MSc Sustainable Energy Engineering with Environmental Management – E512 (Under Review)

1. CONTEXT AND OBJECTIVES

The world is facing many environmental problems together with energy security issues. The increasing demand for energy is not only compromising the use of available energy resources but also causing several problems which are affecting the environment. In the present time, the biggest environmental problems associated with energy are global warming and climate change. With the increasing level of environmental problems and energy issues, there is hence an urgent need to provide proper capacity building to address these problems.

The Sustainable Energy Engineering and Environmental Management (S3EM) programme provides a state-of-the-art knowledge in the field of energy engineering and environmental management. The programme focuses on energy production and management, green energy, environmental management, climate change and sustainable development together with the economic aspects. The S3EM programme prepares the graduates with the necessary knowledge and skills in order to resolve or propose solutions for multi-disciplinary problems in energy engineering and environmental management. The programme provides graduates with the proper tools and knowledge to develop, implement, monitor and evaluate energy and/or environmental management strategies, policies and projects. The programme will also enable the graduates to be amongst the new team of professionals who will lead the energy and environmental revolution.

The programme aims at providing technical understanding, knowledge and expertise in conventional and renewable energy sources taking the social and environmental aspects into consideration. The programme has been designed to equip graduates with the necessary knowledge, problem solving and technical skills in order to address problems in energy engineering and environmental management.

The main objectives of the programme are as follows:

- To develop in-depth knowledge in a variety of clean technologies relevant for energy and environmental engineering/management;
- To understand tools that can be used for assessing the options for improving the environmental and energy impacts of products and production processes;
- To efficiently analyze alternative energy policy options in terms of risks, benefits and costs;
- To apply the use of renewable energy technologies in industries in order to promote low-carbon development and green productivity;
- To understand the concept of sustainable development and the relationships between resource utilization, production processes, societal processes and environmental pressure.

2. LEARNING OUTCOMES

On successful completion of this programme, graduates should be able to:

- Understand the linkages between energy, environment and sustainability, their implications for organizations, and assesses strategies for ecologically sustainable economic development in relation to resources and energy usage
- Comprehend the different mode of heat transfer, heating and ventilation and air conditioning system
- Conduct energy audit in process industries, apply energy recovery measures and implement energy management system
- Comprehend the concepts of combustion, the operational principles of boilers, conduct energy balance on engines and turbines and understand combined heat and power systems and combine cycles
- Understand the role of clean energy and renewable energy technologies, the role plays in climate change mitigation.

- Use economic tools to develop logical approach to planning economical path for any type of project and to perform cost analysis of projects and reach decisions on its feasibility based on payback periods, net present value and Internal rate of returns.
- Understand the core concepts involved in the economic and social (equally political) analysis as it pertains to the design and evaluation of environmental and energy policies, understand sustainability options within simple policy frameworks
- Demonstrate critical thinking on the responsibilities and roles of citizens, decision and policy makers, planners, managers, engineers, technicians, producers and consumers in assessing the environmental and energy-related factors which make up the relevant policies

3. TEACHING AND LEARNING METHODS

The teaching methods will include formal lectures, tutorials, presentations and case studies. Lecture and tutorial materials will be made available to the students in advance for them to prepare for the lecture sessions.

For each module, the learners are expected to conduct self-study twice the number of lecture hours and use this time to study the materials provided and prepare for the tutorials and case studies planned, that is, 6 hours of self-study and 9 hours of other learning activities per week for each semester.

4. ENTRY REQUIREMENTS

General Requirements

Successful completion of an undergraduate degree with at least a Second Class or 50% whichever applicable or a GPA not less than 2.50, or equivalent, from a recognized higher education institution or alternative qualification acceptable to the UoM.

Programme Requirements

At least a Second Class honours degree in Science, Engineering and/or Agriculture related subjects or an alternative equivalent qualification acceptable to the University of Mauritius.

Preference will be given to candidates with relevant work experience.

General and Programme Requirements – Special Cases

The following may be deemed to have satisfied the General and Programme requirements for admission:

(i) Applicants who do not satisfy any of the requirements as per Regulations 3 and 4 above but who submit satisfactory evidence of having passed examinations which are deemed by the Senate to be equivalent to any of those listed.

(ii) Applicants who do not satisfy any of the requirements as per Regulations 3 and 4 above but who in the opinion of Senate submit satisfactory evidence of the capacity and attainments requisite to enable them to pursue the programme proposed.

