



DE LA SALLE UNIVERSITY – MANILA
COLLEGE OF SCIENCE
Mathematics Department

SYLLABUS

COURSE CODE MSS503M
COURSE TITLE Introduction to Statistical Theory 2
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

This is a bridging course for MS Statistics students which focuses on the theory of inference.

COURSE OBJECTIVES

The students will:

1. properly define basic concepts and state well – known results in elements probability theory;
2. demonstrate ability to determine various expectations of functions of random variables;
3. show the capability of calculating probabilities of events for a probability model;
4. identify distributions of special random variables.
5. Exhibit values like:
 - 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
I. SAMPLING AND SAMPLING DISTRIBUTIONS	Lecture-Discussions Problem Solving Hands-on Exercises	4 Hours
1. Elementary Sampling Theory		

Topic/Subtopic	Learning Strategies/ Activities	Week/Meeting
2. Results Derived from the Normal Distribution A) Basic Rules B) Chi-square Distribution C) F – Distribution D) Student’s T – Distribution		
QUIZ 1		
II. PARAMETRIC POINT ESTIMATION 1. Preliminaries of Statistical Inference 2. Methods of Estimation A) Method of Moments B) Maximum of Likelihood Method 3. Properties of Estimators A) Unbiasedness B) Mean Square Error C) Consistency D) Sufficiency E) Completeness 4. Sufficiency and Unbiasedness Estimation A) Rao-Blackwell and Lehmann-Scheffe B) The Frechet-Cramer-Rao Inequality 5. Exponential Family of Distributions 6. Location and Scale Invariance	Lecture-Discussions Problem Solving Hands-on Exercises	12 Hours
QUIZ 2		
III. PARAMETRIC INTERVAL ESTIMATION 1. Definition of Confidence Interval 2. Confidence Intervals A) Mean, Variance, Proportion – One Popula- tion B) Mean, Variance, Proportion – Two Popula- tions	Lecture-Discussions Problem Solving Hands-on Exercises	12 Hours
IV. HYPOTHESIS TESTING 1. Preliminaries on Testing Hypotheses 2. The Neyman-Pearson Lemma and the Most Pow- erful Test (MPT) 3. Generalized Likelihood Ratio Tests (GLRT) 4. Confidence Intervals and Hypothesis Tests	Lecture-Discussions Problem Solving Hands-on Exercises	12 Hours
QUIZ 3		
FINAL EXAMINATION		2 Hours

COURSE REQUIREMENTS

- Quizzes and Long Exams
- Final Examination
- Problem Sets
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REFERENCES

- Hogg, McKean, and Craig., *Introduction to Mathematical Statistics*, Pearson Education, 2005
- Hogg and Tanis, *Probability and Statistical Inference*. Prentice Hall, 2001.
- Wackerly, Mendenhall, and Scheaffer (2007). *Mathematical Statistics with Applications, 7/e*. Cengage Learning, 2007.

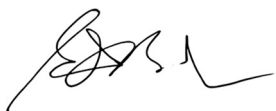
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- Shi, N.Z., and J.Tiao. (2008). *Statistical Hypothesis Testing: Theory and Methods*. World Scientific.
- Devore, J. L. (2012). *Probability and statistics for engineering and the sciences*. Boston, MA: Brooks/Cole, Cengage Learning.
- Rohatgi, V. K. (2003). *Statistical inference*. Mineola, N.Y.: Dover Publications.

