

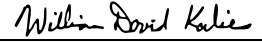


 FLORIDA ATLANTIC UNIVERSITY	NEW COURSE PROPOSAL Graduate Programs		UGPC Approval _____ UFS Approval _____ SCNS Submittal _____ Confirmed _____ Banner _____ Catalog _____	
	Department Mathematica Sciences College Science <i>(To obtain a course number, contact erudolph@fau.edu)</i>			
Prefix STA Number 6116	<i>(L = Lab Course; C = Combined Lecture/Lab; add if appropriate)</i> Lab Code	Type of Course Lecture	Course Title Technology in Statistics and Probability	
Credits <i>(Review Provost Memorandum)</i> 3	Grading <i>(Select One Option)</i> Regular <input checked="" type="checkbox"/>	Course Description <i>(Syllabus must be attached; see Guidelines)</i> This class will present the mathematics and technology background to effectively teach statistics and probability and their connection to other STEM subjects. Topics will include data and variability, graphical and numeric descriptions, bivariate data, estimating probabilities, sampling, inference, and modeling data. Not intended for students in the Ph.D. program in mathematics.		
Effective Date <i>(TERM & YEAR)</i> Fall 2020	Sat/UnSat			
Prerequisites Enrollment in MST in Mathematics program or permission of instructor		Academic Service Learning (ASL) course Academic Service Learning statement must be indicated in syllabus and approval attached to this form.		
		Corequisites	Registration Controls <i>(For example, Major, College, Level)</i>	
Minimum qualifications needed to teach course: Member of the FAU graduate faculty and has a terminal degree in the subject area (or a closely related field.)		List textbook information in syllabus or here -- Online Statistics Education: An Interactive Multimedia Course of Study, David M. Lane (Rice University) -- An Introduction to Statistical Learning with Applications in R, Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani, 8th printing 2017		
Faculty Contact/Email/Phone Dr. Richard Voss/ rvoss@fau.edu/(561)-297-3358		List/Attach comments from departments affected by new course		

Approved by Department Chair 	Date Feb 25, 2020
College Curriculum Chair  2020.03.06 11:44:18 -05'00'	
College Dean  March 9, 2020	
UGPC Chair _____	_____
UGC Chair _____	_____
Graduate College Dean _____	_____
UFS President _____	_____
Provost _____	_____

Email this form and syllabus to UGPC@fau.edu 10 days before the UGPC meeting.

STA 6116 – 3 credits
Technology in Statistics and Probability
Florida Atlantic University
Department of Mathematical Sciences

Fall 2020

Fully online, lectures Wednesdays 6-8:50 pm

Instructor: Prof. Richard Voss

Office: FAU Boca S&E (Building 43) Room 210

Phone: (561) 297-3358

Email (preferred contact method): rvoss@fau.edu

Office hours: W 3:00 – 5:00 pm and by appointment

Virtual Office: [WebEx](#)



Prerequisites: Enrollment in Math MST program or permission of instructor, along with comfort and familiarity with teaching technology including FAU’s online Canvas system, dynamic geometry software (GeoGebra), spreadsheets (Excel), and simple programming (Python) as well as a computer for class participation via online WebEx interactions and class related explorations.

There are no formal course prerequisites for MAT 6933, but comfort with mathematical reasoning; and familiarity with sequences, limits, infinite series and fluency with beginning undergraduate level algebra, geometry, and statistics is assumed. Basic usage of GeoGebra, Excel, and Python programming will be briefly introduced and reviewed at the beginning of the course.

5. Course Description: Recent changes to the Mathematics Florida Standards (MAFS) have substantially increased the statistics and probability content in the high school curriculum and related standardized tests. This class will present the mathematics and technology background to effectively teach statistics and probability and their connection to other STEM subjects. Topics will include data and variability, graphical and numeric descriptions, bivariate data, estimating probabilities, sampling, inference, and modeling data.

This is one of the elective courses for the FAU Department of Mathematical Science’s Master of Science in Teaching (MST) degree. It is designed for pre- and in-service mathematics instructors. This course may also be used to satisfy the elective requirements of graduate students in the College of Education’s Curriculum and Instruction programs with specialization in mathematics.

6. Course Objectives: mathematics instructors who successfully complete this course will be able to:

- Use statistical methods to summarize complex data sets through numeric and graphical descriptions and the use of basic mathematical models.
- Quantify uncertainty using confidence intervals and hypothesis testing and choose between different models using goodness of fit tests.
- Demonstrate mastery of appropriate technology, such as Excel, GeoGebra or Python, for the numeric and graphical summaries and modeling of statistical data.
- Demonstrate understanding and effective integration of technology in a research project or a lesson appropriate to their own classroom.

