DOCTOR OF PHILOSOPHY (STATISTICS) PROGRAM

UP School of Statistics
GRADUATE PROGRAMS

ABOUT THE PROGRAM

The program provides students with advanced proficiency in statistics to enable them to participate in the **development of statistical methods. Emphasis is placed on independent research.** Seminar and reading courses are incorporated in the curriculum in order to meet the individual requirements of the student's program of research.

FIRST YEAR		SECOND YEAR		THIRD YEAR
1ST SEM	2ND SEM	1ST SEM	2ND SEM	
Stat 301 3	Stat 302 3	Stat 303 3	Stat 390 2	Stat 400 12
Elective 3	Stat 311 3	Stat 312 3	Stat 396 1	
Elective 3	Stat 390 2	Stat 390 2		
	Students are encouraged to start working on their Dissertation at this point.			
TOTAL 9	TOTAL 8	TOTAL 8	TOTAL 3	

Non-MS Statistics graduates of the School may be required to take additional mathematics and statistics courses before admission to the program. Additional requirements shall be determined by the Graduate Committee of the School.

DOCTORAL COURSES

Stat 301: Theory of Probability I

Measure theory; probability spaces; random variables; integration; expectation and moments; convergence.

Stat 302: Theory of Probability II

Conditional expectations; dependence; martingales.

Stat 303: Stochastic Processes

The theory of stochastic processes; some stochastic processes.

Stat 311: Theory of Statistical Inference I

Sufficiency, completeness, exponential families, unbiasedness; equivariance; Bayes estimation; minimax estimation; admissibility.

Stat 312: Theory of Statistical Inference II

Uniformly most powerful tests; unbiased tests; invariance; linear hypothesis; minimax principle.

Other Courses & Electives

Stat 390: Reading Course

This must be taken three times.

Stat 396: Seminar

Faculty and graduate student discussions of current researches in statistics.

Stat 400: Dissertation

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Electives based on Area of Concentration

- ❑ Industrial Statistics
- ❑ Mathematical Statistics
- ❑ Computational Statistics
- ❑ Market Research and Business Intelligence
- ❑ Social Statistics
- ❑ Risk Management and Stochastic Finance

Elective courses

Stat 210: Statistical Software

Database management and programming using statistical software

Stat 224: Experimental Designs

Completely randomized designs; randomized complete block design; Latin square design; factorial experiments; incomplete block design; higher-order designs.

Stat 225: Time Series Analysis

Classical procedures; stationarity; Box-Jenkins modeling procedure: autocorrelation function, partial autocorrelation function, identification, estimation, diagnostic checking, forecasting; transfer functions; applications.

Stat 226: Applied Multivariate Analysis

Multivariate normal distribution; principal components analysis; biplots and h-plots; factor analysis; discriminant analysis; cluster analysis; multidimensional scaling; correspondence analysis; canonical correlation analysis; graphical and data oriented techniques; applications.

Stat 235: Survey of Stochastic Processes

Markov chains; Markov processes; Poisson processes; renewal processes; martingales.

ELECTIVE COURSES

Stat 240: High Dimensional Data

High dimensional data; high dimensional data visualization; high dimensional data analysis; dimension reduction; pattern search; clustering; applications.

Stat 242: Econometric Methods

Distributed lag models; structural change; simultaneous equations; limited dependent variables; ARCH, GARCH processes; cointegration; applications.

Stat 243: Categorical Data Analysis

Cross-classified tables, multidimensional tables; loglinear model; logit models, measures of association; inference for categorical data; applications.

Stat 245: Survival Analysis

Functions of survival time; estimation of survival functions; survival distributions and their applications; distribution fitting and goodness-of-fit tests.

Stat 246: Response Surface Methods

Product design and development; optimal designs; response surface models; response surface optimization; applications.

ELECTIVE COURSES

Stat 247: Data Mining and Business Intelligence

Principles of data mining; methods of data mining; themes of data mining; applications of data mining in business intelligence.

Stat 249: Nonparametric Modeling

Smoothing methods; kernel smoothing; spline smoothing; regression trees; projection pursuit; nonparametric regression; cross-validation; scoring; high dimensional predictors; additive models; backfitting

Stat 260: Quantitative Risk Management

Market risk; financial time series; copulas; extreme value theory; credit risk models; operational risks.

Stat 261: Stochastic Calculus for Finance

Continuous-time model; Brownian motion; random walk; quadratic variation; Ito formula; Black-Scholes equation; risk-neutral measure; martingale representation theorem; fundamental theorems of asset pricing.

Stat 263: Bayesian Analysis

Bayesian inference; empirical and hierarchical analysis; robustness; numerical procedures.

ELECTIVE COURSES

Stat 266: Applied Nonparametric Methods

Methods for single, two and k samples; trends and association; nonparametric bootstrap.

Stat 267: Advanced Applied Multivariate Analysis

Confirmatory factor analysis; multidimensional scaling; correspondence analysis; classification trees; CHAID; procrustes analysis; neural networks; structural equation modeling

Stat 268: Advanced Time Series Analysis

Nonstationarity; cointegration; interventions models; state space models; transfer functions; frequency domain; panel data; nonparametric methods for time series; nonparametric prediction; AR-Sieve; block bootstrap.

Stat 271: Statistical Quality Control

Overview of the statistical methods useful in quality assurance; statistical process control; control charts for variables and attributes, cusum chart, multivariate chart; process capability analysis; acceptance sampling; MIL STD tables and JIS tables; off-line quality control; introduction to response surface analysis; Taguchi method; applications.

ELECTIVE COURSES

Stat 274: Market Research

The marketing research; data and data generation in marketing research; analytical methods; consumer behavior modeling

Stat 275: Economic Statistics

The Philippine Statistical System; surveys being regularly conducted by the system: questionnaire designs, sampling designs, estimators, issues; official statistics being generated: national accounts, consumer price index, input-output table, poverty statistics, leading economic indicators, seasonally adjusted series; statistical methods useful in generating official statistics

Stat 276: Statistics for Geographic Information Systems

Components of a geographical information system, data structures and elements of spatial modeling; exploratory spatial data analysis; quadrat analysis, tesselations and spatial autocorrelation; spatial modeling and prediction; some sampling theory; applications.

Stat 277: Statistics for Image Analysis

Radiometric enhancement techniques; geometric enhancement using image domain techniques; multispectral transformation of data; supervised classification techniques; clustering and unsupervised classification; applications.