THE CYPRUS INTERNATIONAL INSTITUTE OF MANAGEMENT
COURSE UNIT DESCRIPTION

Course Unit Title	**Sustainable Energy: Economics, Policy and Management**	
Course Unit Code	GD690	
Type of Unit	Elective	
Level of Course Unit	Second cycle	
Year of Study	First/second year	
Semester	On demand	
Number of ECTS Credits	6 ECTS	
Course Unit Objectives	The objectives of this course are to provide students with a solid understanding of the economics underlying the sustainable energy, the conversion principles and technology behind various renewable energy sources, to examine the policy and the management issues of the sustainable energy market, and to contrast these to the commodity markets for oil and gas. This course builds understanding of the global energy situation, sustainable energy policies, and the market outlook for various energy sources: conventional power generation, wind power, solar energy, oil and natural gas. Drivers of demand, supply and price formation will be explored, including their relationship to resource scarcity, technology and innovation, economic factors, and policy variables. Sustainability is examined by studying global and regional environmental impacts, economics, energy efficiency, consumption patterns and energy policy. The current energy system that encompasses resource extraction, conversion processes and end-uses are covered. Responses to current challenges such as declining fossil fuels and climate change are explored: unconventional fossil fuels, carbon sequestration, emerging technologies (e.g., renewable sources: biomass, wind, and photovoltaics; fuel cells) and end-use efficiency and conservation. Finally, the impact of the sustainable energy technologies and policies on energy markets is analyzed in terms of current and future states for energy supply and demand (trends, challenges, opportunities, projections) from economic, business, and sustainability perspectives.	
Learning Outcomes	On completion of this course students are expected to:	
	CILO 1	Demonstrate awareness of sustainable energy trends, market structures, finances, and investments, and master analytical tools and methods to address questions relating to demand, supply, price formation and policy concerns
	CILO 2	Evaluate the economic behavior and price formation in each market segment and the role of demand-side management in improving energy efficiency
	CILO 3	Explain the principles of operation of the broad spectrum of renewable energy technologies, and conduct resource assessments for a variety of renewable energy technologies
	CILO 4	Describe how modern markets for energy commodities and for RES are structured and regulated including environmental concerns, technologies and policies
	CILO 5	Demonstrate understanding of the impact of energy market developments for industry trends and business cycles and reflect critically on the policy response to global energy developments at global, national and business level
	CILO 6	Critically assess the current economic, technical, and sustainability issues involved in the integration of renewable energy systems.

	CILO 7	Assess the impact of the sustainable energy technologies and policies on energy markets and the oil and gas sector from economic, business and sustainability perspectives	
Name of Lecturer(s)	Dr. Dario Pontiggia		
Mode of delivery	Face to Face		
Prerequisites or corequisites	None		
Course Content	Energy markets: trends, market structures, and finances. Sustainability and energy use. Lifetime of fossil fuels.		CILO 1
	Energy demand, supply and price formation.		CILO 1, 2
	Energy efficiency and demand-side management.		CILO 1, 2
	Energy conversion technologies. Introduction to sustainable energy. Energy systems. Solar energy. Bioenergy. Wind energy. Water power. Geothermal energy.		CILO 3
	Regulation and policy formulation in energy markets: concepts, tools and experience.		CILO 4
	Technological developments, environmental concerns and policy responses. Energy growth analysis and carbon accounting		CILO 5
	Grid integration of renewable energy. Energy storage, and other challenges.		CILO 6
	Impacts of sustainable energy technologies and policies on energy markets and the oil and gas sector. Critical challenges and opportunities for a sustainable energy future.		CILO 7
Recommended or required reading	**Textbooks** Chu, S. and A. Majundar "Opportunities and Challenges for a Sustainable Energy Future" Nature (2012) 488.7411: 294-303Press, 2012. Subhes C. Bhattacharyya, *Energy Economics: Concepts, Issues, Markets and Governance* by (2019, Springer, SBN 978-1-4471-7468-4) Boyle, Godfrey. *Renewable Energy: Power for a Sustainable Future*, Third Edition. Oxford University Press, 2012. Tester, et al. *Sustainable Energy, Choosing Among Options*, 2nd Edition. MIT Press, 2012. **Journal articles** Chu, S. and A. Majundar "Opportunities and Challenges for a Sustainable Energy Future" Nature (2012) 488.7411: 294-303Press, 2012. **Online Sources** Global Energy Assessment Toward a Sustainable Future Key Findings Summary for Policymakers Cambridge University Press xii – xviii. http://www.iiasa.ac.at/Research/ENE/GEA/doc/GEA-Summary-web.pdf Energy Technology Perspectives: Catalysing Energy Transformations, Executive Summary. IEA 2017. https://www.iea.org/publications/freepublications/publication/EnergyTechnologyPerspectives2017ExecutiveSummaryEnglishversion.pd Building a Sustainable Energy Future National Science Foundation (2009) http://www.nsf.gov/nsb/publications/2009/comments_se_report.pdf		

Planned learning activities and teaching methods	Lectures; in-class discussion and debates; in-class exercises; problem sets; team work; case studies, team presentations, interactive online learning via Moodle (quizzes, assignments, forums)
Assessment methods and criteria	Class Participation:30% (including online quizzes, case studies and/or in-class group work) In-class Exam: 70%
Language of Instruction	English
Work Placement(s)	Not applicable