

Cover Sheet: Request 15177

QMB 3XXX: Foundations of Business Analytics & Artificial Intelligence (AI)

Info

Process	Course New Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	Erica Studer-Byrnes erica.byrnes@warrington.ufl.edu
Created	7/13/2020 4:29:45 PM
Updated	9/10/2020 1:58:25 PM
Description of request	The Warrington College of Business is requesting consideration of a new course: Foundations of Business Analytics & Artificial Intelligence (AI).

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CBA - Information Systems and Operations Management 011707000	Hsing Cheng		7/13/2020
No document changes					
College	Approved	CBA - College of Business Administration, Warrington	Renee Mathis	Approved by the faculty at a virtual meeting on 7/23/20.	7/24/2020
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			7/24/2020
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 15177

Info

Request: QMB 3XXX: Foundations of Business Analytics & Artificial Intelligence (AI)
Description of request: The Warrington College of Business is requesting consideration of a new course: Foundations of Business Analytics & Artificial Intelligence (AI).
Submitter: Erica Studer-Byrnes erica.byrnes@warrington.ufl.edu
Created: 8/26/2019 5:10:32 PM
Form version: 1

Responses

Recommended Prefix QMB
Course Level 3
Course Number XXX
Category of Instruction Intermediate
Lab Code None
Course Title Foundations of Business Analytics & Artificial Intelligence (AI)
Transcript Title Bus Analytics & AI
Degree Type Baccalaureate

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

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

Amount of Credit 4

S/U Only? No
Contact Type Regularly Scheduled
Weekly Contact Hours 4

Course Description This course is designed to introduce students to the basics of data analytics and machine learning using the powerful programming language Python. Students will learn Python basics, as well as how to write programs and use Python to solve real world problems.

Prerequisites MAC2233 OR MAC2311

Co-requisites NA

Rationale and Placement in Curriculum Businesses today often use data to solve complex problems. A business that ignores the data it generates is at a significant disadvantage. The skills required to analyze and interpret that data are in short supply. Regardless of the domain a student decides to work in after graduation, it is likely that data analytics skills will make them more competitive in the job market.

This course is designed to introduce students to the basics of data analytics and machine learning using the powerful programming language Python. No prior programming experience is required. The course is structured into two sections. Students will first learn the basics of Python and how to write programs, and in module 2 progress to using Python to solve real world problems

Why learn Python? Python is rapidly becoming the language of choice for data scientists, data analysts, and those working on cutting edge business analytics. It is the tool of choice for this work at companies such as Google, Amazon, Facebook, IBM, NASA, Accenture, & Deloitte. It is also free to use, making it widely available to firms and users around the world. Beyond business analytics, Python is often used as a general programming language to automate tasks.

Initially, this course will be offered as an elective option for students who are interested in developing and beginning to apply this skill set as a component of their career readiness. Based on analysis of data acquired during the pilot phase it is probable that the college will be interested in formally

introducing this course to the curriculum more broadly. Additionally, the college intends to introduce discipline appropriate projects throughout the upper-division curriculum across BSBA and BABA majors that rely on the Python skills and applications developed in this course.

Course Objectives By the end of the class, students will know how to:

- Install and use Python and Jupyter notebooks
- Write and run Python Scripts to read, write, filter, merge, summarize, and graph a given dataset
- Write and run Python Scripts to extract, import, export and manipulate data.
- Produce basic statistical summaries of continuous and categorical data
- Produce basic visualizations using standard Python Libraries
- Write and produce basic analytical reports using markdown (in Jupyter)
- Build a simple Machine Learning model
- Understand how Python and other business analytics programs can be used in business applications

In addition, students will demonstrate competency in the following opportunities in business analytics:

- Increased analytics and data literacy
- Use of data insights in business decision making
- Familiarity with the steps and process to develop, analyze and report on important business trends. Thinking critically about data and analytics presented by stakeholders throughout the company.
- Creating reproducible value by means of analytical tools and solutions.

Course Textbook(s) and/or Other Assigned Reading [1] Ceder, V. (2010). The Quick Python book. Manning Publications Co.. 3rd Edition

[2] Python Data Science Handbook by Jake VanderPlas; (free book)

<https://jakevdp.github.io/PythonDataScienceHandbook/>

Weekly Schedule of Topics Please see attached syllabus for weekly schedule of topics.

Grading Scheme Please see attached syllabus for proposed grading scheme.

