Course Change Request

New Course Proposal

Date Submitted: 04/06/21 11:02 am

Viewing: FRSC 601 : Quantitative Methods for Forensic Scientists

Last edit: 04/06/21 1:12 pm

Changes proposed by: afalsett

In Workflow

1. **FRSC Representative**
2. **SC Curriculum Committee**
3. SC Associate Dean
4. Assoc Provost-Graduate
5. Registrar-Courses
6. Banner

Approval Path

1. 04/06/21 1:15 pm Kimberly Rule (kcarisi): Approved for FRSC Representative

Are you completing this form on someone else's behalf?

No

Effective Term: Fall 2021

Subject Code: FRSC - Forensic Science

Course Number: 601

Bundled Courses:

Is this course replacing another course? No

Equivalent Courses:

Catalog Title: Quantitative Methods for Forensic Scientists

Banner Title: Quantitative Methods for Foren

Will section titles vary by semester? No

Credits: 3

Schedule Type: Lecture

Hours of Lecture or Seminar per week: 3

Repeatable: May only be taken once for credit (NR)
GRADUATE ONLY

Default Grade Mode: Graduate Regular

Recommended Prerequisite(s):

Recommended Corequisite(s):

Required Prerequisite(s) / Corequisite(s) (Updates only):

Registrar's Office Use Only - Required Prerequisite(s)/Corequisite(s):

And/Or	(	Course/Test Code	Min Grade/Score	Academic Level	)	Concurrency?

Registration Restrictions (Updates only):

Registrar's Office Use Only - Registration Restrictions:

Field(s) of Study:

Class(es):

Level(s):

Degree(s):

School(s):

Catalog Description:

This is an introductory course in quantitative methods as related to forensic science. It focuses on the most important principles of statistics and concepts relevant to methodologies used by forensic scientists in their research and laboratory casework. Topics include data analysis and interpretation for one and multiple variables, probability, estimation, and hypothesis testing for proportions and means, correlation, and regression. Specific, forensic science-related topics include, but not limited to Likelihood Ratios and their importance to DNA interpretation, Discriminant Function Analysis, and its importance to Forensic

Anthropology. Court cases pertinent to forensic science will also be examined, for example, PCAST motions. Statistical software will be used for assignments.

Justification:

What is being proposed: FRSC 601 Quantitative Methods for Forensic Scientists is a new 3 credit lecture-based graduate course.

Why is this course being proposed: FRSC 601 Quantitative Methods for Forensic Scientists is designed to meet the quantitative needs of forensic science graduate students preparing for their individual forensic research projects (theses), as well as providing them with the capabilities to critically comprehend scientific literature, either published or unpublished. Both intellectual and practical needs will be addressed in this course; knowledge of statistical theorem and hands-on experience collecting and analyzing data using various Mason licensed software such as R, SAS, SPSS, and Matlab.

Does this course cover material which crosses into another department? No

Learning Outcomes:

- Students will interpret quantitative information (i.e., formulas, graphs, tables, models, and schematics) and draw inferences from them.
- Identify, select, and apply probabilistic and statistical principles, methods, and tools that will prove useful in research and casework.
- Use technology (statistical software i.e., R, Excel, and SAS) to solve data analysis problems.
- Solve problems involving discrete and continuous univariate probability distributions.
- Solve problems involving discrete and continuous multivariate probability distributions.
- Report, interpret and discuss the information contained in data from a variety of sources.
- Be able to evaluate published literature used to support the admissibility of forensic science methods in the courtroom.

Attach Syllabus

FRSC 601 Quantitative Methods for Forensic Scientists.pdf

Additional Attachments

Staffing:

Anthony B. Falsetti

Relationship to Existing Programs:

FRSC 601 Quantitative Methods for Forensic Scientists, does not seem to have any relationship to existing programs.

Relationship to Existing Courses:

FRSC 601 Quantitative Methods for Forensic Scientists is designed to assist students in starting their Forensic Research Project (FRSC 610) in which they will be preparing their experimental design.

Additional Comments:

Reviewer Comments

Key: 17185

GEORGE MASON UNIVERSITY
Quantitative Methods for
Forensic Scientists – FRSC 601

Instructor: Anthony B. Falsetti, Ph.D., D-ABFA
Office: Exploratory Hall Room 3407
Email: afalsett@gmu.edu (preferred method of contact)
Phone #: 703-993-6091 (office)

Texts: The required textbook for this class is, *Introduction to Statistics for Forensic Scientists*, by David Lucy. It is available via the GMU bookstore or other resources. E-versions are acceptable.

