MS Changes

The MS Requirements will be as Follows:

Core Courses: STAT 6510 or STAT 6810, STAT 6520 or STAT 6820, STAT 6420, STAT 6430, STAT 8000

Research Skills (STAT 8910 and STAT 8920 are currently required of supported students only): No longer required of MS students under this proposal.

Demonstration of Mastery Requirement: Thesis or Exam (known as the qualifying exam). This proposal makes no changes to the thesis and exam options. Any changes to these options will be considered in a separate proposal.

Additional requirements: Under the Thesis option: 4 elective courses; under the Exam option: 6 elective courses.

Additional Components of the Proposal Related to the MS Program:

1. Three new split level courses,
   STAT 4/6620, Applied Categorical Data Analysis;
   STAT 4/6250, Applied Multivariate Analysis and Statistical Learning; and
   STAT 4/6350, Applied Bayesian Statistics
   will be introduced. The courses will be designed as specified in Appendix A, CAPA Proposals. These courses would address gaps at both the undergraduate and MS level in our course catalog.

2. STAT 8330[*] will be revised to include many modern topics in applied statistics that are not treated in STAT 6420, STAT 6430 or in other elective courses. Topics would include Monte Carlo simulations, resampling techniques, penalized regression, generalized linear models, robust methods, nonlinear regression, multiple testing adjustment, and smoothing techniques. The details of the course changes can be found in Appendix A, CAPA Proposals.

Notes Regarding the Proposed MS Changes Listed Above[1]:

1. The MS Core will remain the same as it is now except

   a. STAT 8260 will be replaced by STAT 6430 in the MS core. MS students may still take STAT 8260 as an elective.
   b. STAT 8910 and STAT 8920 will no longer be required of supported students.

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[*] An asterisk next to a course number in this document indicates that the course will be revised under the proposal. All new course proposals and course change proposals can be found in Appendix A.

[1] no additional changes are proposed here

2. Because MS students will not take STAT 8260, it will not be necessary to offer STAT 6800 on a regular basis. This document makes no proposal regarding STAT 6800, however.

3. Under the proposed changes to the MS program, it becomes particularly important that:

    a. STAT 6420 should follow its Topical Outline and include an introduction to logistic regression. *This is no change from the current course as it is officially defined.*
    b. STAT 6520 should follow its Topical Outline and include some coverage of theoretical aspects of linear models. *This is no change from the current course as it is officially defined.*

4. The Committee recommends that the three new split level courses STAT 4/6250, STAT 4/6350, and STAT 4/6620 be taught on an every-other-year basis, but the scheduling of these courses is not part of this proposal.

5. The revised STAT 8330* will not be required in either the MS or PhD programs, but it would be a valuable course for students in both programs to take. The Committee recommends that the department encourage students to take it through advising and by offering it on an annual basis.

PhD Changes

The PhD Requirements will be as Follows:

1st Year Core: STAT 6810, STAT 6820, STAT 8260*, and STAT 6430†

2nd Year Core: STAT 8060*, STAT 8170, STAT 8350*, STAT 8530*

Sub-Core: Eliminated under this proposal.

Research Skills Courses 8920-8930 (currently required for supported students): Not required.

Additional requirements: 6 electives

And for supported students: STAT 8910 required in semesters 2-6. In semester 2, students will attend talks by departmental faculty (i.e., "Professors on Parade"); in semesters 3-6 students will be required to attend departmental colloquia.

Exams: QEP (Data Analysis and Theory), Comprehensive (Oral and Written)

Additional Components of the Proposal Related to the MS Program:

1. Content of the following 8000-level courses will be revised and, in some cases, combined as specified below. Detailed Course Change Proposals for all courses that are to be revised appears in Appendix A.

    a. STAT 8260* will include theory of linear models (currently in STAT 8260) and linear mixed models (currently in STAT 8630).
    b. STAT 8530 content will be revised to eliminate some overlap with STAT 6810-20 and to add some material on asymptotics that is currently in the topical outline for STAT 8540. See Appendix A for details.
    c. STAT 8350* will be revised to be aimed at 2nd year PhD students, with prerequisites of STAT 6820, STAT 8260, and STAT 8060. See Appendix A for details.
    d. STAT 8060* will be revised to modernize its content, with more emphasis on statistical computing algorithms and less emphasis on numerical analysis and basic computing tasks. STAT 8070* would be revised to continue where STAT 8060* ends. See Appendix A for details.
    e. STAT 8920* will remain a 2-hour course, and will be redesigned to concentrate on ethics, communication skills, and research materials and methods. This will include some material that is currently taught in STAT 8930. See Appendix A for details.

† Note that STAT 6430 has STAT 6420 as a prereq, but it is anticipated that this prereq would be waived for some PhD students with prior training in multiple regression.

f. STAT 8910 will be a 1 credit hour course for all students. It will be required for first year students in the second semester, during which they will attend talks to be given by departmental faculty members (i.e., a "Professors on Parade" series) and would not be required to attend colloquia. Enrollment in STAT 8910 will be required of 2nd and 3rd year students and strongly encouraged of all students, provided that registration for the course does not change their enrollment status in a manner that would incur additional tuition or fees. The course requirement for students enrolled in STAT 8910 would be to attend departmental colloquia or, for first-year students in their 2nd semester, to attend the Professors on Parade series.

g. The department will introduce three 1-credit hour supplemental study sessions, one for each of the core courses, STAT 6810, STAT 6820, and STAT 8260. These three sessions will be new courses, tentatively numbered STAT 6811, STAT 6821, and STAT 8261.
    i. In each case, enrollment in the session will be optional for students in the corresponding core course, but students will not be able to enroll in the problem session (e.g., STAT 6811) without being in the corresponding 3-hour course (STAT 6810). That is, STAT 6810 will be a co-requisite for STAT 6811, but not vice versa. The same co-requisite relationship will hold for STAT 6820-21 and STAT 8260-61.
    ii. The STAT XXX0 courses will not directly assess material that is presented in the corresponding STAT XXX1 unless it is also covered in the STAT XXX0 course. That is, the STAT XXX1 course will not present new material for assessment in STAT XXX0; it will only review background material for the STAT XXX0 course and provide additional study opportunities for the course content in the STAT XXX0 course.
    iii. The three new STAT XXX1 courses will not be valid electives toward a graduate degree in statistics.

Notes Regarding the Proposed PhD Changes Listed Above[2]:

1. Notes on course changes:

    a. Because the revised STAT 8260* will no longer be required for MS students, it should be possible to move more quickly, especially through any review of linear algebra that is included. This should make room for more extensive coverage of the theory of linear mixed effect models.
    b. The Committee makes the following additional recommendations regarding STAT 8920* and STAT 8930, which should not be regarded as part of this proposal.

        i. We recommend that STAT 8930 no longer be taught on a regular basis.
        ii. We recommend that the instructor assigned to teach STAT 8920* should receive credit for a standard 1 course teaching assignment, but with the combined

[2] no additional changes are proposed here

responsibilities of (a) teaching STAT 8920* in the Fall, (b) co-chairing the colloquium series (perhaps with a junior faculty member), and (c) organizing a "Professors on Parade" series during spring semester for first year students who are enrolled in STAT 8910.

