MARSHALL UNIVERSITY
DEPARTMENT OF MATHEMATICS
STUDENT INFORMATION SHEET AND SYLLABUS

Course Title/Number	MTH 413/513 – Experimental Designs
Section	201
CRN	4083/4096
Semester/Year	Spring 2016
Days/Time	TR 12:30 - 1:45 PM
Location	WAEC 3121
Instructor	Dr. Avishek Mallick
Office	SH 741A
Phone ext.	3443
E-Mail	mallicka@marshall.edu
Office/Hours	MWF 10:30-11:30 AM TR 2:00 - 3:00 PM and 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 be going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/?page_id=802 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

Course Description and Objectives

This course covers topics in ANOVA, randomized block design, Latin square design, factorial and fractional factorial designs, and response surface methods.

The principle objective of the course is to introduce graduate and advanced undergraduate students to the underlying theory and the practical problems that are encountered in using experimental designs in real-life situation. We will also cover the use of the statistical packages like R and Minitab.

Prerequisite

Previous coursework in Probability and Statistics, including knowledge of estimation, confidence intervals, and hypothesis testing and its use in at least one and two sample problems. Some familiarity with Calculus and Linear Algebra, or permission of instructor.

The table below shows the following relationships: How each student learning outcomes will be practiced and assessed in the course.

Course Student Learning Outcomes	How students will practice each outcome in this Course	How student achievement of each outcome will be assessed in this Course
Students will understand how to design experiments, carry them out, and analyze the data they yield.	In class activities, intensive reading of relevant chapters and homework	Exams and final project
Students will understand the process of designing an experiment including factorial and fractional factorial designs and also be able to interpret analysis results in a meaningful context for application by practitioners in the field.	In class activities, intensive reading of relevant chapters and homework	Exams and final project
Students will demonstrate competency in oral and written communication skills.	In class activities, intensive reading of relevant chapters and homework	Final project and presentation

Required Text

Title	: *Applied Linear Statistical Models, 5th edition.*
Author	: J. Neter et al.
ISBN-10	: 007310874X
ISBN-13	: 978-0-07-310874-2
Publisher	: McGraw-Hill/Irwin
Year	: 2004

Additional Requirements: Software/Computing

The R statistical package shall be used for demonstration of some topics in class. It is recommended that R be used for homework assignments and exams. R is free software that can be downloaded from the web at http://www.r-project.org/. It can be installed/compiled on Windows, Mac, and Linux/UNIX machines. You are encouraged to use the Computer Lab in SH532. In addition the SAS software is installed on those computers for those of you who would like to use SAS. Students are free to use any other statistical package should they prefer. However, the instructor will not be able to offer software support for other packages.

Academic Dishonesty: Plagiarism and/or Cheating

Note that plagiarism (the submission as one's own work of any oral, graphic, or written material wholly or in part created by another), is a form of academic dishonesty. Sanctions for academic dishonesty shall be imposed in accordance with university's guidelines on such matter. Also note that in a case where a student is suspected to have cheated, the student may be asked to re-take the test. And where the student is found or confirmed to have cheated, a zero grade will be awarded to the student.

You may wish to refer to other university policies concerning academic dishonesty at, http://www.marshall.edu/wpmu/academic-affairs/policies/#AcademicDishonesty

Attendance Policy

Students are expected to attend all scheduled classes. It is the student's responsibility to find out what was discussed in a missed class. Although, attendance records will not be used to compute grades (except possibly in borderline cases), however, missing class can be expected to significantly reduce your chances of success. Note also that it is the student's responsibility to present approved notice of any absence that would be excused under the terms and regulations stipulated by the university.

Student behavior

Students are advised to turn their cell phones and other noise generating devices off prior to entering the class. In the case where a student awaits any emergency call, the noise should be restricted and made personal. And in this case, I should be notified as soon as the student enters the class. Food items, apart from water or soft drink, are not allowed in the class. The reading of newspapers and other unrelated materials while the class is in session is prohibited. Please ensure that other students are respected.

Grading Policy and Exam dates

The final grade will be based on the following components:

- Homework Assignments worth 25 points each (30% of the final grade).
- Midterm Exam worth 100 points (25% of the final grade).
- Final Project worth 100 points (20% of the final grade). The project will be due on the last day of the class.
- Final Exam worth 100 points (25% of the final grade).

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

90 -100% -- A
80 - 89% -- B
70 - 79% -- C
60 - 69% -- D
00 - 59% -- F

FINAL EXAMINATION: Tuesday May 03 [12:45 – 2:45 PM]

Course coverage

- Analysis of Variance
- Completely Randomized Design
- Randomized Block Design
- Latin Square Design
- Multiple Comparisons of Treatment Means
- Factorial Designs
- Nested Designs
- Analysis of Covariance