

Sustainability & Energy Security

1.1 Course Number: MT5211

1.2 Contact Hours: 40 Hours, **Credits:** 11

1.3 Semester-offered: Seventh Semester

1.4 Prerequisite: Basics of Energy

1.5 Syllabus Committee Member: Dr. Sanjay Kumar Kar and Dr. M.S. Balathanigaimani

2. Objective:

- The course lays on innovations, and the enhancement of knowledge of general management and other related sectors namely renewable energy, corporate sustainability, energy efficiency, power, oil and gas, climate change and sustainable development, green buildings, global standards, and energy security.

3. Course Content:

Unit-wise distribution of content and number of lectures

Unit	Topics	Sub-topic	Lectures (Hrs)
1	Technology and Policy Options for GHG Emission Mitigation	Renewable Energy, Energy Efficient Technologies by Sector and End-Use, Cleaner Production, Barriers to GHG Mitigation Technologies, Carbon tax and Tradable Emission Permits, Other Policy Options	10
2	Geopolitics & Energy Security	Introduction to Energy Security, Energy Security: Role of Conventional Energy –Oil & Coal, Geopolitics and Global Energy Scenarios	10
3	Features and Indicators of Energy Security	History of energy security and corresponding definitions and dimensions. Features of quantitative and qualitative indicators for energy security. Different methods for detecting, verifying, and extracting different energy resources as well as geological, environmental, and political constraints in exploitation. Building and characteristics of energy systems	10
4	Urban Energy Use and the Environment	Efficient/cleaner transport options of electric vehicles and their effects on energy use, Environment and GHG emissions, other options to improve energy use and environment in urban areas.	10
		Total	40

4. Readings

4.1 Reference Books:

- R. T. Watson, M. C. Zinyowera, and R. H. Moss (eds.): Technologies, Policies, and Measures for Mitigating Climate Change, IPCC Technical Paper No. 1, Intergovernmental Panel on Climate Change, 1996.
- 5. W.R. Cline: The Economics of Global Warming, Institute for International Economics, Washington, D.C., 1992.

5. Outcome of the Course:

On the completion of this course, the students are expected to:

- Develop understanding of energy industry in general and oil & gas in specific
- Learn about the economic growth and development consequences of transitioning to a sustainable path.
- critically analyse and apply the concept of energy security using different definitions, actors, and dimensions