Cover Sheet: Request 15366

ESI4610 - Introduction to Data Analytics

Info

Process	Course|New|Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Serdar Kirli kirli@ise.ufl.edu
Created	10/23/2020 9:04:44 PM
Updated	11/17/2020 8:43:37 AM
Description of request	New course request

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	ENG - Industrial and Systems Engineering 19060000	David Kaber	The syllabus content is as discussed and supported by the ISE faculty. The course represents new skills that our students need to address industry demands.	10/27/2020
ESI4610_Syllabus.pdf					10/27/2020
College	Approved	ENG - College of Engineering	Heidi Dublin	Approved by the HWCOE Curriculum Committee and Faculty Council	11/17/2020
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			11/17/2020
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 15366

Info

Request: ESI4610 - Introduction to Data Analytics
Description of request: New course request
Submitter: Serdar Kirli kirli@ise.ufl.edu
Created: 10/27/2020 5:05:42 PM
Form version: 5

Responses

Recommended Prefix ESI
Course Level 4
Course Number 610
Category of Instruction Advanced
Lab Code None
Course Title Introduction to Data Analytics
Transcript Title Data Analytics I
Degree Type Baccalaureate

Delivery Method(s) On-Campus
Co-Listing No

Effective Term Earliest Available
Effective Year Earliest Available
Rotating Topic? No
Repeatable Credit? No

Amount of Credit 3

S/U Only? No
Contact Type Regularly Scheduled
Weekly Contact Hours 3
Course Description Provides a basic understanding of the skills necessary for managing and analyzing data. The concepts that will be covered in this class include exploratory data analysis, data manipulation, data cleaning, data wrangling, and machine learning models. We also provide a basic understanding of data management with SQL. All the technical skills will be motivated by different examples involving data. Python is the programming language that will be used in this class.
Prerequisites COP2271 (C) & ESI3215C (C)
Co-requisites N/A
Rationale and Placement in Curriculum This course will be one of the restricted electives within the Operations Research and Data Analytics focus area in the revised curriculum (effective fall 2021). It will also serve as one of the electives in the HWCOE AI UG certificate.
Currently, this course is being offered with a temporary number (EIN4905). We would like to institutionalize it before the revised curriculum goes into effect (fall 2021).
Course Objectives At the end of this course, students will be able to:

Prepare data for analysis
Pose correct and relevant questions in the presence of large-scale data set
Conduct exploratory data analysis
Find patterns in large-scale datasets
Develop hands-on experience utilizing Python and SQL to manage data and apply proper models.

Course Textbook(s) and/or Other Assigned Reading (1) No textbook is required but the list of recommended books is as follows:
Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython by Wes McKinney.
Python Data Science Handbook: Essential Tools for Working with Data by Jake VanderPlas.
An Introduction to Statistical Learning: With Applications in R by Gareth James, Daniela Witten, Trevor Hastie, and Robert Tibshirani.

(2) Lecture notes (posted online in Canvas)
(3) Videos (posted online in Canvas)
(4) Jupyter Notebook

Weekly Schedule of Topics Week Topic Assignments

1	Introduction to Data Analytics	Introduction Assignment
2	Introduction to Python	Homework 1
3	Scientific Computing	
4	Data Manipulation and Analysis	Homework 2
5	Data Manipulation and Analysis	Forming a Project Team
6	Data Manipulation and Analysis	Exam 1
7	Data Visualization	Homework 3
8	Data Visualization	Project Proposal Due
9	Predictive Analytics	
10	Predictive Analytics	
11	Predictive Analytics	Homework 4
12	Predictive Analytics	Exam 2
13	Relational Database Management (SQL)	
14	Relational Database Management (SQL)	Homework 5
15	Relational Database Management (SQL)	Project submission and presentation

Grading Scheme Exam-1 25%
Exam-225%
Homeworks 20%
Project 30%

Your grade will be based on two exams, homework assignments, and a project. In each exam, I include a few challenging tasks, which only the best students will be able to answer. These are the questions that distinguish the A students.
Students are required to work on a data analytics project to practice the skills learned during the class. Projects can be done individually or in a team of maximum of 3 students. You can choose the topic of your choice and discuss your project with the instructor. Project assignments and the due dates are presented in the course schedule section of this syllabus.

Instructor(s) McKenzie Landrum
Attendance & Make-up Yes
Accomodations Yes
UF Grading Policies for assigning Grade Points Yes
Course Evaluation Policy Yes

ESI4610: Introduction to Data Analytics

Class Periods: M,W,F 9 (4:05 pm – 4:55 pm)
Academic Term: Fall 2020

Instructor:
McKenzie Landrum - landrum@ise.ufl.edu, (352-294-7732)
Office Hours: M, W 1:30 pm – 2: 30 pm or by appointment, through Zoom

Teaching Assistants:
Please contact through the Canvas website

Course Description
Provides a basic understanding of the skills necessary for managing and analyzing data. The concepts that will be covered in this class include exploratory data analysis, data manipulation, data cleaning, data wrangling, and machine learning models. We also provide a basic understanding of data management with SQL. All the technical skills will be motivated by different examples involving data. Python is the programming language that will be used in this class.

