

Tamkang University Academic Year 112, 1st Semester Course Syllabus

Course Title	ALGEBRA	Instructor	YAO CHENG
Course Class	TSMAM1A MASTER'S PROGRAM, DEPARTMENT OF MATHEMATICS, 1A	Details	<ul style="list-style-type: none"> ◆ General Course ◆ Required ◆ 1st Semester
Relevance to SDGs	SDG4 Quality education SDG17 Partnerships for the goals		
Departmental Aim of Education			
Expose students to cutting-edge research areas in mathematics and data science, and enhance their ability to pursue professional careers or advanced studies in related specializations.			
Subject Departmental core competences			
A. Proficiency with fundamental knowledge in mathematics or statistics.(ratio:30.00) B. Ability to recognize, formulate, and solve mathematics problems.(ratio:25.00) C. Ability to conduct independent research and communicate mathematical or statistical concepts clearly and effectively.(ratio:25.00) D. Ability to transform real-world problems into mathematical or statistical models. (ratio:10.00) E. Ability to collect, analyze, interpret data, and present findings with visualization.(ratio:10.00)			
Subject Schoolwide essential virtues			
1. A global perspective. (ratio:10.00) 2. Information literacy. (ratio:30.00) 3. A vision for the future. (ratio:10.00) 4. Moral integrity. (ratio:5.00) 5. Independent thinking. (ratio:25.00) 6. A cheerful attitude and healthy lifestyle. (ratio:5.00) 7. A spirit of teamwork and dedication. (ratio:10.00) 8. A sense of aesthetic appreciation. (ratio:5.00)			

Course Introduction	This is a one academic year course on graduate algebra. In the first semester, our focus will be on the group theory. Especially, the classification of finite abelian groups and the Sylow's theorems.
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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 let students be familiar with advance topics in group theory.	Cognitive

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

No.	Core Competences	Essential Virtues	Teaching Methods	Assessment
1	ABCDE	12345678	Lecture, Discussion	Testing, Discussion(including classroom and online), Report(including oral and written)

Course Schedule

Week	Date	Course Contents	Note
1	112/09/11 ~ 112/09/17	Review of undergraduate algebra	
2	112/09/18 ~ 112/09/24	Definition and Examples of Groups	
3	112/09/25 ~ 112/10/01	Basic Properties of Groups	
4	112/10/02 ~ 112/10/08	Subgroups	
5	112/10/09 ~ 112/10/15	Isomorphisms and Homomorphisms	

6	112/10/16 ~ 112/10/22	The Symmetric and Alternating Groups	
7	112/10/23 ~ 112/10/29	Congruence and Lagrange's Theorem	
8	112/10/30 ~ 112/11/05	Normal Subgroups	
9	112/11/06 ~ 112/11/12	Quotient Groups	
10	112/11/13 ~ 112/11/19	Quotient Groups and Homomorphisms	
11	112/11/20 ~ 112/11/26	Direct Products	
12	112/11/27 ~ 112/12/03	Finite Abelian Groups	
13	112/12/04 ~ 112/12/10	The Sylow Theorems	
14	112/12/11 ~ 112/12/17	Conjugacy and the Proof of the Sylow Theorems	
15	112/12/18 ~ 112/12/24	The Structure of Finite Groups I	
16	112/12/25 ~ 112/12/31	The Structure of Finite Groups II	
17	113/01/01 ~ 113/01/07	Final Exam	
18	113/01/08 ~ 113/01/14	Transcendence Bases	
Key capabilities			
Interdisciplinary			
Distinctive teaching			
Course Content		Logical Thinking	
Requirement			

Textbooks and Teaching Materials	Self-made teaching materials:Handouts
References	Abstract algebra-an introduction, by Thomas W. Hungerford, 3rd edition
Grading Policy	<p>◆ Attendance : % ◆ Mark of Usual : 40.0 % ◆ Midterm Exam : 30.0 %</p> <p>◆ Final Exam : 30.0 %</p> <p>◆ Other () : %</p>
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>