Delivery: This course will be delivered fully online via live interactive Canvas WebEx evening sessions that review previous assignments and present new material. Recordings of each session will be available on the course Canvas page. The initial time is Wednesday 6:00-8:50 pm (with a break), however, the specific day and time may be adjusted based on the requirements of registered students. It is recommended (but not required) that students near the Boca campus attend the initial and final sessions in person at the FAU Boca Science building SE 43.

7. Assessment: There is no midterm or final exam. 70% of the course grade will be based on online submission of a weekly or biweekly class journal including homework assignments. 20% will be based on a final project/paper. The remaining 10% will be divided between attendance, online forum participation and in-class discussions and short timed quizzes.

Journal/Homework grading will be based on:

- **Completeness**
Include a summary/discussion of all topics presented in class.
- **Ease of use, clear organization of submitted material**
A narrative style works well.
- **Originality and Understanding**
Demonstrate understanding beyond rote repetition.
Make the material your own.
Try assignments on your own before consulting others or www.
Use novel restatement/summary of major ideas.
Summarize new connections between topics, disciplines, your present or future teaching, or everyday life.
Include questions, self-reflection, and other materials such as www resources.

Students are encouraged to work in small groups outside of class on homework assignments, but all submissions must clearly reflect the individual's perspective and work.

8. Grading Scale: Numerical grades will translate to the following letter grades:

% Score Range	<60	[60,70)	[70,75)	[75,78)	[78,80)	[80,85)	[85,88)	[88,90)	≥90
Grade	F	D	C	C+	B-	B	B+	A-	A

9. Assessment Submission and Make-Up Policy: Weekly or biweekly journals and assignments will be submitted as pdf document along with software specific files (e.g. from Excel, GeoGebra, or Python) via Canvas. Submissions are typically due on the day before the following week's meeting, where they will be reviewed.

Short timed quizzes (10-30 min) may be included as part of the Canvas/WebEx sessions. These will be downloaded from Canvas during the class, completed on the student's computer, and the results upload to Canvas.

The lowest journal and quiz scores may be dropped in determining the final grade. In exceptional cases with verifiable excuses alternate make-up assignments will be adapted to particular circumstances.

Credit Hour Requirements: To master the material in this course, fifteen weeks of effort are required for a passing grade, with a minimum of nine hours per week including Canvas/WebEx class sessions as well as individual effort.

Attendance: According to FAU Academic Policy, “Students are expected to attend all of their scheduled University Classes and to satisfy all academic objectives as outlined by the instructor”. Attendance includes meaningful, active involvement in all class sessions and online class discussions.

10. Class and Internet Etiquette: Students are expected to exhibit professional, ethical, conduct in all class interactions, whether F2F or online. FAU’s Academic Policy (<http://www.fau.edu/academic/registrar/FAUcatalog/academics.php>) states that “In order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cell phones, are to be disabled in class sessions”. Consult <http://www.fau.edu/oit/student/netiquette.php> for the conventions of politeness pertaining to e-mail and technology use.

11. Students with Disabilities: In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Student Accessibility Services (SAS) located in Boca Raton – SU 133 (561-297-3880), in Davie – LA 131 (954-236-1222), or in Jupiter – SR 117 (561-799-8585), and follow all SAS procedures. <http://www.fau.edu/sas>

Religious Accommodation: In accordance with rules of the Florida Board of Education and Florida law, students have the right to reasonable accommodations from the University in order to observe religious practices **and beliefs with regard to admissions, registration, class attendance and the scheduling of** examinations and work assignments. For further information, please see <http://www.fau.edu/academic/registrar/FAUcatalog/academics.php>

12. Academic Integrity: Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty, including cheating and plagiarism, is considered a serious breach of these standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see <http://www.fau.edu/ctl/AcademicIntegrity.php>.

13. Counseling and Psychological Services (CAPS) Center: Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU’s Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <https://www.fau.edu/counseling/>

14. Materials: Lecture notes and recordings will be distributed electronically on Canvas.

Recommended, but not required, reference texts:

- An Introduction to Statistical Learning with Applications in R, Gareth James, Daniela Witten, Trevor Hastie and Robert Tibshirani, 8th printing, ISBN: 978-1461471370, Springer, 2017
- Introduction to Probability, 2nd edition, by Bertsekas and Tsitsiklis, ISBN: 978-1886529236, Athena Scientific, 2008 and video lectures based on this book from an MIT Open Course at <https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-041-probabilistic-systems-analysis-and-applied-probability-fall-2010/index.htm>

Recommended, but not required, online reference materials:

