Previously Approved Elective Courses

AEC 624 ADVANCED QUANTITATIVE METHODS IN AGRICULTURAL ECONOMICS. (3)
This course uses statistical tools to model agricultural and economic systems. Subjects covered include: (1) the classical linear regression model, (2) statistical hypotheses tests, and (3) estimation techniques for single and simultaneous equation models. Prereq: ECO 391, STA 291 and MA 113. [Offered in spring only.]

AEC 510 INTERNATIONAL TRADE AND AGRICULTURAL MARKETING. (3)*
A study of institutional, economic and cultural factors that influence aggregate agricultural trade and exports of individual agribusinesses. Macro issues of agricultural trade policies are examined along with elements of international marketing for agricultural products. Prereq: AEC 303 (or equivalent) and AEC 305. [Offered in fall only.] ***Future elective approval for this course will depend on topics reviewed in this class. Previously, this class included in the final paper Statistical analysis using descriptive statistics like central tendency and measures of variability, as well as multiple regression models by Eviews application in order to find the relationship between the variables. Approval will depend on a similar course requirement.**

BIO 520 BIOINFORMATICS. (3)
An introduction to computer analysis of macromolecular structure information. This course describes how to access, process, and interpret structural information regarding biological macromolecules as a guide to experiments in biology. Prereq: BIO 315 or BIO 304 or BCH 401 or BCH 501 or BCH 502 or BIO 510 or consent of instructor. (Same as INF 520.)

BST 761 TIME TO EVENT ANALYSIS.
(3)
Analysis of time to event data encountered in Public Health and Medicine. Survival distributions and hazard functions. Time to event analysis using Kaplan-Meier method and life-table method. Accelerated failure time model, logit model for discrete data, complimentary log-log model, and proportional hazards model. Tests for goodness-of-fit, graphical methods, and residual and influence statistics. Time-dependent covariates, non-proportional hazards, left truncation, and late entry into the risk set. Sample size and power, competing risks, and time to event analysis with missing data. Prereq: STA 580 or equivalent.

CE 599 TOPICS IN CIVIL ENGINEERING (Subtitle required). (1-4) *
A detailed investigation of a topic of current significance in civil engineering such as: design of small earth dams, man and the environment, drilling and blasting, scheduling construction operations, construction equipment and methods, traffic safety, optimum structural design, environmental impact analysis, systems analysis in civil engineering, motor vehicle noise and its control. May be repeated to a maximum of eight credits, but only four credits can be earned under the same title. A particular topic may be offered at most twice under the CE 599 number. Prereq: Variable; given when topic is identified; plus engineering standing. ***Future Elective Approval Dependent on Topic Choosen.**

CE 635 HIGHWAY SAFETY. (3)
A detailed review of the impacts of safety considerations on highway design and planning, focusing on the highway environment, its users (both vehicles and drivers) and their interactions. The role of special interest groups (tracking industry, insurance agencies) is also examined. Prereq: CE 539 or consent of instructor.

CHE 623 CHEMICAL EQUILIBRIUM AND DATA ANALYSIS. (3)
An advanced treatment of chemical equilibrium, sampling, and the evaluation of data obtained from chemically related measurements. Prereq: CHE 226 or 522 or a physical chemistry course at the 400 level or above.

CJT 665 QUANTITATIVE METHODS IN COMMUNICATION RESEARCH. (3)
The scientific method. Communication research as part of social science research. Study and practice of quantitative behavioral research techniques which apply to communication. Prereq: Graduate standing in communication or consent of instructor.

***CPH 630 BIOSTATISTICS II. (3)**
Students will learn statistical methods used in public health studies. This includes receiver operator curves, multiple regression logistic regression, confounding and stratification, the Mantel-Haenzel procedure, and the Cox proportional hazardous model. Lecture, two hours; laboratory, two hours per week. Prereq: STA 580 or CPH 580. (Same as STA 681.)

CPH 631 DESIGN AND ANALYSIS OF HEALTH SURVEYS. (3)
Students will learn design and analysis issues associated with well-known national health surveys, including reliability and validity of measurements, instrument validation, sampling designs, weighing of responses, and multiple imputations. Students will learn how to use statistical software to analyze data from complex survey designs. Lecture, two hours; laboratory, two hours per week. Prereq: STA 580 or equivalent.

