Tamkang University Academic Year 109, 1st Semester Course Syllabus

Course Title	EVOLUTIONARY COMPUTATION	Instructor	CHENG SHIAN LIN
Course Class	TEIBM1A MASTER'S PROGRAM, DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING (ENGLISH-TAUGHT PROGRAM), 1A	Details	◆ General Course ◆ Selective ◆ One Semester

Departmental Aim of Education

Ⅰ. Cultivate the ability to conduct independent research and problem solving.

Ⅱ. Strengthen creativity and research capacity.

Ⅲ. Build profound professional knowledge in computer science and information engineering.

Ⅳ. Engage in self-directed lifelong learning.

Subject Departmental core competences

B. Independent innovative thinking ability.(ratio:30.00)

D. Research & development (R&D) ability in information engineering.(ratio:70.00)

Subject Schoolwide essential virtues

2. Information literacy. (ratio:70.00)

5. Independent thinking. (ratio:30.00)

Course Introduction	The course is designed for graduate students to enhance the concepts of Evolutionary computation (EC) and some new optimization techniques derived from EC. In addition, the practical applications of EC will be introduced as well. Finally, students can apply those EC algorithms to the related research area.

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	To give a concise introduction to evolutionary computation (EC)	Cognitive
2	Discussing the optimization techniques derived from evolutionary computation	Cognitive
3	Training of independent thinking	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	BD	25	Lecture, Discussion	Study Assignments, Discussion(including classroom and online), Report(including oral and written)
2	BD	25	Lecture, Discussion	Study Assignments, Discussion(including classroom and online), Report(including oral and written)
3	BD	25	Lecture, Discussion	Study Assignments, Discussion(including classroom and online), Report(including oral and written)

Course Schedule

Week	Date	Course Contents	Note
1	109/09/14 ~ 109/09/20	Syllabus and course introduction	
2	109/09/21 ~ 109/09/27	Basic Matlab Programming	
3	109/09/28 ~ 109/10/04	Basic Matlab Programming	
4	109/10/05 ~ 109/10/11	Introduction to Evolutionary computation	
5	109/10/12 ~ 109/10/18	Simulated Annealing and Tabu Search	

6	109/10/19~109/10/25	Genetic Algorithm (GA)	
7	109/10/26~109/11/01	Genetic Algorithm (GA)	
8	109/11/02~109/11/08	Genetic Algorithm (GA)	
9	109/11/09~109/11/15	Project Proposal	Project Proposal(Explain the final project)
10	109/11/16~109/11/22	Midterm Exam	
11	109/11/23~109/11/29	Particle Swarm Optimization (PSO)	
12	109/11/30~109/12/06	Particle Swarm Optimization (PSO)	
13	109/12/07~109/12/13	Ant Colony Optimization (ACO)	
14	109/12/14~109/12/20	Ant Colony Optimization (ACO)	
15	109/12/21~109/12/27	Case Study	
16	109/12/28~110/01/03	Case Study	
17	110/01/04~110/01/10	Final Project Report	
18	110/01/11~110/01/17	Final Exam	

Requirement	
Teaching Facility	Computer, Projector
Textbooks and Teaching Materials	Self compiling teaching material
References	1. Introduction to evolutionary computing (2003) / Agoston E. Eiben,James E. Smith. 2.Melanie Mitchell, (1996) An introduction to genetic algorithms, MIT Press 3. John Koza et al, (2003) Genetic Programming IV - Routine Human-Competitive Machine Intelligence, Morgan Kaufmann
Number of Assignment(s)	(Filled in by assignment instructor only)
Grading Policy	◆ Attendance： 20.0 % ◆ Mark of Usual： % ◆ Midterm Exam： 20.0 % ◆ Final Exam： 35.0 % ◆ Other〈Homework〉：25.0 %

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 .
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