Class Website: Canvas will be the website for course information and primary communication channel for this class. Go to http://canvas.uncc.edu and login with your ninernet credentials.

Instructor: Dr. C. Subramaniam
Office: 266-B Friday building (second floor)
Phone: 704-687-7604
Email: csubrama@uncc.edu

Class time: TR 2.30pm-3.45pm
Classroom: 280 Friday (second floor), unless indicated otherwise by instructor
Office hours: T 1.00-2.00pm; R 4.00-4.30pm; By appointment at other times (all office hours are conducted online, as explained later in the syllabus)

Important Information & Policies for Fall 2020 semester

Niner Nation Cares: All students must follow the updates and instructions related to Fall semester reopening posted on http://ninernationcares.uncc.edu and https://ninernationcares.uncc.edu/students. For your own health and safety and that of your friends and families, make sure to adhere to the health and safety guidelines posted on the above links. Please do not treat these guidelines lightly.

Remote sessions: The classes from September 7 until October 1 will be held online. You must join the class online via the zoom links posted on Canvas for the classes during the above period.

Face coverings in classrooms and labs: It is the policy of UNC Charlotte for the Fall 2020 semester that as a condition of on-campus enrollment, all students are required to engage in safe behaviors to avoid the spread of COVID-19 in the 49er community. Such behaviors specifically include the requirement that all students properly wear CDC-compliant face coverings while in buildings including in classrooms and labs. Students are permitted to remove face coverings in classroom or lab settings only when I explicitly grant permission to do so (such as while asking a question, participating in class discussion, or giving a presentation) and while at an appropriate physical distance from others. Failure to comply with this policy in the classroom or lab may result in dismissal from the current class session. If the student refuses to leave the classroom or lab after being dismissed, the student may be referred to the Office of Student Conduct and Academic Integrity for charges under the Code of Student Responsibility.

1 This syllabus may be subject to minor changes during the semester after adequate advance notice to students.
**Absenteeism during Covid-19:** Students are expected to attend every class and remain in class for the duration of the session when it is safe to do so in accordance with university guidance regarding COVID-19. 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.

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

- **Do not come to class if you are sick.** Please protect your health and the health of others by staying home. Contact your healthcare provider if you believe you are ill.
- **If you are sick:** If you test positive or are evaluated by a healthcare provider for symptoms of COVID-19, [complete this form](#) to alert the University. Representatives from Emergency Management and/or the Student Health Center will follow up with you as necessary, and your instructors will be notified.
- **If you have been exposed** to COVID-19 positive individuals and/or have been notified to self-quarantine due to exposure, [complete this form](#) to alert the University. Representatives from Emergency Management and/or the Student Health Center will follow up with you as necessary, and your instructors will be notified.

To return to class after being absent due to a COVID-19 diagnosis or due to a period of self-quarantine, students should submit an [online request form](#) to Student Assistance and Support Services (SASS). Supporting documentation can be attached directly to the request form and should be from a student's health care provider or the Student Health Center, clearly indicating the dates of absences and the date the student is able to return to class. Instructors will be notified of such absences.

If you are absent from class as a result of a COVID-19 diagnosis or quarantine, please notify your instructor immediately and seek instructions to help you continue to make progress in the course. The specific instructions for this situation will be provided on a case-by-case basis. The final decision for approval of all absences and missed work is determined by the instructor.

**Laptop requirement:** All upper-level business students, which includes all students in this class, are required to have their own personal laptop computer. The policy and the minimum system requirements are found at the link [https://belcollege.uncc.edu/laptop-policy](https://belcollege.uncc.edu/laptop-policy). In particular, students in INFO 3221 must have working webcam and microphone in their laptop.

