Cover Sheet: Request 14731

EEL3XXX Data Science for ECE

Info

Process	Course|New|Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Shannon Chillingworth schill@ece.ufl.edu
Created	2/11/2020 8:21:21 AM
Updated	10/30/2020 10:02:21 PM
Description of request	New course

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	ENG - Electrical and Computer Engineering 19050000	Robert Fox	New course	2/11/2020
No document changes					
College	Conditionall Approved	ENG - College of Engineering	Heidi Dublin	Make up exam policy needs to be in compliance with UF policy, follow UF policy for cheating/plagiarism. Use college template wording. Class participation explanation and add tentative course exam dates--even tentative	2/28/2020
No document changes					
Department	Approved	ENG - Electrical and Computer Engineering 19050000	Robert Fox	Updated syllabus	5/6/2020
No document changes					
College	Approved	ENG - College of Engineering	Heidi Dublin	Approved by HWCOE Curriculum Committee and Faculty Council.	9/15/2020
No document changes					
University Curriculum Committee	Recycled	PV - University Curriculum Committee (UCC)	Casey Griffith	Pending consult with Math/Statistics.	10/20/2020
EEL_3XX_Data_Science-UCC_Edits.docx Stats_Consult.pdf					10/12/2020 10/20/2020
College	Recycled	ENG - College of Engineering	Heidi Dublin	Please see comments. Please note in comments that this has been addressed when you send it back.	10/20/2020
No document changes					
Department	Approved	ENG - Electrical and Computer Engineering 19050000	Robert Fox	Math and Stats consults obtained and uploaded. No objections.	10/21/2020
Math_Consult.pdf					10/21/2020
College	Approved	ENG - College of Engineering	Heidi Dublin	Department indicates that concerns have been addressed.	10/30/2020
No document changes					

Step	Status	Group	User	Comment	Updated
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			10/30/2020
No document changes					
Statewide Course Numbering System					
No document changes					
Office of the Registrar					
No document changes					
Student Academic Support System					
No document changes					
Catalog					
No document changes					
College Notified					
No document changes					

Course|New for request 14731

Info

Request: EEL3XXX Data Science for ECE
Description of request: New course
Submitter: Shannon Chillingworth schill@ece.ufl.edu
Created: 10/12/2020 3:52:44 PM
Form version: 3

Responses

Recommended Prefix
Enter the three letter code indicating placement of course within the discipline (e.g., POS, ATR, ENC). Note that for new course proposals, the State Common Numbering System (SCNS) may assign a different prefix.

Response:
EEL

Course Level
Select the one digit code preceding the course number that indicates the course level at which the course is taught (e.g., 1=freshman, 2=sophomore, etc.).

Response:
3

Course Number
Enter the three digit code indicating the specific content of the course based on the SCNS taxonomy and course equivalency profiles. For new course requests, this may be XXX until SCNS assigns an appropriate number.

Response:
XXX

Category of Instruction
Indicate whether the course is introductory, intermediate or advanced. Introductory courses are those that require no prerequisites and are general in nature. Intermediate courses require some prior preparation in a related area. Advanced courses require specific competencies or knowledge relevant to the topic prior to enrollment.

Response:
Intermediate

• 1000 level = Introductory undergraduate
• 2000 level = Introductory undergraduate
• 3000 level = Intermediate undergraduate
• 4000 level = Advanced undergraduate
• 5000 level = Introductory graduate
• 6000 level = Intermediate graduate
• 7000 level = Advanced graduate
• 4000/5000= Joint undergraduate/graduate
• 4000/6000= Joint undergraduate/graduate

**Joint undergraduate/graduate courses must be approved by the UCC and the Graduate Council)*

Lab Code
Enter the lab code to indicate whether the course is lecture only (None), lab only (L), or a combined lecture and lab (C).

Response:
None

Course Title
*Enter the title of the course as it should appear in the Academic Catalog. There is a 100 character limit for course titles. *

Response:
Data Science for ECE

Transcript Title
Enter the title that will appear in the transcript and the schedule of courses. Note that this must be limited to 30 characters (including spaces and punctuation).

Response:
Data Science for ECE

Degree Type
Select the type of degree program for which this course is intended.

Response:
Baccalaureate

Delivery Method(s)
Indicate all platforms through which the course is currently planned to be delivered.

Response:
On-Campus

Co-Listing
Will this course be jointly taught to undergraduate, graduate, and/or professional students?

