

## Tamkang University Academic Year 102, 1st Semester Course Syllabus

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| Course Title                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | INTRODUCTION TO ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS                                                                                                                                                                                              | Instructor | CHEN, DUEN-KAI                               |
| Course Class                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | TPIAB3A<br>DIVISION OF SOFTWARE ENGINEERING,<br>DEPARTMENT OF INNOVATIVE INFORMATION AND TECHNOLOGY, 3A                                                                                                                                                 | Details    | ◆ Selective<br>◆ One Semester<br>◆ 3 Credits |
| D e p a r t m e n t a l   t e a c h i n g   o b j e c t i v e s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                         |            |                                              |
| Cultivate professional talents in software engineering and communication technology.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                         |            |                                              |
| D e p a r t m e n t a l   c o r e   c o m p e t e n c e s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                         |            |                                              |
| A. Capability of computer program coding, process planning, and problem solving.<br>B. Capability of applying basic mathematics and information technology related mathematics.<br>C. Capability of applying knowledge of internet structure and protocol in communication system.<br>D. Capability of data collecting and analyzing, and organizing software and hardware.<br>E. Capability of understanding and integrating system structure for problem solving.<br>F. Capability of system analyzing, modeling, and designing.<br>G. Capability of management utilizing information technology system. |                                                                                                                                                                                                                                                         |            |                                              |
| Course Introduction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | This class is aimed to provide introduction to efforts from wide range of artificial intelligence research, including symbolic approach, such as Expert Systems, as well as numerical approach, such as artificial neural networks, genetic algorithms. |            |                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                         |            |                                              |

### The Relevance among Teaching Objectives, Objective Levels and Departmental core competences

I.Objective Levels (select applicable ones) :

- (i) Cognitive Domain : C1-Remembering, C2-Understanding, C3-Applying,  
C4-Analyzing, C5-Evaluating, C6-Creating
- (ii) Psychomotor Domain : P1-Imitation, P2-Mechanism, P3-Independent Operation,  
P4-Linked Operation, P5-Automation, P6-Origination
- (iii) Affective Domain : A1-Receiving, A2-Responding, A3-Valuing,  
A4-Organizing, A5-Charaterizing, A6-Implementing

II.The Relevance among Teaching Objectives, Objective Levels and Departmental core competences :

- (i) Determine the objective level(s) in any one of the three learning domains (cognitive, psychomotor, and affective) corresponding to the teaching objective. Each objective should correspond to the objective level(s) of ONLY ONE of the three domains.
- (ii) If more than one objective levels are applicable for each learning domain, select the highest one only. (For example, if the objective levels for Cognitive Domain include C3,C5,and C6, select C6 only and fill it in the boxes below. The same rule applies to Psychomotor Domain and Affective Domain.)
- (iii) Determine the Departmental core competences that correspond to each teaching objective. Each objective may correspond to one or more Departmental core competences at a time. (For example, if one objective corresponds to three Departmental core competences: A,AD, and BEF, list all of the three in the box.)

| No. | Teaching Objectives                                                   | Relevance        |                               |
|-----|-----------------------------------------------------------------------|------------------|-------------------------------|
|     |                                                                       | Objective Levels | Departmental core competences |
| 1   | Introduce variety of technologies and applications of AI to students. | C4               | ABDEFG                        |

### Teaching Objectives, Teaching Methods and Assessment

| No. | Teaching Objectives                                                   | Teaching Methods               | Assessment                                |
|-----|-----------------------------------------------------------------------|--------------------------------|-------------------------------------------|
| 1   | Introduce variety of technologies and applications of AI to students. | Lecture, Discussion, Practicum | Practicum, Report, Participation, project |
|     |                                                                       |                                |                                           |

