De Montfort University

Course Template

1. Basic information

- Course Name: Artificial Intelligence with Robotics
- Course Code: CC308A
- Level (UG, PG): Undergraduate
- Academic Period: 2014
- Faculty: Faculty of Technology
- Department: Games Programming & Intelligent Systems
- PMB COMP
- Offered at: DM - DMU Leicester
- Type (single, joint.): SI
- Highest Award : Bachelor of Science (Honours)
- All possible exit awards : Bachelor of Science; Certificate of Higher Education; Diploma of Higher Education; Institutional Undergraduate Credit
- Award notes :

Professional Body Recognition
- Accreditation by Professional/Statutory body:

No

- Exemption by Professional/Statutory body:

No

- Details

- Modes of attendance: Main MOA: Full-Time
  Other MOA: Year Out/On Placement
- Mode Notes:

- Course leader: Yingjie Yang

2. Entry Requirements and Profile

Award
BSc Hons

Standard Entry Requirements
Curriculum 2000 requirements:
Minimum number of units required - 12
Minimum number of units required from 6/12 unit awards - 12
Tariff points range - 260+
Minimum points from 6/12 unit awards - 80

Curriculum 2000 component acceptability
Acceptable on its own - GCE A level (6 unit), VCE Voc A(6 unit), Voc Double award(12 unit)
Acceptable component - GCE AS(3 unit), A level (6 unit), VCE Voc AS(3 unit), Voc A(6 unit), Voc Double award(12 unit)

Candidates must normally offer one of the following:
Access to HE - 18 units, 14 at level 3
Year 0 foundation studies - pass 8/8 modules, study year must be in computing or science
GCE "A" levels - 12+ points excluding General Studies
City+Guilds level 3 if 2 years full-time study in computing.
Adv GNVQ - Merit in IT, distinction otherwise
BTEC Nat Dip - 2 * merit + 2 * dist in year 2 in Computing/IT or 4 * distinction in year 2 in Business
BTEC Nat Cert - 2 * merit + 2 * dist in phase 2 in Computing/IT or 4 * distinction in second phase in Business
Euro Bac - 70% (diploma awarded at 60%)
Int Bac - 28 (diploma awarded at 24)

Irish leavers cert - Certificate with BBBCC at higher level   (cert awarded with min 6 subjects, min 2 at higher level)
Scottish Higher - BBBBB
Scottish CSYS - CC
Scottish Group Award - Merit
Scottish GSVQ - Merit
Any qualification deemed equivalent to the above

Qualifications at 16
GCSE's - 5 GCSE's @ C including English and Maths
Int GNVQ - Achieve merit (In compensation for absence of 5 GCSE's, must still have GCSE maths or other compensation)
Application of Number III (Key skills) - As compensation for maths GCSE
Communication III (Key skills) - As compensation for English GCSE
FSMU Intermediate+ - As compensation for maths GCSE

Candidates who do not possess the normal entry requirements may be considered for exceptional admission.
Applications are welcomed from mature students whose formal qualifications do not match the levels given above, but who have demonstrated the necessary ability to pursue the diet and benefit from it.

3.   Course Description

Characteristics and Aims

Artificial intelligence is the study of principles and techniques of intelligent processes in nature. The growth of this area of science has been critical to the implementation of more intelligent applications in finance, knowledge discovery and robotics in recent years. This course will provide students with the knowledge and skills to learn and apply the artificial intelligence concepts and techniques in real world applications, including programming of a variety of mobile robots, embedded systems and drives in appliances and knowledge discovery. This course addresses the growing demand for ever smarter programs and embedded computing systems.

This course offers a complementary blend of concepts and techniques of artificial intelligence with its exciting applications in robotics, mechatronics, scheduling and planning. The course also equips students with the knowledge of fundamentals of computer science and practical skills in programming and database design and analysis. This will enable students to meet the demands of the more general computing market for jobs such as programmer or database administrator and also more specific jobs such as AI-games programmer; mobile robot programmer; data analyst and intelligent database developer.

Teaching, Learning and Assessment Strategies

Learning, teaching and assessment will be informed by and implement the Faculty and University strategies.

The knowledge and skills of the students will be developed sequentially during the course. After the completion of year 1 all students will have the basic integrated underpinning in the principles of computer science and artificial intelligence for continued study. By the end of year 2 students continuing to the sandwich placement year of the BSc route will be well prepared to act as an active members of an organisation. The final year will be used to consolidate the students' knowledge and skills and they can choose to specialise in the options modules. On completion of the degree, graduates will be highly skilled and employable, in roles such as games programmer; mobile robot programmer; database administrator; data analyst and intelligent database developer.

Key skills, including undertaking research, report writing, presentation skills, group working and essay writing, will be, at least, taught in level 1, and developed and practised in levels 2 and 3.

By the final year students will be well prepared to tackle the final year project.

The modules offered on the course will have a mixture of learning and teaching strategies to

reflect the content of the module. Most modules will have formal contact in the form of:

Lectures. These are appropriate for presenting basic subject information to all students taking the module.
Tutorials. These provide students with the opportunity to practise and develop skills and techniques under guidance, and obtain feedback.
Computer Laboratory Classes. These are vital for the solution of practical problems.