Instructor(s) Joel Davis (bio attached)

Attendance & Make-up Yes

Accommodations Yes

UF Grading Policies for assigning Grade Points Yes

Course Evaluation Policy Yes

Course Development History: “Foundations of Business Analytics & Artificial Intelligence (AI)”

Initial Course Idea

Initial meeting with John Kraft (Dean), Gary McGill (Associate Dean), Alex Sevilla (Associate Dean), Rich Lutz (Chair, Marketing Department), Jim Hoover (Faculty expert in business analytics); 2/5/2020

The ISOM department has recently introduced a new track to the MS-ISOM degree in Business Analytics track. To date, employers have been very enthusiastic about our future graduates having skills in this area. We are interested in bringing this skill development to undergraduates as well.

- Discussed initiative to enhance and further develop business analytics skills that apply to business majors and careers in business
 - Explore creation of a business analytics course, with later goal to add the course as a requirement for all BSBA/BABA students
 - If students had introductory level skill, business analytics projects (using Python) could then be added across many of the existing core classes to deepen student expertise in this area and to contribute to career readiness at time of graduation (and job search)
- Developed a committee to conduct benchmarking research on the idea and possible implementation:
 - Review content in WCB undergraduate core (courses that are required for ALL business majors), particularly quantitative courses
 - Review b-school peers – assess structure/content of business analytics course(s) in their core curricula
 - Review employer needs – quantify most desired skills/attributes our hiring companies expect from our graduates
 - Construct a new business analytics course that aligns with current UG core and creates key skill development sought by recruiters
 - Build and pilot a course by Fall 2020 to get feedback from undergraduates and employers on an actual course experience (to be taught as special topics course)
 - Committee: Jim Hoover, Erica Studer-Byrnes, Alex Sevilla

Committee Meetings (2/26/2020, 3/9/2020, 3/18/2020, 3/26/2020, 4/9/2020, 4/27/2020, 5/6/2020, 5/12/2020)

During these meetings information about the current core courses and the benchmarking research on business analytics curriculum at peer institutions was gathered and shared. Results from the research are summarized in the slides below. Additionally, committee members sought input and feedback from experts within the college and incorporated their suggestions into the proposed course of action, as well as the attached syllabus. Through these exchanges, a proposal was generated to share with WCB leadership.

Meetings with WCB Leadership:

4/15/2020: John Kraft (Dean), Saby Mitra (Incoming Dean), Selcuk Erenguc (Sr. Associate Dean), Alex Sevilla (Associate Dean), Kenny Cheng (Chair, ISOM Department), Rich Lutz (Chair, Marketing Department), Janice Carillo (faculty, ISOM), Aditi Mukherjee (faculty, ISOM), Jim Hoover (faculty expert in business analytics), Erica Studer-Byrnes (Associate Director, Heavener School of Business)

5/13/2020: John Kraft (Dean), Saby Mitra (Incoming Dean), Selcuk Erenguc (Sr. Associate Dean), Alex Sevilla (Associate Dean), Kenny Cheng (Chair, ISOM Department), Rich Lutz (Chair, Marketing Department), Janice Carillo (faculty, ISOM), Aditi Mukherjee (faculty, ISOM), Jim Hoover (faculty expert in business analytics), Erica Studer-Byrnes (Associate Director, Heavener School of Business), Joel Davis (adjunct faculty), JC Marvin (Director of Marketing & Communication Services), Morgan Robinson (Director of Marketing, MBA)

During these two meetings, college leadership reviewed and discussed the committee findings and the proposal to pilot a Business Analytics course using Python during the Fall 2020 semester in an online format. Suggestions from the ISOM faculty were incorporated into the proposed syllabus. The packet was approved to move forward to the ISOM department for review and determination if they will support the initiative.

Original file: Business_Analytics_Hx.docx

Departmental Review

The course proposal was presented to the faculty of the Information Systems & Operations Management department by the department chair, Dr. Kenny Cheng. On June 19th

, 2020 a vote was taken and the new course was overwhelmingly supported by the department with 19 unanimous votes of approval.

Warrington College of Business Review

The course proposal was presented to the WCB faculty at a virtual meeting by Jim Hoover on July 23, 2020. A vote was taken and the new course was approved by the college faculty unanimously.

From: [Daniels,Michael Joseph](#)
To: [Studer-Byrnes,Erica L](#)
Cc: [Daniels,Michael Joseph](#)
Subject: Re: Course Consultation
Date: Monday, June 29, 2020 6:22:25 PM

Hi Erica,

The new QMB course 'Foundations of Business Analytics & Artificial Intelligence' looks like a good course. I have conferred with the chair of math, Kevin Knudson and we don't have concerns about this new course given the recently introduced python course for the data science major, MAD 2502. The second half of QMBXXXX might serve as an interesting elective for the data science major (if the course was modularized and given more details on the applications etc in the second half of the course).

