### Graduate Courses

**SEAS 145. Buddhism in Southeast Asia (4)** Lecture, 3 hours; outside research, 3 hours. Prerequisite(s): RLST 106 or consent of instructor. Explores various texts, magical practices, forms of meditation, rituals, and beliefs of ancient and modern Buddhism, focusing on the ways in which they are transformed by nuns, monks, and the laity in Burma, Cambodia, Laos, Thailand, and California. Cross-listed with RLST 145.

**SEAS 200. Topics in Southeast Asian Studies (4)** Seminar, 3 hours; written work, 2 hours; term paper, 1 hour. Prerequisite(s): graduate standing or consent of instructor. An introduction to the world of Southeast Asia and the scholarly discussions about it, with an emphasis on cultural aspects, embedded in their historical context. Materials are in English. Course is repeatable as content changes to a maximum of 12 units. Cross-listed with CPLT 200.

**SEAS 203. Southeast Asian Cultures (4)** Seminar, 3 hours; extra reading, 3 hours. Prerequisite(s): graduate standing or consent of instructor. Discusses Southeast Asian topics from the perspective of a regional, comparative, and local perspective. Students produce a substantial research paper that continues their work from HIST 243A/SEAS 243A. May be undertaken as a one- or two-quarter course (HIST 243A/SEAS 243A, HIST 243B/SEAS 243B). After completing both HIST 243A/SEAS 243A and HIST 243B/SEAS 243B, students may repeat the sequence once for credit; total credit for each course may not exceed 8 units. Cross-listed with HIST 243B.

**SEAS 290. Directed Studies (1-6)** Individual study, 3-18 hours. Prerequisite(s): consent of instructor and graduate advisor. Directed study to meet special curricular needs. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SEAS 292. Concurrent Analytical Studies in Southeast Asian Studies (1-4)** Individual study, 3-12 hours. Prerequisite(s): graduate standing; consent of instructor and graduate advisor. Taken concurrently with a 100-series course, but on an individual basis. Devoted to research, criticism, and written work at the graduate level related to the 100-series course. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

**SEAS 299. Research for the Thesis (1-12)** Thesis, 3-36 hours. Prerequisite(s): consent of thesis director. Research and preparation for the thesis. Graded Satisfactory (S) or No Credit (NC). Course is repeatable so far as such theory is necessary for the understanding and analysis of observational data. The applications of the theory delineated in the courses may be made in any field of experience. Laboratory classes in which examples related to the student’s actual field of interest are worked out, play an essential part. The department offers both B.A. and B.S. degrees in Statistics as well as a B.S. in Statistics with options in Statistical Computing and Quantitative Management; the M.S. degree in Statistics; and the Ph.D. degree in Applied Statistics.

The courses STAT 040, STAT 048, STAT 100A, STAT 100B, STAT 104/BUS 104, STAT 110, STAT 130, STAT 140, STAT 146, and STAT 155 are intended for students of other departments who wish a knowledge of statistical techniques. Some of them may be taken as electives by statistics majors. The objective of these courses is to acquaint the student with the elements of statistics with only the necessary amount of mathematical training. STAT 147 and STAT 157 are computer-oriented courses intended for students who would like to learn about computer programming in the most important languages and who would like to learn about statistical computing. In addition to teaching, the Department of Statistics is responsible to the dean of the College of Natural and Agricultural Sciences and director of the Agricultural Experiment Station for collaboration with research workers in the biological and agricultural fields. A consultative service in the design, analysis, and interpretation of experimental data relating to the agricultural sciences is provided.

### Computing Laboratories

The Department of Statistics has a strong applied mission that involves the use of statistical computing while solving real world problems that arise in many disciplines. The department has two interactive multimedia computer laboratories with Unix-class clients and a SUN Microsystems Netra server, and also has a UNIX-based laboratory that contains multiple SUN Microsystems Blade and Ultra 24 workstations. Each of the labs provides users access to a wide variety of statistical software packages and are networked to both the Internet and the campus WiFi network. The CRAY Supercomputer at the San Diego Supercomputer Center (SDSC) is also available to faculty and graduate students, as are the 30 PC workstations in a computing laboratory that is maintained by the Statistical Consulting Collaboratory.

