

Tamkang University Academic Year _2012, _2nd_ Semester
Course Syllabus

Course Title	STATISTICAL THEORY		Instructor	Shu-Fei Wu	
Department/Year/Class		Course Details			
TLSEXM1A	<input checked="" type="checkbox"/> Required <input type="checkbox"/> Selective	<input type="checkbox"/> 0 (One Semester) <input type="checkbox"/> 1 (1st Semester) <input checked="" type="checkbox"/> 2 (2nd Semester) <input type="checkbox"/> 3 (3rd Semester)	Credits	3	
Aim of Education			Core Competences		
1. Statistical Theory Knowledge 2. Statistical Practice Application Skills 3. Diverse Field Learning 4. Communication and Expression Techniques			1. Statistical Theory Research Competence 2. Data Analysis Competence 3. Diverse Field Knowledge Competence 4. Logical Thinking Competence 5. Statistical Consulting Competence		
Course Introduction (50 to 100 words)	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.				
The Relevance among Teaching Objectives, Objective Levels and Core Competences					
I.Objective Levels (select applicable ones) : (I) Cognitive Domain : C1 Remembering 、 C2 Understanding 、 C3 Applying 、 C4 Analyzing 、 C5 Evaluating 、 C6 Creating (II) Psychomotor Domain : P1 Imitation 、 P2 Mechanism 、 P3 Independent Operation 、 P4 Linked Operation 、 P5 Automation 、 P6 Origination (III) Affective Domain : A1 Receiving 、 A2 Responding 、 A3 Valuing 、 A4 Organizing 、 A5 Charaterizing 、 A6 Implementing					
II.The Relevance among Teaching Objectives, Objective Levels and Core Competences : (I)Determine the objective level(s) in any one of the three learning domains (cognitive, psychomotor, and affective) corresponding to the teaching objectives. Each objective should correspond to the objective level(s) of ONLY ONE of the three domains. (II)If more than one objective levels are applicable for each learning domain, select the highest one only. (For example, if the objective levels for Cognitive Domain include C3, C5, and C6, select C6 only and fill it in the boxes below. The same rule applies to Psychomotor Domain and Affective Domain.) (III)Determine the core competences that correspond to each teaching objective. Each objective may correspond to one or more core competences at a time. (For example, if one objective corresponds to three core competences: A, AD, and BEF, list all of the three in the box.)					
Teaching objectives				Relevance	

	Objective Levels	Core Competences
1 Students are able to understand the distribution theory.	C5	ABCD
2 Students are able to understand the Laws of Large Numbers, the Central Limit Theorem and some important limit theorems.	C5	ABCD
3 Students are able to understand the concepts of sufficiency and completeness of a statistic. Students also know how to find the UMVUE of a model parameter.	C5	ABCD
4 Students are able to construct different kinds of estimators such as moment estimator, MLE, Bayes estimator, etc..	C5	ABCD
5 Students are able to understand how to construct an optimal confidence interval for a model parameter.	C5	ABCD
6 Students are able to understand how to make a null hypothesis and how to construct an optimal test for hypotheses testing.	C5	ABCD

Teaching Objectives, Teaching Methods and Assessment

Teaching Objectives	Teaching Methods	Assessment
1 Students are able to understand the distribution theory.	Teaching and Discussion.	Homeworks; Tests; Performance in class.
2 Students are able to understand the Laws of Large Numbers, the Central Limit Theorem and some important limit theorems.	Teaching and Discussion.	Homeworks; Tests; Performance in class.
3 Students are able to understand the concepts of sufficiency and completeness of a statistic. Students also know how to find the UMVUE of a model parameter.	Teaching and Discussion.	Homeworks; Tests; Performance in class.
4 Students are able to construct different kinds of estimators such as moment estimator, MLE, Bayes estimator, etc..	Teaching and Discussion.	Homeworks; Tests; Performance in class.
5 Students are able to understand how to construct an optimal confidence interval for a model parameter.	Teaching and Discussion.	Homeworks; Tests; Performance in class.

6 Students are able to understand how to make a null hypothesis and how to construct an optimal test for hypotheses testing.	Teaching and Discussion.	Homeworks; Tests; Performance in class.
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8		

This course has been designed to cultivate the following essential qualities in TKU students.

Essential Qualities of TKU Students	Description
<input type="checkbox"/> global perspectives	翻譯建構中
<input type="checkbox"/> a vision for the future	
<input type="checkbox"/> information literacy	
<input type="checkbox"/> ethical and moral principles	
<input type="checkbox"/> independent thinking	
<input type="checkbox"/> an awareness of healthy living	
<input type="checkbox"/> effective teamwork	
<input type="checkbox"/> an appreciation of the arts	

Course Schedule

Week	Date	Subject/Topics	Note
1		Principles of data reduction	
2		Principles of data reduction	
3		Principles of data reduction	
4		Point estimation	
5		Point estimation	
6		Point estimation	
7		Hypothesis testing	
8		Hypothesis testing	
9		Hypothesis testing	
10		Midterm Exam Week	
11		Interval estimation	
12		Interval estimation	
13		Interval estimation	
14		Asymptotic evaluations	
15		Asymptotic evaluations	
16		Asymptotic evaluations	
17		Asymptotic evaluations	
18		Final Exam Week	

Requirement

Teaching Facility	<input checked="" type="checkbox"/> Computer <input checked="" type="checkbox"/> Overhead Projector <input type="checkbox"/> Other (_____)
Textbook(s)	Casella, G. and Berger, R. L. (2002). Statistical Inference, 2nd ed., Duxbury Press
Suggested Readings	<ol style="list-style-type: none"> 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. 4. Lehmann, E. L. and Casella, G. (1998). Theory of Point Estimation, 2nd ed., Springer. 5. Lehmann, E. L. and Romano, J. P. (2005). Testing Statistical Hypotheses, 3rd ed., Springer. 6. Rohatgi, V. K. and Saleh, A. K. Md. E. (2001). An Introduction to Probability and Statistics, 2nd ed., Wiley. 7. Shao, J. (2003). Mathematical Statistics, 2nd ed., Springer.
Number of Assignment(s)	3-4 times(Filled in only for those courses that apply)
Grading Policy	2 Tests:40% Midterm:30% Final Exam:30%
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/index.asp.</p> <p>※Unauthorized photocopying is illegal. Using original textbooks is advised. It is a crime to improperly photocopy others' publications.</p>

Form No. : ATRX-Q03-001-FM201-05