Thanks

Best regards,

Mike D

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

On Jun 22, 2020, at 12:10 PM, Studer-Byrnes,Erica L
<erica.byrnes@warrington.ufl.edu> wrote:

Mike,

Thank you for meeting with me this morning to discuss our new curriculum initiative to develop an applied business analytics course for undergraduate business majors. Ultimately, our goal is to facilitate skill development and data literacy for undergraduate business majors that compliments and furthers other analytical tools that we grow through our curriculum. This initiative aligns with the work that we have done at the graduate level in our MSISOM program through the introduction of tracks in business analytics and data science (<https://warrington.ufl.edu/master-of-science-in-information-systems-and-operations-management/courses-and-curriculum/>). Our reasoning for developing this course now is further explained in the "justification" attachment.

As we discussed, I am attaching the syllabus for you and your faculty to review. The pilot course will be taught by Joel Davis. I will also attach his bio for you and your faculty to review. Pending the outcomes of the pilot, Joel will also teach the course

once it is a fully approved course in the curriculum inventory.

Ideally, our committee would like to submit the new course proposal to the University Curriculum Committee by August 1st. If possible, we would greatly appreciate your feedback and endorsement of our new initiative before then so that your perspectives may be incorporated into our proposal. If I can provide any additional details or documents that will aid your review of our proposal, please don't hesitate to reach out.

Appreciatively,
E

—

Erica L. Studer-Byrnes, Ph.D.

*Associate Director
Heavener School of Business*

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<image003.jpg>

From: Studer-Byrnes, Erica L
Sent: Wednesday, June 10, 2020 3:17 PM
To: Daniels, Michael Joseph <daniels@ufl.edu>
Subject: RE: Course Consultation

That sounds great. I just sent a calendar invite with Zoom information.

Best,
E

Erica L. Studer-Byrnes, Ph.D.

*Associate Director
Heavener School of Business*

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From: Daniels, Michael Joseph
Sent: Wednesday, June 10, 2020 8:49 AM
To: Studer-Byrnes, Erica L <erica.byrnes@warrington.ufl.edu>
Subject: Re: Course Consultation

How about monday 6/22 at 11am?

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

On Jun 10, 2020, at 12:13 AM, Studer-Byrnes, Erica L
<erica.byrnes@warrington.ufl.edu> wrote:

Mike,

I am available any of the times below during the week of 6/22:

Monday, 6/22: 10:30-12

Tuesday, 6/23: 10-12
Wednesday, 6/24: 12:30-2, 4-5
Friday, 6/26: 9-12

Please let me know if any of those time slots work for you, and we can get a zoom call setup.

Appreciatively,
E

—

Erica L. Studer-Byrnes, Ph.D.

*Associate Director
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From: Daniels, Michael Joseph
Sent: Sunday, June 7, 2020 6:43 PM
To: Studer-Byrnes, Erica L <erica.byrnes@warrington.ufl.edu>
Subject: Re: Course Consultation

Sounds good. Thanks Erica.

Mike Daniels
Professor and Chair
Andrew Banks Family Endowed Chair
Department of Statistics
University of Florida

Gainesville, FL 32611

On Jun 7, 2020, at 3:26 PM, Studer-Byrnes, Erica L
<erica.byrnes@warrington.ufl.edu> wrote:

Mike,

Thanks for the prompt reply. I'm finalizing my schedule for the week of June 22 within the next day or two, and will be in touch once I have concrete times for my availability.

Best,
E

—

Erica L. Studer-Byrnes, Ph.D.

*Associate Director
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From: Daniels, Michael Joseph
Sent: Friday, June 5, 2020 3:43 PM
To: Studer-Byrnes, Erica L
<erica.byrnes@warrington.ufl.edu>
Cc: Daniels, Michael Joseph <daniels@ufl.edu>
Subject: Re: Course Consultation

Original file: External_Consult_CLAS_STA_Daniels.pdf

Hi Erica,

Happy to chat about this. Maybe a zoom call for sometime the week of June 22? If that will work, please propose some times and hopefully we can find a match. thanks

Best regards,

Mike D

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

On Jun 5, 2020, at 9:25 AM, Studer-Byrnes, Erica L
<erica.byrnes@warrington.ufl.edu> wrote:

Dr. Daniels,

The college of business has been working on developing a new course whose current working title is “Foundations of Business Analytics & Artificial Intelligence (AI)”. The genesis of the course is a desire to equip our graduates with a stronger set of analytical tools to keep up with the evolving demands of the business world. We see data literacy as a fundamental business skill, growing in necessity, across all functional areas (HR, marketing, sales, operations). The key objective of this course is to provide students with an introductory level exposure to a tool (Python) utilized in business analytics.

