



DE LA SALLE UNIVERSITY – MANILA
COLLEGE OF SCIENCE
Mathematics Department

SYLLABUS

COURSE CODE	MSS501M
COURSE TITLE	Introduction to Statistical Theory 1
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 in probability theory. Topics include the concept of sample space and events, conditional probability, probability density function, cumulative distribution functions, mathematical expectations, joint and marginal distribution and functions of several random variables. Special distributions such as uniform, binomial, poisson, geometric, gamma, exponential, normal distributions, etc. are covered.

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
1. PROBABILITY 1. Set Theory 2. Properties of Probability 3. Conditional Probability 4. Independent Events 5. Bayes' Theorem	Lecture-Discussions Problem Solving Hands-on Exercises	5 Hours
QUIZ 1		
2. RANDOM VARIABLES 1. Definition of Random Variables 2. Discrete and Continuous Random Variables 3. Cumulative Distribution Functions 4. Mathematical Expectation 5. Special Mathematical Expectations 6. (Moment Generating Function, Raw Moment and Central Moment) 7. Chebyshev's Inequality	Lecture-Discussions Problem Solving Hands-on Exercises	7 Hours
QUIZ 2		
3. SPECIAL DISCRETE DISTRIBUTIONS 1. Discrete Uniform Distribution 2. Bernouli and Binomial Distributions 3. Hypergeometric Distribution 4. Negative Binomial and Pascal (Geometric) Distributions 5. Poisson Distribution	Lecture-Discussions Problem Solving Hands-on Exercises	7 Hours
4. SPECIAL CONTINUOUS DISTRIBUTIONS 1. Uniform Distribution 2. Gamma, Exponential and Chi-Square Distributions 3. Normal Distribution	Lecture-Discussions Problem Solving Hands-on Exercises	9 Hours
QUIZ 3		
5. MULTIVARIATE DISTRIBUTIONS 1. Joint and Marginal Distributions 2. Stochastic Independence 3. Covariance and Correlation 4. Conditional Distributions	Lecture-Discussions Problem Solving Hands-on Exercises	7 Hours
6. DISTRIBUTION OF FUNCTIONS OF RANDOM VARIABLES 1. Expectations of Functions of Random Variables 2. The Transformation Technique 3. The Moment Generating Function Technique	Lecture-Discussions Problem Solving Hands-on Exercises	5 Hours
QUIZ 4		
FINAL EXAMINATION		2 Hours

COURSE REQUIREMENTS

- Quizzes and Long Exams
- Final Examination
- Problem Sets

REFERENCES

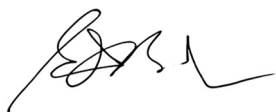
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- Forbes, C. & Evans M. (2011) *Statistical distributions (4th ed)*. Hoboken, NJ: Wiley.
- Hogg, McKean, and Craig., *Introduction to Mathematical Statistics*, Pearson Education, 2005
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- Horwich, P. 2011. (2011). *Probability and evidence*. Cambridge: Cambridge University Press.
- Korolov, L. B. (2007). *Theory of probability and random processes*. New York: Springer.
- Wackerly, Mendenhall, and Scheaffer (2007). *Mathematical Statistics with Applications, 7/e*. Cengage Learning, 2007.
- Mood, Graybill, and Boes, *Introduction to the Theory of Statistics, 3/e*. McGraw Hill, 1974.
- Rudas, T. (2008). *Handbook of probability: theory and applications*. Los Angeles: Sage 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.
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- 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.
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- 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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