- Online Statistics Education: An Interactive Multimedia Course of Study, David M. Lane (Rice University) <http://www.onlinestatbook.com/2/index.html>
- <https://www.probabilitycourse.com/>
- http://ocw.uci.edu/courses/math_131a_introduction_to_probability_and_statistics.html
- http://ocw.uci.edu/courses/math_131b_introduction_to_probability_and_statistics.html
- <https://open.bccampus.ca/find-open-textbooks/?uuid=929d4a8d-30b2-4ced-8b50-c39447dc0b74>
- <https://openstax.org/details/introductory-statistics>
- <https://www.khanacademy.org/math/statistics-probability>

Computer Requirements: Students are required to have an available computer with fast internet connectivity in order to participate in the Canvas WebEx online sessions. It is recommended that the students use a laptop computer in order to enhance the comfort and familiarity with the same hardware and mathematics software as may be used in the student's own classrooms. Specific additional requirements follow:

Operating System: Mac OSX or Windows 7/8/10.

Peripherals: Webcam, speakers and microphone (included with most modern laptops) or headset with microphone (preferred) for required Canvas/WebEx sessions. An external disk drive, thumb drive, or cloud storage is recommended for backup.

Software:

- The user must have sufficient permissions to install and operate software.
- **Microsoft Office** 2010 or newer is preferred. FAU has special arrangements for student purchase of Microsoft products (see: <http://www.fau.edu/oit/desktop/software.php> or see <http://www.fau.edu/oit/getoffice365/>).
- **Adobe Reader** freeware (available from <http://www.adobe.com/products/reader.html>) or equivalent. Most modern browsers also display pdf files.
- **GeoGebra** freeware (available from <http://www.geogebra.org/cms/download>).
- **Python** programming language and environment for data science is free for all operating systems and available at <https://www.anaconda.com/download/>.

A detailed review of the technology requirements will be made during the initial Jan 9 session.

Proposed schedule of topics covered:	estimated weeks
Introduction Review: Definitions of Statistics, Probability, and Key Terms	1
Error in Measurement, Sampling, central tendency, spread	1
Graphical Descriptions:	
Stem and Leaf, Line and Bar graphs, Histograms, Box plots	1
Basic rules of Probability, independent and mutually exclusive events	1
Discrete Random Variables	1
Continuous Random Variables	1
Normal Distributions and Central Limit Theorem	2
Inferential Statistics: Confidence intervals, margin of error	1
Hypothesis testing	2
Bivariate Data, Linear Regression and Correlation	2
F Distribution and One-Way ANOVA	1
Research presentations	1

Important dates:

- Jan 9** Initial class session, recommended in-person attendance.
- Jan 11** Last day at 5 p.m. to drop/add without consequences
- Mar 4-10** Spring Break
- Apr 5** Last day to drop without receiving an F
- Apr 17** Last day of class
- Apr 24 or May 1** Final research presentation

Communication Policy:

- **Announcements:** You are responsible for reading and understanding all Canvas announcements and forum posts from the instructor. Check the announcements and current forum each time you login (at least 3 times each week) to be sure you have read all of them since your last login session.
- **Course-related Questions:** Post course-related questions to the relevant Canvas discussion board. Asking course-related questions in this way allows other participants with the same question to benefit from the responses. Make sure you review the forum prior to posting a question; it may have already been asked and answered in previous posts. You are expected to ask and answer several questions each week. In many cases answers from peers will be more helpful than those from the instructor. Provide hints and guidance to fellow students, but do not provide complete answers to homework assignments.
- **Email Policy:** Email to the instructor (at the email address above) is the preferred method to communicate personal or confidential matters; otherwise, please use the discussion boards. The Instructor will generally respond within 24 hours.

Technical Problem Resolution: Many technical problems can be resolved quickly. Do not wait until the last minute before due dates. When a problem occurs it is important to document the issue and take immediate actions so that your instructor can make appropriate accommodations.

The FAU helpdesk at (561) 297-3999 or <http://www.fau.edu/helpdesk> is your best source for immediate help. Your 2nd option is an email to your instructor if the Helpdesk cannot resolve the problem.

If you lose a Canvas/WebEx connection (relatively common) you may try (1) to restart the WebEx Session, (2) logoff and logon again to Canvas/WebEx, or (3) restart your computer. WebEx sessions will be recorded, so you will have access to the recording after the session.

If you are unable to access Canvas and submit an assignment by the deadline for submission you may email the assignment files to the instructor. Such email submissions will only be accepted for credit when you can document the failure to access Canvas immediately prior to the deadline. Do not wait until the last minute to submit assignments.

Other Resources and Policies:

- [Anti-Discrimination and Anti-Harassment Policy](#)
- [Canvas Support](#)
- [FAU Help Desk](#) or call (561) 297-3999
- [FAU Library](#)

This syllabus is subject to change at the discretion of the instructor. Any changes or updates will be posted on Canvas.