

PROPOSED COURSE OUTLINE TEMPLATE FOR STUDENTS AT NTU

Academic Year	2017-2018	Semester	1
Course Coordinator	Tuti Mariana Lim		
Course Code	EM5105		
Course Title	Energy Resources Management		
Pre-requisites	Year 3 Standing		
No of AUs	3		
Contact Hours	Lecture: 36 hrs; Tutorial: 3 hr		
Proposal Date	30 November 2016		

Course Aims

This course aims to provide you with a general understanding of the various sources of energy; their availability, quality and impact on the environment; and economic growth in the context of sustainable development (3Es). It offers you the opportunity to examine the issues, trends, challenges and technologies relating to energy resource management particularly on the affordances of non-renewable energy sources.

Intended Learning Outcomes (ILO)

At the end of this module, the students should be able to:

1. Explain current energy supply and demand situations;
2. Apply basic knowledge of the various sources of energy;
3. Describe the impact of energy on the human health and the environment;
4. Assess various legislative and regulatory approaches to a sustainable energy management;
5. Evaluate alternative energy solutions that are sustainable.

Course Content :

This introductory course provides an overview of energy resources management in the context of sustainable economic development. Topics include energy and human society, energy resources and reserves, supply, distribution, utilization, recovery and conversion, environmental impacts of energy utilization, energy economics and policies.

Course Outline :

S/N	Topic	Lecture Hrs	Tutorial Hrs
1.	Introduction to Energy, Technology and Human Society	2	
2.	Energy Resources, Production and Consumption	3	
3.	Energy Economics: Effect on Industry & National Economy	2	1
4.	Energy: Effect on Environment	5	
5.	Energy: Policy & Regulation	2	
6.	Energy Efficiency: Trends, Benchmarking, Auditing & Incentives	2	1
7.	Energy Management: Efficient Energy Conversion Technology	5	
8.	Energy Management: Cleaner Production & Energy Conservation	3	

9.	Energy Management: Renewable Energy (Biomass, Wind, Geothermal, Tidal, Solar and Hydropower)	12	1
Total:		36	3

Assessment (includes both continuous and summative assessment)

Component	Course LO Tested	Related Programme LO or Graduate Attributes	Weighting	Team / Individual	Assessment rubrics
1. Final Examination	1, 2, 3, 4, 5	EAB SLOs e, f, g, j, k, l	60%	Individual	
2. Quiz	1, 2, 3, 4, 5	EAB SLOs e, f, g, j, k, l	20%	Individual	
3. Group Project and Presentation	1, 2, 3, 4, 5	EAB SLOs e, f, g, i, j, k, l	20%	Team	Appendix 1
Total			100%		

Part A - Continual Assessment (40%) consist of,

(1) 1 quiz (20%)

- Will be conducted in the second half of the Teaching Week to evaluate learning outcomes. Questions are designed to test students' understanding of basic concepts and principles as well as their ability in applying them in real application scenarios.

(2) A group-based project (20%)

- The project is to test students' ability in understanding and applying basic concepts and principles in environmental sustainability. Students will be given a list of topics in energy in relation to environmental sustainability and each group (3-5 students) will pick one or come up with their own topic. Each group will be required to conduct a literature survey and present their work in a final report. The reports will be circulated to all groups to enable them to share their findings to all students.

Part B - Examination (60%)

- Examination covers topics taught in all 13 Teaching Weeks. Questions are designed to test students' ability in understanding and applying basic concepts and principles in energy resources management.

Formative feedback

The quiz questions will be discussed one week after and you will be able to view their quiz results individually through Blackboard Grade Centre.

Each group will submit your comment with respect to other groups' presentations to the course instructor by email. The group project and presentation results will be released through Blackboard Grade Centre.

Learning and Teaching approach

Class meets once per week over 3 hours in lecture and tutorials format

Approach	How does this approach support students in achieving the learning outcomes?
Lecture	Formal lectures on topics with in-class discussions
Tutorials	This helps you to understand the concept taught during lectures as well as promote life-long learning
Group Report	This helps you to achieve one or more of the outcomes as you need to do self-study and research as well as promote team works.

Textbooks :

1. J.A. Fay and D.S. Golomb: "Energy and the Environment", Oxford, 2002
2. Edward S. Cassedy and Peter Z. Grossman: "Introduction to Energy: Resources, Technology & Society", 2nd Edition, Cambridge Press, 2003.

References :

1. Harold H. Schobert: "Energy & Society", Taylor & Francis, 2002
2. Noel De Nevers: "Air Pollution Control Engineering", 2nd Edition, McGraw Hill, 2000
3. US Department of Energy: www.eia.doe.gov
4. UN Intergovernmental Panel on Climate Change (IPCC): www.ipcc.ch

Course Policies and Student Responsibilities

(1) General

Students are expected to take all scheduled assignments and tests by due dates. Students are expected to take responsibility to follow up with course notes, assignments and course related announcements. Students are expected to participate in all group project discussions and activities.

(2) Absenteeism

Valid reasons include falling sick supported by a medical certificate and participation in NTU's approved activities supported by an excuse letter from the relevant bodies. There will be no make-up opportunities for in-class activities.

Academic Integrity

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the [academic integrity website](#) for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Course Instructors

Instructor	Office Location	Phone	Email
Tuti Lim	N1-1b-39	6790-5269	tlim@ntu.edu.sg

Planned Weekly Schedule

S/N	Topic	Course LO	Readings/ Activities
1.	Introduction to Energy, Technology and Human Society	1 & 2	Reading ppt slides Video lecture Grouping for project
2.	Energy Resources, Production and Consumption	1 & 2	Reading ppt slides Video lecture Grouping for project
3.	Energy Economics: Effect on Industry & National Economy	1 & 2	Reading ppt slides Video lecture
4.	Energy: Effect on Environment	1, 2 and 3	Reading ppt slides Video lecture Group Project Topic Selection
5.	Energy: Policy & Regulation	4	Reading ppt slides Video lecture Tutorial Group Project Topic Allocation
6.	Energy Efficiency: Trends, Benchmarking, Auditing & Incentives	4 & 5	Reading ppt slides Video lecture Tutorial Working on group project
7.	Energy Management: Efficient Energy Conversion Technology	1, 2 & 5	Reading ppt slides Video lecture Tutorial Working on group project
8.	Energy Management: Cleaner Production & Energy Conservation	1, 2 & 5	Reading ppt slides Video lecture Quiz Working on group project
9.	Energy Management: Renewable Energy (Biomass, Wind, Geothermal, Tidal, Solar and Hydropower)	1, 2 & 5	Reading ppt slides Video lecture Tutorials Group Project Report Submissions

Appendix 1: Assessment Criteria for Group Project Report

Criteria	Good (8-10)	Ave (6-7)	Fair (4-5)	Poor (1-3)	Remarks
Introduction/Project Background (20%) <u>ILO 1, 3 & 4</u>					Accurate analysis of project background and description. Well defined project; clear objectives.
Discuss current specific energy technology and possible solutions (30%) <u>ILO 2 & 3</u>					Basic knowledge and application of energy technologies including the pro and con as well as the current application status
Assess the feasibility of applying the specific energy technology in Singapore (20%) <u>ILO 5</u>					Application of the specific energy technology for Singapore
Conclusion (10%) <u>ILO 5</u>					Summarize the report clearly and concisely
Report format and layout including clarity of expression / Style of report (20%) <u>ILO 2, 3 & 5</u>					Clear and concise; good grammar and spelling with appropriate Tables/graphs/Figures; Report are presented well with logical sequence
TOTAL					