1. **Title of the Module**

COMP8270 (CO827) – Programming for Artificial Intelligence

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

Division of Computing, Engineering, Mathematical Sciences (CEMS)

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

15 credits (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**

COMP8810 (CO881) - Object-Oriented Programming

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

Portfolio of Taught Postgraduate Courses in Computing

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

8.1 Read, understand, modify, and evaluate small programs for data manipulation;

8.2 Understand comprehensively, and evaluate critically visualisation solutions to real data and discuss the quality of visualisation solutions through consideration of clarity and informativeness;

8.3 Develop and evaluate critically programs to load, manipulate, visualise and store data;

8.4 Master the usage and the critical and effective evaluation of a range of AI-purposed libraries, such as scientific computing library, visualisation library, data manipulation and analysis library, and machine learning library;

8.5 Develop non-trivial computer programs following data analysis principles.

8.6 Describe concepts used in programming and to discuss programming using vocabulary from professional computer science.

8.7 Choose and use appropriate data structures and algorithms in the construction of programs.

8.8 Apply principled design techniques in the construction of software.

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

9.1 Evaluate trade-offs involved in design choices.

9.2 Communicate with other professionals using appropriate technical vocabulary.

9.3 Critically reflect on and evaluate professional practice.

9.4 Deploy appropriate theory and practices in their use of methods and tools.

9.5 Manage their own learning and development, through self-directed study and working on continuous assessment.

1. **A synopsis of the curriculum**

This module covers the design and implementation of high-quality software, and provides an introduction to software development for Artificial Intelligence (AI). In this module, students will gain an understanding of data analysis and statistics techniques, including effective graphical representations.

Throughout the module, students will learn to embed data analysis and statistics concepts into a programming language which offers good support for AI (e.g., Python). Students will learn to use important AI-purposed libraries and tools, and apply these techniques to data loading, processing, manipulation and visualisation.

1. **Reading list (Indicative list, current at time of publication. Reading lists will be published annually)**

“Python Cookbook”, David Beazley, Brian K. Jones, 3rd Edition, O’Reilly, 2013.

“Artificial Intelligence with Python”, Prateek Joshi, Packt Publishing, 2017.

“Hands-on Machine Learning with Scikit-Learn and TensorFlow”, Aurélien Géron, O'Reilly, 2017.

1. **Learning and teaching methods**

Total contact hours: 42

Private study hours: 108

Total study hours: 150

1. **Assessment methods**
	1. Main assessment methods

This module will be assessed by 100% coursework.

* 20% class exercises (4 hours overall)
* 20% in class test (approximately 1 hour)
* 60% two practical assignments (equally weighted, approximately 16 hours of work each)
	1. **Reassessment Method**

Like for like

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 outcomes** | **8.1** | **8.2** | **8.3** | **8.4** | **8.5** | **8.6** | **8.7** | **8.8** | **9.1** | **9.2** | **9.3** | **9.4** | **9.5** |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Lectures | x | x | x | x | x | x | x | x | x | x | x |  |  |
| Classes | x | x | x | x | x | x | x | x | x | x | x | x |  |
| Private study | x | x | x | x | x | x | x | x | x |  | x | x | x |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Exercise | x | x | x | x | x | x | x | x | x | x | x | x |  |
| Class Test  | x | x | x | x |  | x | x |  | x |  |  | x |  |
| Assignment 1 | x | x | x | x | x | x | x | x | x | x | x | x | x |
| Assignment 2 | x | x | x | x | x | x | x | x | x | x | x | x | x |

1. **Inclusive module design**

The Division 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 topics addressed by this module relate to a field which is of international importance, given the global role of computers in today's technological innovation. The topics covered by this module are international in nature, being identical worldwide and independent of traditional spoken language.

**DIVISION 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 the delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
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