Response:
No

Effective Term
Select the requested term that the course will first be offered. Selecting "Earliest" will allow the course to be active in the earliest term after SCNS approval. If a specific term and year are selected, this should reflect the department's best projection. Courses cannot be implemented retroactively, and therefore the actual effective term cannot be prior to SCNS approval, which must be obtained prior to the first day of classes for the effective term. SCNS approval typically requires 2 to 6 weeks after approval of the course at UF.

Response:
Earliest Available

Effective Year
Select the requested year that the course will first be offered. See preceding item for further information.

Response:
Earliest Available

Rotating Topic?
Select "Yes" if the course can have rotating (varying) topics. These course titles can vary by topic in the Schedule of Courses.

Response:
No

Repeatable Credit?
Select "Yes" if the course may be repeated for credit. If the course will also have rotating topics, be sure to indicate this in the question above.

Response:
No

Amount of Credit
Select the number of credits awarded to the student upon successful completion, or select "Variable" if the course will be offered with variable credit and then indicate the minimum and maximum credits per section. Note that credit hours are regulated by Rule 6A-10.033, FAC. If you select "Variable" for the amount of credit, additional fields will appear in which to indicate the minimum and maximum number of total credits.

Response:
4

S/U Only?
Select "Yes" if all students should be graded as S/U in the course. Note that each course must be entered into the UF curriculum inventory as either letter-graded or S/U. A course may not have both options. However, letter-graded courses allow students to take the course S/U with instructor permission.

Response:
No

Contact Type
Select the best option to describe course contact type. This selection determines whether base hours or headcount hours will be used to determine the total contact hours per credit hour. Note that the headcount hour options are for courses that involve contact between the student and the professor on an individual basis.

Response:

Regularly Scheduled

• Regularly Scheduled [base hr]
• Thesis/Dissertation Supervision [1.0 headcount hr]
• Directed Individual Studies [0.5 headcount hr]
• Supervision of Student Interns [0.8 headcount hr]
• Supervision of Teaching/Research [0.5 headcount hr]
• Supervision of Cooperative Education [0.8 headcount hr]

Contact the Office of Institutional Planning and Research (352-392-0456) with questions regarding contact type.

Weekly Contact Hours
Indicate the number of hours instructors will have contact with students each week on average throughout the duration of the course.

Response:
4

Course Description
Provide a brief narrative description of the course content. This description will be published in the Academic Catalog and is limited to 50 words or fewer. See course description guidelines.

Response:
Analysis, processing, simulation, and reasoning of data. Includes data conditioning and plotting, linear algebra, statistical methods, probability, simulation, and experimental design.

Prerequisites
Indicate all requirements that must be satisfied prior to enrollment in the course. Prerequisites will be automatically checked for each student attempting to register for the course. The prerequisite will be published in the Academic Catalog and must be formulated so that it can be enforced in the registration system. Please note that upper division courses (i.e., intermediate or advanced level of instruction) must have proper prerequisites to target the appropriate audience for the course.
Courses level 3000 and above must have a prerequisite.

Response:
MAC 2312 (C) & EEL 3834 (C).

Completing Prerequisites on UCC forms:

• Use "&" and "or" to conjoin multiple requirements; do not used commas, semicolons, etc.
• Use parentheses to specify groupings in multiple requirements.
• Specifying a course prerequisite (without specifying a grade) assumes the required passing grade is D-. In order to specify a different grade, include the grade in parentheses immediately after the course number. For example, "MAC 2311(B)" indicates that students are required to obtain a grade of B in Calculus I. MAC2311 by itself would only require a grade of D-.
• Specify all majors or minors included (if all majors in a college are acceptable the college code is sufficient).
• "Permission of department" is always an option so it should not be included in any prerequisite or co-requisite.

Example: A grade of C in HSC 3502, passing grades in HSC 3057 or HSC 4558, and major/minor in PHHP should be written as follows:
HSC 3502(C) & (HSC 3057 or HSC 4558) & (HP college or (HS or CMS or DSC or HP or RS minor)

Co-requisites
Indicate all requirements that must be taken concurrently with the course. Co-requisites are not checked by the registration system. If there are none please enter N/A.

Response:
None

Rationale and Placement in Curriculum
Explain the rationale for offering the course and its place in the curriculum.