Throughout the process of discussing the need for this class and the resulting development of a course proposal we have bench marked with peer business schools as well as our UF

colleagues who are also offering coursework in this space. We are aware of the exciting program that you all have been developing, the Data Science major, and wanted to reach out to you to discuss our new course and seek your consultation during this formative phase of course development. I would like to setup a time for us to meet to discuss the Foundations of Business Analytics & Artificial Intelligence (AI) course at your convenience. Please let me know the best way to setup a time for us to meet and I will coordinate.

Appreciatively,
E

—

Erica L. Studer-Byrnes,
Ph.D.

*Associate Director
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<Instructor_Bio.pdf><Justification for Business Analytics
course.pdf><Undergrad- Business Analytics AI Syllabus - v8-jhh.pdf>

From: [Gilbert, Juan E](#)
To: [Studer-Byrnes, Erica L](#)
Subject: Re: Course Consultation
Date: Tuesday, July 14, 2020 6:14:30 PM

Erica, the CISE department doesn't have any issues with this course.

Thanks,

--

Juan E. Gilbert, Ph.D.
Andrew Banks Family Preeminence Endowed Professor & Chair
Computer & Information Science & Engineering Department
Herbert Wertheim College of Engineering
University of Florida
P.O. Box 116120
Gainesville, FL 32611
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352.273.0738 (F)
juan@ufl.edu
Twitter: @DrJuanGilbert
<http://www.juangilbert.com/>

On Jul 14, 2020, at 4:01 PM, Studer-Byrnes, Erica L
<erica.byrnes@warrington.ufl.edu> wrote:

Thank you!

E

—

Erica L. Studer-Byrnes, Ph.D.

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From: Gilbert, Juan E
Sent: Tuesday, July 14, 2020 4:00 PM
To: Studer-Byrnes, Erica L <erica.byrnes@warrington.ufl.edu>
Subject: Re: Course Consultation

Erica, let me check on this and get back with you.

Thanks,

--

Juan E. Gilbert, Ph.D.
Andrew Banks Family Preeminence Endowed Professor & Chair
Computer & Information Science & Engineering Department
Herbert Wertheim College of Engineering
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P.O. Box 116120
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juan@ufl.edu
Twitter: @DrJuanGilbert
<http://www.juangilbert.com/>

On Jul 14, 2020, at 2:41 PM, Studer-Byrnes, Erica L
<erica.byrnes@warrington.ufl.edu> wrote:

Dr. Gilbert,

I hope you are doing well and staying cool in this hot Florida summer! I wanted to send you a quick update following a conversation that I had with Dr. Catia Silva about our course. She reviewed our proposed syllabus for “Foundations of Business Analytics & Artificial Intelligence (AI)” and provided some very insightful and supportive feedback. It sounds like she has been involved in the campus-wide conversations about AI and was enthusiastic about a business data analytics course being offered for undergraduates.

We are still on track for submission to UCC by the end of July. Is it feasible to have a report of your college’s review of our proposed course within that timeframe (i.e., by the end of the month)? Dr. Lindner has indicated that we can submit a formal “consultation” form (attached to this email) or simply a pdf file of your note to me once the committee makes the evaluation. I am happy to do whichever is easier for you. Please let me know if you would like any additional information regarding our request.

Appreciatively,

E

—

Erica L. Studer-Byrnes, Ph.D.

*Associate Director
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From: Studer-Byrnes, Erica L
Sent: Tuesday, June 16, 2020 11:36 AM
To: Gilbert, Juan E <juan@ufl.edu>
Subject: RE: Course Consultation

Thank you!

E

—

Erica L. Studer-Byrnes, Ph.D.

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From: Gilbert, Juan E

Sent: Tuesday, June 16, 2020 11:34 AM

To: Studer-Byrnes, Erica L <erica.byrnes@warrington.ufl.edu>

Subject: Re: Course Consultation

Got it! I will get this to our curriculum committee.

Thanks,

On Jun 16, 2020, at 11:31 AM, Studer-Byrnes, Erica L <erica.byrnes@warrington.ufl.edu> wrote:

Dr. Gilbert,

Thank you for meeting with me this morning to discuss our new curriculum initiative to develop an applied business analytics course for undergraduate business majors. Ultimately, our goal is to facilitate skill development and data literacy for undergraduate business majors that compliments and furthers other analytical tools that we grow through our curriculum (e.g., business statistics). This initiative aligns with the work that we have done at the graduate level in our MSISOM program through the introduction of tracks in business analytics and data science (<https://warrington.ufl.edu/master-of-science-in-information-systems-and-operations-management/courses-and-curriculum/>). Our reasoning for developing this course now is further explained in the "justification" attachment.

