London South Bank University

EST 1892

Module Guide

Artificial Intelligence

CSI_6_ARI

School of Engineering

Level 6

Table of Contents

1. MODULE DETAILS

Module Title:	Artificial Intelligence
Module Level:	Level 6
Module Reference Number:	CSI_6_ARI
Credit Value:	20
Student Study Hours:	200
Contact Hours:	52
Private Study Hours:	148
Pre-requisite Learning (If applicable):	None
Co-requisite Modules (If applicable):	None
Course(s):	Comp. Science
Year and Semester	2019/2020 semester 2
Module Coordinator:	Phillip Burrell
MC Contact Details (Tel, Email, Room):	Tel. 02078157408, email phillb@lsbu.ac.uk, room FW102
Teaching Team & Contact Details (If applicable):	NA
Subject Area:	Computer Science
Summary of Assessment Method:	40% Exam : 60% coursework
External Examiner appointed for module:	Dr Ying Liang

2. SHORT DESCRIPTION

This module covers the history and contemporary development of artificial intelligence systems and looks forward to likely near-future developments. It will cover all the major techniques of problem description, knowledge representation and data searching that represent the current toolkit for developing intelligent applications.

3. AIMS OF THE MODULE

This module aims to give a comprehensive understanding of the field of artificial intelligence and the practical knowledge to develop applications to contribute to it.

4. LEARNING OUTCOMES

4.1 Knowledge and Understanding

- Appraise a range of techniques that have been employed to develop intelligent systems of various kinds.
- Consistently producing and reviewing research informed work which applies and is at the forefront of the developments in the domain

4.2 Intellectual Skills

- Evaluate AI problems for current and future feasibility and suggest approaches that might be applied.

4.3 Practical Skills

- Develop applications that exhibit intelligence in a specific context using established techniques.

4.4 Transferable Skills

- Evaluate the possibilities and limitations of intelligent systems being implemented now and, in the future, and assess their suitability for diverse applications.
- Self-manage your study time and work effectively to meet deadlines, select and evaluate appropriate knowledge, skills, etc...; also select and evaluate supporting resources/tools for a particular purpose, as well as being able to make effective contributions as team member/leader when required.

5. ASSESSMENT OF THE MODULE

Assessment 1: (30%) Practical exercise in the development of an Intelligent system and documentation of the development process.
Assessment 2: (30%) Secondary research in an area of Intelligent Systems. **Final report length: 3000 words**
Assessment 3: (40%) 2 hour, closed book, unseen Examination.

6. FEEDBACK

Feedback will normally be given to students 15 working days after the final submission of an assignment or as advised by their module leader.

General feedback, applying to all students, will also be placed on the module VLE site within 15 working days.

7. INTRODUCTION TO STUDYING THE MODULE

7.1 Overview of the Main Content

- Overview of AI problems; The Turing test, contemporary successes
- Problem characteristics
- Knowledge Representation
- Propositional and predicate logic
- Forward chaining, backward chaining
- Machine Learning; classification, inductive learning, statistical-based learning, such as Naive Bayesian Classifier, decision trees
- Neural networks
- The over-fitting problem
- Problem spaces (states, goals and operators), problem solving by search
- Uninformed search (breadth-first, depth-first, depth-first with iterative deepening)
- Heuristics and informed search (hill-climbing, generic best-first, A*)
- Natural language processing

7.2 Overview of Types of Classes

2 hours formal lecture followed by 2 hours practical tutorial

7.3 Importance of Student Self-Managed Learning Time

Student responsibility in the learning and development process will be emphasised. Students are required to undertake directed self-study and prepare solutions/discussions to questions relative to various topic areas. Students will be encouraged to identify for themselves particular problems of difficulty and to use seminar discussions, where appropriate, for the resolution of these. Students must regularly access the Moodle site for this module. They should download the class/lecture material from the Moodle site, and do the recommended reading, before each lecture/class.
Where appropriate, students are also expected to download the relevant seminar questions and study them in advance of each seminar, in order to derive maximum benefit from seminar time. The programme of teaching, learning and assessment gives guidance on the textbook reading required for each week, the purpose of which is to encourage further reading both on and around the topic.

7.4 Employability

There is a constant commercial and industrial need/demand for Artificial Intelligent practitioners. The module delivers skills in these areas that are directly relevant in both commercial, industrial and research environments.

8. THE PROGRAMME OF TEACHING, LEARNING AND ASSESSMENT

SEMESTER 2		
WEEK	TOPIC	ASSESSMENT
1	Introduction	
2	Characteristics	
3	Knowledge Representation	
4	Rule Chaining	
5	Logic	CW1 handout
6	Uncertainty and Heuristics	
7	Search	
8	Neural Networks	CW2 handout, CW1 handin
9	Induction	
10	CBR	
11	Natural language Processing	
12	Revision and open session	CW2 handin

9. STUDENT EVALUATION

Positive feedback from last year's cohort. No problems raised

10. LEARNING RESOURCES

Reading List

- Russell, S. and Norvig, P. (2016) *Artificial Intelligence: A Modern Approach* Pearson. ISBN 1292153962
- Warwick, K. (2011) *Artificial Intelligence: The Basics* Routledge. ISBN 0415564832