Response:
This course assures that ECE students will have a good grounding in statistics and linear algebra. This course is specifically customized for the needs of ECE students by also exposing them to a higher level programming language. In addition, this course is essential for students interested in pursuing advanced machine learning course work.

Course Objectives
Describe the core knowledge and skills that student should derive from the course. The objectives should be both observable and measurable.

Response:
Upon completion of this course, the student should be able to:
• Generate visualizations to expose meaning in data
• Generate and understand the meaning and uses of summary statistics of data
• Model random phenomena using random variables
• Generate random variables with specified densities or distributions
• Conduct hypothesis tests using simulations and analysis
• Understand and use conditioning to simplify problems
• Estimate parameters of distributions from samples
• Understand dependence and independence among random phenomena
• Use statistical tests to determine or characterize dependence among random phenomena
• Design experiments to understand random phenomena
• Understand the difference between Bayesian statistics and classical statistics
• Use simulation to calculate Bayesian statistics
• Apply linear algebra for data processing and statistical calculations

Course Textbook(s) and/or Other Assigned Reading
Enter the title, author(s) and publication date of textbooks and/or readings that will be assigned. Please provide specific examples to evaluate the course.

Response:
Required Textbooks

Introduction to Probability
o Dimitri P. Bertsekas, John N. Tsitsiklis
o 2nd edition
o Athena Scientific, 2008
o ISBN: 978-1-886529-23-6

Introduction to Applied Linear Algebra – Vectors, Matrices, and Least Squares
o Stephen P. Boyd, Lieven Vandenberghe
o Cambridge University Press, 2018
o ISBN: 978-1-316518-96-0

Think Stats – Exploratory Data Analysis

o 2nd edition
o Allen B. Downey
o O'Reilly Media, 2015
o ISBN: 978-1-491907-33-7

Recommended

Python Data Science Handbook – Essential Tools for Working with Data
o Jake VanderPlas
o O'Reilly Media, 2017
o ISBN: 978-1-491912-05-8
o https://jakevdp.github.io/PythonDataScienceHandbook/

Think Bayes – Bayesian Statistics in Python
o Allen b. Downey
o O'Reilly Media, 2013
o ISBN: 978-1-491945-43-8
o https://greenteapress.com/wp/think-bayes/

Weekly Schedule of Topics
Provide a projected weekly schedule of topics. This should have sufficient detail to evaluate how the course would meet current curricular needs and the extent to which it overlaps with existing courses at UF.

Response:
Part I: Introduction
Week 1
- Introduction to Python and random module; first simulations
- Counting and visualizing data (scatter plots, histograms); introduction to numpy and matplotlib
- Relative frequency and probability
- (Online) Random experiments, sample spaces, and set operations
Week 2
- Counting and simulation for random draws
- Probability spaces and axioms of probability
- (Online) Corollaries and applications
- Mutually exclusive and statistically independent events
Part II: One-dimensional data
Week 3
- Importing data: Pandas and dataframes
- Summary statistics: average, median, mode, standard deviation/variance; K-means clustering
- Conditional probability and binary hypothesis testing using Fisher's exact test
Week 4
- Binary hypothesis testing using resampling/simulation; p-values and confidence intervals
- Chain rule, total probability, Bayes' rule
- Maximum likelihood (ML) and maximum a posteriori (MAP) decision rules with applications to communications
Week 5
- Discrete random variables and their simulation; introduction to scipy.stats
- Cumulative distribution and survival functions
- Expected value for discrete random variables; moments, mean, variance
- (Online) Poisson random variables
Week 6
- Testing fit of data to discrete distributions
- Continuous random variables and density functions
- Kernel density estimation
Week 7
- Expected value for continuous random variables; moments, mean, variance
- Gaussian random variables and binary hypothesis testing using analytic methods
- Testing whether data comes from distributions: Q-Q plot, skew, kurtosis, Komogorov-Smirnov test
- (Online) Central Limit Theorem

