



DE LA SALLE UNIVERSITY – MANILA
COLLEGE OF SCIENCE
Mathematics Department

SYLLABUS

COURSE CODE MSS513M
COURSE TITLE Introduction to the Theory of Statistical Inference
CLASS DAY & TIME
ROOM
NAME OF FACULTY
COURSE CREDIT 3 Units
CONTACT NO. (DEPT) (02) 536-0270, (02) 524-4611 loc. 420/413
TERM/SCHOOL YEAR

COURSE DESCRIPTION

A course on the theory of estimation and hypothesis testing.

COURSE OBJECTIVES

The students will:

1. properly define basic concepts and state well – known results in statistical inference;
 2. demonstrate ability to evaluate estimators and construct appropriate interval estimates and tests of hypotheses;
 3. show the capability of relating the theory of inference to real-world problems;
- cooperation through group study;
 - honesty by claiming credit only for the work he has done;
 - zeal and seriousness of intent to learn by participating actively in class discussion, doing his homework regularly and consulting his mentor;
 - patience, perseverance and diligence by solving assigned exercises completely including the difficult ones;
 - faith by doing what is right and giving his best in performing any assigned task;
 - show concern for the community through sharing of know-how and resources during group discussion;
 - self-reliance by being able to solve problems independently.

Topic/Subtopic	Learning Strategies/ Activities	Week/Meeting
1. PROPERTIES OF A RANDOM SAMPLE 1.2 Sampling from the Normal Distribution 1.3 Properties of the Sample Mean and Variance 1.4 The Derived Distributions: Student's t and Snedecor's F 1.5 Order Statistics 1.6 Convergence Concepts 1.7 Convergence in Probability 1.8 Almost Sure Convergence 1.9 Convergence in Distribution	Lecture-Discussions Problem Solving Hands-on Exercises	7 hrs

Topic/Subtopic	Learning Strategies/ Activities	Week/Meeting
1.10 Generating a Random Sample		
QUIZ 1		1 hr
2. PRINCIPLE OF DATA REDUCTION 2.1 Introduction 2.2 The Sufficiency Principle 2.3 Sufficient Statistics 2.4 Minimal Sufficient Statistics 2.5 Ancillary Statistics 2.6 Sufficient, Ancillary, and Complete Statistics 2.7 The Likelihood Principle 2.8 The Likelihood Function 2.9 The Formal Likelihood Principle 2.10 The Equivariance Principle	Lecture-Discussions Problem Solving Hands-on Exercises	12 hrs
QUIZ 2		1 hr
3. POINT ESTIMATION 3.1 Introduction 3.2 Methods of Finding Estimators 3.3 Method of Moments 3.4 Maximum Likelihood Estimators 3.5 Bayes Estimators 3.6 The EM Algorithm 3.7 Methods of Evaluating Estimators 3.8 Mean Squared Error 3.9 Best Unbiased Estimators 3.10 Sufficiency and Unbiasedness 3.11 Loss Function Optimality	Lecture-Discussions Problem Solving Hands-on Exercises	9 hrs
4. HYPOTHESIS TESTING 4.1 Introduction 4.2 Methods of Finding Tests 4.3 Likelihood Ratio Tests 4.4 Bayesian Tests 4.5 Union-Intersection and Intersection-Union Tests 4.6 Methods of Evaluating Tests 4.7 Error Probabilities and the Power Function 4.8 Most Powerful Tests 4.9 Sizes of Union-Intersection and Intersection-Union Tests 4.10 p-Values	Lecture-Discussions Problem Solving Hands-on Exercises	9 hrs
QUIZ 3		1 hr
FINAL EXAMINATION		2 hrs

COURSE REQUIREMENTS

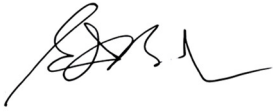
- Quizzes and Long Exams
- Final Examination
- Problem Sets

SOURCES

- Casella, G. and Berger, R. (2002). *Statistical Inference, 2/e.* Duxbury, CA.
- Casella, G and Lehmann, E. (1998). *Theory of Point Estimation, 2/e.* Springer.
- Dekking, et. al. (2005). *A Modern Introduction to Probability and Statistics.* Springer.

- Roussas, G. (1997). *A First Course in Mathematical Statistics, 2/e*. Academic Press.
- Young, G.A. and Smith, R.L. (2005). *Essentials of Statistical Inference*. Cambridge University Press.

Noted by:

A handwritten signature in black ink, appearing to read 'IBJ', with a long horizontal stroke extending to the right.

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