2. The committee recommends that if the instructor of a STAT XXX0 core course for which a STAT XXX1 supplementary session exists is given 4-hours of teaching credit, then he/she should teach the corresponding STAT XXX1 session, rather than delegating that teaching task to a TA.

3. Summary of Changes to the Core and Sub-core:

    a. The Sub-core requirement (2 courses chosen among 4) will cease to exist.
    b. The number of Core courses will remain the same.
    c. Changes to the First-year Core:
        i. Courses Added: STAT 6430
        ii. Courses Removed: STAT 6420
        iii. Courses Remaining: STAT 6810, STAT 6820, STAT 8260*
    d. Changes to the Second-Year Core:
        i. Courses Added: STAT 8060*, STAT 8350*
        ii. Courses Removed that are Currently in the Core: STAT 8620, STAT 8700
        iii. Courses Removed that are Currently in the Sub-core: STAT 8210, STAT 8540, STAT 8630
        iv. Courses Remaining: STAT 8170, STAT 8530*

4. Summary of Changes to Electives: The number of required electives will change from 4 to 6 to offset the elimination of the requirement to take 2 Sub-core courses.

5. Summary of Changes to the Research Skills Requirement: Supported students will be required to take STAT 8910 in Spring Semester of their first year and in both semesters of their second and third years. The requirement for supported students to take STAT 8920 and STAT 8930 will be eliminated.

<u>Recommended Changes to Graduate Course Offerings and Scheduling</u>

The proposed and recommended MS- and PhD-level changes outlined above involve the introduction of three new courses and more frequent offerings of some courses relative to current practice. However, the committee also recommends several changes that would reduce the number of courses offered on a regular basis, offsetting the course increases. Below are the major changes in course offerings and scheduling that we foresee under the current proposal.

- New Courses:
    - STAT 4/6250 (recommended for every other year, tentatively in even spring semesters)

    - STAT 4/6350 (recommended for every other year, tentatively in odd fall semesters)
    - STAT 4/6620 (recommended for every other year, tentatively in even fall semesters)
- Courses Offered More Frequently:
    - STAT 8060* (proposal requires it to be offered every year, we suggest in fall)
    - STAT 8350* (proposal requires it to be offered every year, we suggest in spring)
    - STAT 8330* (recommended to be offered every year, we suggest in fall)
- Courses Recommended to No Longer Offered on a Regular Basis:
    - STAT 6800
    - STAT 8250
    - STAT 8930
- Courses Recommended to be Offered Less Frequently:
    - STAT 8700 (every other year, tentatively in odd fall semesters)

Additional details about recommended course scheduling appear in the file `Proposal-MS&PhDCourseChanges-04-06-18.xlsx.` This file summarizes non-binding recommendations of the committee for implementation of our formal proposal. Therefore it is not part of the proposal *per se* that is subject to approval. This is an Excel file containing three worksheets of the following descriptions:

- [CourseSequences] Recommended course sequences for MS students, PhD students who need MS-level training, and PhD students who do not need MS level training.
- [CourseDescriptions] Course descriptions for all graduate level courses that are affected by the proposed changes or which play a prominent role in the MS and PhD program (e.g., course other than electives and service courses).
- [Course Scheduling] The recommended course scheduling for almost all 6000 and higher level courses that we currently offer on a regular basis or which are proposed to be offered on a regular basis. Courses omitted from this list are graduate level service courses and research (STAT 7000, 7300, etc.) and internship courses.

Appendix A, CAPA Proposals

<u>CAPA Proposals Connected to Proposal for Curriculum Change from the Ad Hoc Graduate Program Revision Committee</u>

04/06/2018

This document contains New Course Applications and Course Change Applications to be submitted to the UGA CAPA system. The New Course Applications are for the following courses:

1. STAT 4/6250, Applied Multivariate Analysis and Statistical Learning (previously submitted to CAPA, but small changes here)
2. STAT 4/6350, Applied Bayesian Statistics
3. STAT 4/6620, Applied Categorical Data Analysis (previously submitted to CAPA, no changes here)

The Course Change Applications are for the following courses:

1. STAT 6420 (very minor changes here)
2. STAT 8060
3. STAT 8070
4. STAT 8260
5. STAT 8330
6. STAT 8350
7. STAT 8530
8. STAT 8920

In addition, the committee recommends several scheduling changes for which additional CAPA Course Change Proposals ought to be submitted that would solely address changes to the frequency with which the following courses would be offered:

- STAT 6800, STAT 8250: Not offered on a regular basis
- STAT 8210: Offered every Spring
- STAT 8290: Offered every other Spring (Odd or even yet to be decided)
- STAT 8700: Offered in odd Falls

The University of Georgia
New Course Application

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1. COURSE ID: STAT 4250/6250

2. TITLES

COURSE Title: Applied Multivariate Analysis and Statistical Learning
Computer Title: APPL MULT & STAT LEARN

3. COURSE DESCRIPTION:

Introduction to popular methodologies from classical multivariate analysis and statistical machine learning for upper level undergraduates and master's degree students in statistics. Each topic will be introduced with motivating examples and explained with matrix algebra. Students will use R or Matlab to practice the methods.

4. ADDITIONAL REQUIREMENTS FOR GRADUATE STUDENTS

Additional and/or alternative problems of a more challenging nature will be required for graduate students on homework assignments and exams.

5. GRADING SYSTEM

A-F (Traditional)

6. CREDIT HOURS AND LECTURE/LAB/DISCUSSION HOURS

	Fixed	Variable
Credit Hours	3	
Lecture Hours	3	
Hours in Discussion Group per week		

7. NON-TRADITIONAL FORMAT (if lecture/lab hours or lecture/discussion hours are fewer than credit hours, please justify)

8. REPEAT POLICY

Course cannot be repeated for credit

9. DUPLICATE CREDIT STATEMENT (do not list quarter course IDs).

The course will not be open to students who have credit in the following courses:
STAT 8210, STAT 8250

10. REQUIRED PREREQUISITES

Undergraduate: STAT 4230 and STAT 4360 and (MATH 3000 or MATH 3300)

Graduate: (A course on linear algebra and STAT 6360 and either STAT 6420 or STAT 6230) or permission of the department

11. PREREQUISITE OR COREQUISITE COURSES

12. COREQUISITE COURSES

13. PRIMARY DELIVERY MECHANISM (select only one):

Lecture

14. COURSE WILL BE OFFERED

Scheduling for this course has not yet been determined

15. EFFECTIVE SEMESTER AND YEAR OF CURRENT VERSION OF COURSE

Semester following UCC approval

16. ADDITIONAL INFORMATION REQUIRED FOR THE SYLLABUS

COURSE OBJECTIVES OR EXPECTED LEARNING OUTCOMES

Students will learn how to visualize and summarize multivariate data sets. Students will learn multivariate analogs of one and two population inference on means, and the multivariate analysis of variance. Students will learn how to determine which multivariate methods are appropriate for a given situation. Students will learn the basic mathematical ideas behind each method as well as understand the underlying assumptions and conditions under which the methodology is expected to perform well and the proper interpretation of the output. Students will learn how to implement the methods covered in the course using appropriate statistical software.

