012 Edition /by Ricardo Guerrero-Lemus, José Manuel Martínez-Duart. XXIII, 373 p. 214 illus., 210 illus. in color. online resource. (Lecture Notes in Energy, 2195-1284 ; 3)

COMPLEMENTARY BIBLIOGRAPHY:

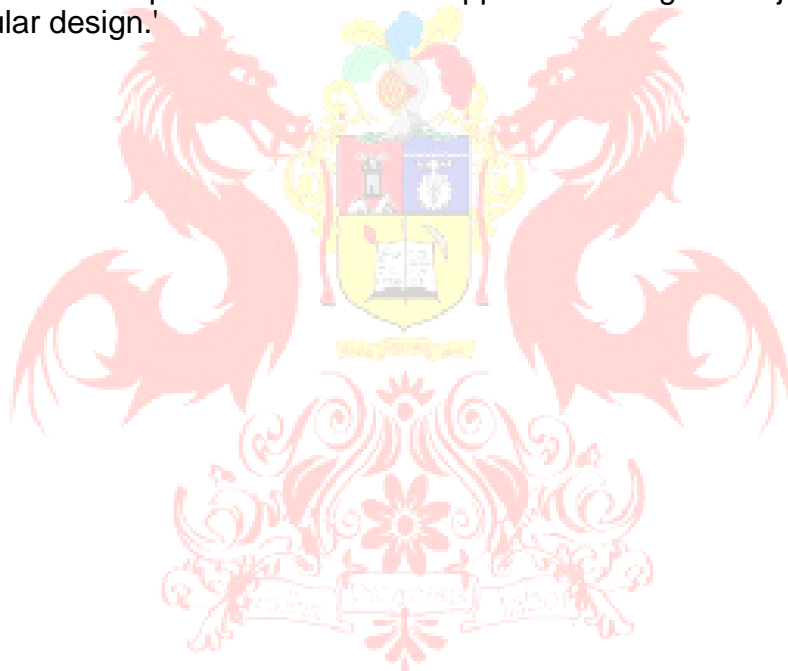
[The complementary bibliography can be digital format]



POLICIES:

All students taking courses at USFQ must follow the ethics of learning, ethics of research and ethics of behavior rules detailed in the [USFQ's Code of Honor and Coexistence](#). All the general policies for the courses offered at USFQ are detailed in the Student's Manual, it can be downloaded in [Manual del Estudiante](#).

This syllabus (Syllabus) was reviewed and approved by the coordination of the academic area or department responsible, so all the parallels that are dictated must be governed by this program. If changes / adjustments to the study program are necessary, you should To the coordination of the academic area or department responsible so that the approved changes / adjustments are reflected in the system of Curricular design.'



Universidad San Francisco de Quito