### Statistical Consulting Center

The Statistical Consulting Collaboratory provides a broad range of analytical and statistical support services, including design of experiments, statistical inference, hypothesis testing, and data modeling for the campus community, and promotes cooperative research between statisticians and other investigators in all fields of the application of statistics. The Collaboratory is...
staffed by a faculty director, two Ph.D. statisti-
cians and graduate students.

Daniel R. Jeske, Ph.D., Faculty Director
Karen Huaying Xu, Ph.D., Associate Director
Scott M. Lesch, Ph.D., Principal Consulting
Statistician

University Requirements
See Undergraduate Studies section.

College Requirements
See College of Natural and Agricultural
Sciences, Colleges and Programs section.

Some of the following requirements for the
major may also fulfill some of the college's
breadth requirements. Consult with a depart-
ment advisor for course planning.

Major Requirements
The department offers both a B.A. and a B.S.
degree in Statistics as well as a B.S. in Statis-
tics with options in Statistical Computing and
Quantitative Management.

The major requirements for the B.A. and the
B.S. degrees in Statistics are as follows:

For the Bachelor of Arts
1. Core requirements (24–25 units)
   a) CS 010, MATH 008B or MATH 009A,
      MATH 009B, MATH 009C, MATH 010A
   b) Four (4) additional units in Mathematics,
      chosen from MATH 023, MATH 113, or
      MATH 131

2. Upper-division requirements
   a) Thirty-six (36) units of upper-division
      course work
      (1) STAT 147, STAT 155, STAT 157,
      STAT 170A, STAT 170B
      (2) Twelve (12) units chosen from
      STAT 127/BUS 127, STAT 130,
      STAT 140, STAT 146, STAT 160A,
      STAT 160B, STAT 160C, STAT 171
      (3) Four (4) units of STAT 197 taken at
      the end of Senior year
   b) Sixteen (16) units of additional course
      work chosen, with the approval of the
      major advisor, from Statistics courses
      numbered 104 and higher or from related
      fields.

   Note An introductory Statistics class such as
   STAT 048, or STAT 100A is strongly recom-
   mended.

Statistical Computing Option
The requirements for this option are in addition to
the requirements for the B.S. in Statistics,
except that the option requirement takes the
place of the 16 units in 2.b) above.

   1. Lower-division requirements (8 units):
      (1) CS 141, CS 177
      (2) MATH 112, MATH 120
      (3) STAT 198-I
   a) MATH 113
   b) Twelve (12) units of course work selected
      from
      (1) CS 141, CS 177
      (2) MATH 112, MATH 120
      (3) STAT 198-I
   c) MATH 135A, MATH 135B recommended

Quantitative Management Option
The requirements for this option are in addition to
the requirements for the B.S. in Statistics,
except that the option requirement takes the
place of the 16 units in 2.b) above.

   1. Lower-division requirements (16–17 units)
   a) ECON 003
   b) Bus 010, BSAD 020A, BSAD 020B

   2. Upper-division requirements (16 units)
   a) MATH 113
   b) Three courses from one area
      (1) Marketing: BUS 103, BUS 113,
      BUS 117
      (2) Finance: BUS 106/ECO 134,
      BUS 135A, BUS 135B, BUS 136,
      BUS 138
      (3) Accounting: BUS 108, BUS 165A,
      BUS 165B, BUS 168A, BUS 168B
      (4) Management Information Systems:
      BUS 101, BUS 171, BUS 173

Minor
The minor in Applied Statistics is designed to
give students in either the social sciences or
the physical sciences a cohesive set of statis-
tics courses to deal with the data analytic
aspects of their disciplines and to understand
the statistical summaries that are encountered
in everyday activities.

The requirements for the minor consist of at
least 24 and not more than 28 upper-division
units in Statistics to include the following:

   1. STAT 100A, STAT 100B
   2. Eight (8) units from STAT 110, STAT
      127/BUS 127, STAT 130, STAT 140, STAT
      146
   3. Four (4) units from STAT 147, STAT 157
   4. Four (4) additional units from 2. or 3. above

   Of the specified upper-division units, a mini-
   num of 16 must be unique to the minor and
   may not be used to satisfy major requirements.

   No more than 4 units may be in courses num-
   bered 190 through 199.

   See Minors under the College of Natural and
   Agricultural Sciences in the Colleges and
   Programs section of this catalog for additional
   information on minors.

Graduate Programs
The Department of Statistics offers the M.S.
degree in Statistics and the Ph.D. degree in
Applied Statistics.

