

Tamkang University Academic Year 112, 1st Semester Course Syllabus

Course Title	STATISTICAL THEORY	Instructor	WU SHU-FEI
Course Class	TLSXM1A MASTER'S PROGRAM, DEPARTMENT OF STATISTICS, 1A	Details	<ul style="list-style-type: none"> ◆ Blended Course ◆ Required ◆ 1st Semester ◆ 3 Credits
Relevance to SDGs	SDG4 Quality education		
Departmental Aim of Education			
<ul style="list-style-type: none"> I. Cultivate students with ability to conduct research on statistical theory. II. Cultivate students with ability for statistical programming. III. Cultivate students to become statistical professionals with management capabilities. IV. Cultivate students with international perspectives. 			
Subject Departmental core competences			
<ul style="list-style-type: none"> A. Ability to conduct research of statistical theory.(ratio:30.00) B. Data analysis skills.(ratio:15.00) C. Ability to acquire interdisciplinary knowledge.(ratio:15.00) D. Logical thinking ability.(ratio:30.00) E. Statistical consulting ability.(ratio:10.00) 			
Subject Schoolwide essential virtues			
<ul style="list-style-type: none"> 1. A global perspective. (ratio:10.00) 2. Information literacy. (ratio:10.00) 3. A vision for the future. (ratio:10.00) 4. Moral integrity. (ratio:20.00) 5. Independent thinking. (ratio:30.00) 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 course focuses on the theoretical statistics. Topics include distribution theory, approximation to distributions, modes of convergence, limit theorems, statistical models, parameter estimation, comparison of estimators, confidence sets, theory of hypothesis tests, and Bayesian inference.
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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	Students are able to understand the distribution, Laws of Large Numbers, the Central Limit Theorem and some important limit theorems. Students are able to understand the concepts of sufficiency and completeness of a statistic theory.	Cognitive
2	Students know how to find the UMVUE of a model parameter and construct different kinds of estimators such as moment estimator, MLE, Bayes estimator, etc. Students know how to construct an optimal confidence interval for a model parameter. Students know how to make a null hypothesis and how to construct an optimal test for hypotheses testing. Large Numbers, the Central Limit Theorem and some important limit theorems.	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, Study Assignments, Discussion(including classroom and online)
2	ABCDE	12345678	Lecture	Testing, Study Assignments, Discussion(including classroom and online)

Course Schedule

Note for Blended Course : When utilizing weekly digital instruction, please fill in "Online Asynchronous Instruction".

Week	Date	Course Contents	Note
1	112/09/11 ~ 112/09/17	Introduction of this course	
2	112/09/18 ~ 112/09/24	Chap. 1: Probability Theory	
3	112/09/25 ~ 112/10/01	Chap. 1: Probability Theory	
4	112/10/02 ~ 112/10/08	Chap. 2: Transformations and Expectations	線上非同步教學
5	112/10/09 ~ 112/10/15	Chap. 2: Transformations and Expectations	線上非同步教學
6	112/10/16 ~ 112/10/22	Chap. 2: Transformations and Expectations	
7	112/10/23 ~ 112/10/29	Chap. 2: Transformations and Expectations	線上非同步教學
8	112/10/30 ~ 112/11/05	Chap. 3: Common Families of Distributions	線上非同步教學
9	112/11/06 ~ 112/11/12	期中考試	
10	112/11/13 ~ 112/11/19	Chap. 3: Common Families of Distributions	
11	112/11/20 ~ 112/11/26	Chap. 3: Common Families of Distributions	
12	112/11/27 ~ 112/12/03	Chap. 3: Common Families of Distributions	
13	112/12/04 ~ 112/12/10	Chap. 3: Common Families of Distributions	
14	112/12/11 ~ 112/12/17	Chap. 4: Multiple Random Variables	
15	112/12/18 ~ 112/12/24	Chap. 4: Multiple Random Variables	
16	112/12/25 ~ 112/12/31	Chap. 4: Multiple Random Variables	
17	113/01/01 ~ 113/01/07	期末考	
18	113/01/08 ~ 113/01/14	彈性教學周	
Key capabilities		self-directed learning Problem solving	

Interdisciplinary	STEAM course (S:Science, T:Technology, E:Engineering, M:Math, A field:Integration of Art and Humanist)
Distinctive teaching	Online Asynchronous
Course Content	Logical Thinking
Requirement	上課不可使用notebook, Ipad 或其他電腦設備(除非老師要求), 違反規定者總分扣十分
Textbooks and Teaching Materials	Using teaching materials from other writers:Textbooks Name of teaching materials: Statistical Inference. 2nd ed. George Casella, Roger L. Berger (2002)
References	1. Bickel, P. J. and Doksum, K. A. (2001). Mathematical Statistics: Basic Ideas and Selected Topics, Vol I, 2nd ed., Prentice Hall. 2. Lehmann, E. L. (1983). Theory of Point Estimation, Wiley. 3. Lehmann, E. L. (1986). Testing Statistical Hypotheses, 2nd ed., Wiley.
Grading Policy	◆ Attendance : 30.0 % ◆ Mark of Usual : 30.0 % ◆ Midterm Exam : 20.0 % ◆ Final Exam : 20.0 % ◆ Other () : %
Note	<p>1. This syllabus may be uploaded at the website of the Course Syllabus Management System at https://info.ais.tku.edu.tw/csp or through the link of the Course Syllabus Upload posted on the home page of the TKU Office of Academic Affairs http://www.acad.tku.edu.tw/CS/main.php</p> <p>2. According to the Implementation regulations of distance education for junior college and above are prescribed pursuant to Article 2, "The distance learning course referred to in these Measures refers to more than one-half of the teaching hours in each subject."</p> <p>3. According to the regulations of Tamkang University Enforcement Rules for digital teaching, Paragraph 2 and Article 3, the distance learning course of our school must be "The course of digital teaching with distance learning platform or synchronous video system in our school. Teaching Hours include course lectures, teacher-student interaction discussions, quizzes and other learning activities."</p> <p>4. If there are any temporary course changes (including time changes and classroom changes of distance learning courses, blended courses), please make out an application according to regulations to the Office of Academic Affairs.</p> <p>※ Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</p>