

## Tamkang University Academic Year 113, 1st Semester Course Syllabus

Course Title	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING	Instructor	TYAN FENG
Course Class	TGEHB0A HONORS PROGRAM, 0A	Details	<ul style="list-style-type: none"> <li>◆ General Course</li> <li>◆ Required</li> <li>◆ One Semester</li> <li>◆ 2 Credits</li> </ul>
Relevance to SDGs	SDG4 Quality education		
<b>Departmental Aim of Education</b>			
Educate our undergraduate students to be successful engineers who have interdisciplinary knowledge, techniques and literacy.			
<b>Subject Departmental core competences</b>			
<ul style="list-style-type: none"> <li>A. The ability to solve engineering problems using basic information techniques and computer software.(ratio:40.00)</li> <li>B. The ability to recognize and treasure professional ethics.(ratio:20.00)</li> <li>C. The ability to learn and integrate basic knowledge of mathematics, science and engineering.(ratio:40.00)</li> </ul>			
<b>Subject Schoolwide essential virtues</b>			
<ul style="list-style-type: none"> <li>1. A global perspective. (ratio:10.00)</li> <li>2. Information literacy. (ratio:10.00)</li> <li>3. A vision for the future. (ratio:10.00)</li> <li>4. Moral integrity. (ratio:10.00)</li> <li>5. Independent thinking. (ratio:30.00)</li> <li>6. A cheerful attitude and healthy lifestyle. (ratio:10.00)</li> <li>7. A spirit of teamwork and dedication. (ratio:10.00)</li> <li>8. A sense of aesthetic appreciation. (ratio:10.00)</li> </ul>			

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

**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	ABC	12345678	Lecture, Discussion	Testing, Study Assignments, Discussion(including classroom and online)
2	ABC	12345678	Lecture, Discussion	Testing, Study Assignments, Discussion(including classroom and online)

3	ABC	12345678	Lecture, Discussion	Testing, Study Assignments, Discussion(including classroom and online)
4	ABC	12345678	Lecture, Discussion	Testing, Study Assignments, Discussion(including classroom and online)
5	ABC	12345678	Lecture, Discussion	Testing, Study Assignments, Discussion(including classroom and online)
6	ABC	12345678	Lecture, Discussion	Testing, Study Assignments, Discussion(including classroom and online)
7	ABC	12345678	Lecture, Discussion	Testing, Study Assignments, Discussion(including classroom and online)

### Course Schedule

Week	Date	Course Contents	Note
1	113/09/09 ~ 113/09/15	Introduction to Machine Learning	P.K. 1
2	113/09/16 ~ 113/09/22	Introduction to Machine Learning	P.K. 1
3	113/09/23 ~ 113/09/29	MATLAB Recipes for Machine Learning	M.P. 2,3
4	113/09/30 ~ 113/10/06	Neural Network	P.K. 2
5	113/10/07 ~ 113/10/13	Neural Network	P.K. 2
6	113/10/14 ~ 113/10/20	Neural Network	P.K. 2
7	113/10/21 ~ 113/10/27	Training of Multi-Layer Neural Network	P.K. 3
8	113/10/28 ~ 113/11/03	Training of Multi-Layer Neural Network	P.K. 3
9	113/11/04 ~ 113/11/10	Midterm Exam Week	
10	113/11/11 ~ 113/11/17	Training of Multi-Layer Neural Network	P.K. 3
11	113/11/18 ~ 113/11/24	Neural Network and Classification	P.K. 4
12	113/11/25 ~ 113/12/01	Neural Network and Classification	P.K. 4
13	113/12/02 ~ 113/12/08	Neural Network and Classification	P.K. 4
14	113/12/09 ~ 113/12/15	Deep Learning	P.K. 5

15	113/12/16~ 113/12/22	Deep Learning	P.K. 5
16	113/12/23~ 113/12/29	Deep Learning	P.K. 5
17	113/12/30~ 114/01/05	Final Exam Week	
18	114/01/06~ 114/01/12	Flex week, learning activities should be arranged.	P.K. 6
Key capabilities	self-directed learning Information Technology Problem solving Interdisciplinary		
Interdisciplinary	STEAM course (S:Science, T:Technology, E:Engineering, M:Math, A field:Integration of Art and Humanist)		
Distinctive teaching	Special/Problem-Based(PBL) Courses		
Course Content	Computer programming or Computer language (students have hands-on experience in related projects) Logical Thinking AI application		
Requirement	1.You will need to familiarize yourself with MATLAB.		
Textbooks and Teaching Materials	Self-made teaching materials:Presentations, Handouts, MATLAB files Using teaching materials from other writers:Textbooks, Presentations, Handouts, MATLAB		
References	Michael Paluszek and Stephanie Thomas, "MATLAB Machine Learning," Apress, 2017.		
Grading Policy	◆ Attendance :           %   ◆ Mark of Usual : 15.0 %   ◆ Midterm Exam : 35.0 % ◆ Final Exam :   50.0 % ◆ Other <    > :           %		
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> . <b>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</b>		