Week 8
- Point conditioning, total probability, Bayes' rule for continuous random variables
- ML decisions with conditionally Gaussian random variables; application to and simulation of communication systems
- (Online) MAP decisions with conditionally Gaussian random variables
- (Online) Introduction to functions of random variables
Part III: Multi-dimensional data
Week 9
- Introduction to two-dimensional data, vectors, and plotting
- Summary statistics (mean, median, variance, covariance, correlation) and K-means clustering
- Chi-squared tests
Week 10
- Constant-vector and vector-vector operations
- Special vector-vector operations and applications
- Norm, distance, Cauchy-Schwartz and triangle inequalities, angles between vectors
Week 11
- Correlation coefficient for n-dimensional data
- Orthonormal bases and Gram-Schmidt algorithm
- Rotation; introduction to matrices and matrix-vector multiplication
Week 12
- Feature weighting and selection using matrix-vector multiplication
- Matrix-matrix operations; transpose; identity matrix
- Understanding and dealing with dependence in data: linear dependence, systems of linear equations,
Gauss-Jordan reduction
Week 13
- Determinants; matrix inverses and their use in solving systems of linear equations
- Jointly distributed random variables; bivariate Gaussians
- Covariance, correlation coefficient, covariance matrix
Week 14
- Linear regression and correlation coefficient
- Nonlinear regression
- Hypothesis testing for correlation
Week 15
- Multi-dimensional Gaussian; covariance matrices
- Orthogonal bases and eigen-decomposition
- Principal component analysis (PCA) and application to data reduction/feature extraction

Grading Scheme
List the types of assessments, assignments and other activities that will be used to determine the course grade, and the percentage contribution from each. This list should have sufficient detail to evaluate the course rigor and grade integrity. Include details about the grading rubric and percentage breakdowns for determining grades. If participation and/or attendance are part of the students grade, please provide a rubric or details regarding how those items will be assessed.

Response:
Evaluation of Grades
Assignment

Total Points

Percentage of Final Grade
Homework and projects

100 each

15%
In-class Evaluations

100 each

15%
Participation

100

10%
Midterm Exam 1

100

20%
Midterm Exam 2

100

20%
Final Exam

100

20%

100%

Instructor(s)
Enter the name of the planned instructor or instructors, or "to be determined" if instructors are not yet identified.

Response:
Drs. John Shea and Catia Silva

Attendance & Make-up
Please confirm that you have read and understand the University of Florida Attendance policy.
A required statement statement related to class attendance, make-up exams and other work will be included in the syllabus and adhered to in the course. Courses may not have any policies which conflict with the University of Florida policy. The following statement may be used directly in the syllabus.

• Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Response:
Yes

Accomodations
Please confirm that you have read and understand the University of Florida Accommodations policy.
A statement related to accommodations for students with disabilities will be included in the syllabus and adhered to in the course. The following statement may be used directly in the syllabus:

• Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation.

Students with disabilities should follow this procedure as early as possible in the semester.

Response:
Yes

UF Grading Policies for assigning Grade Points

Please confirm that you have read and understand the University of Florida Grading policies.
Information on current UF grading policies for assigning grade points is require to be included in the course syllabus. The following link may be used directly in the syllabus:

• *https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx*

Response:
Yes

Course Evaluation Policy

Course Evaluation Policy
Please confirm that you have read and understand the University of Florida Course Evaluation Policy.
A statement related to course evaluations will be included in the syllabus. The following statement may be used directly in the syllabus:

• *Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/public-results/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.*

* *

Response:
Yes

Data Science for ECE

EEL 3XXX Section XXXX
Class Periods: MWF, period 6, 12:50 PM – 1:40 PM, R, period 6, 12:50 PM – 1:40 PM
Location: LAR 310 (MWF), WEIL 273 (R)
Academic Term: TBD

Instructor:
Name
Email Address
Office Phone Number
Office Hours: Days of week, hours available, office location

Supervised Teaching Student:
Please contact through the Canvas website
- Name, email address, office location, office hours
  Name, email address, office location, office hours

Course Description
(4 credits) Analysis, processing, simulation, and reasoning of data. Includes data conditioning and plotting, linear algebra, statistical methods, probability, simulation, and experimental design.

Course Pre-Requisites / Co-Requisites
- MAC 2312 (Calculus 2)
- EEL 3834 (Programming for EE 1)

Course Objectives (as time allows):
Upon completion of this course, the student should be able to:
- Generate visualizations to expose meaning in data
- Generate and understand the meaning and uses of summary statistics of data
- Model random phenomena using random variables
- Generate random variables with specified densities or distributions
- Conduct hypothesis tests using simulations and analysis
- Understand and use conditioning to simplify problems
- Estimate parameters of distributions from samples
- Understand dependence and independence among random phenomena
- Use statistical tests to determine or characterize dependence among random phenomena
- Design experiments to understand random phenomena
- Understand the difference between Bayesian statistics and classical statistics
- Use simulation to calculate Bayesian statistics
- Apply linear algebra for data processing and statistical calculations