Admission Domestic and international appli-
cants must supply scores from the GRE gen-
eral exam. In addition, TOEFL scores must be
supplied by all applicants whose first language
is not English. The department considers appli-
cations for teaching assistantships at the same
time as those for fellowships. Normally, applica-
tions for fellowships are awarded by February
or March for students admitted for the following
Fall quarter.

Students in the Ph.D. program who have satis-
fi ed all requirements for the master's degree
may apply for this degree while completing
requirements for the Ph.D. program.

Master's Program
The Department of Statistics offers the M.S.
degree in Statistics.

Admission Students entering the program must
either have completed a bachelor's degree in
Statistics (or the equivalent), or take
STAT 160A, STAT 160B, STAT 160C, STAT 161
and STAT 170A, STAT 170B, STAT 171, covering
basic areas of probability and statistics.
These courses would not be counted as credit
towards the master's degree.

Students must also meet the other require-
ments for admission as specified by the Gradu-
ate Division. The program is Plan II (Compre-
hensive Examination) described in the Gradu-
ate Studies section of this catalog. No foreign
language is required.

Plan II (Comprehensive Examination) Graduate
students in Statistics must take (or have taken)
appropriate courses in Mathematics to give
them the proper background for graduate work
in Statistics. Important areas include Calculus
(at least MATH 008B or MATH 009A,
MATH 009B, MATH 009C, and MATH 010A)
and Linear Algebra (at least MATH 131).
Students are strongly encouraged to take
at least one of the following: MATH 120 (Optim-
ization), MATH 126 (Combinatorics),
MATH 135A, MATH 135B (Numerical
Analysis), MATH 151A, MATH 151B, MATH 151C (Advanced Calculus), MATH 165A, MATH 165B (Complex Variables), and MATH 209A, MATH 209B, MATH 209C (Real Analysis). The specific courses selected naturally depend on the research area selected by the student.

The program consists of a minimum of 36 approved units. These must include 1 unit of STAT 288; 12 units of STAT 293 are counted approved units. These must include 1 unit of the student.

Early in the program the student submits a program proposal, which requires the approval of the M.S. advisor. The advisor also supervises the student's progress and course of study. After completion of the required courses, the student takes a written comprehensive examination. This is generally offered twice annually, in the fall and spring quarters. Some students proceed from the M.S. degree to the Ph.D. program in Applied Statistics. Admission to the Ph.D. program normally requires preparation equivalent to the M.S. degree.

Students in the Ph.D. program who have satisfied all requirements for the master's degree may apply for this degree while completing requirements for the Ph.D. program.

Doctoral Degree

The Department of Statistics offers the Ph.D. degree in Applied Statistics. The program emphasizes both the theory of statistics and its application to special fields of interest. In addition to courses in statistics, a student would take courses in a substantive field from which a thesis problem requiring a statistical approach should arise. The substantive field may be chosen from areas such as biology, economics, political science, psychology or administration. Specialties might include, for example, population genetics, biological control, hydrology, epidemiology, geology, discrimination in learning, or scales and measurements.

Students usually have completed a master's degree in Statistics, Computer Science, Mathematics, or some other quantitatively based discipline. In some instances, students with a master's degree in other fields may be admitted to the program, but in such cases, remedial course work in Statistics, Computer Science, or Mathematics will probably be required. Students also have to meet the general requirements listed in the Graduate Studies section of this catalog.

Course Work

Courses to be taken are in Statistics and the substantive field appropriate to the student's interest. Students without the courses prescribed by the M.S. in Statistics or their equivalent must take them as soon as possible. Students must complete course work in statistics greater in depth than that required for the M.S. Students must have knowledge of at least one computer language and the use of statistical computer packages; students lacking this background should take STAT 157. They must select four or more additional quarter courses in Statistics at the 200 level, not to be graded “Satisfactory/No Credit.” These additional courses should be selected in consultation with the graduate advisor and/or the student's major professor in order to strengthen a student's background in statistics and to prepare the student for thesis work and a career in research and teaching. To be approved, a program must include STAT 210A, STAT 210B, STAT 210C and three of the following five courses: STAT 200A, STAT 203A, STAT 203B, STAT 205, STAT 207A, STAT 207B, STAT 210A, STAT 210B, STAT 210C, STAT 215, STAT 216A, STAT 216B, STAT 220A, STAT 220B, STAT 230, STAT 240.

