Marshall University
Syllabus

Course Title/Number	Multivariate Mathematical Statistics /STA 662/201/4999 (3CH)
Semester/Year	Spring 2018
Days/Time	TR, 09:30AM – 10:45AM
Location	SH 509
Instructor	Alfred Akinsete
Office	SH 524
Phone	304.696.6010
E-Mail	akinsete@marshall.edu
Office/Hours	11:00AM – 1:00PM on Tues. & Thurs. Any other time by appointment
University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to www.marshall.edu/academic-affairs, and clicking on "Marshall University Policies." Alternatively, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/policies. Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment. The policy on university-excused absences is provided at the bottom of the syllabus. For example, here is the policy concerning disability: Policy for Students with Disabilities: Marshall University is committed to equal opportunity education for all students, including those with physical, learning and psychological disabilities. University policy states that it is the responsibility of students with disabilities to contact the Office of Disability Services (ODS) in Prichard Hall 117 (304.696.2467) to provide documentation of their disability. Following this, the ODS Coordinator will send a letter to each of the student's instructors outlining the academic accommodation he/she will need to ensure equality in classroom experience, outside assignment, testing, and grading. The instructor and student will meet to discuss how the accommodation(s) requested will be provided. For more information, access the website for the Office of Disabled Student Services: http://www.marshall.edu/disabled.

Course Description: From Catalog, and Course Objectives

Description: The course centers on the theory and applications of multivariate statistical analysis. We assume that students are familiar with univariate statistical techniques, and in particular, methods based on the univariate normal distribution. Knowledge of matrix algebra is a prerequisite, although we shall review this in the earlier part of the course.

Objective: The focus of the course shall be in the mathematical development of the topics listed above with applications as necessary. At the end of this course, students should understand with adequate knowledge in

the following: Random vectors and matrices; characteristic roots and vectors; spectral and singular-value decomposition of matrices; sample geometry, and sampling distributions; various techniques used in multivariate normal distributions (MVN); estimation of mean vector; comparisons of several multivariate means; principle component analysis (PCA); factor analysis; canonical correlation analysis.

Required Texts, Additional Reading, and Other Materials

I will provide materials* that will be used in this class. However, you may, if you want, wish to consult any of the following (**Recommended) textbooks:
1. *Johnson, R. A. and Wichern, D. W. (2007). Applied Multivariate Statistical Analysis, 6th ed. Pearson Prentice Hall. ISBN: 978-0-13-187715-3.
2. Anderson, T. W. (2003). *An Introduction to Multivariate Statistical Analysis*, 3rd ed. John Wiley. New Jersey. ISBN: 978–0–471–36091–9
3. Hardle, W. K. and Simar, L., (2003)**. Applied Multivariate Statistical Analysis, 3rd ed. Springer. New York. ISBN: 978-3-642-17228-1

Grading Policy.

All tests will be given during the regular class sessions. For makeup tests, please see the university's policy on excused absences.

The final grade will be based on the following components:
1 Test	100 points (Thursday, March 8, 2018 – Week 9)
Homework Exercises	150 points
Project	100 points
Final Examination	150 points (Tuesday, May 1, 2018 @ 08:00AM – 10:00AM. Venue is SH 509)
Total	**500 points**

The semester grade will be based on the percentage of the 500 total possible points, using the following scale.

% Grade Range:
90 - < 100%   -- A, 80 - < 90%   -- B, 70 - < 80%   -- C, 60 - < 70%   -- D, 0 - < 60%   -- F

Course Requirements / Due Dates

1. Pre-requisite requirement: Grade C or better in MTH 546, or by permission.

2. Behavioral requirement: Students are advised to turn their cell phones and other voice generating devices off prior to entering the class. In the case where a student awaits any emergency call, the volume should be restricted and made personal. Please ensure that other students are respected.

3. Final Exam Day: Tuesday, May 1, 2018 @ 08:00AM – 10:00AM. Venue is SH 509.

Computer Requirements:

There are many statistical software, and you are free to use any that you are comfortable with. However, the R statistical package will be used extensively, after a thorough theoretical understanding of the outlined topics. You may wish to install this package on your laptop. Visit http://www.r-project.org/ or http://en.wikipedia.org/wiki/R for details on how to install the R package. A good introduction to R is available in the Help section after downloading and installing R. A pdf copy of this will be made available to you for reference.