# Tamkang University Academic Year 109, 1st Semester Course Syllabus

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| Course Title | ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING | Instructor | TYAN FENG |
| Course Class | TGEHB0A<br>HONORS PROGRAM, 0A | Details | ◆ General Course<br>◆ Required<br>◆ One Semester |

## Departmental Aim of Education

Educate our undergraduate students to be successful engineers who have interdisciplinary knowledge, techniques and literacy.

## Subject Departmental core competences

A. The ability to solve engineering problems using basic information techniques and computer software.(ratio:50.00)

C. The ability to learn and integrate basic knowledge of mathematics, science and engineering.(ratio:50.00)

## Subject Schoolwide essential virtues

1. A global perspective. (ratio:20.00)
2. Information literacy. (ratio:20.00)
3. A vision for the future. (ratio:20.00)
4. Moral integrity. (ratio:5.00)
5. Independent thinking. (ratio:20.00)
6. A cheerful attitude and healthy lifestyle. (ratio:5.00)
7. A spirit of teamwork and dedication. (ratio:5.00)
8. A sense of aesthetic appreciation. (ratio:5.00)

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| Course Introduction | The primary objective of this course is to introduce the basic principles, techniques, and applications of Artificial Intelligence.<br>Emphasis will be placed on the teaching of these fundamentals, not on providing a mastery of specific software tools or programming environments.<br>Assigned projects promote a "hands-on" approach for understanding, as well as a challenging avenue for exploration and creativity. |

**The correspondences between the course's instructional objectives and the cognitive, affective, and psychomotor objectives.**

Differentiate the various objective methods among the cognitive, affective and psychomotor domains of the course's instructional objectives.

I. Cognitive : Emphasis upon the study of various kinds of knowledge in the cognition of the course's veracity, conception, procedures, outcomes, etc.

II.Affective : Emphasis upon the study of various kinds of knowledge in the course's appeal, morals, attitude, conviction, values, etc.

III.Psychomotor: Emphasis upon the study of the course's physical activity and technical manipulation.

| No. | Teaching Objectives | objective methods |
|---|---|---|
| 1 | Introduction to Machine Learning | Cognitive |
| 2 | MATLAB Recipes for Machine Learning | Cognitive |
| 3 | Neural Network | Cognitive |
| 4 | Training of Multi-Layer Neural Network | Cognitive |
| 5 | Neural Network and Classification | Cognitive |
| 6 | Deep Learning | Cognitive |
| 7 | Convolutional Neural Network | Cognitive |

The correspondences of teaching objectives : core competences, essential virtues, teaching methods, and assessment

| No. | Core Competences | Essential Virtues | Teaching Methods | Assessment |
|---|---|---|---|---|
| 1 | AC | 12345678 | Lecture, Discussion | Testing, Study Assignments, Discussion(including classroom and online) |
| 2 | AC | 12345678 | Lecture, Discussion | Testing, Study Assignments, Discussion(including classroom and online) |
| 3 | AC | 12345678 | Lecture, Discussion | Testing, Study Assignments, Discussion(including classroom and online) |
| 4 | AC | 12345678 | Lecture, Discussion | Testing, Discussion(including classroom and online) |
| 5 | AC | 12345678 | Lecture, Discussion | Testing, Study Assignments, Discussion(including classroom and online) |
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| 6 | AC | 12345678 | Lecture, Discussion | Testing, Study Assignments, Discussion(including classroom and online) |
| 7 | AC | 12345678 | Lecture, Discussion | Testing, Study Assignments, Discussion(including classroom and online) |

Course Schedule

| Week | Date | Course Contents | Note |
|---|---|---|---|
| 1 | 109/09/14 ~ 109/09/20 | Introduction to Machine Learning | P.K. 1 |
| 2 | 109/09/21 ~ 109/09/27 | Introduction to Machine Learning | P.K. 1 |
| 3 | 109/09/28 ~ 109/10/04 | MATLAB Recipes for Machine Learning | M.P. 2,3 |
| 4 | 109/10/05 ~ 109/10/11 | Neural Network | P.K. 2 |
| 5 | 109/10/12 ~ 109/10/18 | Neural Network | P.K. 2 |
| 6 | 109/10/19 ~ 109/10/25 | Neutral Network | P.K. 2 |
| 7 | 109/10/26 ~ 109/11/01 | Training of Multi-Layer Neural Network | P.K. 3 |
| 8 | 109/11/02 ~ 109/11/08 | Training of Multi-Layer Neural Network | P.K. 3 |
| 9 | 109/11/09 ~ 109/11/15 | Training of Multi-Layer Neural Network | P.K. 3 |
| 10 | 109/11/16 ~ 109/11/22 | Midterm Exam Week | |
| 11 | 109/11/23 ~ 109/11/29 | Neural Network and Classification | P.K. 4 |
| 12 | 109/11/30 ~ 109/12/06 | Neural Network and Classification | P.K. 4 |
| 13 | 109/12/07 ~ 109/12/13 | Neural Network and Classification | P.K. 4 |
| 14 | 109/12/14 ~ 109/12/20 | Deep Learning | P.K. 5 |
| 15 | 109/12/21 ~ 109/12/27 | Deep Learning | P.K. 5 |
| 16 | 109/12/28 ~ 110/01/03 | Deep Learning | P.K. 5 |
| 17 | 110/01/04 ~ 110/01/10 | Convolutional Neural Network | P.K. 6 |
| 18 | 110/01/11 ~ 110/01/17 | Final Exam Week | |

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| Requirement | 1.You will need to familiarize yourself with MATLAB. |
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| Teaching Facility | Computer, Projector, Other (MATLAB) |
| Textbooks and Teaching Materials | Phil Kim, " MATLAB Deep Learning With Machine Learning, Neural Networks and Ar- tificial Intelligence," Apress, 2017. |
| References | Michael Paluszek and Stephanie Thomas, "MATLAB Machine Learning," Apress, 2017. |
| Number of Assignment(s) | 8 (Filled in by assignment instructor only) |
| Grading Policy | ◆ Attendance： % ◆ Mark of Usual：15.0 % ◆ Midterm Exam： 35.0 %<br>◆ Final Exam： 50.0 %<br>◆ Other〈 〉： % |
| Note | This syllabus may be uploaded at the website of Course Syllabus Management System at http://info.ais.tku.edu.tw/csp or through the link of Course Syllabus Upload posted on the home page of TKU Office of Academic Affairs at http://www.acad.tku.edu.tw/CS/main.php .<br>**※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.** |