**Student Support:** The details of student support resources available are provided at the following links.

- **Academic support:** [https://ninernationcares.uncc.edu/students/academic-support](https://ninernationcares.uncc.edu/students/academic-support)
- **Health support:** [https://ninernationcares.uncc.edu/health-support-services](https://ninernationcares.uncc.edu/health-support-services)
Syllabus and Class Expectations

Catalog 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

Course Materials & Software

1. Course materials: There are no required text books 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. You can print the posted material and bring them to class. Please note that I will not provide printed copies of any of the posted materials.

2. Hardware: During in-person class sessions, you can use the computers in the classroom (280 Friday building) or your laptop. You are also expected to have access to a personal computer/laptop outside of class in order to work your practice problems and assignments. Your personal computer/laptop should be capable of installing and running R, R-Studio, and Anaconda Navigator.

3. Software: This class will use R & R-Studio for R and Jupyter Notebook for Python. The above software are installed in the computer labs in the Friday building. Please check for the availability of the relevant software if planning to work on campus computer labs outside of the Friday building. Pursuant to the “laptop requirement policy”, install the above software on your laptop using instructions posted on Canvas. You must have R & R-Studio installed before the first class (i.e., Sep 8th)
Office hours: In Fall semester, office hours and one-on-one meetings will be held online via zoom. During the scheduled open office hours, appropriate zoom link will be posted on Canvas. Click the link to enter the virtual office, and your instructor will allow you in in the order of the students who have entered. If you like to set up an appointment outside of the scheduled office hours, email your instructor giving your availability and the instructor will setup a zoom link for you to join at the agreed meeting time.

Grading

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
<th>Group/Individual</th>
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</thead>
<tbody>
<tr>
<td>2 Exams</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exam 1</td>
<td>250</td>
<td>Individual</td>
</tr>
<tr>
<td>Exam 2</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>Comprehensive Optional Final Exam (can replace Exam 1 or Exam 2)</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>Homework &amp; In-class Assignments</td>
<td>300</td>
<td>Individual</td>
</tr>
<tr>
<td>Quizzes</td>
<td>100</td>
<td>Individual</td>
</tr>
<tr>
<td>Attendance &amp; class participation</td>
<td>100</td>
<td>Individual</td>
</tr>
<tr>
<td>Total</td>
<td>1000</td>
<td></td>
</tr>
</tbody>
</table>

A: >= 900; B: >= 800 and < 900; C: >= 700 and < 800; D: >= 600 and < 700; F: < 600

Exams
The exams may be online or in-person in the lab. The exams are closed-book and closed-notes, unless permitted otherwise by the instructor. The exams mostly include problem solving with R and Python. All exam grades will be posted on Canvas. The instructor will not discuss exam solutions in class. However, students can review their exams individually during office hours or by appointment. Students who like to review their exams should do so 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. No makeup exam will be given after Dec 3rd, 2020.
Assignments and quizzes
During the semester, the instructor will give various assignments. Some of these assignments are required to be completed by the end of the class period (in-class assignments), while other assignments are completed at home (homework assignments). In addition, the instructor may give quizzes on topic that have been completed prior to that class. During every class, all students should have practiced and be prepared to answer any questions on materials covered prior to that class. There is no make up for any missed quiz or in-class assignment, irrespective of the reason for a student missing the assignment. Instead, you will be allowed to drop one quiz or one in-class assignment from all the quizzes and in-class assignments given throughout the semester and it could be the one that is missed or with lowest grade.

Attendance
Regular attendance is necessary for doing well in this course. It has been my observation that students who miss more than 3 classes are most likely to end up with a failing grade in this class. However, when you attend class, it is important to not arrive late or leave early as it is very, very disruptive. You are responsible for completing the work from all of the class meetings. You are responsible for any material covered, announcements made, assignments distributed, and any other type of work you may miss during any absence from class. The exams may contain material discussed in the class but not posted on Canvas.

