Data Programming in R | MSCI:6060 | Summer 2019

Course Instructor
Samuel Burer
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Office Hours: By appointment or via email

Class Meeting Times. This course will meet online via Zoom (Virtual Classroom) on most Wednesdays from 7:00-9:00 PM. See *Course Summary* below for details

Prerequisites. (none)

Required Text. (none)

Optional Texts. R for Data Science, R for Everyone, and Art of R Programming. The third book is available for free in digital form from the UI Libraries.

Course Academic Home
Department of Management Sciences
DEO: Barrett Thomas
Phone: (319) 335-0938
Email: barrett-thomas@uiowa.edu

Program Goals. The administrative home of this course is the Business Analytics Graduate Program within the Department of Management Sciences in the Tippie College of Business, which governs academic matters relating to the course. This program has learning goals that drive decisions about curriculum and assignments within its courses. These goals are that graduates will: (1) exhibit knowledge and skills relevant to data and its application in business; (2) create and communicate solutions to data-related business problems that impact their organizations and communities; (3) understand and contemplate ethical and privacy issues arising in their own work; (4) demonstrate the ability to be effective team members in a diverse and complex world.

Course Description and Goals. This course introduces the principles and practices of computer programming that are applicable to software development in any programming language, but the course places a special emphasis on techniques and tools useful for data scientists. Accordingly, the main programming environment for the course will be the open-source R environment using RStudio. The main topics include:

- Introduction to R and RStudio
- Basics of Data Frames

- Debugging
- Data Transformation and Cleaning
- Summary Tables
- Graphics
- External Data Sources
- Dynamic Reports and Web Apps
- Intermediate Data Types
- Control Logic
- Functions
- Error Handling

Course activities will include formal and active-learning lectures, individual and group in-class exercises, individual homeworks, individual tests, and a group project. In addition, students are expected to prepare ahead of time for each class meeting.

Media/System Requirements and Textbooks/Materials. Each student should have access to a laptop computer (any modern operating system should be fine) which they can bring to each class and on which they are allowed to install open-source software downloaded from the Internet. There are no required texts for the course, but some optional texts are listed above. The Internet is also a rich resource for the course. In addition, the course web site will be hosted on the university ICON server listed above. Please check the web site frequently for announcements, assignments, etc.

Grading Criteria and Coursework. The coursework breakdown is shown along with this syllabus on ICON. Final grades will be assigned according to the following planned curve (however, the professor reserves the right to deviate from this curve if deemed necessary):

- A range: $\geq 50\%$ of students
- B range: $\geq 45\%$ of students
- C range: $< 5\%$ of students
- D, F: as needed

In addition, the A range and B range will be equally divided into +/- designations.

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The following are *Course-Specific Policies and Guidelines*.

Late Assignments and Make-Up Exams. All assignments are expected on time. You may turn in an assignment late, but you will receive a 10% deduction for each day that it is late, including the first day.

Expectations of Student Academic Integrity. Because I regard this class as any job responsibility, it seems prudent to clarify in advance the policy on academic integrity. Given the professional nature of the Business Analytics program, it is unlikely that a student in this class would turn in work which is not his or her own. However, if I determine that any assignment, project,

paper or test was not written solely by the student(s) whose name(s) appears on the project, or material taken from other sources is not appropriately cited, the student(s) involved will not pass this course and may be subject to program-level discipline.

The administrative home of this course is the Tippie College of Business, which governs academic matters relating to the course such as the add/drop deadlines, the second-grade-only option, issues concerning academic misconduct, and how credits are applied for various graduation requirements. Different colleges might have different policies. As a registered student in a course in the Tippie College of Business, you are responsible for the *Collegiate Policies and Guidelines* listed below.

Please also note that students of this program are subject to the policies, procedures, and requirements of the Graduate College and the University of Iowa. For additional details, students should consult: the Manual of Rules and Regulations of the Graduate College, applicable sections of the University of Iowa Catalog, and Policies and Regulations Affecting Students.