I also wanted to let you know that I had reached out to Dr. Fox a few weeks earlier to seek collaboration. He shared our

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plan with several faculty and reported back to me that there was broad support for our development of this course (I'll attach the email for your reference). He also suggested that I reach out to Catia Silva for further collaboration, which I will do this week.

As requested, I am attaching the syllabus for your curriculum committee to review. The pilot course will be taught by Joel Davis. I will also attach his bio for you and your faculty to review. Pending the outcomes of the pilot, Joel will also teach the course once it is a fully approved course in the curriculum inventory.

Ideally, our committee would like to submit the new course proposal to the University Curriculum Committee by August 1st. If possible, we would greatly appreciate your feedback and endorsement of our new initiative before then so that your perspectives may be incorporated into our proposal. If I can provide any additional details or documents that will aid your review of our proposal, please don't hesitate to reach out.

Appreciatively,
E

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Erica L. Studer-Byrnes, Ph.D.

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From: Studer-Byrnes, Erica L
Sent: Wednesday, June 10, 2020 11:35 PM
To: Gilbert, Juan E <juan@ufl.edu>
Cc: Stephens, Tina <tstephens@cise.ufl.edu>
Subject: RE: Course Consultation

Great, thank you!

Best,
E

—

Erica L. Studer-Byrnes, Ph.D.

*Associate Director
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From: Gilbert, Juan E
Sent: Wednesday, June 10, 2020 5:24 PM
To: Studer-Byrnes, Erica L
<erica.byrnes@warrington.ufl.edu>
Cc: Stephens, Tina <tstephens@cise.ufl.edu>
Subject: Re: Course Consultation

Erica, my assistant, Tina, can find a time we can talk.

Thanks,

Sent from my iPhone

On Jun 10, 2020, at 5:17 PM, Studer-Byrnes, Erica L
<erica.byrnes@warrington.ufl.edu> wrote:

Dr. Gilbert,

The college of business has been working on developing a new course whose current working title is “Foundations of Business Analytics & Artificial Intelligence (AI)”. The genesis of the course is a desire to equip our graduates with a stronger set of analytical tools to keep up with the evolving demands of the business world. We see data literacy as a fundamental business skill, growing in necessity, across all functional areas (HR, marketing, sales, operations). The key objective of this course is to provide students with an introductory level exposure to a tool (Python) utilized in business analytics.

Throughout the process of discussing the need for this class and the resulting development of a course proposal we have bench marked with peer business schools as well as our UF colleagues who are also offering coursework in this space. We are aware of some new undergraduate courses that your department has been developing, specifically the “Performant Programming in Python (CIS4930)” and “Programming for Applied Data Science” courses, and wanted to reach out to you to discuss our new course and seek your consultation during this formative phase of course development. I would like to setup a time for us to meet to discuss the Foundations of Business Analytics & Artificial Intelligence

(AI) course at your convenience. Please let me know the best way to setup a time for us to meet and I will coordinate.

Appreciatively,
E

Erica L. Studer-Byrnes, Ph.D.

*Associate Director
Heavener School of Business*

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<Justification for Business Analytics course.pdf>
<Undergrad- Business Analytics AI Syllabus - v8-
jhh.pdf><Instructor_Bio.pdf><Mail Attachment.eml>

Juan E. Gilbert, Ph.D.
Andrew Banks Family Preeminence Endowed Professor &
Chair
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Twitter: @DrJuanGilbert
<http://www.juangilbert.com/>

<UCC_External_Consult_Form.pdf>

QMBXXXX – Foundations of Business Analytics & Artificial Intelligence (AI)

Professor:
Office:
Telephone:
Email:
Office Hours:
Term:
Section:
Location:

Course Description

This course is designed to introduce you to the basics of data analytics and machine learning using the powerful programming language Python. No prior programming experience is required. The course is structured into two sections. Students will first learn the basics of Python and how to write programs, and in module 2 progress to using Python to solve real world problems

Why learn Python? Python is rapidly becoming the language of choice for data scientists, data analysts, and those working on cutting edge business analytics. It is the tool of choice for this work at companies such as Google, Amazon, Facebook, IBM, NASA, Accenture, & Deloitte. It is also free to use, making it widely available to firms and users around the world. Beyond business analytics, Python is often used as a general programming language to automate tasks.

Why learn data analytics and machine learning? Businesses today often use data to solve complex problems. A business that ignores the data it generates is at a significant disadvantage. The skills required to analyze and interpret that data are in short supply. Regardless of the domain a student decides to work in after graduation, it is likely that data analytics skills will make them more competitive in the job market.