Materials and Supply Fees
None

Professional Component (ABET):
4 credits of Engineering Science

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. An ability to identify, formulate, and solve engineering problems by applying principles of engineering, science, and mathematics.	High
2. An ability to apply both analysis and synthesis in the engineering design process, resulting in designs that meet desired needs.	High
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	High
4. An ability to communicate effectively with a range of audiences	
5. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	
6. An ability to recognize the ongoing need for additional knowledge and locate, evaluate, integrate, and apply this knowledge appropriately.	
7. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty	

Required Textbooks and Software

- Introduction to Probability
  - Dimitri P. Bertsekas, John N. Tsitsiklis
  - 2nd edition
  - Athena Scientific, 2008
  - ISBN: 978-1-886529-23-6
  - An e-book version will be cheaper and is perfectly fine for this course: you can access it for free here

- Introduction to Applied Linear Algebra – Vectors, Matrices, and Least Squares
  - Stephen P. Boyd, Lieven Vandenberghe
  - Cambridge University Press, 2018
  - ISBN: 978-1-316518-96-0
  - An e-book version will be cheaper and is perfectly fine for this course: you can access it for free here
- Think Stats – Exploratory Data Analysis
  - 2nd edition
  - Allen B. Downey
  - O'Reilly Media, 2015
  - ISBN: 978-1-491907-33-7
  - An e-book version will be cheaper and is perfectly fine for this course: you can access it for free here

In addition to freely accessible digital copies, all required textbooks are listed on Courses Reserves. One (1) physical copy will be available for semester-long use at the Marston library. Please find this course on

https://ares.uflib.ufl.edu/ares/ to access the Catalogue record. You can also find this information under the icon "Course Reserves" in our Canvas page.

Recommended Textbooks

- Python Data Science Handbook – Essential Tools for Working with Data
  - Jake VanderPlas
  - O'Reilly Media, 2017
  - ISBN: 978-1-491912-05-8
  - https://jakevdp.github.io/PythonDataScienceHandbook/

- Think Bayes – Bayesian Statistics in Python
  - Allen b. Downey
  - O'Reilly Media, 2013
  - ISBN: 978-1-491945-43-8
  - https://greenteapress.com/wp/think-bayes/

Course Schedule (as time allows)

Online* - refers to short (< 20 min) pre-recorded videos to watch as a preparation or complement of a class meeting.

Part I: Introduction

Week 1

- Introduction to Python and random module; first simulations
- Counting and visualizing data (scatter plots, histograms); introduction to numpy and matplotlib
- Relative frequency and probability
- (Online*) Random experiments, sample spaces, and set operations

Week 2

- Counting and simulation for random draws
- Probability spaces and axioms of probability
- (Online*) Corollaries and applications
- Mutually exclusive and statistically independent events

Part II: One-dimensional data

Week 3

- Importing data: Pandas and dataframes
- Summary statistics: average, median, mode, standard deviation/variance; K-means clustering
- Conditional probability and binary hypothesis testing using Fisher's exact test

Week 4

- Binary hypothesis testing using resampling/simulation; p-values and confidence intervals
- Chain rule, total probability, Bayes' rule
- Maximum likelihood (ML) and maximum a posteriori (MAP) decision rules with applications to communications

Week 5

- Discrete random variables and their simulation; introduction to scipy.stats
- Cumulative distribution and survival functions
- Expected value for discrete random variables; moments, mean, variance
- (Online*) Poisson random variables

Week 6

- Testing fit of data to discrete distributions

- Continuous random variables and density functions
- Kernel density estimation

Week 7

- Expected value for continuous random variables; moments, mean, variance
- Gaussian random variables and binary hypothesis testing using analytic methods
- Testing whether data comes from distributions: Q-Q plot, skew, kurtosis, Kolmogorov-Smirnov test
- (Online*) Central Limit Theorem

MIDTERM EXAM 1

Week 8

- Point conditioning, total probability, Bayes' rule for continuous random variables
- ML decisions with conditionally Gaussian random variables; application to and simulation of communication systems
- (Online*) MAP decisions with conditionally Gaussian random variables
- (Online*) Introduction to functions of random variables