(iii) Applicants who hold a full practicing professional qualification obtained by examination.

5. PROGRAMME DURATION

The Programme will be offered on a part-time basis. The duration of the Graduate Programme should normally not exceed 4 years (8 semesters).

	Normal	**Maximum**
Master's Degree	4 Semesters	8 Semesters

6. MINIMUM LCCS CREDITS REQUIRED

Minimum No. of credits per year: 12 Credits

Maximum No. of credits per year: 48 Credits

Minimum LCCS Credits Required For Awards

Master's Degree	72
Postgraduate Diploma	48
Postgraduate Certificate	24

A six LCCS credit module will consist of 30 hours of lecture & tutorial, 60 hours of self-study and 90 hours of other learning activities.

Breakdown as follows:

	Core Taught Modules (Min)	**Project**	**Elective Modules**
	LCCS Credits	**LCCS Credits**	**LCCS Credits**
Master's Degree	48	18	6
Postgraduate Diploma	42		6
Postgraduate Certificate	24		

7. ASSESSMENT AND DEADLINES

Students are required to register for modules which they intend to follow in a given semester on date(s) specified by the Faculty.

Each module will carry 100 marks and will be assessed as follows (unless otherwise specified):

- Written examination of 2-hour duration and continuous assessment of **40%** to **50%** of total marks.
- Continuous assessment may be based on seminar and/or assignments or presentation and **will include at least one class test per module.**

An overall total of **40%** for combined assessment and written examination components would be required to pass the module, without minimum thresholds within the individual continuous assessment and written examination.

All modules carry equal weight.

The Project carries 18 LCCS Credits.

Submission Deadline for Dissertation: As per University Policy.

8. LIST OF MODULES

Code	Module Name	L*/T*/P* (Contact Hours)	Self-Study hrs	Other Learning hrs	LCCS Credits**
CHE 6107	Energy Technology & Production	30	**60**	**90**	**6**
CHE 6108	Principles of Environmental Engineering	30	**60**	**90**	**6**
CHE 6109	Engineering Economics	30	**60**	**90**	**6**
CHE 6110	Renewable Energy Technologies	30	**60**	**90**	**6**
CHE 6111	Research Methods	30	**60**	**90**	**6**
CHE 6112	Environmental Management & Sustainability	30	**60**	**90**	**6**
CHE 6207	Energy Utilisation & Management	30	**60**	**90**	**6**
CHE 6208	Energy and Environmental Policies	30	**60**	**90**	**6**
PROJECT					
ENGG 6000	Project				**18**
ELECTIVE MODULES					
CHE 6209	Energy and Climate	30	**60**	**90**	**6**
CHE 6210	Emerging Energy Technologies	30	**60**	**90**	**6**

Students have to complete ALL core taught modules, the degree project work and ANY one (1) elective.

Students are required to submit at the end of Semester 1 a Plan of Study for their whole programme of Studies, indicating the list of elective modules and in which semester each of them will be taken.
The University reserves the right not to offer a given elective module if the critical number of students is not attained and/or for reasons of resource constraints.

9. PROGRAMME PLAN

YEAR 1					
Semester 1			**Semester 2**		
Code	**Module Name**	**LCCS Credits**	**Code**	**Module Name**	**LCCS Credits**
CORE			**CORE**		
CHE 6107	Energy Technology & Production	6	CHE 6110	Renewable Energy Technologies	6
CHE 6108	Principles of Environmental Engineering	6	CHE 6111	Research Methods	6
CHE 6109	Engineering Economics	6	CHE 6112	Environmental Management & Sustainability	6
Sub-Total		**18**	**Sub-Total**		**18**
				Total for Year 1	**36**
YEAR 2					
Semester 1			**Semester 2**		
Code	**Module Name**	**LCCS Credits**	**Code**	**Module Name**	**LCCS Credits**
CORE			**CORE**		
Yearly Module					
ENGG 6000	Project				18
Semester Modules					
CHE 6207	Energy Utilisation & Management	6	CHE 6208	Energy and Environmental Policies	6
ELECTIVE			**ELECTIVE**		
CHE 6209	Energy and Climate	6	CHE 6210	Emerging Energy Technologies	6
Sub-Total		**12**	**Sub-Total**		**30**
				Total for Year 2	**42**
					Grand Total = 78