Course Objectives

By the end of the class, students will know how to:

- Install and use Python and Jupyter notebooks
- Write and run Python Scripts to read, write, filter, merge, summarize, and graph a given dataset
- Write and run Python Scripts to extract, import, export and manipulate data.
- Produce basic statistical summaries of continuous and categorical data
- Produce basic visualizations using standard Python Libraries
- Write and produce basic analytical reports using markdown (in Jupyter)
- Build a simple Machine Learning model
- Understand how Python and other business analytics programs can be used in business applications

Course Prerequisites

1. MAC2233 or MAC2311
2. This course is suitable for those with no programming experience.

Computer hardware/software

3. The notebooks assume a Python 3 installation with the standard modules from an Anaconda installation such as Numpy and Matplotlib. Students should use the Anaconda distribution of Python on a Windows or Macintosh PC. The download and all required software are free. Although UF APPS has the required software, a local installation is strongly preferred. You will be expected to use your laptop for each class and lab.
4. For problems with UF APPS or connectivity (WIFI) please contact the UF Help desk <http://helpdesk.ufl.edu/>, 352-392-4357

Communication with Course Staff

- The primary means to get help with a particular problem will be the Canvas message boards. The instructor will check the board daily, to answer inquiries. Other students should feel free to post responses to these questions as well within the guidelines discussed in the section on collaboration.
- Regular office hours are Tuesdays and Thursdays from 2:00 PM to 4:00 PM or by appointment. Meetings will be conducted using Zoom.
- Additional drop in hours, an open meeting hosted on Zoom for any to join and ask questions or work through problems, will be posted in Canvas. Please choose a username the course staff can recognize to be admitted to the meeting.
- Students requesting or needing assistance can also use Canvas Inbox for private inquiries.

Course Structure

Lectures:

You will watch prerecorded course lectures within the course website pages. You will be responsible for all material presented in lectures. Lectures occasionally will be used to clarify and summarize the text, but will also include material not covered in the text. A PDF of the lecture will also be posted in the class website. Please note that exam and assignment questions may come from material discussed verbally in the lecture, but not on the handout. Additional videos may be posted throughout the course to answer student questions. The content of these will not be on the exams.

Workbooks

Each lab and homework assignment will come with a Jupyter notebook. The notebooks assume a Python 3 installation with the standard modules from an Anaconda installation. For labs and assignments, the notebooks will be partially complete with instructions on what each section needs.

Assignments

Code Completion Assignments: This homework will be a partially completed Jupyter notebook, and students will follow the instructions within the notebook and submit for grading. Please submit the notebook, not a PDF or a copy paste from the notebook into some other format. For these assignments,

some collaboration with other students is acceptable, and even encouraged. Please read the section below on collaboration for the limits and rules on acceptable collaboration. Each of these workbooks will also include a text field called “REFLECT”. Instructions on REFLECT are in each assignment, but in general this is a place for you to comment on the assignment, what you’ve learned, and any challenges you might have had. A video example of this type of assignment will be posted in Canvas.

Question/Answer Assignments: These take the form of quizzes posted in Canvas. These assignments will have both multiple choice and code completion components and will require students to recall material from lectures and the labs. These quizzes will sometimes, but not always, require students to use a Jupyter notebook provided to solve problems and answer questions. *On these assignments collaboration with other students is not permitted.* Students may continue to search for answers online, in coding forums such as stack exchange and google forums. Students may not post the quiz questions on the internet to receive answers. A video example of this type of assignment will be posted in Canvas.

Collaboration

Writing code and performing data analytics is often a collaborative exercise. You are free to discuss on Canvas or elsewhere the code completion assignments and approaches to solving them, as long as the work you submit for grading was completed and written by you. To be clear, you are not permitted to share your code or copy the code of other students. You may, of course, copy/modify code that you saw in a lecture or in the lab. If you use code from an online source, it must be cited in your work (instructions on doing this will be provided). The code completion assignments are not designed as a test, but an exercise. If you are stuck, ask for help from either another student or course staff. If you know the solution, feel free to help others without sending them the code. If you are at all in doubt whether your collaboration has crossed some line, please tell the course staff in the submission or prior to it.

Labs

Each lab will walk through one (or more) Jupyter notebooks that review the relevant material using a business case as our example. Students will each have a partially completed notebook and can complete the notebook during or after the lab. The lab is ungraded and serves as an active learning exercise. Material from the lab will be included in the assignments, mid-term, and final exam. You are free to share your lab notebook and code with other students. Please do not post the workbook online (in an online forum for example).

Participation

Throughout the course I will ask for participation on a given topic in the class forum. Participation points will be awarded for those posts/discussions. Instructions on participation points will be discussed in the first lecture. The first participation points are awarded in week 1 and 2, so please keep an eye out for these.