Part III: Multi-dimensional data

Week 9

- Introduction to two-dimensional data, vectors, and plotting
- Summary statistics (mean, median, variance, covariance, correlation) and K-means clustering
- Chi-squared tests

Week 10

- Constant-vector and vector-vector operations
- Special vector-vector operations and applications
- Norm, distance, Cauchy-Schwartz and triangle inequalities, angles between vectors

Week 11

- Correlation coefficient for n-dimensional data
- Orthonormal bases and Gram-Schmidt algorithm
- Rotation; introduction to matrices and matrix-vector multiplication

MIDTERM EXAM 2

Week 12

- Feature weighting and selection using matrix-vector multiplication
- Matrix-matrix operations; transpose; identity matrix
- Understanding and dealing with dependence in data: linear dependence, systems of linear equations, Gauss-Jordan reduction

Week 13

- Determinants; matrix inverses and their use in solving systems of linear equations
- Jointly distributed random variables; bivariate Gaussians
- Covariance, correlation coefficient, covariance matrix

Week 14

- Linear regression and correlation coefficient
- Nonlinear regression
- Hypothesis testing for correlation

Week 15

- Multi-dimensional Gaussian; covariance matrices
- Orthogonal bases and eigen-decomposition
- Principal component analysis (PCA) and application to data reduction/feature extraction

FINAL EXAM

Attendance Policy, Class Expectations, and Make-Up Policy

Excused absences must be consistent with university policies in the undergraduate catalog (https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx) and require appropriate documentation.

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Homework	100 each	20%
Short Assignments	10 each	10%
Participation	Up to 5	10%
Midterm Exam 1	100	20%
Midterm Exam 2	100	20%
Final Exam	100	20%
		100%

Assignment descriptions:

- **Homework:** will consist of practical and theoretical understanding of the topics covered in class. A typical homework will have two parts: Part I – analytical questions that assess the theoretical component of the course; Part II – consists of Python simulation problems that assess Python programming.

- **Participation:** Students are expected to contribute to the learning environment in the class through active participation. However, students may participate in many different forms, which may be inside or outside of class. The instructor(s) will assess students' participation across many modalities, including in class, on E-Learning (through Discussions, comments, or emails), in office hours, and through messaging (both text messages and messaging apps such as Slack, when offered). Participation will range from 1 to 5, where 5 (maximum points awarded) indicates very high participation level in one or more modalities, and grade of 1 (minimum points awarded) indicates no participation (not attending class, not participating in class discussions).

- **Short Assignments:** will typically consist of short Python implementations or short analytical derivations. These assignments serve to aid student learning as they provide short and immediate practical experience on topics learned in class. Furthermore, these assignments will have a shorter completion timeframe (2-3 weekdays).

- **Exams:** The exams will be drawn evenly from all lectures, assignments, and readings that occurred up to that point in the course. None of the exams will cover any other topics outside of the ones listed, although some concepts are in nature cumulative. You are responsible for all assigned material. A full practice exam(s) will be posted in canvas. Students should have a notebook up and running for the exam to assist with validating answers to code completion problems.

Grading Policy

Grades (and the corresponding grade points) will be assigned according to the Registrar's official policies (see table below). Grades will be curved. However, an A grade of > 90% is guaranteed an A, > 80% is guaranteed a B, etc. Undergraduate students, in order to graduate, must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). Note: a C- average is equivalent to a GPA of 1.67, and therefore, it does not satisfy this graduation requirement. Graduate students, in order to graduate, must have an overall GPA of 3.0 or better (B or better). Note: a B- average is equivalent to a GPA of 2.67, and therefore, it does not satisfy this graduation requirement.

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

For more information on grades and grading policies, please visit:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Students Requiring Accommodations
Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://www.dso.ufl.edu/drc) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

University Honesty Policy
UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment
The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:
• Your academic advisor or Graduate Program Coordinator
• Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@eng.ufl.edu

• Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
• Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use
All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy
There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: https://registrar.ufl.edu/ferpa.html

Campus Resources:

Health and Wellness

U Matter, We Care:
Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence
If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)
Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or http://www.police.ufl.edu/.

Academic Resources

E-learning technical suppor*t*, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. https://lss.at.ufl.edu/help.shtml.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. https://www.crc.ufl.edu/.

Library Support, http://cms.uflib.ufl.edu/ask. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. https://teachingcenter.ufl.edu/.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. https://writing.ufl.edu/writing-studio/.