The Covid-19 absenteeism policy is described on pages 1 & 2. Attendance will be taken at random in class (at any time during class hours) and will count towards your attendance and participation grade. For online class sessions, you are expected to be present throughout the entire class duration, unless dismissed early by the instructor. Any partial presence will be counted as absence for that day. Attendance will also be an important factor in making borderline grade decisions. Besides, there are a number of good reasons to attend all classes:
- some topics discussed in the class are not covered adequately in the posted materials and the instructor may present alternative explanations.
- historically, those who skip the class tend to make less than their target grades.
- instructor may refuse to answer questions already covered in class but missed due to absenteeism. A student who misses a class is responsible for obtaining any needed information (e.g., notes, announcements) from fellow students.

Tardiness or early departure (whether in in-person or online class) is highly disruptive and is strongly discouraged in my class. Recurrence of such disruptive behavior will be noted and will lead to deduction of significant grade points and the student being asked to leave the class.

Class conduct
Disruptive behavior in class distracts from the ability of others to benefit from their in-class experience. Such disruptive behavior includes arriving late, leaving early, using cell-phone/smartphones during class time without the instructor’s explicit permission, surfing the net during the class, side conversations between two or more students during lecture, unnecessary comments that add no value to class, and any activity that negatively impacts the ability of other students to learn and/or follow in class. Such behavior will be considered
inappropriate and **will not be tolerated**. Since it is my responsibility to provide an environment that is conducive to learning for everyone in the class, I will deduct points from the grade of any student who chooses to repeatedly engage in disruptive behavior. In particularly egregious and/or recurrent cases, I will have the student permanently removed from the class.

Please avoid spending class time working on assignments for other classes, checking e-mail, surfing the Web, or printing out homework. Repeated engagement in such behavior will be reflected in lower grades and may lead to removal from the class.

When class is conducted online (via zoom), the instructor will decide if the entire class or a subsection of the class has to turn on the webcam. The instructor may also ask you questions to be answered by you through your mic. So, make sure the webcam and mic are working during online classes. Inability to turn on webcam and/or mic will be considered as non-participation and appropriate non-participation penalty will be applied.

**DO NOT JOIN ONLINE CLASSES WHILE DRIVING. IT IS ABSOLUTELY UNSAFE & UNWISE.**

**Online Exam or Quiz:**
When an exam or quiz is conducted online, the instructor will ask you 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.

**Electronic Devices in Class**
Students are permitted to use laptops or tablets during class for note-taking and other class-related work only, but this should be done without distracting other students and without distracting you from the topic of discussion. Those using these devices during class for work not related to this class must leave the classroom for the remainder of the class period.

Cellular phones MUST BE TURNED OFF/SILENCED DURING CLASS and students are strongly discouraged from checking their cell-phone messages when the class is in progress. Use of instant messaging, email or other communication technologies during class time will be considered disruptive. Calculators and computers are not allowed during examinations and quizzes, unless specifically allowed by the instructor.

*I will take very seriously any disruptive behavior in my class. Students in my class should feel free to let me know if any electronic device usage 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 actions to make sure that such distractions are eliminated and there is a positive learning environment in the class.*

Students violating the electronic devices policies will be marked for disruptive behavior and may be asked to leave the class. Their grade will also be affected according to the rules of class conduct.
Due dates for submitting work
Students are expected to complete homework assignments and submit by the specified
deadline. Late homework submission is allowed for 24 hours beyond the scheduled deadline,
but will incur a 25% penalty. After that period, your homework will not be accepted, and you
will receive a 0 for that assignment. **No exceptions will be made.** If you know you will miss
class, make arrangements to turn in your work ahead of time. All quizzes and in-class
assignments must be submitted before the specified deadline. Any late submission of quiz or
in-class assignment will receive a 0.

