Unit Outline (Higher Education)

Institute / School:	Institute of Innovation, Science & Sustainability
Unit Title:	Renewable Energy Principles
Unit ID:	ENGPG9204
Credit Points:	15.00
Prerequisite(s):	Nil
Co-requisite(s):	Nil
Exclusion(s):	(ENGRG2204)
ASCED:	031301

Description of the Unit:

This unit provides an introduction to principles of renewable energy. The unit covers different types of renewable and alternative energy sources, and discuss their configurations, basic principles of operation, achievable efficiency, and cost. The impact of the new energy technologies on the environment, obstacles to their wide implementation in industrial and consumer applications, and the role of social attitudes and government planning, financial investments and incentives are also introduced.

Grade Scheme: Graded (HD, D, C, P, MF, F, XF)

Work Experience:

No work experience

Placement Component: No

Supplementary Assessment: Yes

Where supplementary assessment is available a student must have failed overall in the Unit but gained a final mark of 45 per cent or above, has completed all major assessment tasks (including all sub-components where a task has multiple parts) as specified in the Unit Description and is not eligible for any other form of supplementary assessment.

Course Level:

Level of Unit in Course	AQF Level of Course					
	5	6	7	8	9	10
Introductory						
Intermediate			✔			
Advanced						

Learning Outcomes:

Knowledge:

K1. Identify different renewable energy systems and describe their suitability based on geographic locations and their environmental impacts.

K2. Develop a comprehensive understanding of basic principles of the renewable energy technologies.

K3. Recognise and discuss the environmental impact and sustainability of different renewable energy technologies.

Skills:

S1. Design and integrate energy storage systems.

S2. Construct partial and full renewable energy systems.

S3. Perform economic analysis and feasibility studies of different renewable energy technologies.

Application of knowledge and skills:

A1. Interpret the principles of the renewable energy and sustainability to generate electrical power.

A2. Apply renewable energy techniques to modify and improve existing engineering systems.

A3. Analyse characteristics of different renewable energy technologies.

Unit Content:

Topics may include:
1. Introduction to renewable electrical energy systems, to include their characteristics, design procedures and economic analysis
2. Renewable energy sources - solar PV, wind, fuel cell, marine, hydro, etc.
3. Design and analysis of practical renewable electrical energy systems as well as on the distributed generation, recent grid codes and economic analysis of renewable energy sources in the context of smart grid

FEDTASKS

Federation University Federation recognises that students require key transferable employability skills to prepare them for their future workplace and society. FEDTASKS (**T**ransferable **A**ttributes **S**kills and **K**nowledge) provide a targeted focus on five key transferable Attributes, Skills, and Knowledge that are be embedded within curriculum, developed gradually towards successful measures and interlinked with cross-discipline and Co-operative Learning opportunities. *One or more FEDTASK, transferable Attributes, Skills or Knowledge must be evident in the specified learning outcomes and assessment for each FedUni Unit, and all must be directly assessed in each Course.*

FEDTASK attribute and descriptor		Development and acquisition of FEDTASKS in the Unit	
		Learning Outcomes (KSA)	Assessment task (AT#)
FEDTASK 1 Interpersonal	Students will demonstrate the ability to effectively communicate, inter-act and work with others both individually and in groups. Students will be required to display skills in-person and/or online in: • Using effective verbal and non-verbal communication • Listening for meaning and influencing via active listening • Showing empathy for others • Negotiating and demonstrating conflict resolution skills • Working respectfully in cross-cultural and diverse teams.	Not applicable	Not applicable
FEDTASK 2 Leadership	Students will demonstrate the ability to apply professional skills and behaviours in leading others. Students will be required to display skills in: • Creating a collegial environment • Showing self -awareness and the ability to self-reflect • Inspiring and convincing others • Making informed decisions • Displaying initiative	Not applicable	Not applicable
FEDTASK 3 Critical Thinking and Creativity	Students will demonstrate an ability to work in complexity and ambiguity using the imagination to create new ideas. Students will be required to display skills in: • Reflecting critically • Evaluating ideas, concepts and information • Considering alternative perspectives to refine ideas • Challenging conventional thinking to clarify concepts • Forming creative solutions in problem solving.	Not applicable	Not applicable
FEDTASK 4 Digital Literacy	Students will demonstrate the ability to work fluently across a range of tools, platforms and applications to achieve a range of tasks. Students will be required to display skills in: • Finding, evaluating, managing, curating, organising and sharing digital information • Collating, managing, accessing and using digital data securely • Receiving and responding to messages in a range of digital media • Contributing actively to digital teams and working groups • Participating in and benefiting from digital learning opportunities.	Not applicable	Not applicable
FEDTASK 5 Sustainable and Ethical Mindset	Students will demonstrate the ability to consider and assess the consequences and impact of ideas and actions in enacting ethical and sustainable decisions. Students will be required to display skills in: • Making informed judgments that consider the impact of devising solutions in global economic environmental and societal contexts • Committing to social responsibility as a professional and a citizen • Evaluating ethical, socially responsible and/or sustainable challenges and generating and articulating responses • Embracing lifelong, life-wide and life-deep learning to be open to diverse others • Implementing required actions to foster sustainability in their professional and personal life.	Not applicable	Not applicable

Learning Task and Assessment:

Learning Outcomes Assessed	Assessment Tasks	Assessment Type	Weighting
K1, K3, S1, S2, S3, A3	It aims to consolidate the concepts and principles of renewable energy discussed in the lectures. They will examine students' level of understanding of different renewable energy technologies through constructing partial and full energy systems.	Quizzes/Assignments	20%-30%
K1, K2, A1, A2	For students to prepare technical reports on specified topics to catch up with the state-of-the-art development of renewable energy. This assessment task will promote communication and research skills.	Report	20%-30%
K2, K3, S1, S2, A3	The examination tests analytical and critical thinking and a general understanding of the unit materials.	Test or exam	40%-60%

Adopted Reference Style:

IEEE ()

Refer to the library website for more information

Fed Cite - referencing tool