1. **Title of the module**

COMP5280 (CO528) - Introduction to Intelligent Systems

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

School of Computing

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

Level 5

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 or Spring

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

Pre-requisite: COMP5200: Further Object-Oriented Programming

or COMP5230: Fundamentals of Programming and Logic

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

CS BSc, CS and Management Science, CS with Artificial Intelligence, Business Computing,

Mathematics and CS, Computing and Business Administration, Applied Computing Joint

Honours, and Year in Industry variants.

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

8.1 Explain the motivation for designing intelligent machines, their implications and associated philosophical issues, such as the nature of intelligence and learning.

8.2 Describe the main kinds of state-space search algorithms, discussing their strengths and limitations.

8.3 Explain the main concepts and principles associated with different kinds of knowledge representation, such as logic, case-based representations, and subsymbolic/connectionist representations.

8.4 Explain the differences between the major kinds of machine learning problems – namely supervised learning, unsupervised learning and reinforcement learning – and describe the basic ideas of algorithms for solving those problems.

8.5 Describe the main concepts and principles of major kinds of biologically-inspired algorithms, and understand what is required in order to implement one such technique.

8.6 Describe how various intelligent-system techniques have been used in the context of several case studies, and compare different techniques in the context of those case studies.

Outcomes 11.1-11.5 are related to the following Computer Science programme outcomes:

• Knowledge and Understanding of: A.2 (Software), A.4 (Practice) and A.5 (Theory).

• Intellectual Skills: B.1 (Modelling) B.4 (Criteria Evaluation and Testing).

Outcome 11.6 is related to the following Computer Science programme outcomes:

• Subject-Specific Skills: B.7 (Computational thinking), C.1 (Design and Implementation), C.14 (Identify and develop solutions for computational problems requiring machine intelligence) and D.2 (Evaluation).

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

9.1 Discuss and give examples of the role of analogy and metaphor in science and engineering;

9.2 apply mathematical and computational skills in solving problems;

9.3 compare different strategies for problem solving, choose a strategy and justify that choice;

9.4 assess the strengths and weaknesses of hypotheses and techniques;

9.5 use the library and appropriate internet resources in support of learning.

Outcomes 12.1-12.2 are related to the following Computer Science programme outcomes:

• Intellectual Skills: B.1 (Modelling) B.4 (Criteria Evaluation and Testing).

Outcomes 12.3 and 12.4 are related to the following Computer Science programme outcomes:

• Knowledge and Understanding of: A.2 (Software), A.4 (Practice) and A.5 (Theory).

• Intellectual Skills: B.4 (Criteria Evaluation and Testing).

Outcome 12.5 is related to the following Computer Science programme outcomes:

• Transferable Skills: D.3 (Information Technology) and D.5 (self-management).

1. **A synopsis of the curriculum**

This module covers the basic principles of machine learning and the kinds of problems that can be solved by such techniques. You learn about the philosophy of AI, how knowledge is represented and algorithms to search state spaces. The module also provides an introduction to both machine learning and biologically inspired computation.

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

S.J. Russell & P. Norvig, “Artificial Intelligence: a modern approach”, 2nd Edition. Prentice-Hall, 2002. (main textbook)

S. Pinker. “How the Mind Works”, W.W. Norton & Company, 1999.

A. Cawsey, “The Essence of Artificial Intelligence”, Prentice-Hall, 1998.

P. Bentley. “Digital Biology”, Simon & Schuster, 2002

1. **Learning and teaching methods**

Total contact hours: 22

Private study hours:128

Total study hours: 150

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

A1 – Practical assignement (25%)

A2 – Practical assignement (25%)

2 hour unseen written examination (50%)

13.2 Reassessment methods

Like for like.

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

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** | *8.1* | *8.2* | *8.3* | *8.4* | *8.5* | *8.6* | *9.1* | *9.2* | *9.3* | *9.4* | *9.5* |  |
| **Learning/ teaching method** |  |  |  |  |  |  |  |  |  |  |  |  |
| **Private Study** |  |  |  |  |  | x | x | x | x | x | X |  |
| *Lectures* | x | x | x | x | x | x | x |  | x |  |  |  |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |  |
| *Coursework* | x | x | x | x | x | x |  | x |  | x | X |  |
| *Examination* | 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 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.

**FACULTIES SUPPORT OFFICE USE ONLY**

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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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Revised FSO Jan 2018