TOPICAL OUTLINE

Visualization and summary statistics for multivariate data, the multivariate normal distribution, inference on multivariate means, multivariate analysis of variance, penalized regression, principal component analysis, linear discriminant analysis, naïve Bayes, classification trees, multi-dimensional scaling, canonical correlation analysis, cluster analysis, support vector machines, random forests, and cross-validation.

UNIVERSITY HONOR CODE AND ACADEMIC HONESTY POLICY

UGA Student Honor Code: "I will be academically honest in all of my academic work and will not tolerate academic dishonesty of others." *A Culture of Honesty*, the University's policy and procedures for handling cases of suspected dishonesty, can be found at www.uga.edu/ovpi. Every course syllabus should include the instructor's expectations related to academic integrity.

The University of Georgia
New Course Application

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1. COURSE ID: STAT 4350/6350

2. TITLES

COURSE Title: Applied Bayesian Statistics

Computer Title: Applied Bayesian Statistics

3. COURSE DESCRIPTION (50 words or less):

Introduction to theory and methods of the Bayesian approach to statistical inference and data analysis. Covers components of Bayesian analysis (prior, likelihood, posterior), computational algorithms, and philosophical differences among various schools of statistical thought.

4. ADDITIONAL REQUIREMENTS FOR GRADUATE STUDENTS

Additional and/or alternative problems of a more challenging nature will be required for graduate students on homework assignments and exams.

5. GRADING SYSTEM

A-F (Traditional)

6. CREDIT HOURS AND LECTURE/LAB/DISCUSSION HOURS

	Fixed	Variable
Credit Hours	3	
Lecture Hours	3	
Hours in Discussion Group per week		

7. NON-TRADITIONAL FORMAT (if lecture/lab hours or lecture/discussion hours are fewer than credit hours, please justify)

8. REPEAT POLICY

Course cannot be repeated for credit

9. DUPLICATE CREDIT STATEMENT (do not list quarter course IDs).

The course will not be open to students who have credit in the following courses:
STAT 8350

10. REQUIRED PREREQUISITES

Undergraduate: STAT 4510 and STAT 4230 and (MATH 2260 or MATH 2310H or MATH 2410 or MATH 2410H)

Graduate: (STAT 6510 and (STAT 6230 or STAT 6420)) or permission of the department

11. PREREQUISITE OR COREQUISITE COURSES

12. COREQUISITE COURSES

13. PRIMARY DELIVERY MECHANISM (select only one):

Lecture

14. COURSE WILL BE OFFERED

Every other year in odd Spring semesters.

15. EFFECTIVE SEMESTER AND YEAR OF CURRENT VERSION OF COURSE

Semester following UCC approval

16. ADDITIONAL INFORMATION REQUIRED FOR THE SYLLABUS

COURSE OBJECTIVES OR EXPECTED LEARNING OUTCOMES

The goal of this course is to provide students a basic understanding of the philosophical, methodological, and computational underpinnings of the Bayesian approach to data analysis and inference. By the end of the course, students should be able to fully specify the components of a Bayesian model (likelihood, priors, hyperpriors) and carry out the requisite computations for the analysis of such a model. Students should also understand and be able to discuss the philosophical and practical differences between a Bayesian and classical data analysis, and know when it is appropriate to use each. The course is aimed at students within the field of statistics as well as those in other disciplines who have interest and training in statistics, data analysis and other quantitative methods.

TOPICAL OUTLINE

Historical introduction; basics of Bayesian analysis - likelihood, prior, posterior; model building and checking; sensitivity analysis; comparisons with frequentist approach (theoretical and practical); computing the posterior distribution; sampling from the posterior distribution; MCMC algorithms (Metropolis-Hasting algorithm, Gibbs sampler, modern methods).

UNIVERSITY HONOR CODE AND ACADEMIC HONESTY POLICY

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The University of Georgia
New Course Application

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1. COURSE ID: STAT 4620/6620

2. TITLES

COURSE Title: Applied Categorical Data Analysis
Computer Title: Appl Categorical Data Analysis

3. COURSE DESCRIPTION:

This is an introduction to the methodology of categorical data analysis and its applications. The course covers descriptive and inferential methods for contingency tables, an introduction to generalized linear models, logistic regression, multinomial response models, regression for counts, and methods for categorical data from matched pairs.

4. ADDITIONAL REQUIREMENTS FOR GRADUATE STUDENTS

Additional and/or alternative problems of a more challenging nature will be required for graduate students on homework assignments and exams.

5. GRADING SYSTEM

A-F (Traditional)

6. CREDIT HOURS AND LECTURE/LAB/DISCUSSION HOURS

	Fixed	Variable
Credit Hours	3	
Lecture Hours	3	
Hours in Discussion Group per week		

7. NON-TRADITIONAL FORMAT (if lecture/lab hours or lecture/discussion hours are fewer than credit hours, please justify)

8. REPEAT POLICY

Course cannot be repeated for credit

9. DUPLICATE CREDIT STATEMENT (do not list quarter course IDs).

The course will not be open to students who have credit in the following courses:

STAT 8620

10. REQUIRED PREREQUISITES

Undergraduate: STAT 4220 and STAT 4230 and STAT 4510

Graduate: STAT 6420 and STAT 6510

11. PREREQUISITE OR COREQUISITE COURSES

12. COREQUISITE COURSES

13. PRIMARY DELIVERY MECHANISM (select only one):

Lecture

14. COURSE WILL BE OFFERED

Scheduling for this course has not yet been determined

15. EFFECTIVE SEMESTER AND YEAR OF CURRENT VERSION OF COURSE

Semester following UCC approval

16. ADDITIONAL INFORMATION REQUIRED FOR THE SYLLABUS

COURSE OBJECTIVES OR EXPECTED LEARNING OUTCOMES

Students will learn the categorical and discrete data types and why and how the analysis of these types of data differ from the analysis of continuous data. They will learn what contingency tables are and how to use them to summarize categorical data. They will learn the descriptive and inferential techniques to analyze contingency table data and how to apply them. They will learn the structure of regression models for categorical and discrete data including logistic regression; Poisson and negative binomial log-linear regression for counts; and various multinomial response regression models. They will learn how to specify these models correctly, how to fit them, and how to interpret results of fitted models properly to draw meaningful conclusions about real data. Students will learn the assumptions underlying the statistical models and methods taught in the course and how to assess their validity. More generally, they will learn the domains of application of the methods to be covered and how to choose an appropriate statistical methodology to describe and draw inferences from categorical data.