Knowledge of at least one computer language and the use of statistical computer packages is required, and students lacking this background should take STAT 157.

The dissertation is pertinent to a problem area specified by the candidate's substantive field and is submitted in accordance with the requirements of the Graduate Division, Riverside.

Teaching Requirement

All students in the program, for at least three quarters, assist with laboratory (practice) sections of undergraduate Statistics courses or individual tutorial (consultative) work with undergraduate students.

Normative Time to Degree

15 quarters

Lower-Division Courses

STAT 048, Elements of Statistics (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): none. An introduction to statistics. Adopts the modern Bayesian approach that advocates that estimates, hypothesis tests, and decisions be made from information developed from a formal combination of current and earlier data. Topics include summarizing and displaying data, designing experiments, probability, Bayes' rule, inference from proportions and normal populations, sampling, and regression analysis. Uses Minitab.

STAT 048, Statistics for Business (5) Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): CS 008 or equivalent; MATH 004 or MATH 005 or MATH 008A or MATH 008A or MATH 009A or MATH 09A or equivalent. An introduction to statistics using business applications. Topics include descriptive statistics, probability, discrete and continuous distributions, Bayes' theorem, random variables, estimation and confidence intervals, hypothesis testing, analysis of variance, and simple linear regression. Credit is awarded for only one of STAT 048 or STAT 100A.

Upper-Division Courses

STAT 100A. Introduction to Statistics (5) Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): MATH 005 or MATH 008A or MATH 09A or equivalent. A general introduction to descriptive and inferential statistics. Topics include histograms; descriptive statistics; probability; normal, binomial, and Poisson distributions; sampling distributions; hypothesis testing; and confidence intervals. Credit is awarded for only one of STAT 048 or STAT 100A.

STAT 100B. Introduction to Statistics (5) Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): STAT 100A. An introduction to inferential statistics. Topics include linear regression, correlation, analysis of variance, nonparametric methods, and simple experimental designs.

STAT 104. Decision Analysis and Management Science (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): CS 008, MATH 023, or equivalents; upper-division standing. Survey of deterministic and probabilistic models for decision making. Topics include linear programming and extensions, networks, dynamic programming, decision trees, queueing models, and simulation. Uses of these models in decision making are discussed. Use of the computer is emphasized. Cross-listed with BUS 104.

STAT 110. Biostatistical Methods in Life Sciences (5) Lecture, 3 hours; discussion, 1 hour; laboratory, 3 hours. Prerequisite(s): STAT 100B or consent of instructor. Provides undergraduate students majoring or interested in life sciences with statistical tools for analyzing different types of data frequently encountered in life sciences. Emphasizes applications of methodology, including contingency table analysis, linear regression and ANOVA, maximum likelihood method and the estimation-maximization algorithm, logistic regression, Poisson regression, and survival analysis.

STAT 127. Introduction to Quality Improvements (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 048 or STAT 100A or consent of instructor. Explores Deming's 14 points for management, graphical methods, fishbone diagram, Pareto analysis, control charts for attributes and variables, cusum and moving average charts, process capability, economic design, acceptance sampling, Taguchi method, parameter design, tolerance design, reliability, hazard rate, censoring, and accelerated life testing. Cross-listed with BUS 127.

STAT 130. Sampling Surveys (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 100A, STAT 100B, or equivalents. Simple random sampling. Stratified sampling. Cluster sampling. Ratio and regression estimates. Random response, capture-recapture and jack-knife techniques.

STAT 140. Nonparametric Techniques (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 100B or equivalent. Covers randomization tests, rank tests, methods of association, and distribution-free tests.

STAT 146. Statistical Forecasting Techniques (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 100B or equivalent. Topics include exponential smoothing, simple and multiple regression analysis, time series, trend analysis, and seasonal analysis.
STAT 147. Introduction to Statistical Computing (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 040 or equivalent. Introduction to computer-assisted data analysis and statistical inference using both the MINITAB and SAS packages. Topics include input, output, and editing of data; graphical procedures; descriptive statistics; cross-tabulation; inferential statistical techniques including estimation and testing; regression; and analysis of variance.

STAT 155. Probability and Statistics for Science and Engineering (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 099C or MATH 09HC (MATH 099C or MATH 09H may be taken concurrently). Covers sample spaces and probability; random variables and probability distributions; elements of statistical inference; and testing and estimation. Also addresses selected topics in multivariate distributions and introduces stochastic processes.