Grading

Participation 10%
Assignments 50%
Mid Term 20%
Final 20%

Mid Term & Final Exam

The exams will be drawn evenly from all lectures, labs, and readings that occurred up to that point in the course. The final exam is drawn from material since the MidTerm. The exam does not include content from lectures prior to the midterm. You are responsible for all assigned material. The exam does not cover or include business case discussion(s) or insights from analyzed data from the labs, but will include questions about processes and procedures to derive those results. An example of this distinction is available in Canvas. A full practice exam 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.

Weekly Course Schedule of Topics and Assignments

Holidays – Nov 26th Thanksgiving

Week	Date	Topics/lectures	Content
1	25-Aug	Introduction 5. Syllabus 6. Why this course	1. Reading: Class Notes on Canvas 2. Lab: Installing Python, launching notebooks, command line 3. Assignment: Install Python
	27-Aug	Foundations of Business Analytics • Motivating Examples	
2	1-Sep	Python Basics • Data Types and Variables • Strings, Lists, and Tuples • List Manipulations, Dictionaries	1. Reading: Class Notes on Canvas; Ch 4, 5, 6 (see Canvas for pages) ^[1] 2. Lab 3. Assignment: Practice Problem
	3-Sep	Python Basics	
3	8-Sep	Control flow & Functions 7. Loops: While, if, for 8. Basic functions.	1. Reading: Ch 8,9 (see Canvas for pages) ^[1] 2. Lab 3. Assignment: Writing Functions
	10-Sep	Control flow & Functions	
4	15-Sep	NumPy • NumPy Arrays • Subsetting, sorting, indexing • basic statistics	1. Reading: Class Notes on Canvas 2. Lab 3. Assignment: Data Manipulation part 1
	17-Sep	NumPy	
5	22-Sep	Pandas 9. Manipulating data using NumPy and Pandas	1. Reading: a. "Introducing Pandas Objects" ^[2] b. "Data Indexing and Selection" ^[2] 2. Lab 3. Assignment: Data Manipulation part 2
	24-Sep	Pandas	
	29-Sep	Data Wrangling	1. Reading:

6		10. Missing data 11. Combining, aggregating, grouping data	a. "Handling Missing Data" ^[2] b. Reading: "Combining Datasets: Concat and Append" ^[2]
	1-Oct	Data Wrangling	2. Assignment: None! 3. Lab
7	6-Oct	Data Wrangling • Special cases of data extraction	1. Reading: a. "Aggregation and Grouping" ^[2] b. Reading: "Working with Time Series" ^[2]
	8-Oct	Data Wrangling	2. Lab 3. Assignment: Data Wrangling Challenge
8	13-Oct	Data Visualization • Matplotlib for basic line, scatter plots, histograms	1. Reading: "Visualization with Matplotlib" ^[2] 2. Lab: Matplotlib Exercises 3. Assignment: Matplotlib Exercises
	15-Oct	Data Visualization	
9	20-Oct	Data Visualization • Improving basic plots with Seaborn	1. Reading: "Visualization with Seaborn" ^[2] 2. Lab 3. Assignment: Visualization Exercises
	22-Oct	Data Visualization	
10	27-Oct	Analytics & Machine Learning • Overview and fundamentals • Scikit-Learn	1. Reading: "What is Machine Learning" ^[2] 2. Lab 3. Midterm: Covers week 1-17
	29-Oct	Analytics & Machine Learning	
11	3-Nov	Analytics & Machine Learning • Unsupervised Learning • Clustering	1. Reading: Class Notes on Canvas 2. Lab 3. Assignment: Clustering customers
	5-Nov	Analytics & Machine Learning	
12	10-Nov	Analytics & Machine Learning • Supervised Learning • Linear Regression	1. Reading: "Linear Regression" ^[2] 2. Lab 3. Assignment: Modeling using linear regression.
	12-Nov	Analytics & Machine Learning	
13	17-Nov	Analytics & Machine Learning • Tree Based models	1. Reading: "Decision Trees and Random Forests" ^[2] 2. Lab 3. Assignments: None
	19-Nov	• OFF	
14	24-Nov	AI Methods Introduction • Differences between methods 12. Motivating Examples	1. Reading: Class Notes on Canvas 2. Lab 3. Assignment: Using a pretrained classifier to identify images ^[a]

	26-Nov	Holiday (Thanksgiving)	
15	1-Dec	AI Methods Introduction	1. Reading: Class Notes on Canvas 2. Lab 3. Assignments: None.
	3-Dec	AI Methods Introduction • How AI is applied to business problems	
16	8-Dec	Course Review	Course Review
	10-Dec	13. FINALS WEEK	14. Final Exam

Disclaimer: This syllabus represents current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.

