# Module Definition Form (MDF)

| Module code: MOD002862 | **Version:** 5 **Date Amended:** 22/Apr/2022 |
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| 1. Module Title |
|---|
| Biogeography |

| 2a. Module Leader |
|---|
| Philip Pugh |

| 2b. School |
|---|
| School of Life Sciences |

| 2c. Faculty |
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| Faculty of Science and Engineering |

| 3a. Level |
|---|
| 6 |

| 3b. Module Type |
|---|
| Standard (fine graded) |

| 4a. Credits |
|---|
| 15 |

| 4b. Study Hours |
|---|
| 150 |

**5. Restrictions**

| Type | Module Code | Module Name | Condition |
|---|---|---|---|
| Pre-requisites: | None | | |
| Co-requisites: | None | | |
| Exclusions: | None | | |
| **Courses to which this module is restricted:** | None | | |

## LEARNING, TEACHING AND ASSESSMENT INFORMATION

### 6a. Module Description

Biogeography explores the distribution of living things in both space and time, and how they have been affected by global change. This 'synthetic' science contains elements of climatology, geology, geography and computer applications, but is firmly rooted in biology. Many 19th Century naturalists, including Darwin, wrote the fundamental theories on large scale distribution patterns within the natural world. We will use computer technologies to verify and model these theories.

You will use a group of animals, plants or microbes that is of interest to you, as a model to show your understanding of ‘biogeography’ through computer analyses of distribution and physical and molecular characteristics appropriate to your group. You will combine your analyses with maps of modern and ancient Earth to develop an integrated, evolutionary history of your chosen group. You will become proficient with a range of relevant computer techniques including cluster analysis, ordination methods, area cladograms, and track analysis, as well as phylogenetic analysis of both the structure and DNA of your chosen group of organisms. This module will enable you to become familiar with arrange of computer software which will support your work and give you key competencies in data handling.

### 6b. Outline Content

- The theoretical development of biogeography from the 19th Century naturalists (Darwin and Wallace) via 20th Century ecologists (MacArthur & Wilson) to 21st Century modellers. - The under-pinning geological 'Earth processes' of continental drift and climate change. - 'Pattern recognition' - association with climate zones, biomes, altitude and latitude. - 'Pattern analysis' - using computer programmes of cluster and principal components analyses, cladistic analysis, area cladograms, track analysis. - 'Pattern explanation' - in terms of endemism, vicariance, dispersal and speciation.

### 6c. Key Texts/Literature

The reading list to support this module is available at: https://readinglists.aru.ac.uk/

### 6d. Specialist Learning Resources

Software available via the Computer Resource Centre: MVSP - MultiVariate Statistical Package (version 3.1). Kovach Computing Services, Anglesey. PHYLIP - Phylogeny Inference Programme (version 3.6). J. Felsenstein, University of Washington. Access to Cambridge University Botanic Garden and Zoology Museum.

| 7. Learning Outcomes (threshold standards) | | |
|---|---|---|
| **No.** | **Type** | **On successful completion of this module the student will be expected to be able to:** |
| 1 | Knowledge and Understanding | Explain the theoretical development of biogeography from descriptive natural history to hypothesis/ explanation (e.g. ETIB) and the development of integrated and verifiable models. This understanding must be cached in terms of Earth history and the geological time scale, referring to plate tectonics, orogeny, sea-level and climate change. |
| 2 | Knowledge and Understanding | Describe the biogeography of a named taxon in terms of Earth history and the key biological processes of dispersal, vicariance, speciation and extinction. |
| 3 | Intellectual, practical, affective and transferrable skills | Develop mechanical and theoretical skills in using a range of computer software. |
| 4 | Intellectual, practical, affective and transferrable skills | Interpret and integrate the outputs from a range of computer applications. |

| 8a. Module Occurrence to which this MDF Refers | | | | |
|---|---|---|---|---|
| **Year** | **Occurrence** | **Period** | **Location** | **Mode of Delivery** |
| 2025/6 | ZZF | Template For Face To Face Learning Delivery | | Face to Face |

| 8b. Learning Activities for the above Module Occurrence | | | |
|---|---|---|---|
| **Learning Activities** | **Hours** | **Learning Outcomes** | **Details of Duration, frequency and other comments** |
| Lectures | 11 | 1-4 | 11 x 1 hrs lectures/active learning |
| Other teacher managed learning | 25 | 1-4 | 11 x 2 hrs computer workshops + 3 hrs assessment literacy |
| Student managed learning | 114 | 1-4 | Background reading, online activities, preparation for lectures and practicals, and completion of assessments |
| TOTAL: | 150 | | |

| 9. Assessment for the above Module Occurrence | | | | | |
|---|---|---|---|---|---|
| **Assessment No.** | **Assessment Method** | **Learning Outcomes** | **Weighting (%)** | **Fine Grade or Pass/Fail** | **Qualifying Mark (%)** |
| 010 | Coursework | 1-4 | 100 (%) | Fine Grade | 30 (%) |
| **Coursework; 3000 words** | | | | | |

**In order to pass this module, students are required to achieve an overall mark of 40% (for modules at levels 3, 4, 5 and 6) or 50% (for modules at level 7*).**

**In addition, students are required to:**
**(a) achieve the qualifying mark for each element of fine graded assessment as specified above**
**(b) pass any pass/fail elements**

**[* the pass mark of 50% applies for all module occurrences from the academic year 2024/25 – see Section 3a of this MDF to check the level of the module and Section 8a of this MDF to check the academic year]**