Resource Efficiency and Security	
Module Ref No:	
Date of Validation:	**2020**
SCQF Level:	**9**
SCQF Credits:	**15**

1. Rationale

Resource efficiency is the sustainable use of the planet's limited resources while minimising our impact on the environment. Natural resources underpin the functioning of our economy and quality of life. Yet, until fairly recently, the definition of resources has focused mainly on raw materials such as fossil fuels, minerals and metals. Recent changes in EU policy have broadened the definition of resources to include food, soil, water air, biomass and ecosystems.

This module will examine progress in achieving resource efficiency and security; using case study examples to analyse how resource efficiency is delivered in key sectors, including food production, housing, energy, water and transport. These examples will be used to analyse how resource efficiency is supporting sustainable production and consumption, improvements in waste management, research and innovation and developing a circular economy.

2. Learning Outcomes

At the conclusion of this module the student should be able to:

LO1:	Assess the factors which define resource efficiency and linkages with resource security.
LO2:	Review mechanisms for achieving resource efficiency.
LO3:	Evaluate different approaches for achieving resource efficiency.

3. Content

3.1	**Defining resource efficiency & security** The definition of resources will be discussed and the factors which have led to the broadening of this definition will be considered. Reference will be made to the resource hierarchy. The role of policy in addressing resource efficiency and security will also be discussed.
3.2	**Topics in resource efficiency 1** Defining food, soil, water air, biomass and ecosystems as resources, there complexities and applications.
3.3	**Topics in resource efficiency 2** Innovation and technological improvements in energy, industry, agriculture, fisheries, transport systems, water, and producer and consumer behaviour.
3.4	**Mechanisms for achieving resource efficiency** Overview of some of the tools used to deliver resource efficiency, e.g. Life Cycle Analysis and initiatives being delivered at international and levels (e.g. Resource Efficient Scotland).
3.5	**Case Studies (for example)** • Food versus fuel • Sustainable production in agriculture - "30–50% of all food produced never reaches a human stomach" • Innovation in transport. • Improving efficiency in buildings. • Dealing with water stress and scarcity. • Linking resource use to climate change.

4. Approaches to Learning and Teaching	
Notional Study Hours: Typically, students will have to undertake about **150 hrs** of study to successfully achieve the learning outcomes for this module; this will be made up of a combination of both scheduled and independent study as indicated below.	
Scheduled Study: Typically consisting of:	**35 hrs**
Lectures	25 hrs
Tutorials	7 hrs
External visits	3 hrs
Independent Study:	**115 hrs**

5. Graduate Attributes	
Opportunity to develop the following aspects of graduate attributes will be included within this module:	
Graduate Attribute	**Learning Activity and Aspect Developed**
1. Academically competent	A blended learning approach will support students in gaining knowledge of the impacts of global resource use on the natural environment and human society, and understand the need and requirement for mitigation and behaviour change. Assessment will encourage students to explore the scientific literature helping them to improve their skills in searching, reading and understanding scientific literature.
2. Critical thinker	Through tutorial / workshops / case studies and individual assessment students will be supported to learn how to evaluate the results of research and its application to policy development.
3. Desire for learning and personal development	Self-study and an assessment framework will enable students to pursue resource efficiency methods and policy and will help motivate students to learn and develop skills through engagement with subject matter.
4. Responsible member of society	This module will help raise an understanding of the global nature and impact of resource use, and drivers of change, through self and directed study.
5. Employability	Through guided study, self - study and assessment students will gain professional/academic knowledge, and understanding of national and international policy, and will gain skills (e.g. using literature, scientific writing, and delivering seminars) that will be valuable in the workplace.

6. Assessment		
This module will be assessed using the following methods:		
Assessment Method	**Contribution to Grade (%)**	**Nature of Assessment**
Written Exam	50%	A 1.5 hr essay-based exam, where students must answer two out of four questions.. (LO's 1 & 2)
Report	50%	The student will select a case study topic (from either a pre-selected list or one their own choice in agreement with the module leader) and present an evaluation of how that case study is achieving resource efficiency. (2500 words, LO3)

7. Reading
Required: *(reading for any particular year will depend on the topics covered, and will also include a range of relevant website for most up to date information)*
Online Resource Efficiency Platform http://ec.europa.eu/environment/resource_efficiency/

Additional:
Lankford, B (2013) Resource Efficiency Complexity and the Commons: The Paracommons and Paradoxes of Natural Resource Losses, Wastes and Wastages, Routeledge Journal of Cleaner Production http://www.journals.elsevier.com/journal-of-cleaner-production/