Module Code	CE7C05
Module Name	C5: Advanced Spatial Analysis Using GIS
ECTS Weighting[1]	5 ECTS
Semester taught	Semester 2
Module Coordinator/s	Assist. Prof. Niamh Harty [hartyn@tcd.ie]
Module Learning Outcomes with reference to the Graduate Attributes and how they are developed in discipline	On successful completion of this module, students should be able to: LO1. Investigate and solve Spatial Analysis problems by applying interdisciplinary approaches. LO2. Discuss and debate solutions to problems in the environment. LO3. Communicate effectively in technical and scientific writing, and present scientific/technical ideas concisely to a technical audience that may not be expert in the specific domain of the presentation. LO4. Use technical knowledge to address a spatial analysis problem. LO5. Identify and use appropriate mathematical methods, numerical techniques and GIS tools for application to new and ill-defined spatial analysis problems. LO6. Consult and work with experts in various fields in the realisation of a product or system. L07. Have knowledge and understanding of concepts from a range of areas outside engineering. LO8. Describe succinctly, the relevant advantages and disadvantages of various technologies to a lay audience, and to communicate effectively in public. **Graduate Attributes: levels of attainment** To act responsibly - Enhanced To think independently - Enhanced To develop continuously - Enhanced To communicate effectively - Enhanced

Module Content	This module introduces students to the framework and methods used in real-life problems related to the field of Spatial Analysis by applying the theoretical knowledge gathered during the module to live project work. The module seeks to impart the necessary skills and knowledge to enable graduates to engage as team members and leaders in the types of large and complex sustainable environment projects that are increasingly being planned across the world.
	It aims to help fill a major and increasingly obvious skills gap. A unique feature of this module is the use of Dublin and Ireland as learning laboratory, where the students will take responsibility of a real-life project. The introduction to Advanced Spatial Analysis using GIS module is designed to introduce the student to spatial analysis using a Geographic Information Systems (GIS) platform and guide him/her through the learning process of advanced tools dedicated to network analysis, spatial data mining and environmental phenomena modelling.

Teaching and Learning Methods	Teaching strategies • Problem based learning. • Computer Lab-based tutorials. • Lectures. • Project report

Assessment Details[2]
Please include the following:
- **Assessment Component**
- **Assessment description**
- **Learning Outcome(s) addressed**
- **% of total**
- **Assessment due date**

Assessment Component	Assessment Description	LO Addressed	% of total	Week due
Project	Students are required to complete a report based upon the work conducted for the project. The report should be approximately 3,000/4,000 words. Students will be provided with detailed guidance on writing the report.	all	90%	
Test	In-class theory test	4,5	5%	
Test	In-class practical test	4,5	5%	

Reassessment Requirements	Reassessment Project 100%
Contact Hours and Indicative Student Workload[2]	Total **Contact hours: 26** • **Lectures – 6 hours** • **Tutorials – 20 hours** **Independent Study (preparation for course and review of materials): 26 hours** **Independent Study (preparation for assessment, incl. completion of assessment): 70 hours**
Recommended Reading List	The following textbook is recommended: An Introduction to Geographical Information Systems, Ian Heywood, Sarah Cornelius, Steve Carver, 4th edition, Prentice Hall. LEN copies in Lecky Library. A list of recommended reading materials, standards, manuals, best practice documents is provided in the project section of the module. Each list is relevant to each specific project.
Module Pre-requisite	
Module Co-requisite	
Module Website	Students should have access to a computer (Windows or Mac) to be able to run the latest stable version of the open source software QGIS from home.
Are other Schools/Departments involved in the delivery of this module? If yes, please provide details.	No
Module Approval Date	
Approved by	
Academic Start Year	1st September 2022
Academic Year of Date	2022/2023