**Foundations of Analytics with R**

MET CS544

Learn from Anywhere Course Format, Offered Simultaneously On Campus and Remote

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Office hours: by appointment

Class location: EPC, 204

Capacity of classroom for in person: 24

**Course Description**

The goal of this course is to provide students with the mathematical and practical background required in the field of data analytics. Starting with an introduction to probability and statistics, the R tool is introduced for statistical computing and graphics. Different types of data are investigated along with data summarization techniques and plotting methods. Data populations using discrete, continuous, and multivariate distributions are explored. Sampling methods and errors during measurements and computations are analyzed in the course. String manipulations and data wrangling methods are examined in detail. The concepts covered in the course are demonstrated using R.

**Text Book**

* "Introduction to Probability and Statistics Using R", by G. Jay Kerns, 2010. ISBN13: 978-0-557-24979-4. (Reference book)

<https://github.com/gjkerns/IPSUR/blob/master/IPSUR.pdf>

**Additional Reference Books**

* "Using R for Introductory Statistics, 2nd edition", by John Verzani, CRC Press, 2014. ISBN13: 978- 1466590731. (Reference book)
* "R for Everyone: Advanced Analytics and Graphics, 2nd Edition", by Jared P. Lander, Addison-Wesley Professional, 2017. ISBN13: 978-0134546926. (Reference book)

**Courseware**

List course website (Blackboard, CourseInfo, or other), as well as any web links that will be necessary for the class.

**Fall 2020 COVID-19 Policies**

**Classroom Rotations:** Classrooms on campus have new capacities that follow guidelines issued by state and local health and government authorities related to COVID-19 and physical distancing. Before the beginning of the class, and throughout the semester, I will be reaching out to students who have indicated that they want to attend the classroom in-person. Our classroom hold 24 students. At this moment there is no need for rotations of students that come to class on campus, but I will let you know if anything changes. In the case rotating students, you will be asked to attend remotely on the week that you have rotated out the classroom.

**Compliance:** All students returning to campus will be required, through a digital agreement, to commit to a set of [Health Commitments and Expectations](http://www.bu.edu/dos/policies/lifebook/covid-19-policies-for-students/) including face coverings, symptom attestation, testing, contact tracing, quarantine, and isolation. The agreement makes clear that compliance is a condition of being a member of our on-campus community.

You have a critical role to play in minimizing transmission of COVID-19 within the University community, so the University is requiring that you make your own health and safety commitments. Additionally, if you will be attending this class in person, you will be asked to show your [Healthway](https://www.bu.edu/healthway/) badge on your mobile device to the instructor in the classroom prior to starting class, and wear your face mask over your mouth and nose at all times. If you do not comply with these rules you will be asked to leave the classroom. If you refuse to leave the class, the instructor will inform the class that they will not proceed with instruction until you leave the room. If you still refuse to leave the room, the instructor will dismiss the class and will contact the academic Dean’s office for follow up.

Boston University is committed to offering the best learning environment for you, but to succeed, we need your help. We all must be responsible and respectful. If you do not want to follow these guidelines, you must participate in class remotely, so that you do not put your classmates or others at undue risk. We are counting on all members of our community to be courteous and collegial, whether they are with classmates and colleagues on campus, in the classroom, or engaging with us remotely, as we work together this fall semester.

**Class Policies**

1. **Assignment Completion & Late Work** – all the assignment has to be submitted in person or electronically (e.g. email). No late work will be acceptable.
2. **Academic Conduct Code** – Cheating and plagiarism will not be tolerated in any Metropolitan College course. They will result in no credit for the assignment or examination and may lead to disciplinary actions. Please take the time to review the Student Academic Conduct Code:

<http://www.bu.edu/met/metropolitan_college_people/student/resources/conduct/code.html>.

**Grading Criteria**

The course grade will be based on

* Active class participation (10%)
* Quizzes (20%)
* Assignments (20%)
* Final project (20%)
* and final exam (30%)

Assignments are expected to be submitted by their respective due dates. Late submissions are not accepted.

**Class Meetings, Lectures & Assignments**

*Lectures, Readings, and Assignments subject to change, and will be announced in class as applicable within a reasonable time frame.*

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| **Date** | **Topic** | **Readings Due** | **Assignments Due** |
| Module 1 | Introduction to statistics and probability  |  |  |
| Module 2 | Conditional ProbabilityRandom Variables |  |  |
| Module 3 | Data Desciption |  |  |
| Module 4 | Discrete and Continuous distributions |  |  |
| Module 5 | Multivariate distributions |  |  |
| Module 6 | Central limit theoremSampling techniquesResampling methods |  |  |
| Module 7 | Estimation and Regression |  |  |