

Liverpool John Moores University

Title: THE CRYOSPHERE IN A CHANGING CLIMATE
Status: Definitive
Code: **5403NATSCI** (127326)
Version Start Date: 01-08-2021

Owning School/Faculty: Biological and Environmental Sciences
Teaching School/Faculty: Biological and Environmental Sciences

Team	Leader
Tim Lane	Y
Laura Edwards	
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Academic Level: FHEQ5 **Credit Value:** 20 **Total Delivered Hours:** 50
Total Learning Hours: 200 **Private Study:** 150

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	20
Practical	18
Workshop	12

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	Report	Stakeholder presentation concerning an aspect of the cryosphere chosen by students.	60	
Presentation	Pres.	Presentation on the mechanics of cryospheric change.	40	

Aims

This module aims to examine the physical processes controlling the cryosphere and the changes it has and will undergo. This will look at the interactions between the

cryosphere, the environment, and societies in polar and alpine regions. The module aims to provide students with necessary knowledge and practical skills for understanding the changes the cryosphere is undergoing.

Learning Outcomes

After completing the module the student should be able to:

- 1 Describe and discuss the role of cryosphere in the Earth's climate system
- 2 Critically assess, synthesise, and interpret cryospheric data from palaeo-records, monitoring, and projections
- 3 Understand the impact of a changing climate (warming and cooling) on all aspects of the cryosphere
- 4 Understand the impacts a changing cryosphere will have on human populations

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Stakeholder report	2	3	4
Specialist presentation	1	2	

Outline Syllabus

Ice in the climate system, glacier mass balance, ice dynamics, the Arctic (ice caps, sea-ice, climatological importance), Antarctica (ice streams, ice shelves, East Antarctica and West Antarctica), mountain glaciers. Permafrost, permafrost degradation, society and permafrost.

Learning Activities

Lectures, workshops, and GIS-based practicals. Lectures will develop an understanding of the subject, which will be explored further in student-led workshops. Practicals will use GIS to investigate the impact of past, present, and future climate change on the cryosphere.

Notes

The module will examine the cryosphere and its importance to global systems and humans. The initial themes will introduce subject specific knowledge of the cryosphere, before more complex concepts of changes, causation, and teleconnections are explored. The last section of the module will explicitly explore the impacts on humans.