



Code	Title
5.1	Energy and Sustainable development
ECTS/Credits	Language
Up to 12 ECTS	English

<i>Specific teaching Objectives of the course/Learning outcomes (Dublin Descriptors)</i>
<i>a. Knowledge and Understanding</i>
At the end of the course, students should be able to: 1. Understand the definition of sustainable development; 2. Understand the interdependence between renewable energy, environment and sustainable development; 3. Integrate renewable energy projects and environmental impact assessment; 4. Explore mechanisms for optimal utilization of renewable energy resources for sustainable development; 5. Acquire the knowledge and understanding of different Energy policy at national and international levels.
<i>b. Applying knowledge and understanding</i>
At the end of the course, students should be able to: 1. Use the linkage between renewable energy and environment in sustainable development; 2. Develop renewable energy projects; 3. Conduct environmental impact assessment for renewable energy projects; 4. Apply the environmental policy for renewable energy development; 5. Use renewable energy models in designing relevant sustainable development policies.
<i>c. Making Judgements</i>
At the end of the course, students should be able to: 1. Develop understanding of energy sector and its significance to the countries welfare and economics; 2. Design energy strategy in a global concept of sustainable development.
<i>d. Communication skills</i>
At the end of the course, students should be able to: 1. Illustrate the concept of Sustainable Development; 2. Explain the meaning of Sustainable Development Goals; 3. Demonstrate the sustainability of a technical decision and/or solution; 4. Write technical reports.
<i>e. Learning skills</i>
At the end of the course, students should be able to: 1. Enhance learning skills through application of knowledge attained in case studies, projects work assignments; 2. Use platform as Moodle and Google class.



<i>Main topics</i>			
	Estimated number of hours		
	Lectures	Laboratory	Tutorial
INTRODUCTION			
<ol style="list-style-type: none"> 1. Definition of Sustainable Development 2. Overview on UN Sustainable Development Goals <ol style="list-style-type: none"> a. What are SDGs, SDG indicators b. Tracking Progress towards SDGs c. National development plan as a strategy tool 3. Relation between sustainable development and energy: Energy security, energy equity, energy sustainability 4. Problems of current energy systems in relation to sustainability 5. Factors driving energy development 6. Renewable energy and Development indicators 7. Challenges and opportunities for renewable energy development 8. Analysis of scenarios of energy systems in both developing and developed nations 			
CHAPTER 1			
SUSTAINABLE DEVELOPMENT <ol style="list-style-type: none"> 1. Definitions of concepts 2. Theories and genesis of sustainable development 3. The Values of Sustainable Development 4. Principles for sustainable development 5. Pillars of sustainable development 6. Indicators of sustainable development and Sustainable indicator framework 7. Sustainable Development versus sustainability 8. Measures for sustainable development 9. Sustainability concerns in today's development 10. Social, economic and environmental aspects of Sustainable development 11. Sustainable Agriculture 12. Energy sources for Sustainable Livelihoods 13. Challenges of achieving sustainable Development 			
CHAPTER 2			
SUSTAINABLE ENERGY <ol style="list-style-type: none"> 1. SDG 7 "Affordable and clean energy" 2. Energy sources: conventional and renewable 			



<ol style="list-style-type: none"> 3. Energy Indicators, Energy pillars, Production, consumption (Present situation, Forecasts & Energy reserve) 4. Energy Balance and share of renewable energy in the global energy mix 5. Environmental impacts of energy and Lifecycle Analysis 6. Access to energy services, energy distribution 7. Energy efficiency 8. Economic Growth 9. Cost benefit analysis approach - selected energy technologies/systems 				
CHAPTER 3				
SUSTAINABLE CITIES <ol style="list-style-type: none"> 1. SDG 11 “Sustainable Cities and Communities” 2. Public transport and electric solutions 3. Air quality 4. Urban waste management 5. Efficiency in buildings: NZEB and retrofit solutions* 				
CHAPTER 4				
CLIMATE CHANGE <ol style="list-style-type: none"> 1. SDG 13 “Climate Action” 2. Causes and Impacts 3. Climate change consequences 4. Law, policies and human rights 5. Possible solutions 				
CHAPTER 5				
SUSTAINABLE ECONOMY <ol style="list-style-type: none"> 1. Circular economy 2. Social and environmental circularity 3. Green jobs 				
CHAPTER 6				
SUSTAINABILITY AND SOCIETY <ol style="list-style-type: none"> 1. Environment and social management system (ESMS) 2. Social and environmental assessment (SEA) 3. Social and environmental standards 4. Environment policy regulation control, Political Ecology 5. Environmental Justice 6. Environmental conflicts 7. Environmental modeling and monitoring 8. Welfare and natural resource economics of the Environment 9. Urbanization (towns, factories, markets, roads) 10. Ethics and social cultural aspects related to energy 				



(attitude, willingness to pay, systems uptake etc)			
11. Case studies of environmental and social cultural assessment of selected energy technologies/systems			

<i>Course description</i>
<p>In this course, the interrelation of energy, that is renewable and non-renewable with the environment reflecting of the sustainability aspects such as economic, environmental, technical, socio-cultural among others will be handled. In the economic aspect, costs and investment considerations for energy systems will be elaborated while, impact on environment from various energy systems will be considered in environmental assessment. Given that this energy generated would be used by people, incorporation their attitudes, culture etc. are crucial in promoting acceptance of the systems, hence socio-cultural assessments. Meanwhile, understanding of system technical aspect reflected through functionality, flexibility, adaptability among others is pertinent in enabling design, installation and operation of the Energy systems. Additionally, other “soft” aspects such as policy and relevant regulatory framework will also be expounded on in this course since existence of relevant laws and regulations influence dissemination of energy.</p>