Tippie Honor Code. The Tippie College of Business has an Honor Code, and you must abide by it in completion of all assignments. Integrity is a reflection of your character and is critical for creating meaningful and lasting relationships. One part of integrity is abstaining from acts like cheating, so cheating on any assignment in this class will result in an appropriate consequence, usually a zero for the grade in question and, if that penalty does not reduce the grade, a penalty of a full letter grade reduction. In addition, all incidents of cheating will be reported to the appropriate academic offices, and the student may be placed on disciplinary probation, be suspended, or even permanently expelled, depending on the severity of the offense.

If a student has been found in violation of this policy, they will first be notified directly, then I will report to the appropriate program office. Faculty and students can report Academic Misconduct via the college website.

Privacy As part of this course, your name will be revealed to other students in the class. If you have concerns, please contact me immediately.

Lecture Capture Policy. As a service to students, the program offers lecture capture of most of its courses. This allows students to access video and audio recordings of the class, after the class has been recorded. As a student, you can opt out of being visible in the recording. Unless otherwise noted, this course is being recorded, and will be available to all enrolled members of the class under a password protected website (the ICON course site). I may choose at various points (i.e. during exams or guest speakers) to not record the class.

Fairness and Freedom of Expression. Every student is entitled to the same intellectual freedom I have. I will respect that freedom, and I am obliged to

protect your freedom to learn, regardless of your religion, race, sex, sexual orientation, gender identity, or political views, or on your agreement or disagreement with my positions pertaining to matters of controversy within the discipline. I will do my best to provide you with a fair and impartial evaluation of your work, consistent with articulated standards for this course.

Complaint Procedures. If at any time you have concerns about this class or your performance in it, please contact me directly. If you do not feel that your concern has been resolved satisfactorily, you should contact the Department Executive Officer (DEO) who oversees the department offering this course (Barrett Thomas, 319-335-0938, barrett-thomas@uiowa.edu.

As a registered student in a course through the University of Iowa, the following *University Policies and Guidelines* apply to you.

Accommodations for Disabilities. The University is committed to providing an educational experience that is accessible to all students. If you have a diagnosed disability or any other condition that would impair your ability to complete the course requirements as stated above, please inform me as early in the semester as possible, but no later than two weeks prior to the scheduled activity. Students needing accommodations must register with Student Disability Services, (SDS): visit this page to obtain a Student Academic Accommodation Request (SAAR) form. The form will specify what course accommodations are reasonable for that student. The office is located at 3100 Burge Hall, 319-335-1462.

Mental Health. Students are encouraged to be mindful of their mental health and seek help if they are feeling overwhelmed or incapable of meeting course expectations. For assistance with the class, students are encouraged to talk to the faculty member. For additional advice or support, students are encouraged to contact University Counseling Services at University Capital Centre Suite 1950 or 3223 Westlawn South (319-335-7294) for same day appointments (Mon-Fri 8:00 AM-4:30 PM). After hours, we encourage you to call the Johnson County Crisis Line at 319-351-0140 or 911 if you are in immediate danger.

Sexual Harassment. Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. The University will not tolerate sexual harassment, nor will it tolerate unwelcomed behavior of a sexual nature toward members of the University community when that behavior creates an intimidating or hostile environment for employment, education, on-campus living, or participation in a University activity. As a member of the university community you have a responsibility to report concerns of sexual harassment immediately at the Office of the Sexual Misconduct Response Coordinator.

Multicultural Holidays. Students compelled by their religious convictions to refrain from attending class on specific days must request instructor permission during the first few days of the session. If this request is denied, a student may

address concerns according to University Procedures.

Sustainability. The University is committed to demonstrating sustainability practices within all facets of the institution. Students are encouraged to utilize recycled materials and use as few natural resources as possible (such as by making use of digital forms of note taking, as appropriate). Recycling of all paper materials is expected. Learn more at the Office of Sustainability.