Marine Ecology and Conservation	
Module Ref No:	**F700-4**
Date of Validation:	**2020**
SCQF Level:	**10**
SCQF Credits:	**15**

1. Rationale	
This module allows students to develop knowledge of the marine environment and encourages them to examine some of the issues affecting oceans and coasts. It covers the relationship between physical and chemical factors and the ecology of marine communities, impacts of human activities on them and current conservation issues and initiatives that affect them. An issues-based approach will be adopted with an emphasis on site visits and case studies through a study tour. Students will cover a range of issues including coastal zone management, marine fisheries problems and management, impacts of aquaculture, mineral exploitation, marine pollution and the causes and consequences of large scale events such as El Niño and climate change. Students will consider and evaluate attempts to mitigate anthropogenic impacts through legislation, regulation and voluntary activities.	
2. Learning Outcomes	
At the conclusion of this module the student should be able to:	
LO1	Explain the influence of the physical, chemical and ecological processes functioning in the marine ecosystems.
LO2	Assess factors which determine the distribution of organisms in a range of marine habitats.
LO3	Evaluate the current effects of anthropogenic impacts and development on the marine environment and ecosystems
LO4	Evaluate the operation and effectiveness of the principal legislation and agreements which affect the marine environment and the effectiveness of the main voluntary and statutory bodies involved in marine conservation.
3. Content	
3.1	**Physical and chemical properties** Oceanic patterns of variables such as temperature, salinity, nutrient availability, etc. are essential knowledge to aid understanding of the timing of productivity and subsequent species distribution and associated ecological webs. This should be delivered as lectures and associated readings.
3.2	**Ecosystems and habitats** Oceanic and coastal zones and associated marine and coastal habitats and communities covering a range of topographies and niches. This should be integrated with physical and chemical properties to allow a holistic knowledge of related issues to be achieved. Discussions and readings should link these aspects.
3.3	**Anthropogenic impacts and development** Marine issues caused by human activities should be covered such as the scale and impacts of fishing, oil and gas production, aquaculture, shipping, tourism and pollution. Activities and materials should include case studies, individual student research and relevant field trips to provide current examples of emerging issues and best practice.
3.4	**Legislation and conservation** National and international legislation to safeguard the marine environment. International agreements, designations, and their effectiveness. Voluntary and statutory organisations, their effectiveness and predictions for the future of the marine environment. Current status of Marine Protection Areas (MPA's).

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:	30 hrs
Lectures	15 hrs
Tutorials	5 hrs
External visits/ Study Tour	10 hrs (additional hrs will be required for travel)
Independent Study:	**110 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**
Academically competent	The essay and exam (summative assessments) require students to develop a breadth and depth of knowledge and understanding in this area, and to be able to communicate this knowledge and understanding, using informed and balanced argument. Information gained from lectures and reading will give background knowledge but different viewpoints may be illustrated during study tour visits and enable students to contextualise knowledge and ideas, and help students recognise the value of informed argument and debate.
Critical thinker	The report (summative assessment) which students are required to produce is based on specified field trips/visits undertaken during the study tour and requires the students to collect information from a range of sources, including the visits and further research, to synthesise and analyse this, and communicate it effectively.
Responsible member of society	Knowledge of human impacts on the marine environment will be enhanced from study of this module, and will contribute to an understanding of global issues and responsibilities, principles of sustainability, and should engender a responsible attitude to environmental issues

6. Assessment

This module will be assessed using the following methods:

Assessment Method	**Contribution to Grade (%)**	**Nature of Assessment**
Written exam	50%	Two hour exam consisting of two questions to be attempted out of 4 choices.
Written assignment or essay	50%	Essay on an underpinning issue relating current research to field trip visits. 2000 words ± 10%

7. Reading

Required:

Michel J Kaiser, Martin J Attrill, Simon Jennings, David N Thomas, David K. A. Barnes, Andrew S. Brierley, Jan G. Hiddink, Hermanni Kaartokallio, Nicholas V. C. Polunin, and David G. Raffaelli (2011) Marine Ecology: Processes, Systems and Impacts, Second Edition. Oxford University Press, Oxford, ISBN: 9780199227020

Levinton, S. Marine Biology: Function, Biodiversity, Ecology (2013) Oxford University Press, ISBN: 9780199857128

Additional:	
G. Carleton Ray, Jerry McCormick-Ray, Robert L. Smith Jr. (Illustrator) Marine Conservation: Science, Policy, and Management (2013) Wiley-Blackwell, ISBN: 978-1-405-19347-4| Julia M. Wondolleck, Steven L, (2017) Marine ecosystem-based management in practice : different pathways, common lessons [electronic book] / Washington, DC : Imprint: Island Press, 2017. Caveen, A (2015), The Controversy over Marine Protected Areas [electronic resource] : Science meets Policy [ebook] Springer International Publishing : Imprint: Springer.	
8. Staff	
Module Leader:	John MacDonald (Aberdeen) Cath Seeds (Ayr) Deirdre Wilson (Edinburgh)
Other contributing staff:	