Additional recommended texts for this class are, *Essential Mathematics and Statistics for Forensic Science*, by Craig Adam, and *Introduction to Data Analysis with R for Forensic Scientists* (International Forensic Science and Investigation) 1st Edition, by James Michael Curran. They are also available via the GMU bookstore or other resources. E-versions are acceptable.

Course Description: This is an introductory course in quantitative methods as related to forensic science. It focuses on the most important principles of statistics and concepts relevant to methodologies used by forensic scientists in their research and laboratory casework. Topics include data analysis and interpretation for one and multiple variables, probability, estimation, and hypothesis testing for proportions and means, correlation, and regression. Specific, forensic science related topics include, but not limited to Likelihood Ratios and their importance to DNA interpretation, Discriminant Function Analysis, and its importance to Forensic Anthropology. Court cases pertinent to forensic science will also be examined, for example PCAST motions. Statistical software will be used for assignments.

Course Objectives:

- To familiarize the student with the use of statistical methods in the field of forensic science.
- To provide the student an opportunity to utilize and generate data for analysis with specific attention to the forensic sciences.
- To provide a framework through knowledge of statistical methods via hands on application to provide the student a means to evaluate published forensic science literature.

Course Outcomes:

- Students will interpret quantitative information (i.e., formulas, graphs, tables, models, and schematics) and draw inferences from them.
- Identify, select, and apply probabilistic and statistical principles, methods, and tools that will prove useful in research and casework.
- Use technology (statistical software i.e., R, Excel, and SAS) to solve data analysis problems.
- Solve problems involving discrete and continuous univariate probability distributions.
- Solve problems involving discrete and continuous multivariate probability distributions.
- Report, interpret and discuss the information contained in data from a variety of sources.
- Be able to evaluate published literature used to support admissibility of forensic science methods in the courtroom.

Student Responsibilities: Each week will cover complimentary topics as found in the assigned readings.

Participation: Participation grades will vary by format, classroom assignments, hallway, discussion boards, etc., but may be graded by either attendance, quizzes, and/or group sessions. **No make-up quizzes will be given.**

Grading: Not only am I interested in your analytical development and how you apply critical thinking to the issues presented, I must also evaluate your intellectual efforts. To accomplish this, class participation, attendance, quizzes, group sessions, presentations (or project), and various quizzes will determine your final grade in the course.

Participation (attendance/quizzes/group sessions) 20%
Classroom assignments and discussion boards 20%
Midterm 20%
Final Exam 20%
Presentation or Project 20%

Grading Scale:

100	A+	89-87	B+	79-70	C
99-95	A	86-83	B	69 and below	F
94-90	A-	82-80	B-		

Note: Additional reading assignments may be added throughout the semester and can be found in the appropriate section.

Late/Makeup Policy:
Makeup participation points will not be given under any circumstances. Quizzes may be timed and when they are timed-out you will not be allowed extra time to complete your quiz if you are late, absent, or unavailable.

Course Material Restrictions: All course materials posted to Blackboard including PowerPoint Presentations, recordings, photographs, and videos, etc. are private to this class; all materials must not be shared with anyone not enrolled in this class. Unauthorized sharing of any materials will be reported to the Office of Academic Integrity.

Required Equipment: Activities and assignments in this course will extensively use the Blackboard learning system, available at https://mymason.gmu.edu. Students are required to have regular, reliable access to a computer with an updated operating system (recommended: Windows 10 or Mac OSX 10.13 or higher) and a stable broadband Internet connection (cable modem, DSL, satellite broadband, etc., with a consistent 1.5 Mbps [megabits per second] download speed or higher.

UNIVERSITY RESOURCES

GMU Honor Code:
Standards of academic integrity as set forth by the University are strictly observed and rigorously enforced in this class. The complete Honor Code is as follows: *To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University community and with the desire for greater academic and personal achievement, we, the student members of the university community, have set forth this honor code:* **Student members of the George Mason University community pledge not to cheat, plagiarize, steal, or lie in matters related to academic work.**

The University Code of Student Conduct is George Mason University's statement of community values. The Code fosters a safe, secure, and fair learning environment by establishing expectations for behavior, identifying a process for resolving incidents outside the stated expectations and the results of such processes. No student or student organization shall commit an Act of Misconduct in any location. Students and student organizations found responsible under this CSC of committing Acts of Misconduct are subject to sanctions by the University. The Office of Student Conduct has authority over all non-academic disciplinary matters. Please refer to, https://studentconduct.gmu.edu/

Diversity and Inclusion
Students from all diverse backgrounds and perspectives are viewed as a resource, strength, and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated.