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|----------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| This course has been designed to cultivate the following essential qualities in TKU students |                          |                                                                                                                                                         |      |
| Essential Qualities of TKU Students                                                          |                          | Description                                                                                                                                             |      |
| ◆ A global perspective                                                                       |                          | Helping students develop a broader perspective from which to understand international affairs and global development.                                   |      |
| ◆ Information literacy                                                                       |                          | Becoming adept at using information technology and learning the proper way to process information.                                                      |      |
| ◇ A vision for the future                                                                    |                          | Understanding self-growth, social change, and technological development so as to gain the skills necessary to bring about one's future vision.          |      |
| ◇ Moral integrity                                                                            |                          | Learning how to interact with others, practicing empathy and caring for others, and constructing moral principles with which to solve ethical problems. |      |
| ◇ Independent thinking                                                                       |                          | Encouraging students to keenly observe and seek out the source of their problems, and to think logically and critically.                                |      |
| ◆ A cheerful attitude and healthy lifestyle                                                  |                          | Raising an awareness of the fine balance between one's body and soul and the environment; helping students live a meaningful life.                      |      |
| ◇ A spirit of teamwork and dedication                                                        |                          | Improving one's ability to communicate and cooperate so as to integrate resources, collaborate with others, and solve problems.                         |      |
| ◇ A sense of aesthetic appreciation                                                          |                          | Equipping students with the ability to sense and appreciate aesthetic beauty, to express themselves clearly, and to enjoy the creative process.         |      |
| Course Schedule                                                                              |                          |                                                                                                                                                         |      |
| Week                                                                                         | Date                     | Subject/Topics                                                                                                                                          | Note |
| 1                                                                                            | 102/09/16 ~<br>102/09/22 | Overview of this course                                                                                                                                 |      |
| 2                                                                                            | 102/09/23 ~<br>102/09/29 | Brief History of Artificial Intelligence                                                                                                                |      |
| 3                                                                                            | 102/09/30 ~<br>102/10/06 | Brief History of Artificial Intelligence                                                                                                                |      |
| 4                                                                                            | 102/10/07 ~<br>102/10/13 | Uses and Limitations. Introduction to AI applications.                                                                                                  |      |
| 5                                                                                            | 102/10/14 ~<br>102/10/20 | Introduction to AI applications.                                                                                                                        |      |
| 6                                                                                            | 102/10/21 ~<br>102/10/27 | Knowledge Representation                                                                                                                                |      |
| 7                                                                                            | 102/10/28 ~<br>102/11/03 | Term project proposal presentation                                                                                                                      |      |
| 8                                                                                            | 102/11/04 ~<br>102/11/10 | Search Methodologies and Game Playing                                                                                                                   |      |
| 9                                                                                            | 102/11/11 ~<br>102/11/17 | Search Methodologies and Game Playing                                                                                                                   |      |
| 10                                                                                           | 102/11/18 ~<br>102/11/24 | Midterm Exam Week                                                                                                                                       |      |
| 11                                                                                           | 102/11/25 ~<br>102/12/01 | Expert systems and Rule-based systems                                                                                                                   |      |
| 12                                                                                           | 102/12/02 ~<br>102/12/08 | Expert systems and Rule-based systems                                                                                                                   |      |
|                                                                                              |                          |                                                                                                                                                         |      |

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|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|--|
| 13                      | 102/12/09 ~<br>102/12/15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Expert systems and Rule-based systems |  |
| 14                      | 102/12/16 ~<br>102/12/22                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Introduction to Machine Learning      |  |
| 15                      | 102/12/23 ~<br>102/12/29                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Introduction to Machine Learning      |  |
| 16                      | 102/12/30 ~<br>103/01/05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Introduction to Machine Learning      |  |
| 17                      | 103/01/06 ~<br>103/01/12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Term project presentation             |  |
| 18                      | 103/01/13 ~<br>103/01/19                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Final Exam Week                       |  |
| Requirement             | Details of grading policy and how course project works will be announce in first class.<br>Lecturer remain the right to adjust grading policy.<br>成績計算方式及專題執行細節將於課堂上說明，且授課教師保留調整計算方式的彈性。                                                                                                                                                                                                                                                                                                                                         |                                       |  |
| Teaching Facility       | Computer, Projector                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                       |  |
| Textbook(s)             | Artificial Intelligence Illuminated, Ben Coppin, Jones & Bartlett Publishers (March 2004),<br>ISBN-13: 978-0763732301                                                                                                                                                                                                                                                                                                                                                                                                            |                                       |  |
| Reference(s)            | Artificial Intelligence: a guide to intelligent systems 2nd Edition by Michael Negnevitsky,<br>Addison Wesley                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       |  |
| Number of Assignment(s) | (Filled in by assignment instructor only)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                       |  |
| Grading Policy          | ◆ Attendance :                %    ◆ Mark of Usual : 20.0 %    ◆ Midterm Exam : 10.0 %<br>◆ Final Exam :    10.0 %<br>◆ Other 〈course project〉 : 60.0 %                                                                                                                                                                                                                                                                                                                                                                          |                                       |  |
| Note                    | This syllabus may be uploaded at the website of Course Syllabus Management System at <a href="http://info.ais.tku.edu.tw/csp">http://info.ais.tku.edu.tw/csp</a> or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at <a href="http://www.acad.tku.edu.tw/CS/main.php">http://www.acad.tku.edu.tw/CS/main.php</a> .<br><br><b>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</b> |                                       |  |