Student Complaints Campus*:* https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

On-Line Students Complaints*:* http://www.distance.ufl.edu/student-complaint-process.

Chillingworth,Shannon M

From: Harris,John Gregory
Sent: Wednesday, October 21, 2020 9:53 AM
To: Fox,Robert M; Chillingworth,Shannon M
Subject: Fwd: Course consult on new Data Science for ECE course

John G. Harris, Professor and Chair
Department of Electrical and Computer Engineering
216 Larsen Hall, P.O. Box 116200
University of Florida, Gainesville, FL 32611-6200
www.ece.ufl.edu, harris@ece.ufl.edu, (352) 392-0913

Begin forwarded message:

From: "Knudson,Kevin P" <kknudson@ufl.edu>
Subject: Re: Course consult on new Data Science for ECE course
Date: October 20, 2020 at 2:57:18 PM EDT
To: "Harris,John Gregory" <harris@ece.ufl.edu>

Hi John.

Sorry. When working from home I have to make a special effort to get to that email address and it often falls to the bottom of my to-do list.

This course looks fine. No objections from the math department.

Best,
Kevin

Professor and Chair
UF Distinguished Teaching Scholar
Department of Mathematics
University of Florida
PO Box 118105
Gainesville, FL 32611
e: kknudson@ufl.edu
w: http://people.clas.ufl.edu/kknudson

On Oct 20, 2020, at 2:18 PM, Harris,John Gregory <harris@ece.ufl.edu> wrote:

<EEL_3XX_Data_Science-050520.docx>

Chillingworth,Shannon M

From: Harris,John Gregory
Sent: Tuesday, October 20, 2020 2:20 PM
To: Fox,Robert M; Chillingworth,Shannon M
Subject: Fwd: Course consult on new Data Science for ECE course
Attachments: EEL_3XX_Data_Science-050520.docx

Here are my 3 email attempts to the Math Dept chair. Hopefully he will respond sometime.

John

John G. Harris, Professor and Chair
Department of Electrical and Computer Engineering
216 Larsen Hall, P.O. Box 116200
University of Florida, Gainesville, FL 32611-6200
www.ece.ufl.edu, harris@ece.ufl.edu, (352) 392-0913

Begin forwarded message:

From: "Harris,John Gregory" <jgharris@ufl.edu>
Subject: Re: Course consult on new Data Science for ECE course
Date: October 20, 2020 at 2:18:39 PM EDT
To: Kevin Knudson <kknudson@ufl.edu>
Cc: ". CLAS-Mathematics Department Chair" <departmentchair@math.ufl.edu>

Hi Kevin,

Your website said to use your official math chair email account but I am not getting any response there. Is the math department ok with us teaching this course? This course will provide our ECE students all the statistics and linear algebra that they need for our major. And they will learn these topics in the context of ECE applications. It is designed especially for ECE students and only for ECE students.

Please let me know.

John

John G. Harris, Professor and Chair
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www.ece.ufl.edu, harris@ece.ufl.edu, (352) 392-0913

On Oct 19, 2020, at 5:02 PM, Harris,John Gregory <harris@ece.ufl.edu> wrote:

Hi Kevin,

We have a deadline for tomorrow with our college curriculum committee. Is the Math Department OK with us teaching this course?

John

John G. Harris, Professor and Chair
Department of Electrical and Computer Engineering
216 Larsen Hall, P.O. Box 116200
University of Florida, Gainesville, FL 32611-6200
www.ece.ufl.edu, harris@ece.ufl.edu, (352) 392-0913

> On Oct 9, 2020, at 10:58 AM, Harris,John Gregory <harris@ece.ufl.edu> wrote:
>
> Hi Kevin,
>
> Hope you are doing well. We are trying to get a new course approved by the UCC and they have asked us for a “consult" with the Math Department. I attached the syllabus for the course EEL3XXX Data Science for ECE. It is a new 4-credit course we are teaching that includes Linear Algebra and Statistics within a Python framework for doing data experiments of the type we use in ECE. We don’t see that this course exists anywhere else. We are also asking the Statistics Dept for a consult. Can you or someone else in Math provide us some feedback so that we can get it approved by the UCC? The feedback could be as simple as: “We have no problem with you teaching this course.”
>
> John
>
> **John G. Harris, Professor and Chair**
> **Department of Electrical and Computer Engineering**
> **216 Larsen Hall, P.O. Box 116200**
> **University of Florida, Gainesville, FL 32611-6200**
> **www.ece.ufl.edu, harris@ece.ufl.edu, (352) 392-0913**
> <EEL_3XX_Data_Science-050520.docx>

Chillingworth,Shannon M

From: Harris,John Gregory
Sent: Tuesday, October 20, 2020 2:13 PM
To: Fox,Robert M; Chillingworth,Shannon M
Subject: Fwd: Course consult on new Data Science for ECE course

Here is the email that Statistics is OK with the course.