STAT 160A. Elements of Probability and Statistical Theory (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 100A, STAT 100B, or equivalents; STAT 147; or consent of instructor. A study of major statistical packages, including SAS and BMDP with the emphasis on advanced SAS programming. Topics include advanced graphical procedures, linear models (regression and analysis of variance), multivariate techniques, and SAS macros.

STAT 160B. Elements of Probability and Statistical Theory (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A. Topics include distributions of sample statistics, statistical inference, and estimation. Credit is awarded for only one of MATH 149A or STAT 160A.

STAT 160C. Elements of Probability and Statistical Theory (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160B. Topics include hypothesis testing, chi-square tests, and nonparametric methods. Credit is awarded for only one of MATH 149C or STAT 160C.

STAT 161. Introduction to Probability Models (4)

STAT 170A. Regression Analysis (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 147, STAT 157, or equivalents. Topics include simple and multiple linear regression; scatter-plots; point and interval estimation; prediction; testing; calibration; interpretation and practical applications of multiple regression; simple, partial, and multiple correlation; variable selection methods; diagnostic procedures; and regression for longitudinal data.

STAT 170B. Design of Experiments (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 170A. Topics include principles of design; completely randomized designs and one-way analysis of variance; complete block designs and two-way analysis of variance; multiple comparisons; complete factorial experiments; fixed, random, and mixed models; split-plot designs; nested designs; analysis of covariance; sample size determination and power analysis.

STAT 171. General Statistical Models (4)

STAT 190. Special Studies (1-5)
To be taken with the consent of the chair of the department as a means of meeting special curricular problems. Course is repeatable to a maximum of 10 units.

STAT 197. Research for Undergraduates (2-4)
Outside research, 3-6 hours; individual study, 3-6 hours. Prerequisite(s): upper-division standing or consent of instructor. An introduction to research in Statistics. Requires a research project completed under the supervision of a Statistics faculty member or a group of faculty members. Students who make an oral presentation of the research project or submit a written research report receive a letter grade; other students receive a Satisfactory (S) or No Credit (NC) grade. Course is repeatable as research topic changes to a maximum of 8 units.

STAT 198-1. Individual Internship in Statistics (1-12)
Internship, 2-24 hours; outside research, 1-12 hours. Prerequisite(s): STAT 100B, consent of instructor, upper-division standing. An internship to provide statistical field experience in governmental, industrial, or research units. Projects must be approved by the Statistics Department and the head of the unit in which the internship is to be carried out. Requires a written report. Graded Satisfactory (S) or No Credit (NC). Course is repeatable to a maximum of 16 units, but total credit toward graduation may not exceed 12 units.

STAT 199H. Senior Honors Research (1-5)
Prerequisite(s): senior standing with major concentration in statistics and with consent of instructor. Senior standing with major concentration in statistics and with consent of instructor. Course is repeatable to a maximum of 10 units.

Graduate Courses

STAT 200A. Advanced Design and Analysis of Experiments (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 170A, STAT 170B, STAT 171, or equivalents. Topics include fixed, mixed, and random effects models; complete and incomplete block designs; row-column designs; nested designs; split-plot designs; crossover designs; analysis of covariance; repeated measure designs; and optimality of designs.

STAT 200B. Advanced Design and Analysis of Experiments (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 170A, STAT 170B, STAT 171, or equivalents; STAT 200A. Topics include factorial experiments; confounding and fractional factorial experiments for symmetrical and asymmetrical factorial experiments; orthogonal and balanced arrays; optimal fractional factorial designs; first and second order response surface designs; rotatability; and blocking of response surface designs; method of steepest ascent; canonical representation; and minimum bias, variance, and mean square error designs.

STAT 203A. Bayesian Statistics I (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160C or equivalent. Subjective probability; Renyi axiom system; Savage axioms; coherence; Bayes theorems; credibility intervals; Lindley paradox; empirical Bayes estimation; natural conjugate priors; de Finetti’s theorem, approximation methods; Bayesian bootstrap; Bayesian computer programs.

STAT 203B. Bayesian Statistics II (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 203A. Assessing priors, nonparametric density estimation for expert group judgements; Bayesian regression; Bayesian analysis of variance; Bayesian regression with correlated disturbances and heteroscedasticity; Bayesian inference in time series models; Bayesian classification; Bayesian inference in spatial statistics; Bayesian factor analysis, disputed authorship.

