

Tamkang University Academic Year 112, 2nd Semester Course Syllabus

Course Title	GEOMETRIC ANALYSIS	Instructor	PAK-TUNG HO
Course Class	TSMAM1A MASTER'S PROGRAM, DEPARTMENT OF MATHEMATICS, 1A	Details	<ul style="list-style-type: none"> ◆ General Course ◆ Selective ◆ 2nd Semester
Relevance to SDGs	SDG4 Quality education		
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			
<ul style="list-style-type: none"> A. Proficiency with fundamental knowledge in mathematics or statistics.(ratio:20.00) B. Ability to recognize, formulate, and solve mathematics problems.(ratio:20.00) C. Ability to conduct independent research and communicate mathematical or statistical concepts clearly and effectively.(ratio:20.00) D. Ability to transform real-world problems into mathematical or statistical models. (ratio:20.00) E. Ability to collect, analyze, interpret data, and present findings with visualization.(ratio:20.00) 			
Subject Schoolwide essential virtues			
<ul style="list-style-type: none"> 1. A global perspective. (ratio:12.00) 2. Information literacy. (ratio:12.00) 3. A vision for the future. (ratio:12.00) 4. Moral integrity. (ratio:12.00) 5. Independent thinking. (ratio:12.00) 6. A cheerful attitude and healthy lifestyle. (ratio:12.00) 7. A spirit of teamwork and dedication. (ratio:12.00) 8. A sense of aesthetic appreciation. (ratio:16.00) 			

Course Introduction	Understanding the concepts in Geometric Analysis. I plan to talk about the concepts of differentiable manifolds, differentiable maps, tangent spaces, Riemannian metrics, connections, etc.
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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	Learning the concepts in Geometric Analysis	Affective

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, Study Assignments, Discussion(including classroom and online)

Course Schedule

Week	Date	Course Contents	Note
1	113/02/19~ 113/02/25	Affine Connection	
2	113/02/26~ 113/03/03	Riemannian Connection	
3	113/03/04~ 113/03/10	Curvature	
4	113/03/11~ 113/03/17	Curvature	
5	113/03/18~ 113/03/24	Curvature	

6	113/03/25 ~ 113/03/31	Curvature	
7	113/04/01 ~ 113/04/07	geodesic	
8	113/04/08 ~ 113/04/14	geodesic	
9	113/04/15 ~ 113/04/21	space of constant curvature	
10	113/04/22 ~ 113/04/28	variation of energy	
11	113/04/29 ~ 113/05/05	variation of energy	
12	113/05/06 ~ 113/05/12	variation of energy	
13	113/05/13 ~ 113/05/19	divergence, Laplacian on Riemannian manifold	
14	113/05/20 ~ 113/05/26	Bochner formula	
15	113/05/27 ~ 113/06/02	Application of Bochner formula	
16	113/06/03 ~ 113/06/09	Application of Bochner formula	
17	113/06/10 ~ 113/06/16	Application of Bochner formula	
18	113/06/17 ~ 113/06/23	Application of Bochner formula	
Key capabilities	Problem solving		
Interdisciplinary	STEAM course (S:Science, T:Technology, E:Engineering, M:Math, A field:Integration of Art and Humanist)		
Distinctive teaching			
Course Content	Logical Thinking		
Requirement			

Textbooks and Teaching Materials	Using teaching materials from other writers:Textbooks Name of teaching materials: Riemannian Geometry, Do Carmo
References	
Grading Policy	<p>◆ Attendance : 20.0 % ◆ Mark of Usual : % ◆ Midterm Exam : %</p> <p>◆ Final Exam : %</p> <p>◆ Other (Assignment) : 80.0 %</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>