Text:

[1] Ceder, V. (2010). *The Quick Python Book*. Manning Publications Co.. 3rd Edition

[2] VanderPlas, J. (2016). *Python data science handbook: Essential tools for working with data.* " O'Reilly Media, Inc.". available online at <https://jakevdp.github.io/PythonDataScienceHandbook/>

Assignments:

[a] The last assignment “Using a pretrained classifier to identify images” only requires minimal code completion and a submission of the final results.

Late or Missed Assignments

Late or missed assignments may not receive full point credit or may be assigned 0 points.

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>

If you have technical issues that prevent you from submitting assignments on schedule, please ensure that you contact the TAC Student Information Technology Support Center to document your problem and help resolve the issue. Information on how to contact Student Support can be found at:

<https://warrington.ufl.edu/information-technology-support-programs/technical-services/tac-student-support/>

Grading Scale and Grading Policies for Assigning Grade Points

Evaluation and Grading Criteria

Date Assigned	Due	Activity	Points
		Participation	100
25-Aug	31-Aug	Assignment: Install Python	30
1-Sep	7-Sep	Assignment: Practice Problem	50
8-Sep	14-Sep	Assignment: Writing Functions	50

15-Sep	21-Sep	Assignment: Data Manipulation part 1	50
22-Sep	28-Sep	Assignment: Data Manipulation part 2	50
6-Oct	12-Oct	Assignment: Data Wrangling Challenge	50
13-Oct	19-Oct	Assignment: Matplotlib Exercises	50
20-Oct	26-Oct	Assignment: Visualization Exercises	50
3-Nov	9-Nov	Assignment: Clustering customers	50
10-Nov	16-Nov	Assignment: Modeling using linear regression.	50
26-Nov	2-Dec	Assignment: Using a pretrained classifier to identify images	20
TBD	TBD	Mid Term	200
10-Dec	16-Dec	Final Exam	200
		Participation	100
		Assignment total	500
		Exam Total	400
		Total	1000

The following scale will be used to determine your final grade:

Grade	Points
A	930 and above
A-	929 to 900
B+	899 to 866
B	865 to 830
B-	829 to 800
C+	799 to 766
C	765 to 730
C-	729 to 700
D+	699 to 666
D	665 to 630
D-	629 to 600
E	599 and below

Information on current UF grading policies for assigning grade points can be found at: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

Required and Recommended Textbooks, Readings, and Class Notes

[1] Ceder, V. (2010). *The Quick Python book*. Manning Publications Co.. 3rd Edition

[2] Python Data Science Handbook by Jake VanderPlas;

<https://jakevdp.github.io/PythonDataScienceHandbook/>

Class Notes, Code, and Data – Class notes, Python-code and datasets for this course will be available in Canvas - <https://ufl.instructure.com>.

Attendance, Make-up Exams, and Other Work

Students are responsible for satisfying all academic objectives as defined by the professor. Absences count beginning with the first class meeting and are incorporated into the participation grade. Additionally, you will be evaluated based on your contribution to your team.

In general, acceptable reasons for absence from or failure to participate in class include illness, serious family emergencies, special curricular requirements (e.g., judging trips, field trips, professional conferences), military obligation, severe weather conditions, religious holidays, and participation in official university activities such as music performances, athletic competition or debate. Absences from class for court-imposed legal obligations (e.g., jury duty or subpoena) must be excused. Other reasons also may be approved.

Students shall be permitted a reasonable amount of time to make up the material or activities covered in their absence.

Students cannot participate in the class unless they are registered officially or approved to audit with evidence of having paid audit fees. The Office of the University Registrar provides official class rolls to instructors.

Accommodations for Students with Disabilities

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the module.

Online Course Evaluation Process

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/>.

Honor Code Reminder

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 (<http://www.dso.ufl.edu/sccr/process/student-conduct-honorcode/>) specifies several 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.”

Assurance of Learning

Assurance of Learning Objectives: Each program at the Warrington College of Business Administration has developed goals and objectives that express the most valued skills and knowledge that students should be able to demonstrate upon completion of the total learning experiences in that program. The following goals and objectives are specifically mapped onto this course:

- **Goal 1: Demonstrate competency in and across business disciplines.**
 - 1A. Demonstrate knowledge and understanding of elements of economics, finance, accounting, marketing, operations management, organizational behavior, business law, information technology, and business statistics.

 - 1B Demonstrate proficiency in the use of business-related software applications.

- **Goal 2: Apply appropriate problem solving and decision-making skills**
 - 2A. Specify and implement a framework for identifying a business problem and develop alternative solutions and a set of evaluation criteria.