STAT 205. Discrete Data Analysis (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C or equivalents; or consent of instructor. Contingency tables, log-linear models, information theory models, maximum likelihood estimation, goodness of fit, measures of association, computational procedures.

STAT 207A. Statistical Computing (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 170A, STAT 170B; or consent of instructor. Topics include computational aspects of least squares in linear statistical models, optimization in nonlinear statistical models, numerical accuracy and error analysis, simulations and Monte Carlo methods for problems in statistical inference, pseudorandom numbers, and numerical approximations.

STAT 207B. Statistical Computing (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 170A, STAT 170B; or consent of instructor. Topics include resampling methods, expectation maximization (EM) algorithm, Markov chain and Monte Carlo methods, and other current computational methods.

STAT 209A. Statistical Data Mining (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 170A, STAT 170B; or consent of instructor. Topics include principal data-mining methodologies, major software tools, and typical applications for structuring, understanding, and using large datasets effectively and efficiently. Statistics graduate students who have not completed all courses required for the degree receive a letter grade; other students receive a letter grade or petition for a Satisfactory (S) or No Credit (NC) grade.

STAT 209B. Statistical Data Mining (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 209A; or consent of instructor. Introduces principal data-mining methodologies, major software tools, and typical applications for structuring, understanding, and using large datasets effectively and efficiently. Statistics graduate students who have not completed all courses required for the degree receive a letter grade; other students receive a letter grade or petition for a Satisfactory (S) or No Credit (NC) grade.

STAT 210A. Theoretical Statistics and Probability (4)
Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 010B, STAT 160C, or equivalents. Topics include conditional probability, independence, distribution functions, generating functions, convergence concepts, limit theorems, and order statistics.
STAT 210B. Theoretical Statistics and Probability (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 210A. Topics include estimation, decision theory, Bayes and empirical Bayes rules, and efficiency.

STAT 210C. Theoretical Statistics and Probability (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 210B. Topics include hypothesis testing, sequential inference, distributions, and free and robust techniques.


STAT 216A. Time Series Analysis (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C, or equivalents. Topics include stationary processes, autoregressions—moving average (ARIMA) processes, trend, seasonality, model building, estimation and forecasting, and spectral analysis and estimation.

STAT 216B. Time Series Analysis (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 216A or consent of instructor. Topics include spectral analysis and estimation, higher-order spectral analysis, Kalman filtering and prediction, and nonlinear, nonstationary, and non-Gaussian time series.

STAT 220A. Multivariate Analysis (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160A, STAT 160B, STAT 160C, or equivalents; familiarity with matrix algebra. Topics include algebra and calculus of vectors and matrices, special multivariate distributions (Normal, Wishart, Hotelling's T-squared, multivariate T, multivariate log-normal, etc.).

STAT 220B. Multivariate Analysis (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 220A or consent of instructor. Topics include categorical dependent variable regression, loglinear models, inference in the multivariate normal distribution, multivariate multiple regression, hypothesis testing, likelihood ratio tests, multivariate analysis of variance and covariance, principal components analysis, factor analysis, and classification and discrimination models.

STAT 230. Sampling Theory (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160C. Covers the theory of stratified, ratio, and regression methods of estimation and cluster and double sampling. Includes the concept of sufficiency and its applications from finite populations, nonsampling errors, estimation of response bias and of optimum number of interviewees, and sampling inspection.

STAT 231A. Statistics for Biological Sciences (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): MATH 023, STAT 100A, STAT 100B, or equivalents, or consent of instructor. Topics include one- and two-sample tests, one- and two-way analysis of variance, multiple comparison, simple and multiple linear regression, nonparametric statistics, and categorical data. Statistics graduate students who have not completed all courses required for the degree receive a letter grade; other students receive a letter grade or petition for a Satisfactory (S) or No Credit (NC) grade.

STAT 231B. Statistics for Biological Sciences (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 231A or consent of instructor. Topics include logistic regression, analysis of covariance, advanced experimental design, bootstrapping, jack-knifing, and other procedures. Statistics graduate students who have not completed all courses required for the degree receive a letter grade; other students receive a letter grade or petition for a Satisfactory (S) or No Credit (NC) grade.