Statistical software will be integrated into the course and students will learn how to use software to implement analyses and to produce results that are suitable for communicating statistical information clearly in a non-technical manner. Students will develop their abilities to communicate statistical information in both written and oral format.

TOPICAL OUTLINE

The first part of the course will introduce types and scales of categorical and discrete data; contingency tables; measures of association and summary statistics for contingency table data; probability distributions for contingency table data including the binomial, multinomial, Poisson, and hypergeometric distributions; and inferential methods for contingency tables including both large-sample methods and exact methods. Next, generalized linear models will be introduced with an emphasis on the structure of this model class and its scope, including an overview of the important special cases that fall within it. Special cases of the generalized linear model will then be introduced and discussed, each in turn. These special cases will include the logistic regression model, loglinear regression models for unbounded counts, and multinomial regression models. The proper handling of overdispersion relative to these standard model classes will be discussed. Statistical methods and models for categorical data from matched pairs and longitudinal data will be introduced toward the end of the course. Topics will be motivated and illustrated with real data examples throughout the course and the practical implementation of methodology will be emphasized.

UNIVERSITY HONOR CODE AND ACADEMIC HONESTY POLICY

UGA Student Honor Code: "I will be academically honest in all of my academic work and will not tolerate academic dishonesty of others." A Culture of Honesty, the University's policy and procedures for handling cases of suspected dishonesty, can be found at www.uga.edu/ovpi. Every course syllabus should include the instructor's expectations related to academic integrity.

The University of Georgia
Course Change Application

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1. COURSE ID: STAT 6420

2. TITLES

Current:

Course Title: Applied Linear Models
Course Computer Title: APPL LINEAR MODELS

3. COURSE DESCRIPTION:

Current:

An introduction to statistical data analysis techniques and multiple linear regression via its matrix representation, regression diagnostics, logistic regression for binary data, basic design of experiments and relevant statistical computing packages.

Proposed:

Introduction to data analysis via linear models and logistic regression. Linear regression topics include estimation, inference, variable selection, diagnostics, remediation. Basic design of experiments, analysis of variance, and logistic regression will also be covered, including an introduction to generalized linear models. Vector and matrix formulations are used throughout the course.

4. GRADING SYSTEM

Current:

A-F (Traditional)

5. CREDIT HOURS AND LECTURE/LAB/DISCUSSION HOURS

Current:

	Fixed	Variable
Credit Hours	3	
Lecture Hours	3	
Hours in Discussion Group per week		

6. NON-TRADITIONAL FORMAT(if lecture/lab hours or lecture/discussion hours are fewer than credit hours, please justify)

Current:

7. REPEAT POLICY

Current: Course cannot be repeated for credit

8. DUPLICATE CREDIT STATEMENT(do not list quarter course IDs)

The course will not be open to students who have credit in the following courses:

Current:

9. REQUIRED PREREQUISITES

Current:

Permission of department

Proposed:

A course in linear/matrix algebra and permission of department

10. PREREQUISITE OR COREQUISITE COURSES

Current:

11. COREQUISITE COURSES

Current:

12. PRIMARY DELIVERY MECHANISM (select only one):

Current:

Lecture

13. COURSE WILL BE OFFERED

Current: Every Year - Fall

14. EFFECTIVE SEMESTER

Semester following UCC approval

15. ADDITIONAL INFORMATION REQUIRED FOR THE SYLLABUS

COURSE OBJECTIVES OR EXPECTED LEARNING OUTCOMES

Current:

The goal of this course is for students to learn the basic form and methodology of the linear model, including multiple regression and the analysis of variance. After completing this course students will be familiar with the matrix representation of the linear model, will understand the associated methodology for estimation and inference, will know how to apply the linear model for the purpose of data analysis, will be familiar with the basic principles of experimental design and some specific designs, and will be introduced to the logistic regression model for the analysis of binary data.

Proposed:

The goal of this course is for students to learn the basic form and methodology of the linear model, including multiple regression and the analysis of variance. After completing this course students will be familiar with the matrix representation of the linear model, will understand the associated methodology for estimation and inference, and will know how to apply the linear model for the purpose of data analysis. Emphasis will be on linear regression, but students will also learn the basic principles of experimental design and will learn some specific designs and how to apply and analyze them with analysis of variance models and methods. They will understand differences in the analytic approach for observational and experimental data. Students will understand alternative parameterizations for statistical models. They will gain a basic understanding of the broad class of generalized linear models and study the logistic regression model for the analysis of binary data.

TOPICAL OUTLINE

Current:

Course topics will include simple linear regression, multiple linear regression, the matrix representation of the multiple regression model, least squares estimation, prediction, confidence and prediction intervals, hypothesis testing, model building, variable selection, model diagnostics, completely randomized and block designs, logistic regression for binary data, and relevant statistical computing packages.

Proposed:

Course topics will include simple linear regression, multiple linear regression, the matrix representation of the multiple regression model, ordinary and weighted least squares estimation, prediction, confidence and prediction intervals, hypothesis testing, model building, traditional and modern variable selection techniques, model diagnostics, completely randomized and blocked designs, introduction to generalized linear models, logistic regression for binary data, and relevant statistical computing packages.

The University of Georgia

Course Change Application

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1. **COURSE ID: STAT 8060**
2. **TITLES**

Current:
Course Title: Computing Techniques in Statistics I
Course Computer Title: COMPUTING STAT I

Proposed:
Course Title: Statistical Computing I
Course Computer Title: Statistical Computing I

3. **COURSE DESCRIPTION (must be 50 words or less)**

Current:
Essential numerical methods for statistical computing are presented. All algorithms are implemented in a high-level language that furnishes a function that performs the algorithm, as well as in a low-level language in which the algorithms must be programmed from scratch.

Proposed:
Course covers tools and methods of statistical computing beginning with mathematical and computational underpinnings of statistical computation and progressing through Monte Carlo simulation, numerical linear algebra, optimization, numerical differentiation and integration, and simulation-based statistical algorithms. Students will learn methods, theory, and implementation via existing functions and their own code.

