Spatial humanities

Organising entities: Maynooth university

EQF: 7
Semesters: 2

Study area: Social sciences (Social and behavioural sciences)

This course builds on the ethos of Maker Culture combined with modern tools and methodologies that provide students with the necessary creative, technological, digital, entrepreneurial, and management skills to respond to a competitive economy that requires an agile, adaptable, and creative workforce.

Index

Modules

1. Introduction to programming

ECTS: 7
Semester: 1

Programming fundamentals: variables, types, expressions and assignment; simple I/O; Conditional and iterative control structures (if statements and while loops); Strings and string processing; Use of class APIs for creating objects and calling methods; Understanding data abstraction and encapsulation; Problem solving: understanding and developing algorithms; Implementing algorithms as simple programs. Introduction to algorithms and data structures. Review of elementary programming concepts suitable for the implementation of abstract data types (operators, types and expressions; control of flow; methods; recursion; input & output); Algorithms for searching: linear, bounded linear and binary searches; Algorithms for sorting: selection, insertion, bubble and quick sorts; Fundamental linear data structures: stacks, queues, linked lists; Object-oriented programming: encapsulation and information hiding, classes, interfaces, class hierarchies, inheritance, polymorphism, basic exception handling; Analysis of basic algorithms.

2. Mapping anf modelling space and time

ECTS: 7
Semester: 1

This module provides an introduction to the basics of data analysis, exploration and visualisation, with particular focus on spatial and temporal data. The module consists of a series of lectures including an introduction and start-up session to a take away practical exercise using the statistical programming language R, as well as an introduction to the concept of three-dimensionality and a series of simple 3D modelling tools that will provide the basis for delving into more advanced 3D modelling methodologies during the course. The module begins with basic methods to explore, describe and graphically represent one-, two-, and three-dimensional data, before moving on to consider more advanced methods to manipulate and visualise geospatial information, and explore and identify trends and seasonal patterns in time series data. In addition, some methodological aspects of data analysis are introduced, in particular the use of open data and 'citizen science' data and the idea of reproducibility in data analysis. Theoretical debates and challenges in the field will also be discussed through the relevant bibliography and characteristic case studies.

Courses (Module: Mapping anf modelling space and time)

2.1. Art and geo-data visualisation

ECTS: 0
Semester: 0

2.2. Visualization of temporal geographic data

Linked BoK concepts:

- [CV4-4] Visualization of temporal geographic data

ECTS: 0
Semester: 0

2.3. Introduction to 3D Modeling tools

Linked BoK concepts:

- [DM5-3] Modeling three-dimensional (3D) entities
- [DM2-8] Introduction to CityGML

ECTS: 0
Semester: 0