***CPH 636 DATA MINING IN PUBLIC HEALTH. (3)**
This course concerns statistical techniques for and practical issues associated with the exploration of large public health data sets, the development of models from such data sets, and the effective communication of one's findings. Prereq: STA/CPH 580 and CPH 535, or

graduate program status in Ph.D. Statistics or Ph.D. Epidemiology/Biostatistics.

CPH 664 DESIGN AND ANALYSIS OF CLINICAL TRIALS. (3)
This course will introduce the fundamental concepts used in the design of Phase IIV clinical trials and statistical methodology associated with trial data analysis. Prereq: STA 570 or permission of instructor.

CPH 738 SPECIAL TOPICS IN BIOSTATISTICS: (Subtitle required). (1-3)*
This course will engage students in readings, projects, lectures and/or discussions to address current topics of special interest or concerns. May be repeated to a maximum of 6 credit hours. Prereq: Enrollment in a Public Health degree program or consent of instructor. Previously Approved Topic: **Text Mining for Biomedicine**. *Future elective approval will depend on topic

CS 685 SPECIAL TOPICS IN COMPUTER SCIENCE (Subtitle required). (3)*
Topics to be selected by staff. May be repeated to a maximum of six credits but only three credits may be earned under the same topic. Prereq: Consent of instructor or two 500-level computer science courses. Approved Topic: **Special Topics in Data Mining;** Future approval will depend on topic.

ECO 603 RESEARCH METHODS AND PROCEDURES IN ECONOMICS. (3)

The basic procedures and methods of research in economics are considered from the standpoint of their applicability to problem solving and discovery of new scientific facts and generalizations in economics. Definition of the problem, statement of hypothesis, research design, data collection methods, and data analysis constitute the major topics. Attention is given to proper style and preparation of research reports in economics.

***EDP 711 ADVANCED QUANTITATIVE METHODS. (3)**
This course will provide students with an overview of the theory and applications of advanced quantitative methods. A quantitative research method focuses on advanced quantitative methodologies used in methodologically-oriented studies in educational education, evaluation, and statistics. The goal of this course is to prepare students to analyze data using advanced quantitative methods. It covers topics in the areas of multilevel modeling, data mining, missing data, categorical data analysis, meta-analysis, and longitudinal data analysis. Other specific analysis techniques may also be explored. Given the advanced nature of the course, we will not shy away from using the mathematical tools needed to develop the conceptual understanding. But the emphasis of the course will be on the conceptual understanding and application of the tools rather than on the math or the mechanics behind the tools. Prereq: Prereq: Intermediate Statistics. (Same as EPE 711.)

EPE 660 RESEARCH DESIGN AND ANALYSIS IN EDUCATION. (3)
This is a statistics-oriented course that focuses on various aspects of regression analysis (general and generalized linear models). Topics to be covered include, but are not limited to, simple correlation and regression, multiple regression (with and without interaction/moderation terms, with/without nonlinear terms, contrast variable coding for categorical predictors, nested model comparison for hierarchical regression, etc.), regression diagnostics (outlying and influential cases identification and assessment, collinearity evaluation, residual analysis, etc.), logistic regression (with a comparison of the logit model with other commonly used classification models like probit model, decision tree model, etc.), among other things. The course will familiarize students with cleaning data for regression analysis, building regression models, conducting statistical inference of regression models, selecting the optimal regression model(s) for the data in hand, and interpreting regression analysis results using the right language. Students will gain requisite foundation knowledge necessary to learn more complex statistical tests and procedures, and become more critical of statistical presentations in academic journals and the mass media. Students will also become proficient in using at least one major

statistics computer program (SPSS, Minitab, SAS, Stata, or R). Prereq: EPE/EDP 558 or consent of instructor. (Same as EDP 660.)

***EPE 711 ADVANCED QUANTITATIVE METHODS. (3)**

This course will provide students with an overview of the theory and applications of advanced quantitative methods. A quantitative research method focuses on advanced quantitative methodologies used in methodologically-oriented studies in educational education, evaluation, and statistics. The goal of this course is to prepare students to analyze data using advanced quantitative methods. It covers topics in the areas of multilevel modeling, data mining, missing data, categorical data analysis, meta-analysis, and longitudinal data analysis. Other specific analysis techniques may also be explored. Given the advanced nature of the course, we will not shy away from using the mathematical tools needed to develop the conceptual understanding. But the emphasis of the course will be on the conceptual understanding and application of the tools rather than on the math or the mechanics behind the tools. Prereq: Prereq: Intermediate Statistics. (Same as EDP 711.)