4. **GRADING SYSTEM**

Current:
A-F (Traditional)

5. **CREDIT HOURS AND LECTURE/LAB/DISCUSSION HOURS**

Current:

	Fixed	Variable
Credit Hours	3	
Lecture Hours	3	
Hours in Discussion Group per week		

6. **NON-TRADITIONAL FORMAT(if lecture/lab hours or lecture/discussion hours are fewer than credit hours, please justify)**

   Current:

7. **REPEAT POLICY**

   Current:
   Course cannot be repeated for credit

8. **DUPLICATE CREDIT STATEMENT(do not list quarter course IDs)**

   The course will not be open to students who have credit in the following courses:

   Current:

9. **REQUIRED PREREQUISITES**

   Current: (STAT 4510/6510 or STAT 6810) and STAT 6420

   Proposed: (STAT 4510/6510 or STAT 6810) and STAT 6420

10. **PREREQUISITE OR COREQUISITE COURSES**

    Current :

11. **COREQUISITE COURSES**

    Current :

12. **PRIMARY DELIVERY MECHANISM (select only one):**

    Current: Lecture

13. **COURSE WILL BE OFFERED**

    Current: Every Odd Year - Fall

    Proposed: Every Year - Fall

14. **EFFECTIVE SEMESTER AND YEAR OF CURRENT VERSION OF COURSE**

Proposed: Fall 2018

15. ADDITIONAL INFORMATION REQUIRED FOR THE SYLLABUS

COURSE OBJECTIVES OR EXPECTED LEARNING OUTCOMES

Current:
Students will learn computing and basic numerical algorithms in order to write their own programs for statistical analysis. Students will learn a high-level computing package that has the studied algorithms easily accessible as a single command. Students will also learn a low-level computing language in which they must write their own programs to execute the studied algorithms.

Proposed:
Students will learn the mathematical and computational methods and theory underlying modern statistical computing. They will learn efficient and stable computational methods to implement techniques from mathematics that are important in statistics and gain some insight into the statistical methods to which those techniques apply. They will also learn some computational methods that are inherently statistical or probabilistic and which are important in modern statistical analysis. Students will learn about existing implementations of important computational methods in a statistics or matrix-oriented programming environment such as R or Matlab. They will also learn how to write their own code to implement computational techniques in a lower level general purpose programming language such as Python.

TOPICAL OUTLINE

Current:

Computer arithmetic.
Generation of discrete and continuous pseudo-random numbers: generation of continuous uniform pseudo-random numbers, generation by definition, inverse-CDF method, Box-Mueller transformation, the (acceptance-)rejection method, generation of gamma pseudo-random variables.
Numerical integration: extended trapezoidal rule, Romberg integration, extended midpoint rule, Gaussian quadrature, Monte Carlo integration.
Numerical differentiation.
Numerical optimization: quasi-Newton algorithm, evolutionary algorithm.
Numerical matrix methods: Gaussian elimination, pivoting, LU decomposition, Cholesky decomposition, QR decomposition, singular-value decomposition, eigenvalue computation.

Proposed:
Computer arithmetic, pseudo-random numbers and Monte Carlo simulation, numerical linear algebra, numerical differentiation and integration, numerical optimization, Markov chain Monte Carlo (MCMC) methods.

The University of Georgia
Course Change Application

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1. **COURSE ID: STAT 8070**
2. **TITLES**

   Current:
   Course Title: Computing Techniques in Statistics II
   Course Computer Title: COMPUTING STAT II

   Proposed:
   Course Title: Statistical Computing II
   Course Computer Title: Statistical Computing II

3. **COURSE DESCRIPTION (must be 50 words or less)**

   Current:
   A continuation of Computing Techniques in Statistics I. Students will learn computational algorithms and heuristics and how to program them. Many of the methods studied in this course are higher level approaches built from the computational and numerical techniques from Computing Techniques in Statistics I. Students will be confronted with statistical problems requiring innovative computational solutions.

   Proposed:
   Course continues STAT 8060, Statistical Computing I. Advanced statistical computing techniques will be covered. Topics may include advanced MCMC methods, Expectation-Maximization methods, machine learning algorithms, constrained optimization, density estimation, nonparametric regression perfect sampling, data visualization, parallel computing, etc. Students will learn methods, theory, and implementation via existing functions and their own code.

4. **GRADING SYSTEM**

   Current:
   A-F (Traditional)

5. **CREDIT HOURS AND LECTURE/LAB/DISCUSSION HOURS**

   Current:

   Fixed Variable

Credit Hours	3
Lecture Hours	3
Hours in Discussion Group per week	

6. NON-TRADITIONAL FORMAT(if lecture/lab hours or lecture/discussion hours are fewer than credit hours, please justify)

Current:

7. REPEAT POLICY

Current:
Course cannot be repeated for credit

8. DUPLICATE CREDIT STATEMENT(do not list quarter course IDs)

The course will not be open to students who have credit in the following courses:

Current:

9. REQUIRED PREREQUISITES

Current: STAT 8060

10. PREREQUISITE OR COREQUISITE COURSES

Current :

11. COREQUISITE COURSES

Current :

12. PRIMARY DELIVERY MECHANISM (select only one):

Current: Lecture

13. COURSE WILL BE OFFERED

Current: Every Even Year - Spring

Proposed: Scheduling for this course has yet to be determined.

14. EFFECTIVE SEMESTER AND YEAR OF CURRENT VERSION OF COURSE

Proposed: Spring 2019

15. ADDITIONAL INFORMATION REQUIRED FOR THE SYLLABUS

COURSE OBJECTIVES OR EXPECTED LEARNING OUTCOMES

Current:
This course is a continuation of Computing Techniques in Statistics I, Computing Techniques in Statistics I. Students will learn advanced methods of modern statistical computation. They will learn the purpose and logic of computational algorithms and heuristics, how to program them, and their utility for solving statistical problems. Students will be assigned projects requiring innovative computational solutions and applications of the algorithms studied in the course.

Proposed:
This course is a continuation of STAT 8060, Statistical Computing I. Students will learn advanced methods of modern statistical computation. They will learn the purpose and logic of computational algorithms and heuristics, how to program them, and their utility for solving statistical problems. Students will be assigned projects requiring innovative computational solutions and applications of the algorithms studied in the course.

TOPICAL OUTLINE

Current:
Bootstrapping (both parametric and nonparametric); design and implementation of simulation studies; kernel density estimation and kernel regression; the expectation-maximization (EM) algorithm and its generalizations; hidden Markov models and Baum's EM algorithm; Markov chain Monte Carlo (MCMC) techniques including the Gibbs sampler, Metropolis algorithm, and MCMC approximation of a likelihood function; the fast Fourier transform; and wavelet decompositions. Additional topics at the discretion of the instructor.

Proposed:
Advanced MCMC methods, density estimation, smoothing, the EM algorithm, machine learning algorithms, perfect sampling, constrained optimization, data visualization, parallel computing, and additional topics at the discretion of the instructor.

