INFO 3221 – 001
Programming for Business Analytics
Spring 2021

INSTRUCTOR: Dr. Sungjune Park
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OFFICE HOURS: Mon 2:15 pm – 3:00 pm & Wed 2:15 pm – 3:30 pm,
                         and by appointment
CLASS HOURS: Mon & Wed 1:00 pm - 2:15 pm, Online (Zoom via Canvas)

COURSE DESCRIPTION

INFO 3221. Programming for Business Analytics. (3) Prerequisites: INFO 2130 with a grade of C or above or permission of BISOM department. A study of fundamental programming constructs and concepts required for solving data analytics problems. Emphasizes the use of widely adopted industry platforms such as Python and R to extract, transform, and make use of business data.

LEARNING OBJECTIVES

"Business analytics" is a field which deals extensively with structured and unstructured data to build predictive models and visualizations to drive business decisions and actions. This class will focus on how to write code in R and Python to extract, modify and prepare the data for analyses and to perform simple data analyses. The class will emphasize hands-on learning. You should be prepared to write programming code and use programming logic to solve data-driven problems.

The specific learning objectives are as follows:

- Understand data representations in R and Python (data types and structures)
- Read a variety of data files in R and Python (data frames)
- Reformat and process data files in R and Python
- Subset, slice, and modify data files in R and Python (data wrangling)
- Create visualizations in R (ggplot2)
- Write programs and functions in R and Python

REQUIRED MATERIALS AND RESOURCES

Textbook: There are **no required textbooks** to purchase for this class. All required readings will be posted as documents or web links on Canvas. Since the best way to learn R and Python is through hands-on problem solving, the instructor will post

problem sets on various topics and these problems sets are considered part of your course materials.

Hardware: You are also expected to have access to a personal computer/laptop (https://belkcollege.uncc.edu/laptop-policy) in order to work your practice problems and assignments. Your personal computer/laptop **should be equipped with a webcam** for Zoom-based online class and should be capable of installing and running R, R-Studio, and Anaconda.

Software: This class will use R & R-Studio for R and Jupyter Notebook for Python. You are strongly encouraged to install these software packages on your personal machine. However, whenever you experience technical difficulty, remember that you have an option to use your Apporto virtual desktop (https://uncc.apporto.com), in which the above software packages are pre-installed.

Datacamp

For class preparations, you will be required to complete the whole or part of the chapters in selected R/Python courses in Datacamp (https://www.datacamp.com/), a free interactive learning platform for R, Python, and more. You are encouraged to take more courses or try more chapters even if they are not part of the class assignments.

Piazza

We will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TA, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. If you have any problems or feedback for the developers, email team@piazza.com.

If you did not receive a welcome email to activate your Piazza account, find our class signup link at: https://piazza.com/uncc/spring2021/202110info322100123216

Gradescope

We will be using Gradescope this term, which allows us to provide fast and accurate feedback on your work. Homework will be submitted through Gradescope, and homework and exam grades will be returned through Gradescope. As soon as grades are posted, you will be notified immediately so that you can log in and see your feedback. You may also submit regrade requests if you feel we have made a mistake. Note that Gradescope has a tool that **checks code similarity,** which can be used to detect academic integrity issues.

Your Gradescope login is your university email, and your password can be changed at https://gradescope.com/reset_password. The same link can be used if you need to set your password for the first time.

GRADING

Component	Points
Exams (2)	200
Assignments	200
In-class assignments and quizzes	60
Class Participation/Attendance	40
Total	**500**

Final letter grades will be based on the following scale.
A: 450 and above, B: 400-449, C: 350-399, D: 300-349, F: 299 and below.

EXAMS

All exams will be strictly time-limited, and you will be required to have your webcam on. In addition, other technologies like Respondus Monitor and Lockdown Browser may be required to be activated. Failure to turn on the webcam or activate the required technologies will result in your submission not being accepted for grading and you will get a zero for that exam or quiz. There is no exception to this requirement.

The exams mostly include problem solving with R and Python and will be administered via Gradescope. All regrade requests should be submitted within 5 days of the posting of the exam grades (except for the optional final exam). No grade reviews or grade changes will be done beyond this 5-day period.

