1. **Title of the module**

GEOG5004 Spatial Analysis: Principles and Methods

1. **School or partner institution which will be responsible for management of the module**

School of Anthropology and Conservation

1. **The level of the module (Level 4, Level 5, Level 6 or Level 7)**

5

1. **The number of credits and the ECTS value which the module represents**

15 (7.5 ECTS)

1. **Which term(s) the module is to be taught in (or other teaching pattern)**

Autumn

1. **Prerequisite and co-requisite modules**

None

1. **The programmes of study to which the module contributes**

Compulsory for: BSc Wildlife Conservation, BSc Human Geography (and associated programs)

Optional for: BA Environmental Social Sciences, BSc Anthropology, BSc Biological Anthropology (and associated programs)

Also available as an elective module

1. **The intended subject specific learning outcomes.
On successfully completing the module students will be able to:**

8.1 Demonstrate knowledge of the generic concepts of spatial analysis and an understanding of the application of GIS and remote sensing in geography, environmental sciences, biodiversity conservation and other disciplines using real world examples

8.2 Apply knowledge of main concepts of spatial analysis to solve practical problems in geography, environmental sciences, wildlife conservation and other disciplines

8.3 Understand the main principals underlying the analysis of spatial data and remote sensing data

8.4 Gain practical knowledge of the main GIS analytical techniques and how to use them to generate maps and analyse and describe spatial data

8.5 Understand GIS and remote sensing outcomes and write reports on GIS mapping and analysis

1. **The intended generic learning outcomes.**

**On successfully completing the module students will be able to:**

9.1 Develop quantitative and IT skills in the context of the use of GIS software

9.2 Combine different methods and techniques to produce effective research designs and analysis

9.3 Communicate research findings effectively

9.4 Understand how to manage study/work time effectively

9.5 Improve writing reports and presentation skills

1. **A synopsis of the curriculum**

The overall aim of this module is to provide students with an outline of the principals of Spatial Analysis and to introduce a range of methods for collection and analysis of spatial data. Particular attention is paid to the development of students’ analysis skills through the use of remote sensing techniques and Geographic Information Systems (GIS). GIS are increasingly being used in many disciplines, including geography, wildlife conservation and environmental sciences to help solve a wide range of “real world” problems. As the current trend in these disciplines moves towards the acquisition manipulation and analysis of large datasets with explicit geographic reference, employers often report shortages of relevant GIS skills to handle spatial data. Thus, this module will introduce the use of GIS as a means of solving spatial problems and the potential of GIS and remote sensing techniques for geography, environmental sciences and wildlife conservation providing the student with marketable skills relevant to research and commercial needs. Topics will include:

• understanding the major concepts in Spatial Analysis;

• introduction to the principles of GIS;

• introduction to remote sensing

• data structures in GIS;

• data sources and methods of data acquisition

• georeferencing, co-ordinate systems and projections

• working with raster and vector data

• mapping (how to create and transform maps),

• overview of ArcGIS Pro,

• GIS operations

• manipulation, spatial data query and analysis of a wide range of geographic, environmental and socio-economic information

These topics will be taught using a combination of lectures and practicals. The practical classes will provide hands-on experience using ArcGIS Pro which is the most widely used GIS system. Students will be able to use knowledge and skills acquired in this module in practical project work.

1. **Reading list (Indicative list, current at time of publication. Reading lists will be published annually**
* Bernhardsen, T. (2002) *Geographic Information Systems: an Introduction*, 3rd ed. John Wiley & Sons, New York.
* Bernhardsen, T. (2002) *Geographic Information Systems: an Introduction*, 3rd ed. John Wiley & Sons, New York.
* Burrough, P. A. and McDonnell, R. A. (2015) *Principles of Geographical Information Systems*, 3rd edition. Oxford University Press, Oxford.
* Campbell, J. B. (2011) *Introduction to Remote Sensing*, 5th edition. Guilford Press, New York
* Chang, K.T. (2019) *Introduction to Geographic Information Systems*. 9th edition. McGraw-Hill, New York
* Gorr, W.L. & Kurland, K.S. (2020). GIS Tutorial for ArcGIS Pro 2.6 (GIS Tutorials). 3rd edition. ESRI Press
* Heywood, I., Cornelius, S., and Carver, S. (2011). An *introduction to Geographical Information Systems.* 4th edition. Pearson, Harlow.
* Jensen, J.R. & Jensen, R.R. (2012). Introductory geographic information systems. Upper Saddle River, Pearson Education
* Law, M. & Collins, A. (2019). Getting to Know ArcGIS Pro, 2nd edition. Publisher: ESRI Press
* Lillesand, T. M. , Kiefer R. W. and Chipman J. W. (2015) *Remote Sensing and Image Interpretation*, 7th edition. John Wiley & Sons, New York.
* Longley, P. (2015). *Geographical Information science & systems.* 4th edition. New York, Wiley.
* Shekhar, S., Xiong, H., Zhou, X. (2015). *Encyclopaedia of GIS.* Imprint: Springer (e-book)
* Tripp Corbin GISP (2020). Learning ArcGIS Pro, 2nd edition. Publisher Packt
* Webster R. and Oliver M. (2007) *Geostatistics for environmental scientists*. 2nd edition Chichester, Wiley. E-book
1. **Learning and teaching methods**

Total contact hours: 24

Private study hours: 126

Total study hours: 150

1. **Assessment methods**

13.1 Main assessment methods

Practical Report 20%

Group Project 20%

Individual Report 60

13.2 Reassessment methods:

 Reassessment instrument: 100% coursework

1. **Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section12) and methods of assessment (section 13)**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | 8.1 | 8.2 | 8.3 | 8.4 | 8.5 | 9.1 | 9.2 | 9.3 | 9.4 | 9.5 |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |
| Lectures | x | x | x |  | x |  | x |  |  | x |
| Seminars |  |  |  |  | x |  | x | x | x | x |
| Practicals |  | x |  | x |  | x | x | x | x | x |
| Private study | x | x | x | x | x | x | x | x | x | x |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |
| Practical Report | x |  |  | x |  | x | x | x | x | x |
| Group Project  | x | x | x | x |  |  |  | x | x | x |
| Individual Report | x | x | x | x | x | x | x | x | x | x |

1. **Inclusive module design**

The School recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services.

The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:

a) Accessible resources and curriculum

b) Learning, teaching and assessment methods

1. **Campus(es) or centre(s) where module will be delivered**

Canterbury

1. **Internationalisation**

The module will serve as a compulsory module to the BSc Human Geography and BSc Wildlife conservation programmes to enable students apply the skills of GIS mapping to physical landscapes and environments around the world. These skills are internationally transferable and so students will be equipped with the tools to conduct GIS mapping in whichever country they choose to work.

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**DIVISIONAL USE ONLY**

**Revision record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

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| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
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