STAT 251. Statistics Colloquium (1) Colloquium, 1.5 hours. Prerequisite(s): consent of instructor. Presentation of current research in statistics by faculty, advanced graduate students, and guest lecturers. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

STAT 255 (E-E). Seminar on Topics in Applied Statistics (3-4) Seminar, 3 hours; discussion, 1 hour. Prerequisite(s): graduate standing. Additional prerequisites are required for some segments of this course; see department. Discussions and lectures by graduate students and faculty on topics related to student and faculty research. In some courses students will receive letter grades only. In others students may receive either a letter grade or Satisfactory (S) or No Credit (NC) grade; no petition is required, but students must see instructor for grading basis. The department will maintain a list of all 255 segments and their unit value and grading basis. Normally graded Satisfactory (S) or No Credit (NC), but students may petition the instructor for a letter grade on the basis of assigned extra work or examination.

STAT 288. Literature Seminar (1) Seminar, 1 hour. Students will make oral presentations summarizing important research papers in the statistics literature. All graduate students are encouraged to participate. Topics may vary each term. Graded Satisfactory (S) or No Credit (NC).

STAT 290. Directed Studies (1-6) Prerequisite(s): graduate standing and consent of instructor. Individual studies on specially selected topics in statistical applications. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

STAT 291. Individual Studies in Coordinated Areas (1-6) Consultation, 1-6 hours. Prerequisite(s): graduate standing. A program of studies designed to assist candidates who are preparing for examinations. Open to M.S. and Ph.D. students; does not count toward the unit requirement for the M.S. degree. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

STAT 292. Concurrent Analytical Studies (1-4) Outside research, 3-12 hours. Prerequisite(s): consent of instructor and concurrent enrollment in 100-series course. To be taken on an individual basis. Student will complete a graduate paper related to the 100-series course. Graded Satisfactory (S) or No Credit (NC). May be repeated for credit.

STAT 293. Statistical Consulting and Data Analysis (4) Lecture, 3 hours; discussion, 1 hour. Prerequisite(s): STAT 160C, STAT 170B, STAT 171; or consent of instructor. Covers statistical consulting and analysis of client data, the client-consultant meeting, negotiations, communications, interactions, and skills that facilitate the process of self-learning. Involves client interactions and field trips. Students present written and oral reports and technical talks. Statistics graduate students receive a letter grade; other students receive a letter grade or Satisfactory (S) or No Credit (NC) grade. Course is repeatable to a maximum of 12 units.

STAT 297. Directed Research (1-6) Prerequisite(s): graduate standing and consent of instructor. Directed research in applications of statistics in biological studies, including computer simulation. Graded Satisfactory (S) or No Credit (NC).

STAT 299. Research for Thesis or Dissertation (1-12) Prerequisite(s): graduate standing and consent of instructor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

** Professional Course **

STAT 302. College Teaching Practicum (1-4) Practicum, 3-12 hours. Prerequisite(s): graduate standing and consent of instructor. Required of all teaching assistants in the department. Credit not applicable to graduate unit requirements. Supervised teaching in college level classes under the supervision of the course instructor. Graded Satisfactory (S) or No Credit (NC). Course is repeatable.

** Theatre **

Subject abbreviation: THEA

College of Humanities, Arts, and Social Sciences

D. Eric Barr, M.F.A., Chair
Department Office, 121 Arts
(951) 827-3343; theatre.ucr.edu

Professors
D. Eric Barr, M.F.A.
Richard Hornby, Ph.D.

Professor Emeritus
Richard D. Risso, Ph.D.

Associate Professors
Rickerby Hinds, M.F.A.
Robin Russin, M.F.A.

Assistant Professors
Charles Evered, M.F.A.
Erith Jaffe-Berg, Ph.D.
Stuart Krieger, B.A.
Haibo Yu, M.F.A.

Lecturers
Bonnie Cherrie, M.F.A.
Glen Dunzeweiler, M.F.A.
Marc L. Longlois, M.F.A.

Major

The Department of Theatre offers a B.A. in Theatre. The major focuses on three broad areas of theatre — its literature, history, and criticism; performance, design, direction, and technology; and the elements of production. Students have the opportunity to write, perform, direct, and design. Four stages are available for rehearsals and performances: the 500-seat proscenium University Theatre, the new 150-seat Studio Theatre in the Arts building with state-of-the-moment equipment for facilities, the 120-seat Rehearsal Lab, and the 50-seat Barn Theatre.

Students are able to practice acting in faculty-directed shows, student productions, and class presentations. Special projects and studies are offered for advanced students to produce an original work or to study in more depth acting.