Makeup exams

In the event that a student anticipates missing an exam, she/he must provide appropriate supporting documents at least 24 hours before the exam to the instructor to request a make-up exam. The instructor will review all requests and authorize, at his discretion, eligible students to take makeup exams. A student who misses an exam without prior approval, possibly due to unexpected situation on the exam day, should contact the instructor within 12 hours of the exam start date/time and provide appropriate supporting documentation to be eligible for the makeup exam. It is the student's responsibility to be aware of and follow the make-up exam policies and no special accommodations will be made for any exceptions.

ASSIGNMENTS AND QUIZZES

Each student must develop his or her own solutions to the assigned homework. Although students are encouraged to work together by asking questions and answers on Piazza for homework assignments. A student must not use or copy (by any means) another's work (or portions of it) and represent it as his/her own. Such collaboration constitutes cheating and/or plagiarism.

Late homework submissions are strongly discouraged because class activities and new assignments build on previous assignments. In the case of a late submission on the same day, 20% of the points earned from the submission will be deducted. After the due date, the late homework may be accepted, but with a 50% penalty. Once the grade is posted or a week has passed after the due date, whichever comes first, you will receive a 0 for the late assignment.

WORKLOAD

Learning programming is not something that you can put off until the night before the exam, and the programming knowledge is built only by spending enough time with hands-on exercises. Put in as much time as necessary to get familiar with tools and programming skills in order to succeed in this class. I expect that you will spend **6 hours per week** on average outside of class time for assigned readings, Datacamp assignments, discussions in Piazza, and exam preparations.

The class materials and resources are given for your active learning of R and Python. However, you are strongly encouraged to post questions and answers in Piazza to create an effective collaborative learning environment. I will be using the class time mostly to fill in any gaps that may not be addressed with the class discussions. Class participation is thus very important and will be counted toward your grade.

ATTENDANCE AND CLASS PARTICIPATION

Students are expected to attend every class and remain in class for the duration of the session. Failure to attend class or arriving late may impact your ability to achieve course objectives which could affect your course grade. An absence, excused or unexcused, does not relieve a student of any course requirement. Regular class attendance is a student's obligation, as is a responsibility for all the work of class meetings, including tests and written tasks. Any unexcused absence or excessive tardiness may result in a loss of participation points.

This course uses Canvas and other online learning supporting systems, which provides the instructor with analytics and data on student engagement with the Canvas page, including page views, participation, submissions, timeliness, etc. I will be monitoring student activities on Canvas to ensure successful engagement and participation in the course. If I notice that a student's activities on Canvas indicate issues with pedagogically appropriate engagement, I may reach out to the student to discuss improving course engagement and participation.

COVID-19 related absences

For absences related to COVID-19, please adhere to the following:

Complete your [Niner Health Check](#) each morning.

If you are sick: If you test positive or are evaluated by a healthcare provider for symptoms of COVID-19, indicate so on your Niner Health Check to alert the University. Representatives from Emergency Management and/or the Student Health Center will follow up with you as necessary. Submit a copy of your Niner Health Check notification email to your instructors.

If you have been exposed to COVID-19 positive individuals and/or have been notified to self-quarantine due to exposure, indicate so on your Niner Health Check to alert the University. Representatives from Emergency Management and/or the Student Health Center will follow up with you as necessary. Submit a copy of your Niner Health Check notification email to your instructors.

If you are absent from class as a result of a COVID-19 diagnosis or quarantine, as instructor I will do the following to help you continue to make progress in the course:

- Extend the deadline of assignment and provide make-up exam on a case-by-case basis.
- Give a high priority when schedule meetings during office hours.

The final decision for approval of all absences and missed work is determined by the instructor.

CLASS CONDUCT

I will take very seriously any distraction caused by violating the above policies. Any member of the class should feel free to let me know if any behavior of fellow student(s) is distracting her/his learning experience. Such complaints will be treated as confidential but will help me to take appropriate action to provide a positive learning environment in the class.