Sexual Harassment, Sexual Misconduct, and Interpersonal Violence
Notice of mandatory reporting of sexual or interpersonal misconduct: As a faculty member, I am designated as a "Non-Confidential Employee," and must report all disclosures of sexual assault, sexual harassment, interpersonal violence, stalking, sexual exploitation, complicity, and retaliation to Mason's Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason's confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-380-1434 or Counseling and Psychological Services (CAPS) at 703-993-2380. You may also seek assistance or support measures from Mason's Title IX Coordinator by calling 703-993-8730, or emailing, titleix@gmu.edu.

GMU Email: http://masonlive.gmu.edu
Each student is responsible for activating their GMU email account and checking their account on a regular basis for University and class announcements**. All masonlive accounts must be activated.**

GMU Police Policy: 703-993-2810
If you are currently employed with a law enforcement agency as a sworn officer and would like to carry a firearm on campus and into class, you must contact GMU Police Department as a courtesy.

GMU Students with Disabilities: http://ods.gmu.edu
If you are a student with a disability and you need academic accommodations, please contact the Office of Disability Resources at 703-993-2474. All academic accommodations must be arranged through that office, your instructor is not obligated to provide accommodations without documentation from ODS.

Writing Center: http://writingcenter.gmu.edu
For broad questions and comments please contact wcenter@gmu.edu or call:
703-993-1200 (Robinson Hall A114, Fairfax Campus)
703-993-1824 (Enterprise Hall 076, Fairfax Campus)
All appointments are made through the online scheduling system so please do not email or call to schedule appointments. If you would like to cancel an appointment you may do so via the online scheduler, simply select your appointment and click the "Cancel appointment" box at the bottom of the reservation form and then "save.

University Libraries: "Ask a Librarian" http://library.gmu.edu/mudge/IM/IMRef.html
Margaret Lam, Physical Sciences Liaison Librarian; http://infoguides.gmu.edu/frsc
Fenwick Library, 2207
703-993-2212
mlam3@gmu.edu

Counseling and Psychology Services (CAPS): (703) 993-2380; http://caps.gmu.edu

University Policies:
The University Catalog, http://catalog.gmu.edu, is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at http://universitypolicy.gmu.edu/. All members of the university community are responsible for knowing and following established policies.

International Students (INTO Program):
The INTO Mason Student Services team provides support and a range of services from finding a place to live, to renewing your visa or even scheduling a doctor appointment! Visit their website for a listing of a variety of resources tailored to the specific needs of international students.

The INTO Program is in the Mason Global Center at 4352 Mason Pond Dr, Fairfax, VA 22030. (703) 993-4501
http://www.intohigher.com/us/en-us/the-universities/into-mason/living/student-support.aspx

Weekly Course Topics:

Week	Topic	Reading
1.	A brief history of the statistics in the law.	Lucy, Chapter 1
2.	Data types, location, and dispersion.	Lucy, Chapter 2
3.	Probability. Quiz I	Lucy, Chapter 3, SAS Proc Means, Proc Univariate
4.	Measures of nominal and ordinal association.	Lucy, Chapter 5
5.	Regression and calibration.	Lucy, Chapter 7 & SAS Proc GLM
6.	Evidence evaluation. + Mid-term	Lucy, Chapter 8, PCAST 2016
7.	Conditional probability and Bayes' theorem.	Lucy, Chapter 9
8.	Relevance and the formulation of propositions.	Lucy, Chapter 10
9.	Evaluation of evidence in practice. Quiz II	Lucy, Chapter 11, plus assigned
10.	Evidence evaluation examples.	Lucy, Chapter 12
11.	Errors in interpretation.	Lucy, Chapter 13
12.	DNA. Begin Presentations	Lucy, Chapter 14 & 15, plus assigned
13.	Current court cases & Rulings. Presentations Cont.	Contemporary Readings to be assigned
14.	Final Exam	