The University of Georgia
Course Change Application

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1. COURSE ID:

Current: STAT 8260

2. TITLES

Current:

Course Title: Theory of Linear Models
Course Computer Title: LINEAR MODELS

Proposed:

Course Title: Theory of Linear Models
Course Computer Title: Theory of Linear Models

3. COURSE DESCRIPTION (must be 50 words or less)

Current:

Theory of the linear model is introduced. Topics include a review of relevant linear algebra, distribution theory, the full and non-full rank linear models, ordinary and generalized least squares and maximum likelihood estimation, prediction, interval estimation and hypothesis tests, estimability, analysis of variance, restricted models, reparameterization, and mixed models.

Proposed:

Theory of the linear model is studied. Topics include distribution theory; full and non-full rank linear models; ordinary and generalized least squares; maximum and restricted maximum likelihood estimation; prediction, inference, estimability, analysis of variance, restricted models, reparameterization, and mixed-effect models.

4. GRADING SYSTEM

Current: A-F (Traditional)

5. CREDIT HOURS AND LECTURE/LAB/DISCUSSION HOURS

Current:

	Fixed	Variable
Credit Hours	3	
Lecture Hours	3	
Hours in Discussion Group per week		

6. NON-TRADITIONAL FORMAT(if lecture/lab hours or lecture/discussion hours are fewer than credit hours, please justify)

Current:

7. REPEAT POLICY

Current:

Course cannot be repeated for credit

8. DUPLICATE CREDIT STATEMENT(do not list quarter course IDs)

The course will not be open to students who have credit in the following courses:

Current:

9. REQUIRED PREREQUISITES

Current:

Proposed: STAT 6420 or permission of the department

10. PREREQUISITE OR COREQUISITE COURSES

Current: STAT 6420 and (STAT 6820 or STAT 4520/6520)

Proposed: STAT 6820 or STAT 6520

11. COREQUISITE COURSES

Current:

12. PRIMARY DELIVERY MECHANISM (select only one):

Current: Lecture

13. COURSE WILL BE OFFERED

Current: Every Year - Spring

14. EFFECTIVE SEMESTER

Semester following UCC approval

15. ADDITIONAL INFORMATION REQUIRED FOR THE SYLLABUS

COURSE OBJECTIVES OR EXPECTED LEARNING OUTCOMES

Current:

This is a core course for Statistics Master's and PhD students. It covers the theory of the classical linear model and some of its extensions. Students will learn the theory of the classical linear model including both the full rank and non-full-rank cases. Extensions of the classical linear model to account for correlation and non-constant variance will also be studied, including linear mixed effects models. Students will understand the derivation and use of the classical methods of prediction, point and interval estimation, and hypothesis tests in the linear model context. Along the way, they will learn the theory of the multivariate normal and related probability distributions and will enhance their understanding of linear algebra.

Proposed:

This is a core course for statistics PhD students that covers the theory of the classical linear model and some of its extensions, including the linear mixed-effect model. Students will learn the theory of the classical linear model including both the full rank and non-full-rank cases. Extensions of the classical linear model to account for correlation and non-constant variance will also be studied, including linear mixed effects models. Students will understand the derivation and use of the classical methods of prediction, point and interval estimation, and hypothesis tests in the linear model context. Along the way they will learn the theory of the multivariate normal and related probability distributions and will enhance their understanding of linear algebra.

TOPICAL OUTLINE

Current:

Topics to be covered include a review of linear algebra, classical distribution theory, the full rank linear model, ordinary least squares, maximum likelihood estimation, the Gauss-Markov Theorem, inference in the full rank model, non-spherical covariance structure and generalized least squares estimation, non-full rank models and related concepts and techniques (estimability, reparametrizations, constraints), mixed effect models and variance components.

Proposed:

Topics to be covered include a review of linear algebra, classical distribution theory, the full rank linear model, ordinary least squares, maximum likelihood estimation, the Gauss-Markov Theorem, inference in the full rank model, non-spherical covariance structure and generalized least squares estimation, non-full rank models and related concepts and techniques (estimability, reparametrizations, constraints), optimal prediction, mixed-effect models, variance components, restricted maximum likelihood estimation, and inference in the linear mixed-effect model.

The University of Georgia
Course Change Application
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1. **COURSE ID: STAT 8330**
2. **TITLES**

Current:
Course Title: Advanced Applications and Computing
Course Computer Title: ADV APPL COMP

Proposed:
Course Title: Advanced Statistical Applications and Computing
Course Computer Title: ADV STAT APPL & COMP

3. **COURSE DESCRIPTION (must be 50 words or less)**

Current:

Basics of R programming language, objects in R, graphics in R, implementing modern statistical techniques in R. Topics include smoothing techniques, data summaries, robust methods, the bootstrap, permutation tests, Monte Carlo simulations, linear models, generalized linear models, modern nonlinear regression techniques, multivariate statistics, and survival analysis.

Proposed:

Advanced programming and implementation of modern statistical techniques using statistical software such as R. Topics include Monte Carlo simulations, resampling techniques, penalized regression, generalized linear models, robust methods, nonlinear regression, multiple testing adjustment, and smoothing techniques.

4. **GRADING SYSTEM**

Current:
A-F (Traditional)

5. **CREDIT HOURS AND LECTURE/LAB/DISCUSSION HOURS**

Current:

	Fixed	Variable
Credit Hours	3	
Lecture Hours	3	

Hours in Discussion Group per week

6. **NON-TRADITIONAL FORMAT(if lecture/lab hours or lecture/discussion hours are fewer than credit hours, please justify)**

   Current:

7. **REPEAT POLICY**

   Current: Course cannot be repeated for credit

8. **DUPLICATE CREDIT STATEMENT(do not list quarter course IDs)**

   The course will not be open to students who have credit in the following courses:

   Current:

9. **REQUIRED PREREQUISITES**

   Current: STAT 6420 or STAT 6320

   Proposed: (STAT 6420 and STAT 6360) or permission of the department

10. **PREREQUISITE OR COREQUISITE COURSES**

    Current :

11. **COREQUISITE COURSES**

    Current :

12. **PRIMARY DELIVERY MECHANISM (select only one):**

    Current: Lecture

13. **COURSE WILL BE OFFERED**

    Current: Every Even Year – Fall

    Proposed: Every Year - Fall

14. **EFFECTIVE SEMESTER AND YEAR OF CURRENT VERSION OF COURSE**

Proposed: Fall 2018

15. ADDITIONAL INFORMATION REQUIRED FOR THE SYLLABUS

COURSE OBJECTIVES OR EXPECTED LEARNING OUTCOMES

Current:
The goal of this course is to teach students how to implement modern statistical methods in the R statistical programming language. Students will learn both how to write programs in R and to use existing R functions. They will learn to implement various modern statistical techniques in R, including smoothing techniques, data summaries, robust methods, the bootstrap, permutation tests, Monte Carlo simulations, linear models, generalized linear models, modern nonlinear regression techniques, multivariate statistics, and survival analysis. There will be lectures on the basics of each topic followed by examples of their implementation in R

Proposed:
The goal of this course is to provide students with a survey of several topics in modern applied statistics with an emphasis on implementation in a statistical programming environment. Students will learn how to write their own functions and code for complex tasks as well as the proper use of existing functions. There will be lectures on the statistical methodology associated with each topic followed by examples involving real data and practical implementation in statistical software.