Since it is my responsibility to provide an environment that is conducive to learning for everyone in the class, **I will deduct all participation points from the grade of any student who chooses to repeatedly distract others or create other disruptions. In particularly egregious cases, I will have the student permanently removed from the class and deduct up to a maximum of 15% of the final grade. To attend or not to attend is your decision to make, but once you decide to attend my class, you should refrain from any disruptive behavior during the class.**

Additional Policies for online instructions
During the Zoom sessions, all students will be required to turn on their webcams. Video backgrounds must be neutral, and cameras should be positioned in a manner that prevents the introduction of distracting objects, messages, symbols, or other people. Alternatively, students may choose to blur their background, utilize one of the default Zoom virtual backgrounds, or use one of the UNC Charlotte branded backgrounds. Students who do not abide by this policy will be removed from the Zoom

session [and counted absent or receive a reduction in their participation grade] and will be referred for potential disciplinary action under the Code of Student Responsibility.

Some class sessions will all be audio- and/or video-recorded for the purposes of student-participant reference. All recordings posted on Canvas will be without gallery views, and thus *voice recordings with shared screen* will be available for reviews. Student consent to being recorded during class is a condition of class participation. If you do not consent to being recorded during class, you will need to deactivate your video camera, keep your mute button activated, and participate only via the chat feature, but please note that such actions may have a negative impact on any portion of your grade that is based on class participation. Students are not permitted to make their own recordings of class sessions or to share or distribute University recordings of class sessions. NOTE: Students with specific electronic recording accommodations authorized by the Office of Disability Services may record classes; however, the instructor must be notified of any such accommodation prior to recording. Any distribution of such recordings is prohibited.

ACADEMIC INTEGRITY

THE UNC CHARLOTTE CODE OF STUDENT ACADEMIC INTEGRITY governs the responsibility of students to maintain integrity in academic work, defines violations of the standards, describes procedures for handling alleged violations of the standards, and lists the applicable penalties. The following is a list of prohibited conduct in that *Code* as violating these standards: A) Cheating; B) Fabrication and Falsification; C) Multiple Submission; D) Plagiarism; E) Abuse of Academic Materials; and F) Complicity in Academic Dishonesty. For more detail and clarification on these items and academic integrity, students are strongly advised to read the current "UNCC undergraduate and graduate catalog."

INCOMPLETE GRADE POLICY

The incomplete is not based solely on a student's failure to complete work or as a means of raising his/her grade by doing additional work after the grade report time. An incomplete grade can be given when a student has a serious medical problem or other extenuating circumstance that legitimately prevents completion of required work by the due date. In any cases, the student's work to date should be passing, and the student should provide proper written proof (e.g., a doctor's note), in order to get an 'I' grade.

DISABILITY ACCOMMODATIONS

UNC Charlotte is committed to access to education. If you have a disability and need academic accommodations, please provide a letter of accommodation from Disability Services early in the semester. For more information on accommodations, contact the Office of Disability Services at 704-687-0040 or visit their office in Fretwell 230.

COURSE SCHEDULE

The Instructor reserves the right to change the course contents and schedule. The up-to-date course schedule is available on **Canvas**. Important announcements, specific policies regarding exams, etc. are also available on Canvas. It is the student's responsibility to be aware of any changes in the course schedule, course contents, and course policies by visiting Canvas regularly.

Tentative Course Schedule

Class	Topic
1/20	Course Overview
1/25	Introduction to R, R-Studio and Software Setup
1/27,2/1, 2/3	Data Representations in R (Vectors, Strings, Factors, & Data Frames)
2/15, 2/17	Reading Data from Files
2/22, 2/24	Data Selection and Slicing in R
3/1, 3/3	Data Cleaning and Preparation in R
3/8, 3/10	Data Visualization in R
3/15	R Recap
3/17	Exam 1
3/22	Introduction to Python, Jupyter and Software Setup
3/24, 3/29	Python Variables and Data Structures (Scalar variables, Tuples, Lists, and Dictionaries)
3/31	Python Functions
4/5	Python NumPy Package
4/7	Python Pandas and Data Frames
4/12	Reading Data from Files
4/14, 4/19	Data Selection and Slicing in Python Pandas
4/21, 4/26	Data Cleaning and Preparation in Python
4/28	Data Visualization in Python
5/3	Python Recap
5/5	Exam 2
5/12	Optional Final Exam (can replace Exam 1 or Exam 2), **11 am – 1:30 pm**

The Belk College of Business strives to create an inclusive academic climate in which the dignity of all individuals is respected and maintained. Therefore, we celebrate diversity that includes, but is not limited to ability/disability, age, culture, ethnicity, gender, language, race, religion, sexual orientation, and socio-economic status.