



OMGT 5653/GNEG 590V - Introduction to Analytics

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**Schedule:** Fall (8w1) 2019 Session – August 26<sup>th</sup> – October 15<sup>th</sup>, 2019

### **Instructor Response Times**

The best way to reach me is by email. I will respond to emails/questions within 24-36 hours. If you need to reach me immediately (such as during an exam), by all means please give me a call.

I try to grade assessments as soon as possible. Grades should be returned within 3 – 5 days after the due date, or before the next similar assignment.

### **Course Description**

Introduces data science and data analytics. Provides basic skill instruction in the statistical data analysis programming language R. Provides experience building and interpreting descriptive and predictive data analytics models. Provides practice communicating those results to senior stakeholders and decision makers.

Prerequisites: OMGT 4853 and OMGT 5003.

### **Course Goals/Objectives**

The goal of this course is to introduce students to data analytics. You will be programming in R. Upon completion of this course, students should be able to:

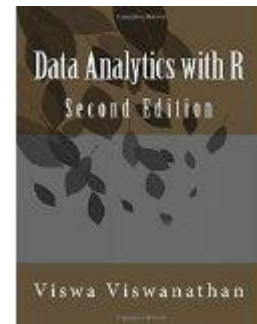
1. Demonstrate basic proficiency in the R programming language for statistical analysis.
2. Apply Affinity Analysis to analyze data to support decision-making.
3. Apply descriptive statistical and graphical displays of data to communicate results of data analytics to senior stakeholders and decision makers.
4. Apply classification methods such as K-Nearest Neighbors and Classification Trees to evaluate solutions to complex engineering problems.

5. Use Linear Regression to make statistical predictions to support decision-making.
6. Use the data reduction method of K-Means Analysis to select between solutions to complex engineering problems.
7. Develop executive summaries, oral presentations, and detailed technical reports to communicate results of data analytics to senior stakeholders and decision makers.

## Required Materials

### Textbook

Data Analytics with R, Second Edition. Viswa Viswanathan, Infivista Inc; 2nd edition (August 29, 2015) ISBN-13: 978-1941773024.



**Correct textbook must be ordered and in hand by the first day of class. Utilizing expedited shipping option may be required. Ensure you order the textbook with the correct ISBN. International or Flexible textbooks are not supported by the instructor. Failure to order the correct textbook in a timely manner will adversely affect your success and your grade in class.**

### Software

- The R programming language, as executed in RStudio in the University of Arkansas Virtual Lab (login and software access provided free with course registration.)
- Microsoft Excel 2013 or later (freely available to you with your enrollment at the University, from <https://techarticles.uark.edu/microsoft/office/>). Also available in the Virtual Lab, free with your course registration.)
- Word processing and presentation software that saves files in Microsoft Office formats such as:
  - [Microsoft Word](#) and [Microsoft PowerPoint](#) (also available in MS Office suites)
- Latest version of [Java](#) to use required applications

**Note:** R and RStudio are freely available and students are welcome to download and install them on their individual computers for convenience. However, we cannot provide technical support for individual installations. We can only help you with the R code you run in our Virtual Lab.

Check the [UA Computer Store](#) for student discounts on software.

## Activities and Assignments

| <b>Description</b>   | <b>Total Points</b> | <b>Percent of Grade</b> |
|--|---------------------|-------------------------|
| 7 Individual Activity Packs @ 25 points apiece. An Individual Activity Pack is one or more homework assignments in a bundle. | 175                 | 17.5%                   |
| 6 Team Activities @ 25 points apiece   | 150                 | 15.0%                   |
| Exam 1 (Weeks 1-4, given ~ Week 4)   | 300                 | 30.0%                   |
| Exam 2 (Weeks 5-8, given ~ Week 8)   | 375                 | 37.5%                   |
| <b>TOTAL</b>   | <b>1000</b>         | <b>100.0%</b>           |

## Grading

- ✓ A = 90-100%
- ✓ B = 80-89%
- ✓ C = 70-79%
- ✓ D = 60-69%
- ✓ F = < 60%

Grades of "I" are awarded for emergency situations ONLY as identified by the University Handbook. Hard copy documentation must be provided in such instances. Incomplete grades automatically turn into an "F" after a certain date. Consult the registrar's office for more information.

## Course Outline

| Week | Dates               | Subject   | Course Goals and Objectives | Assignments   |
|------|---------------------|---|-----------------------------|---|
| 1    | 8/26 – 9/1          | Introduction to R   | 1                           | Week 1 Individual Activity Pack (IAP)<br>Week 1 Team Assignment   |
| 2    | 9/2 – 9/8           | Affinity Analysis   | 2,7                         | Week 2 IAP<br>Week 2 Team Assignment                              |
| 3    | 9/9 – 9/15          | Descriptive and Graphical Displays  | 3,7                         | Week 3 IAP<br>Week 3 Team Assignment                              |
| 4    | 9/16 – 9/22         | Classification Methods: K-Nearest Neighbors (KNN)   | 4,7                         | IAP 4<br>(There is no Week 4 Team Assignment)<br><br>Midterm Exam |
| 5    | 9/23 – 9/29         | Classification Methods: Trees   | 4,7                         | Week 5 IAP<br>Week 5 Team Assignment                              |
| 6    | 9/30 – 10/6         | Linear Regression   | 5,7                         | Week 6 IAP<br>Week 6 Team Assignment                              |
| 7/8  | <b>10/7 – 10/13</b> | Data Reduction: K-Means Clustering  | 6,7                         | Week 7 IAP<br>Week 7 Team Assignment                              |
| 7/8  | <b>10/7 – 10/15</b> | Communicate results to stakeholders and management<br><br><b>Note there is overlap between Week 7 and Week 8.</b> | 7                           | Final Exam  |

## Policies

### Late Work Policy

Individual and Team Activities —if submitted late, the assignment score will include a late assignment deduction of 5 points for each day or part of a day the assignment is submitted past the due date/time. Please see end of term policy below.