TOPICAL OUTLINE

Current:
Topics include programming in R, data summaries, robust methods, density estimation, the bootstrap, permutation tests, Monte Carlo simulations, linear models, generalized linear models, modern nonlinear regression techniques, multivariate statistics, and survival analysis.

Proposed:
Topics include Monte Carlo simulations, resampling techniques (bootstrap, permutation test, and cross validation), penalized regression, generalized linear models, robust methods, nonlinear regression, multiple testing adjustment, and smoothing techniques (kernels and splines).

The University of Georgia
Course Change Application

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1. **COURSE ID: STAT 8350**
2. **TITLES**

   Current:
   Course Title: Bayesian Data Analysis
   Course Computer Title: BAYES DATA ANALYSIS

   Proposed:

   Course Title: Bayesian Statistical Methodology with Applications
   Course Computer Title: BAYESIAN STATISTICAL METHODS

3. **COURSE DESCRIPTION (must be 50 words or less)**

   Current:

   Introduction to the theory and methods of the Bayesian approach to data analysis and statistical inference.

   Proposed:

   This course covers the theory and methodology of Bayesian statistical inference. It provides training in statistical modeling and data analysis under the Bayesian paradigm.

4. **GRADING SYSTEM**

   Current: A-F (Traditional)

5. **CREDIT HOURS AND LECTURE/LAB/DISCUSSION HOURS**

   Current:

	Fixed	Variable
Credit Hours	3	
Lecture Hours	3	
Hours in Discussion Group per week		

6. **NON-TRADITIONAL FORMAT(if lecture/lab hours or lecture/discussion hours are fewer than credit hours, please justify)**

   Current:

7. **REPEAT POLICY**

Current: Course cannot be repeated for credit

8. DUPLICATE CREDIT STATEMENT(do not list quarter course IDs)

The course will not be open to students who have credit in the following courses:

Current:

9. REQUIRED PREREQUISITES

Current: STAT 4510/6510 and (STAT 6320 or STAT 6420)

Proposed: STAT 6820, STAT 8260 and STAT 8060

10. PREREQUISITE OR COREQUISITE COURSES

Current :

11. COREQUISITE COURSES

Current :

12. PRIMARY DELIVERY MECHANISM (select only one):

Current: Lecture

13. COURSE WILL BE OFFERED

Current: Every Odd Year - Fall

Proposed: Every Year - Spring

14. EFFECTIVE SEMESTER AND YEAR OF CURRENT VERSION OF COURSE

Proposed: Spring 2019

15. ADDITIONAL INFORMATION REQUIRED FOR THE SYLLABUS

COURSE OBJECTIVES OR EXPECTED LEARNING OUTCOMES

Current:

The goal of this course is to provide graduate audiences - statisticians and scientists alike - a basic understanding of the philosophical, methodological, and computational underpinnings of the Bayesian approach to data analysis and inference. By the end of the course, students should be able to fully specify the components of a Bayesian model (likelihood, priors, hyperpriors) and carry out the requisite computations for the analysis of such a model. Students should also understand and be able to discuss the philosophical and practical differences between a Bayesian and classical data analysis, and know when it is appropriate to use each.

Proposed:
The goal of this course is to provide graduate audiences--statisticians and scientists alike--an understanding of the philosophical, methodological, and computational underpinnings of Bayesian statistical inference and its methodological applications. By the end of the course, students should be able to fully specify the components of a Bayesian model (likelihood, priors, hyperpriors), obtain the optimal Bayes rule for a specified loss function and carry out the requisite computations for the analysis of such a model. Students will know conjugate Bayesian methods, objective Bayesian methods under diffuse and improper priors, and propriety of resulting posterior distributions. Students will learn Bayesian solutions to interval estimation, hypothesis testing and model selection problems; hierarchical Bayes or multi-level modeling; robust Bayesian methods; and Bayesian computing in applications. Students should also understand and be able to discuss the philosophical and practical differences between a Bayesian and classical data analysis, and know the strengths and weaknesses of each method.

TOPICAL OUTLINE

Current:
Historical introduction; basics of Bayesian analysis - likelihood, prior, posterior; model building and checking; sensitivity analysis; comparisons with frequentist approach (theoretical and practical); computing the posterior distribution; sampling from the posterior distribution; MCMC algorithms (Metropolis-Hasting algorithm, Gibbs sampler, modern methods).

Proposed:
Historical introduction; basics of Bayesian analysis--likelihood, prior, posterior; model building and checking; robustness and sensitivity analysis; comparisons with frequentist approach (theoretical and practical); computing the posterior distribution; sampling from the posterior distribution; MCMC algorithms (Metropolis-Hasting algorithm, Gibbs sampler, modern methods), hierarchical Bayes modeling, objective Bayesian methods, Laplace approximations and asymptotic Bayesian solutions.

The University of Georgia

Course Change Application

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1. COURSE ID:

Current: STAT 8530

2. TITLES

Current:

Course Title: Advanced Statistical Inference I
Course Computer Title: ADV STAT INFER I

3. COURSE DESCRIPTION (must be 50 words or less)

Current:

The theory of statistical inference is presented at an advanced level, including both frequentist and Bayesian perspectives. This course provides justification of many statistical procedures routinely used in good practice of statistics and discusses principles and theory that can be used to derive reasonable solutions to new statistical problems.

Proposed:

Theory of statistical inference is presented at an advanced level, including both frequentist and Bayesian perspectives. This course provides finite-sample and asymptotic justification of statistical procedures routinely used in practice and discusses principles and theory that can be used to derive reasonable solutions to new statistical problems.

4. GRADING SYSTEM

Current: A-F (Traditional)

5. CREDIT HOURS AND LECTURE/LAB/DISCUSSION HOURS

Current:

	FIXED	VARIABLE
Credit Hours	3	
Lecture Hours	3	

6. NON-TRADITIONAL FORMAT(if lecture/lab hours or lecture/discussion hours are fewer than credit hours, please justify)

Current:

7. REPEAT POLICY

Current: Course cannot be repeated for credit

8. DUPLICATE CREDIT STATEMENT(do not list quarter course IDs)

The course will not be open to students who have credit in the following courses:

Current:

9. REQUIRED PREREQUISITES

Current: STAT 6820

10. PREREQUISITE OR COREQUISITE COURSES

Current: STAT 8170

11. COREQUISITE COURSES

Current:

12. PRIMARY DELIVERY MECHANISM (select only one):

Current: Lecture

13. COURSE WILL BE OFFERED

Current: Every Year - Spring

14. EFFECTIVE SEMESTER

Semester following UCC approval

15. ADDITIONAL INFORMATION REQUIRED FOR THE SYLLABUS

COURSE OBJECTIVES OR EXPECTED LEARNING OUTCOMES

Current:

Students successfully completing this course are expected to learn about the two principal approaches in statistics: Bayesian and frequentist. They will also learn various principles of statistical inference that can help select an appropriate statistical method in pursuing good practice of statistics. This course will teach them how to obtain appropriate statistical procedures that can be used in statistical problem solving. Training provided in this course will be crucial for dissertation research.