All students are required to manage their own learning in the following ways:

Supported Self- Study. Students are issued with a module plan for each module which gives a week by week plan of the module and appropriate activities and reading. Access to the Blackboard virtual learning environment is available to our students to support their learning through links to learning material and assessment and collaboration tools.
Assessments. These serve to consolidate and develop students' knowledge and skills. Assessment methods include practical projects, reports, essays, structured exercises, group and individual projects, tests and examinations.
Projects offer the opportunity for students to develop their ability to conduct a sustained individual investigation. Group projects offer further opportunity for the development of team-working skills.

The Industrial Placement Year gives an opportunity for the students to apply and develop the knowledge and skills acquired in levels 1 and 2. On return from placement, the experience gained facilitates a more mature approach to final year study and provides students with a good understanding of the context within which their knowledge can be applied and helps in the choice of final year projects and to clarify career aspirations.

4.   **Outcomes**

Generic outcome headings	What a student should know and be able to do upon completion of the course
• **Knowledge & understanding**	On completion of the course the students should:- Have a good knowledge of the Artificial intelligence concepts and techniques. Have a good knowledge of contemporary mobile robots and their programming tools. Have a good knowledge of contemporary programming languages and design of databases.
• **Cognitive skills**	Students will have developed and be able to demonstrate the following cognitive skills: - Critical reasoning Gathering and using information / data Analysing and evaluating Solving problems Applying methodologies Applying concepts Awareness of professional considerations
• **Subject specific skills**	Students will have developed and be able to demonstrate the following subject specific skills: - To recognise real world situations where an artificial intelligence approach is required or is useful, to select an appropriate modelling paradigm and to select and effectively use (design) appropriate software To participate in the analysis, design and development of intelligent systems to meet specified needs
• **Key Skills**	Students will have developed and be able to demonstrate the following key skills: -

	Confident use of IT Application of number Professional quality communication skills, both written and oral The capacity to learn and develop professionally The ability to work as part of a team

5.   Structure and Regulations

Relationship Details

Module	Credits	Level	Take/Pass	Semester	Locations
CTEC1801	**30.00**	**1**	**Must Take**	**Y**	**DM**
CTEC1901	**30.00**	**1**	**Must Take**	**Y**	**DM**
IMAT1205	**15.00**	**1**	**Must Take**	**Y**	**DM**
IMAT1212	**30.00**	**1**	**Must Take**	**Y**	**DM**
IMAT1213	**15.00**	**1**	**Must Take**	**Y**	**DM**
ENGD2003	**30.00**	**2**	**Must Take**	**Y**	**DM**
IMAT2405	**30.00**	**2**	**Must Take**	**Y**	**DM**
IMAT2605	**30.00**	**2**	**Must Take**	**Y**	**DM**
IMAT2800	**30.00**	**2**	**Must Take**	**Y**	**DM**
SAND2802	**0.00**	**2**	**Neither**	**Y**	**DM**
CTEC3110	**15.00**	**3**	**Neither**	**Y**	**DM**
CTEC3426	**15.00**	**3**	**Neither**	**Y**	**DM**
CTEC3604	**30.00**	**3**	**Neither**	**Y**	**DM**
CTEC3901	**30.00**	**3**	**Neither**	**Y**	**DM**
CTEC3902	**15.00**	**3**	**Neither**	**Y**	**DM**
ENGD3037	**30.00**	**3**	**Neither**	**Y**	**DM**
IMAT3404	**15.00**	**3**	**Neither**	**Y**	**DM**
IMAT3406	**15.00**	**3**	**Must Take**	**Y**	**DM**
IMAT3429	**15.00**	**3**	**Neither**	**Y**	**DM**
IMAT3451	**30.00**	**3**	**Must Take**	**Y**	**DM**
IMAT3603	**30.00**	**3**	**Neither**	**Y**	**DM**
IMAT3901	**15.00**	**3**	**Must Take**	**Y**	**DM**

Structure

Structure notes

1 Course info

Course Specific Differences or Regulations

1 The requirements to progress into the sandwich placement are determined by Faculty Policy which requires that normally students must have passed a minimum of 60 credits at level 2.

Numbers at sites, including partner institutions

1

Relevant QAA Subject Benchmarking statement(s)

1 Computing

6.   Quality Assurance Information

QA of Workbased Learning

Liaison with Collaborative Partners

Procedures for Maintaining Standards

The Programme is managed by a programme leader together with a programme team. They are

guided by the prevailing academic regulations and modular scheme handbooks produced by Registry.

An external examiner is attached to the programme who acts as a critical friend. He/She attends the assessment board and scrutinises student work and marking to ensure that standards have been maintained at an apposite level.

Each year the programme leader completes a Programme Enhancement Plan which is approved by the Programme Board/Subject Authority Board and Faculty Academic Committee.

The student voice is heard via student representatives on the Programme Board and the Staff Student Consultative Committee. Feedback from students is gathered by end of module questionnaires and programme questionnaires.

The programme is subject to a periodic review in line with University requirements.