Course Pre-Requisites / Co-Requisites
COP2271 and ESI3215C with minimum grades of C.

Course Objectives
At the end of this course, students will be able to:
- Prepare data for analysis
- Pose correct and relevant questions in the presence of large-scale data set
- Conduct exploratory data analysis
- Find patterns in large-scale datasets
- Develop hands-on experience utilizing Python and SQL to manage data and apply proper models.

Professional Component (ABET):
This is a course with significant design content. Throughout the semester, students will complete a team project expected to meet specific design criteria.

This course supports the ISE undergraduate program educational objectives of producing graduates who
- "will be successful professionals in industrial and systems engineering or other disciplines",
- "can acquire advanced knowledge through continuing education or advanced degree programs"
- "can become active leaders in their profession and/or community"

Relation to Program Outcomes (ABET):

Outcome	Coverage*
1. Ability to identify, formulate and solve engineering problems by applying principles of engineering, science and mathematics	High
2. Ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare as well as global, cultural, social, environmental, and economic factors	Medium
3. Ability to communicate effectively with a range of audiences	
4. 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	
5. Ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives	
6. Ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	High
7. Ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Medium

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

Required Textbooks and Software

- No textbook is required but the list of recommended books is as follows:
  - Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython by *Wes McKinney.*
  - Python Data Science Handbook: Essential Tools for Working with Data by *Jake VanderPlas.*
  - An Introduction to Statistical Learning: With Applications in R by *Gareth James, Daniela Witten*, *Trevor Hastie*, and *Robert Tibshirani.*
- Lecture notes (posted online in Canvas)
- Videos (posted online in Canvas)
- Jupyter Notebook

Materials and Supply Fees

None

Course Schedule

Week	Topic	Assignments
1	Introduction to Data Analytics	Introduction Assignment
2	Introduction to Python	Homework 1
3	Scientific Computing	
4	Data Manipulation and Analysis	Homework 2
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11	Predictive Analytics	Homework 4
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14	Relational Database Management (SQL)	Homework 5
15	Relational Database Management (SQL)	Project submission and presentation

Video Considerations

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Attendance Policy and Class Expectations

Starting the second week, the class follows a flipped-classroom approach where students are expected to study the lecture notes, watch the videos, and work on practices assigned before each class. The class time will be allocated to hands-on exercises, discussing the lecture notes and videos, and answering questions.

Attendance is not required; however, it is strongly recommended. It will be to your benefit to attend all lectures. Students will be responsible for all material covered in class. Please remember to follow Zoom guidelines. https://elearning.ufl.edu/keep-zoom-secure/student/#extra-tips-and-best-practices

Make-Up Policy

Excused absences require appropriate documentation. 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

Assignments

Your grade will be based on two exams, homework assignments, and a project. In each exam, I include a few challenging tasks, which only the best students will be able to answer. These are the questions that distinguish the A students.

Students are required to work on a data analytics project to practice the skills learned during the class. Projects can be done individually or in a team of maximum of 3 students. You can choose the topic of your choice and discuss your project with the instructor. Project assignments and the due dates are presented in the course schedule section of this syllabus.

Exam-1	**25%**
Exam-2	**25%**
Homeworks	**20%**
Project	**30%**

All assignments must be submitted via E-learning unless specified otherwise. Assignment deadlines are rigid. **If you do not submit before the deadline or submit the wrong file, you will receive a zero.** Only the instructor has the authority to grant late submissions.

Grade Disputes

Exam grade disputes must be made to the instructor within one week after grades are posted. Any grade dispute after the specified period will not be considered. The following describes the procedure:

(1) Within one week after your grade has been posted, e-mail the instructor requesting a grade breakdown,
(2) Compare your solution to the solution posted on the web-site using the detailed grade breakdown you receive,
(3) If you still have questions about your grade, to resolve the issue either go to the instructor's office hours or request an appointment.

Grading Policy

There may or may not be a curve at the end of the semester. This depends on the overall performance of the class throughout the semester.

Please keep in mind that this is a challenging and time-consuming course, and the percentage of As has historically been in the 10% range. You have to study hard and perform well in every course activity in order to deserve an A.

More information on UF grading policy may be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Grade	Range	Grade Points
A	93-100	4.00
A-	90-93	3.67
B+	87-90	3.33
B	83-87	3.00
B-	80-83	2.67
C+	77-80	2.33
C	73-77	2.00
C-	70-73	1.67
D+	65-70	1.33
D	60-65	1.00
D-	55-60	0.67

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://www.dso.ufl.edu/sccr/process/student-conduct-honor-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.