Quality of Work
The expectation is that all your submitted work will be of **professional quality** both in terms of
content and presentation. All files submitted for grading should be named as specified in the
assignment. When the naming is not explicitly specified, name your work as your
ninerusername and the assignment number. Any descriptive work should be clearly marked
with a title and name of student responsible for the work. The question being answered should
be spelled out or identified so the instructor knows what is being answered. Work submitted
online must have all files named appropriately so that the instructor can easily know who
submitted the file and what it contains. The instructor will not spend time going through all
your files in order to find your submitted work. Work that does not have proper identifications
as described above will automatically get a deduction of 20% of the assigned grade for that
work.

Instructor’s help for homework and project
As you practice various sample problems in this class, you will invariably encounter programs
that do not work. It is your responsibility to pay attention to discussions in class related to
debugging. If you are not able to identify the errors when practicing the sample problems, I will
be happy to go through your work with you and help you identify the problems. I can provide
any amount of help with the examples and practice problems. But, **I cannot provide any help
with your homework assignments or exam work**, if you face any problems. **Specifically, I cannot
take a look at your homework before the submission deadline in order to identify/correct
bugs/errors or to judge how well the work meets the requirements.** If you follow the materials
covered in class and work on the practice problems, you should know what is expected in the
assignments and exams. Clarifications related to any typo or ambiguity in the problem
description are the only things answered by the instructor.

Grade Appeals
If you believe that the grade you received on an assignment, exam or other graded course
component was in error or unfair, **you can appeal to the instructor in writing within 3 calendar
days of the receipt of your grade.** The appeal should clearly state the reasons why you believe
the grade to be unfair or the nature of the error. Overdue appeals will not be considered
beyond the 3 days or late in the semester.

Incomplete grade policy
An “incomplete” grade is not based on a student’s failure to complete a given 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 only when a student has been progressing satisfactorily in the class, but has encountered a serious medical problem or other extenuating circumstance that legitimately prevents completion of the semester. In any case, the student's work to date, and before the interruption, should be passing, and the student should provide proper documentation (e.g., a doctor's note), in order to get an 'I' grade.

**Exam Ownership**
Exams take many hours to prepare and, as a form of intellectual property, belong to those who create them (your professors). Consequently, exams and solutions will NOT be shared with students in-person or electronically. Students are encouraged to review their exams during office hours or by appointment for study purposes. However, failure to return an exam after reviewing it or removing an exam from my presence at any time will be considered theft of intellectual property. Such action will result in an exam grade of zero and may warrant further disciplinary action.

**Civility**
The University strives to create an inclusive academic climate in which the dignity of all individuals is respected and maintained. We celebrate diversity that is beneficial to both employers and society at large. Students are strongly encouraged to act appropriately when sharing their views in class discussions.

**Academic Integrity/Honesty**
Students have the responsibility to know and observe the requirements of The UNC Charlotte Code of Student Academic Integrity available online at http://legal.uncc.edu/policies/up-407. This code forbids cheating, fabrication or falsification of information, multiple submissions of academic work, plagiarism (which includes viewing others work without instructor permission), abuse of academic materials, and complicity in academic dishonesty. *This forbidding includes sharing/copying work between individuals or teams without permission of instructors.* Any special requirements or permission regarding academic integrity in this course will be stated by the instructor, and are binding on the students. Students who violate the code can be expelled from UNC Charlotte. The normal penalty for a first offense is zero credit on the work involving dishonesty and further substantial reduction of the course grade. In almost all cases the course grade is reduced to failing. Students are expected to report cases of academic dishonesty to the course instructor.

For this class, peer advice and interactions are allowed when discussing non-graded work. Each student, however, must develop her/his own solutions to any graded assignment or lab exercises. Students may not collaborate on graded assignments or lab exercises. Such collaborations, where not explicitly permitted by the instructor, constitutes cheating. A student may not use or copy (by any means) another's work (or portions of it) and represent it as his/her own. If you have questions about a graded assignment, contact your instructor or TA first, not other classmates.

If you do not have a copy of the Code of Student Academic Integrity, you can obtain one from the Office of the Dean of Students.
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 website at https://ds.uncc.edu/.

