

Tamkang University Academic Year 110, 1st Semester Course Syllabus

Course Title	ALGORITHMIC GAME THEORY	Instructor	CHUANG-CHIEH LIN
Course Class	TEIBM1A MASTER'S PROGRAM, DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION ENGINEERING (ENGLISH-TAUGHT PROGRAM),	Details	<ul style="list-style-type: none"> ◆ General Course ◆ Selective ◆ One Semester
Relevance to SDGs	1A SDG4 Quality education		
Departmental Aim of Education			
<p>I. Cultivate the ability to conduct independent research and problem solving.</p> <p>II. Strengthen creativity and research capacity.</p> <p>III. Build profound professional knowledge in computer science and information engineering.</p> <p>IV. Engage in self-directed lifelong learning.</p>			
Subject Schoolwide essential virtues			
<p>2. Information literacy. (ratio:75.00)</p> <p>5. Independent thinking. (ratio:25.00)</p>			
Course Introduction	<p>This course focuses on theoretical aspects and applications of of game theory. Game theory is ubiquitous in real world and has extensively applied in multiagent mechanism design and building machine learning models such as generative-adversarial network (GAN). We expect the students to learn solid theoretical foundation and also be capable of implementing several projects on simulating import equilibria for several practical games.</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	Basic Solution Concepts	Cognitive
2	Matrix Form and Extensive Form	Cognitive
3	Equilibrium Computation	Cognitive
4	Market Equilibria	Cognitive
5	Inefficiency of Equilibria	Cognitive
6	Network Formation Games	Cognitive
7	Social Choice	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABD	25	Lecture, Discussion	Study Assignments, Discussion(including classroom and online)
2	ABD	25	Lecture, Discussion	Study Assignments, Discussion(including classroom and online)
3	ABDE	25	Lecture, Discussion	Study Assignments, Discussion(including classroom and online), Practicum
4	ABD	25	Lecture, Discussion	Study Assignments, Discussion(including classroom and online)
5	ABD	25	Lecture, Discussion	Study Assignments, Discussion(including classroom and online)
6	ABD	25	Lecture, Discussion	Study Assignments, Discussion(including classroom and online)

7	ABDE	25	Lecture, Discussion	Study Assignments, Discussion(including classroom and online)
Course Schedule				
Week	Date	Course Contents		Note
1	110/09/22~ 110/09/28	Moon Festival (Holiday)		
2	110/09/29~ 110/10/05	Course Introduction		
3	110/10/06~ 110/10/12	Basic Solution Concepts (I)		
4	110/10/13~ 110/10/19	Basic Solution Concepts (II)		
5	110/10/20~ 110/10/26	Matrix Form and Extensive Form (I)		
6	110/10/27~ 110/11/02	Matrix Form and Extensive Form (II)		
7	110/11/03~ 110/11/09	Equilibrium Computation (I)		
8	110/11/10~ 110/11/16	Equilibrium Computation (II)		
9	110/11/17~ 110/11/23	Social Choice (I)		
10	110/11/24~ 110/11/30	Social Choice (II)		
11	110/12/01~ 110/12/07	Midterm Report/Presentation		
12	110/12/08~ 110/12/14	Market Equilibria (I)		
13	110/12/15~ 110/12/21	Market Equilibria (II)		
14	110/12/22~ 110/12/28	Inefficiency of Equilibria		
15	110/12/29~ 111/01/04	Selected Topics (I)		
16	111/01/05~ 111/01/11	Selected Topics (II)		
17	111/01/12~ 111/01/18	Final Project Presentation		
18	111/01/19~ 111/01/25			
Requirement				
Teaching Facility		Computer, Projector		
Textbooks and Teaching Materials		Algorithmic Game Theory. Noam Nisan, Tim Roughgarden, Eva Tardos, and Vijav V. Vazirani. Cambridge University Press. 2011.		

References	Essentials of Game Theory: A Concise, Multidisciplinary Introduction (Synthesis Lectures on Artificial Intelligence and Machine Learning). Leyton- Brown and Kevin, Shoham. Cambridge University Press. 2008.
Number of Assignment(s)	5 (Filled in by assignment instructor only)
Grading Policy	<ul style="list-style-type: none"> ◆ Attendance : 10.0 % ◆ Mark of Usual : 30.0 % ◆ Midterm Exam : 30.0 % ◆ Final Exam : 30.0 % ◆ Other < > : %
Note	<p>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 .</p> <p>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</p>