MGT 780 ADVANCED SOCIAL NETWORK ANALYSIS. (3)
The focus of this course is on the theoretical concepts and methodology of social network analysis, both from a research and applied perspective. The course involves in-depth training in the hands on analysis of social networking data using specialized social network analysis software. Prereq: Consent of instructor.

NUR 794 ANALYSIS, INTERPRETATION, AND PRESENTATION OF QUANTITATIVE DATA. (3)

This course provides opportunities for skill development in the application of a variety of analysis strategies to existing datasets. Students will identify hypotheses and/or research questions, test them using appropriate statistical methods, and interpret the results of their secondary analyses. Students also will gain experience in the

presentation of findings via narrative, tabular, and oral formats. Prereq: STA 671 or equivalent, doctoral standing, and consent of instructor.

PLS 597 SPECIAL TOPICS IN PLANT AND SOIL SCIENCE (Subtitle required). (1-3); Approved Topics: **Metan-Analysis of Ag. Data; Ag. Experimental Design and Analysis**

Special topical or experimental courses in crop science, soil science or related areas of horticulture, or plant physiology for graduate and advanced undergraduate students. Special subtitle required and must be approved by the chair of Agronomy or Horticulture. A particular subtitle may be offered twice under PLS 597. Students may not repeat under the same subtitle. Prereq: Permission of instructor.

PLS 597 SPECIAL TOPICS IN PLANT AND SOIL SCIENCE (Subtitle required). (1-3)* : Population Genetics Laboratory (2 credits)
Special topical or experimental courses in crop science, soil science or related areas of horticulture, or plant physiology for graduate and advanced undergraduate students. Special subtitle required and must be approved by the chair of Agronomy or Horticulture. A particular subtitle may be offered twice under PLS 597. Students may not repeat under the same subtitle. Prereq: Permission of instructor. ***Future elective approval for this course topic will depend on topics reviewed in this class. Previously, this class included statistical analyses for diploid organisms using GenAlEx: measuring population genetic diversity, partitioning total genetic variance among populations (using Rst and Fst), Analysis of covariance, ANOVA, calculating pairwise genetic distances, testing for correlation between genetic and geographic distances (Mantel test). Statistical Analysis: calculating genetic diversity characteristics of microsatellite loci to distinguish individual genotypes (endophyte infected tall fescue, endophyte free tall fescue, novel endophyte tall fescue) and Rst for Tall fescue populations using a SpaGeDi software as well as calculating Streiff's correlation coefficients.**

PLS 664 PLANT BREEDING I. (3)
The application of advanced genetic principles to plant improvement. An in-depth study of existing plant breeding procedures and their applications and consideration of new techniques that can be applied to plant breeding and crop improvement. Prereq: STA 570 or consent of instructor.

PSY 780 PROBLEMS IN PSYCHOLOGY. (1-3)
This number is used for topical seminars taught on an experimental basis or covering special material that may not be presented again. May be repeated to a maximum of 12 hours credit. Approved Elective Topic: **special topic in MLM**

STA 525 INTRODUCTORY STATISTICAL INFERENCE. (3)
Simple random sampling, statistics and their sampling distributions, sampling distributions for normal populations; concepts of loss and risk functions; Bayes and minimax inference procedures; point and interval estimation; hypothesis testing; introduction to nonparametric tests; regression and correlation. Prereq: STA 320 or STA 524 or consent of instructor. (Same as OR 525.)

***STA 681 BIOSTATISTICS II. (3)**
Students will learn statistical methods used in public health studies. This includes receiver operator curves, multiple regression logistic regression, confounding and stratification, the Mantel-Haenzel procedure, and the Cox proportional hazardous model. Lecture, two hours; laboratory, two hours per week. Prereq: STA 580 or CPH 580. (Same as CPH 630.)

SW 795 ADVANCED DOCTORAL SEMINAR IN SOCIAL WORK (Subtitle required). (3)*
*Approval for this Elective Course will depend on the subtitle topic. Topics of current importance in Social Work research and practice, including philosophical, theoretical, ethical, and technical

considerations. May be repeated to a maximum of twelve credits under different subtitles. Prereq: Admission to the joint Ph.D. program.