Exams—no exams accepted after the exam due date.

### Attendance Policy

This is an asynchronous online course, which means there are no specific attendance hours, but you should budget approximately 10 hours per week to this course. You can structure your participation around your work and family obligations. Students are expected to submit weekly homework, participate fully in each weekly Team Activity, and take each of the two exams within the time window.

If you need to make up work due to unforeseen absences, please contact the professor.

### Academic Honesty

I am committed to the principle of academic honesty, and I expect each student in my class to maintain a high standard of academic integrity. My commitment to you, the student, is to provide a learning environment that promotes academic honesty in and out of the classroom.

"As a core part of its mission, the University of Arkansas provides students with the opportunity to further their educational goals through programs of study and research in an environment that promotes freedom of inquiry and academic responsibility. Accomplishing this mission is only possible when intellectual honesty and individual integrity prevail. Each University of Arkansas student is required to be familiar with and abide by the University's '[Academic Integrity Policy](#)' at [honesty.uark.edu](http://honesty.uark.edu). Students with questions about how these policies apply to a particular course or assignment should immediately contact their instructor."

Plagiarism is often misunderstood. It can be defined as submitting someone else's work as your own. It is not permissible to "cut and paste" and then just cite another's work. In writing for homework or projects, you should read and learn, process through your mind, relate ideas, and then express what you learned **in your own words**. Cite the references where you found your information. If you do use someone else's words, you must use quotation marks **and** cite. You should not overuse quotes – save them for a rare occurrence.

## Academic Appeals

Academic appeals: Students are first encouraged to resolve academic conflicts and complaints informally with the instructor involved, through their department, or through the assistance of the University Ombuds Office, which can provide objective and confidential mediation. To assist students in identifying the appropriate contact person, please view this [List of Program, Department, and College Contacts](#). A [flow chart](#) is also available for viewing. If an informal resolution cannot be reached, there are procedures for students to pursue with complaints of an academic nature. Refer to either the [Undergraduate Catalog of Studies](#) or the [Graduate Catalog of Studies](#) for appeals structures and formal procedures for academic grievances.

## Computer Access Policy

This course is offered as an online course and it is assumed that you have the minimum system requirements to participate (see the START HERE section of the course). It is your responsibility to ensure that you can access all course materials, participate in discussions and upload or download materials and software used for this course. In addition, care has been taken to ensure that the software that is used for this course does not require any out of the ordinary system set-ups. But, if your system does not meet the minimum requirements then it is your responsibility to maintain your system to meet the requirements so that you may participate in this course. Technical difficulties on your part will not excuse you from the timely completion of assignments. If you do experience technical difficulties, please make sure that you contact me immediately so that proper assistance might be provided.

## Netiquette

Netiquette is a set of rules for behaving properly online. It is important that all participants in online courses be aware of proper online behavior and respect each other.

Use appropriate language for an educational environment:

- Use complete sentences.
- Use proper spelling and grammar.
- Avoid idioms and slang.
- Do not use obscene or threatening language.

Remember that the university values diversity and encourages discourse. Be respectful of differences while engaging in online discussions. For more information about Netiquette, see [The Core Rules for Netiquette](#) by Virginia Shea.

## CAPS

Academic problems are often related to the non-academic events in your lives. You are welcome to visit with the capable staff at the UA Counseling and Psychological Services (with offices in the North Quadrangle). You can telephone them at 479-575-CAPS. The fact

that you telephone is also entirely confidential. Each semester they conduct a variety of support groups dealing with stressful issues.

#### Accommodations under the Americans with Disabilities Act

University of Arkansas Academic Policy Series 1520.10 requires that students with disabilities are provided reasonable accommodations to ensure their equal access to course content. If you have a documented disability and require accommodations, please contact me privately at the beginning of the semester to make arrangements for necessary classroom adjustments. Please note, you must first verify your eligibility for these through the Center for Educational Access (contact 479-575-3104 or visit [cea.uark.edu](http://cea.uark.edu) for more information on registration procedures).

#### Equal Treatment for All

The UA "Catalog of Studies" reports that the Campus Council supports equal treatment for all. It "does not condone discriminatory treatment of students or staff on the basis of age, disability, ethnic origin, marital status, race, religious commitment, sex, or sexual orientation in any of the activities conducted on this campus. Members of the faculty are requested to be sensitive to this issue when, for example, presenting lecture material, when assigning seating within the classroom, when selecting groups for laboratory experiments, and when assigning student work. The University faculty, administration, and staff are committed to provide an equal educational opportunity to all students."

Our class work will conform to the principle of equal treatment.

#### Inclement Weather or Technical Problems

Weather is unlikely to force cancellation of any online classes or activities. If a known weather event is approaching, it is good practice for students to turn in work early in case of local power outages

#### Caveat re: changes to syllabus

The above schedule and procedures in this course are subject to change at the discretion of the instructor.

Revised 4/29/2019