Accommodations for Religious Observances
UNC Charlotte provides reasonable accommodations, including a minimum of two excused absences each academic year, for religious observances required by a student’s religious practice or belief. Please refer to https://legal.uncc.edu/policies/up-409 for details on requesting such accommodations.

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.

Tentative Schedule Next 2 Pages
# Tentative Schedule (updated 8/25/2020)

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>9/8</strong></td>
<td>Course Overview</td>
</tr>
<tr>
<td><strong>9/10</strong></td>
<td>Introduction to R, R-Studio and Software Setup</td>
</tr>
<tr>
<td><strong>9/15</strong></td>
<td>R - Data Representations &amp; Operations</td>
</tr>
<tr>
<td><strong>9/17</strong></td>
<td>R - Data Representations &amp; Operations</td>
</tr>
<tr>
<td><strong>9/22</strong></td>
<td>R - Data Representations &amp; Operations</td>
</tr>
<tr>
<td><strong>9/24</strong></td>
<td>R – Data Selection and Slicing</td>
</tr>
<tr>
<td><strong>9/29</strong></td>
<td><strong>Student move-in – No class</strong></td>
</tr>
<tr>
<td><strong>10/1</strong></td>
<td>R – Data Selection and Slicing</td>
</tr>
</tbody>
</table>

**Sessions 9/8 thru 10/1 are online; Zoom links are posted on Canvas**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td><strong>10/6</strong></td>
<td>R – Data Selection and Slicing with dplyr package</td>
</tr>
<tr>
<td><strong>10/8</strong></td>
<td>R – Data Selection and Slicing with dplyr package</td>
</tr>
<tr>
<td><strong>10/13</strong></td>
<td>R – Data Cleaning and Missing values</td>
</tr>
<tr>
<td><strong>10/15</strong></td>
<td>R – Data Visualization with ggplot package</td>
</tr>
<tr>
<td><strong>10/20</strong></td>
<td>R - Catch-up and review</td>
</tr>
<tr>
<td><strong>10/22</strong></td>
<td><strong>Exam 1</strong></td>
</tr>
<tr>
<td><strong>10/27</strong></td>
<td>Introduction to Python, Jupyter and Software Setup</td>
</tr>
<tr>
<td><strong>10/29</strong></td>
<td>Python - Variables and Data Structures</td>
</tr>
<tr>
<td><strong>11/3</strong></td>
<td>Python - Variables and Data Structures</td>
</tr>
</tbody>
</table>

**Sessions 10/6 thru end of semester are in-person in lab 280 Friday**
<table>
<thead>
<tr>
<th>Date</th>
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<tbody>
<tr>
<td>11/5</td>
<td>Python - Programming &amp; Functions</td>
</tr>
<tr>
<td>11/10</td>
<td>Python - Programming &amp; Functions</td>
</tr>
<tr>
<td>11/12</td>
<td>Python - Programming &amp; Functions</td>
</tr>
<tr>
<td>11/17</td>
<td>Python - Pandas and Data Frames</td>
</tr>
<tr>
<td>11/19</td>
<td>Python - Pandas and Data Frames</td>
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<tr>
<td>11/24</td>
<td>Python - Pandas Data Selection and Slicing</td>
</tr>
<tr>
<td>11/26</td>
<td>Thanksgiving break – No class</td>
</tr>
<tr>
<td>12/1</td>
<td>Python - Pandas Data Selection and Slicing</td>
</tr>
<tr>
<td>12/3</td>
<td>Python - Pandas Data Selection and Slicing</td>
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<tr>
<td>12/8</td>
<td>Python - Data Cleaning and Missing Values</td>
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<td>Python - Catchup and Review</td>
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<tr>
<td>12/15</td>
<td>Exam 2</td>
</tr>
<tr>
<td>TBD</td>
<td>Optional Final Exam</td>
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Have a wonderful and safe semester at UNCC.