John

John G. Harris, Professor and Chair
Department of Electrical and Computer Engineering
216 Larsen Hall, P.O. Box 116200
University of Florida, Gainesville, FL 32611-6200
www.ece.ufl.edu, harris@ece.ufl.edu, (352) 392-0913

Begin forwarded message:

From: "Daniels,Michael Joseph" <daniels@ufl.edu>
Subject: Re: Course consult on new Data Science for ECE course
Date: October 19, 2020 at 8:06:58 PM EDT
To: "Harris,John Gregory" <harris@ece.ufl.edu>
Cc: "Daniels,Michael Joseph" <daniels@ufl.edu>

ok. Thanks for the quick response.

Statistics is ok with this course.

And for my records (in terms of scheduling sections next year), do you know about how many ECE students had been taking 3032 each year? If you don't have that readily available, I can look it up. thanks

Mike Daniels
Professor and Chair
Andrew Banks Family Endowed Chair
Department of Statistics
University of Florida
Gainesville, FL 32611

On Oct 19, 2020, at 7:48 PM, Harris,John Gregory <harris@ece.ufl.edu> wrote:

Hi Mike,

This course will provide our ECE students all the statistics and linear algebra that they need for our major. And they will learn these topics in the context of ECE applications. Our students would no longer need to take STA 3032 or MAS 3114 (computational linear

algebra). Since the course is tailor-mode for ECE students, we added “for ECE” in its title. No other students will take the class except for ECE students.

John

John G. Harris, Professor and Chair
Department of Electrical and Computer Engineering
216 Larsen Hall, P.O. Box 116200
University of Florida, Gainesville, FL 32611-6200
www.ece.ufl.edu, harris@ece.ufl.edu, (352) 392-0913

> On Oct 19, 2020, at 6:37 PM, Daniels,Michael Joseph <daniels@ufl.edu> wrote:
>
> Sorry for the delay (lost track of this)
>
> Two things:
>
> 1. Does this impact your students taking STA 3032?
>
> 2. I think it would be important for the title of the course to included ‘ECE’ as it currently does.
>
> Please let me know about the first item.
>
> thanks
>
> Best regards,
>
> Mike D
>
> > On Oct 19, 2020, at 5:01 PM, Harris,John Gregory <harris@ece.ufl.edu> wrote:
> >
> > Hi Mike,
> >
> > We have a deadline tomorrow with our college curriculum committee. Is the Statistics dept OK with our new Data Science course?
> >
> > John
> >
> > **John G. Harris, Professor and Chair**
> > **Department of Electrical and Computer Engineering**
> > **216 Larsen Hall, P.O. Box 116200**
> > **University of Florida, Gainesville, FL 32611-6200**
> > **www.ece.ufl.edu, harris@ece.ufl.edu, (352) 392-0913**

On Oct 9, 2020, at 12:07 PM, Daniels,Michael Joseph <daniels@ufl.edu> wrote:

Hi John,
I will take a look and get back to you next week.

Have nice weekend.

Best regards,

Mike D

_____

Mike Daniels
Professor and Chair
Andrew Banks Family Endowed Chair
Department of Statistics
University of Florida
Gainesville, FL 32611

> On Oct 9, 2020, at 10:58 AM, Harris,John Gregory <harris@ece.ufl.edu> wrote:
>
> Hi Michael,
>
> Hope you are doing well. We are trying to get a new course approved by the UCC and they have asked us for a “consult" with the Math Department. Since we are doing consults, we think we should also ask the Statistics Dept for feedback on this course. I attached the syllabus for EEL3XXX Data Science for ECE. It is a new 4-credit course we are teaching that includes Linear Algebra and Statistics within a Python framework for doing data experiments

of the type we use in ECE. We don't see that this course exists anywhere else. Can you or someone else in Statistics provide us some feedback to help us get it approved by the UCC? The feedback could be as simple as: "We have no problem with you teaching this course."

John

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