Proposed:

Students successfully completing this course are expected to learn about the two principal approaches in statistics: Bayesian and frequentist. They will also learn various principles of statistical inference that can help select an appropriate statistical method in pursuing good practice of statistics. This course will teach them how to obtain appropriate statistical procedures that can be used in statistical problem solving. Students will learn about approximation tools that are used to compare and evaluate the performance of statistical procedures based on large samples. Training provided in this course will be crucial for dissertation research.

TOPICAL OUTLINE

Current:

The course will cover the following topics: sufficiency and Factorization Theorem, completeness, Basu's Theorem and its applications, elements of decision theory, Bayes rules, Bayes risk, minimax principle, Bayes estimates based on squared error and absolute error loss, Generalized Rao-Blackwell Theorem, generalized Bayes and minimax decision rules, James-Stein estimation, James-Stein estimators as empirical Bayes estimators, consistency and asymptotic normality of maximum likelihood estimators, concepts of estimating functions, principles and applications of likelihood ratio (LR) tests, asymptotic distribution of LR statistic, Neyman-Pearson Lemma, most powerful and uniformly most powerful (UMP) tests, monotone LR family and applications to UMP tests, uniformly most accurate confidence sets.

Proposed:

1. Exponential families, sufficiency and information
1.1 Exponential families of distributions
1.2 Sufficiency and Fisher information
1.3 Conditioning
2. Likelihood and likelihood-based methods
2.1 Likelihood function
2.2 Likelihood-based methods and first-order theory
2.2.1 Maximum likelihood estimation
2.2.2 Likelihood ratio tests
2.3 Alternatives to the first-order theory (time permits)
2.3.1 Bootstrap
2.4 Modified likelihoods: conditional and partial likelihoods
2.5 EM algorithm (as time permits)
2.6 Estimating equations
3. Bayesian inference
3.1 Bayesian analysis
3.1.1 Basic of a Bayesian inference problem
3.1.2 Inference for full parameter and for parametric function
3.1.3 Inference for a sub-vector and marginalization
3.2 Some examples of Bayesian inference
4. Multiparameter and shrinkage estimation
4.1 James-Stein estimation
4.2 Empirical Bayes estimation
4.3 Hierarchical models
4.3.1 Random effects and prediction
4.3.2 Hierarchical Bayes
4.3.3 Some basic computing issues: Gibbs sampling, rejection sampling, MH algorithm
5. Interval estimation
5.1 Asymptotic confidence intervals
5.2 Credible intervals
5.3 Bayes and frequentist prediction intervals

The University of Georgia
Course Change Application

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1. COURSE ID: STAT 8920

2. TITLES

Course Title: Statistical Research and Professional Practice I
Course Computer Title: STAT RSRC & PRAC I

3. COURSE DESCRIPTION (must be 50 words or less)

Current:

Provides training in the skills, tools, and resources essential for conducting statistical research and for being a successful practicing statistician. Students will learn how to read statistical literature, how to identify and address open problems, communication skills, and the means and methods of research and problem solving.

Proposed:

Provides training in some of the skills, tools, and resources essential for conducting statistical research and for professional practice. Students will learn materials and methods for conducting statistical research as well as written and oral skills for communicating research. The course will also cover professional ethics for the statistician.

4. GRADING SYSTEM

A-F (Traditional)

5. CREDIT HOURS AND LECTURE/LAB/DISCUSSION HOURS

	FIXED	VARIABLE
Credit Hours	2	
Lecture Hours	2	

6. NON-TRADITIONAL FORMAT(if lecture/lab hours or lecture/discussion hours are fewer than credit hours, please justify)

7. REPEAT POLICY

Course cannot be repeated for credit

8. DUPLICATE CREDIT STATEMENT(do not list quarter course IDs)

The course will not be open to students who have credit in the following courses:

9. REQUIRED PREREQUISITES

Permission of department

10. PREREQUISITE OR COREQUISITE COURSES

11. COREQUISITE COURSES

12. PRIMARY DELIVERY MECHANISM (select only one):

Lecture

13. COURSE WILL BE OFFERED

Current:

Every Year - Fall

Proposed:

Scheduling for this course has yet to be determined.

14. EFFECTIVE SEMESTER AND YEAR OF CURRENT VERSION OF COURSE

Semester after approval

15. ADDITIONAL INFORMATION REQUIRED FOR THE SYLLABUS

COURSE OBJECTIVES OR EXPECTED LEARNING OUTCOMES

Current:

This course aims to provide a general introduction to the methods, resources, and skills of statistical research and problem solving. In addition, information about careers in statistics and professional practice will be provided. Students will learn how to read the statistical literature and how to identify and begin to solve theoretical, methodological and applied problems using statistical methods. They will receive training in some of the practical tools for literature search, statistical writing, and presentation, and will gain useful information about careers in statistics, statistical journals and publishing, funding opportunities and agencies, and professional societies.

Proposed:

This course aims to provide a general introduction to the methods, resources, and skills of statistical research and problem solving. In addition, information about careers in statistics will be provided. Students will learn how to read the statistical literature and how to identify and begin to solve theoretical, methodological and applied problems using statistical methods. They will receive training in some of the practical tools for literature search, statistical writing, and presentation. In addition, the course will cover professional ethics for the statistician.

TOPICAL OUTLINE

Current:

Topics include reading the statistical literature; research tools including LaTeX, presentation software such as Beamer, computing resources, and research databases and library resources; presentation skills; writing of statistical research papers and reports; journals and the peer review process; professional societies in the statistical sciences; career opportunities in statistics; and academic honesty and professional ethics.

Proposed:

Professional ethics including the ASA Code of Ethics; ethical issues in publishing; plagiarism; ethical use and reporting of statistical analyses; ethical conduct of scientific research; ethical challenges in managing a research group. Other topics include professional societies and meetings; reading the statistical literature; research databases and library resources; writing of statistical research papers and reports; journals and the peer review process; presentation skills; and career opportunities in statistics.

UNIVERSITY HONOR CODE AND ACADEMIC HONESTY POLICY

UGA Student Honor Code: "I will be academically honest in all of my academic work and will not tolerate academic dishonesty of others." A Culture of Honesty, the University's policy and procedures for handling cases of suspected dishonesty, can be found at www.uga.edu/ovpi. Every course syllabus should include the instructor's expectations related to academic integrity.