Instructor: Wayne Stewart
Email: wayne.s.stewart@ou.edu
Office Hours: Tuesdays 1:00-2:00 CST or by appointment

COURSE DESCRIPTION
R is a free open source statistical programming language used by professionals in every field and industry. Advanced R will begin from where DSA 5011 Introduction to R left off which is essentially the tools necessary to make basic R functions. Most students should already appreciate the need to go further once basic procedural R and introductory functions have become common place to them. Students should already know how to make the common objects:

1. Data frames
2. Vectors
3. Matrices
4. Lists

And carry out basic arithmetic operations, use built in R functions such as plot, curve, summary etc.

COURSE GOALS & LEARNING OBJECTIVES
The following topics will be covered:

1. Names and values
   a. Binding
   b. Copy on modify
2. Vectors
   a. Atomic
   b. Lists
3. Subsetting
4. Control flow
5. Functions
6. Environments
7. Conditions
8. Functionals
9. Function factories
10. Function Operators
11. Object oriented programming (S3)
12. Advanced functions
13. Shiny server (dynamic and reactive)
14. R packages using roxygen2
   a. Vignettes
   b. Function help
   c. Data installation
   d. Demo
   e. Inst
LEARNING MANAGEMENT SYSTEM  https://Canvas.ou.edu

COURSE MEETING TIME & LOCATION
100% Online course

PREREQUISITES
Graduate standing in DSA/C S/ISE, Introduction to R (DSA 5011), or departmental permission.

REQUIRED TEXTBOOKS
In this next level of R I will be using a number of online resources including:
   i)  http://adv-r.had.co.nz/
   ii) https://bookdown.org/csgillespie/efficientR/
   iii) https://rstudio-education.github.io/hopr/
   iv) http://r-pkgs.had.co.nz/

The main resource would be the following book:

COURSE FORMAT
The course is delivered in an online format, consisting of lectures, demonstrations, quizzes, and mini projects.

UNIT QUIZZES
Students are responsible for all of the material covered from the readings, lectures, demonstrations, and any other assigned materials. Each unit features a short quiz. Each quiz is designed to check key points from the readings and videos, and to help you prepare for the unit project.

UNIT PROJECTS
Each unit will feature a mini-project. You will be required to integrate and/or apply the knowledge and skills you have previously developed in order to complete a small task.

EVALUATION
Individual grades in the course are determined by a combination of quizzes and projects. All grades will be in points. Total points in the course are distributed as shown below:

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Total points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quizzes</td>
<td>8 quizzes x 5 points each</td>
<td>40</td>
</tr>
<tr>
<td>Projects</td>
<td>8 projects x 10 points each</td>
<td>80</td>
</tr>
</tbody>
</table>

Total 120

Students must earn 90% or more of the total points to an “A” in this class, 80-89% to earn a “B,” 70-79% to earn a “C,” and 60-69% to earn a “D.”
<table>
<thead>
<tr>
<th>WEEK BEGINNING</th>
<th>TOPIC</th>
<th>DESCRIPTION</th>
</tr>
</thead>
</table>
| 3/9/2020       | 1     | 1. Names and values  
a. Binding  
b. Copy on modify |
| 3/16/2020      | 2     | 2. Vectors  
a. Atomic  
b. Lists |
| 3/23/2020      | 3-4   | Subsetting, Control Flow |
| 3/30/2020      | 5-6   | Environments, Functions |
| 4/6/2020       | 7-8   | Functionals, Conditionals |
| 4/13/2020      | 9-10  | Function Operators, Function Factories |
| 4/20/2020      | 11    | Object Oriented Programming (S3) |
| 4/27/2020      | 12-13 | Advanced Functions, Shiny Server |
| 5/4/2020       | 14    | R Packages using roxygen 2 |
LATE POLICY
All assignments will be considered late if not turned in when due, although assignments can be turned in early. Assignments submitted within five days after due date will get partial credit; however assignments submitted more than five days after due date will get 0 point for assignment.

COURSE POLICY ON ACADEMIC INTEGRITY
Cheating is strictly prohibited at the University of Oklahoma. As a member of the OU community it is your responsibility to protect your educational investment by knowing and following the rules. Should you see someone else engaging in this behavior, I encourage you to report it to myself or directly to the Office of Academic Integrity Programs. That student is devaluing not only their degree, but yours, too. Be aware that it is my professional obligation to report academic misconduct, which I will not hesitate to do. Sanctions for academic misconduct can include expulsion from the University and an F in this course, so don’t cheat. It’s simply not worth it. For specific definitions on what constitutes cheating, review the Student’s Guide to Academic Integrity at http://integrity.ou.edu/students_guide.html.

REASONABLE ACCOMMODATION POLICY
Students requiring academic accommodation should contact the Disability Resource Center for assistance at (405) 325-3852 or TDD: (405) 325-4173. For more information please see the Disability Resource Center website http://www.ou.edu/drc/home.html Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities.

RELIGIOUS OBSERVANCE
It is the policy of the University to excuse the absences of students that result from religious observances and to reschedule examinations and additional required classwork that may fall on religious holidays, without penalty.

TITLE IX RESOURCES AND REPORTING REQUIREMENT
For concerns regarding gender-based discrimination, sexual harassment, sexual misconduct, stalking, or intimate partner violence, the University offers a variety of resources, including advocates on call 24/7. To learn more or to report an incident, please contact the Sexual Misconduct Office at 405-325-2215 (8 to 5, M-F) or OU Advocates at 405-615-0013 (24/7). For more information, please see http://www.ou.edu/eoo.

ADJUSTMENTS FOR PREGNANCY/CHILDBIRTH RELATED ISSUES
Should you need adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact me or the Disability Resource Center at 405/325-3852 as soon as possible.
http://www.ou.edu/eoo/faqs/pregnancy-faqs.html