FACULTY OUTPUT

- Janairo, Jose Isagani B., Co, Frumencio F., Carandang VI, Jose Santos R., and Amalin, Divina M. (2015). Sequence-dependent cluster analysis of biomineralization peptides. *Zeitschrift Fur Naturforschung C (A Journal of Biosciences)*, 70(7-8)c, pp. 191-195. ISSN 0939-5075.
- Palisoc, Shirley T., Natividad, Michelle T., Co, Frumencio F., and Kaw, Kevin Anthony Y. (2015). Morphological, thickness and electrochemical analyses of spin-coated $[\text{Ru}(\text{NH}_3)_6]^{3+}$ /Nafion films. *Optoelectronics And Advanced Materials – Rapid Communications*, Vol. 9, No. 7-8, July – August 2015, p. 1010 – 1013.
- Abolencia, Jesper L., Quipit Jr., Ananias G., Leong, Robert Neil F., and Co, Frumencio F. (2015). Ordinal Regression Analyses of Breastfeeding Duration in the Philippines. *International Journal of Philippine Science and Technology*, 8(1), 22-26.
- Angkiko, Lorraine Christelle B., Diaz, Priscilla A., Robert Neil F., and Co, Frumencio F. (2014). Biosurveillance of Measles using Control Charts: A Case Study using National Capital Region Laboratory Confirmed Measles Counts from January 2009 to January 2014. *The Philippine Statistician*, 63(2), 31-49.
- Chan, Lailani D., Putong, Ilene Renee L., and Co, Frumencio F. (2014). Analysis of an SEIRS Compartmental Model for Tuberculosis in Quezon City from 2007 to 2011. *The DLSU Mathematics Inbox*, 1(2), 67-79.
- Beltrano, Elline Jade, Leong, Robert Neil F., and Co, Frumencio F. (2013). Regression Analyses of the Philippine Birth Weight Distribution. *The Philippine Statistician*, 62(2), 31-52.
- Arcilla, R., Co, F., Ocampo, S., and Tresvalles, R. (2013). *Statistical Literacy for Lifelong Learning*. Abiva Publishing
- Ocampo, S., Arcilla, R., Co, F., Jumangit, R., and Diokno, F. (2013). Enthusing students towards statistical literacy using transformative learning paradigm: Implementation and Appraisal. *2013 IASE/IAOS Conference Proceedings*, IASE/IAOS, Hong Kong/Macau, China, August 2013.
- Carandang, J. and Co, F. (2012). Some factors affecting the student evaluation ratings of Biology faculty at DLSU. *3rd International DLSU Education Congress Proceedings*, DLSU College of Education, Manila, September, 2012, ISSN 2244-0151.
- Co, F., Arcilla, R., and Ocampo, S. (2012). Correlates of Hunger: Evidence from the CBMS Data of Pasay City. *Proceedings of the 2012 PSA Annual Conference*, Philippine Statistical Association, Quezon City, August 2012
- Ocampo, S., Arcilla, R., Co, F., Jumangit, R. and Diokno, F. J. (2011). Exploring Latent Factors Using Non-Bayesian and Bayesian Factor Analyses. *DLSU Science and Technology Congress Proceedings*, DLSU, Manila, February 2011.
- Janairo, Jose Isagani B., Janairo, Gerardo C., Co, Frumencio F., and Yu, Derrick Ethelbert C. (2011). Assessing the Binding Affinity of a Selected Class of DPP4 Inhibitors using Chemical Descriptor-Based Multiple Linear Regression. *Orbital (The Electronic Journal of Chemistry)*, Vol. 3, No. 1, January – March 2011, pp. 15-23 (ISSN 1984-6428 , <http://www.orbital.ufms.br/inpress/inpress.htm>).
- Janairo, Jose Isagani B., Co, Frumencio F., Janairo, Gerardo C., and Yu, Derrick Ethelbert C. (2010). Regression Analysis on the Chemical Descriptors of a Selected Class of DPP4 Inhibitors. *Studies in Mathematical Sciences*, Vol. 1, No. 1, 2010, pp. 01-06 (ISSN 1923-8444-Print; ISSN 1923-8452 – Online, www.cscanada.net).

- Arcilla, R., Co, F., and Ocampo, S. (2011). Correlates of Poverty: Evidence from the Community-Based Monitoring System (CBMS) Data. *DLSU Business and Economics Review*, Vol. 20, No. 2, January 2011, pp. 33-43 (ISSN 0116-7111, <http://www.philjol.info/philjol/index.php/BER/article/view/1912>).
- Acelajado, M., Beronque, Y., and Co, F. (2007). *Algebra: Concepts and Processes, 3rd edition*. National Book Store. ISBN 971-08-6580-3.

Noted by:



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