

**ESC370 Design of Engineering Experiments**

Class material will be posted on Blackboard

**Instructor** Dr. Firas A. Khasawneh  
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**Office hours** Tuesdays & Thursdays: 8-9:30 or by appointment

**Textbooks:**

- Design and Analysis of Experiments, 8th edition, by D.C. Montgomery, Wiley & Sons, NY, 2013.
- R for Everyone: Advanced Analytics and Graphics, 1st edition, by Jared P. Lander, Addison-Wesley Professional, 2013.

Any supplemental course material will be posted on Blackboard.

**Communication:** Check Blackboard frequently, i.e., daily. In the event I must communicate urgently to the class then I will send an email in addition to posting an announcement.

**Grading Scheme:**

Homework and <i>R</i> assignments:	10	Exams (2 exams, 30 each):	60	Final Project:	30
				<b>Total:</b>	<b>100</b>

**Exams:** Each exam during the regular semester is worth 30 points. The students must also complete and present a project that they will complete in teams. This project is worth 30 points. Exam 1 is scheduled on 10/6, and exam 2 is scheduled on 11/17.

**Homework:** You must use the homework format that will be given to you.

- Work submitted for a grade in this course will typically be due at the beginning of class on Thursday. For specific due dates you are referred to the course Blackboard website. No credit will be given for late homework unless an extension is granted prior to the submission date.
- Collaboration on homework problems is strongly encouraged, but each person should submit his/her own work. Cite all collaborators—persons who provided any source of assistance. If none, write “Collaborators: none”.
- Collaboration on programming assignments must be limited to discussing *R* commands and structure related to the assignment. You may not provide or accept any piece of code. When you sit down to write your code you must do so individually and only using your own notes. If you have questions on how to collaborate on programming assignments, come talk to me.

**Computer use:** It is the formal policy of this class that computers are necessary. This includes access to and the use of the Internet. Additional requirements are the use of *R* statistical software.

**Class attendance:** Attendance at Lectures is mandatory.

**Other behavior expectations:** Students are expected to take a sincere interest in learning the classroom material and to abide by the university policies. Keeping with this expectation, students should: 1) not create distractions (i.e. turn cell phones off and put laptops away), 2) show up to class on time, and 3) be courteous to other students and the instructor. During class time, cell phones should be put out of sight so that you are not tempted to text or check your email. Violations of the university policies will be dealt with appropriately and may involve the Academic Conduct Board.

**Course Help:** Good study habits are absolutely essential to your success in this course. If you feel you are having difficulty keeping up with work, please contact me as soon as possible so we can figure out a plan to get you and your study habits back on track.

**Course description:** This is a basic course in designing experiments and analyzing the resulting data. The course deals with the types of experiments that are frequently encountered in industrial settings.

**Course objectives:** By the end of this course, the students are expected to:

- Plan and design experiments efficiently and effectively (ABET a, b, and k)
- Analyze the experimental data to reach objective conclusions (ABET a, and k)
- List examples of the wide applications for design of experiments in various fields of science and engineering (ABET i)

- Implement the methods used in this class using  $R$  (ABET k)

**Course subject outline:**

1. Basic statistical concepts
2. Introduction to design of experiments
3. Analysis of Variance (ANOVA)
4. Practical aspects of planning experiments
5. Randomized complete block design (RCBD)
6. Factorial designs

**Academic Integrity**

Under no circumstances may you submit another person's work for credit. For the products of a team work (e.g. a design project), all team members should submit their work together. SUNY Poly's current Code of Academic Conduct regarding plagiarism and other inappropriate academic activities are in the Student Handbook (Page 49-53, available at [http://www.sunyit.edu/pdf/student\\_handbook.pdf](http://www.sunyit.edu/pdf/student_handbook.pdf)).

**Social Justice Statement**

SUNY Poly is committed to social justice. I concur with the commitment and expect to maintain a positive learning environment based upon open communication, mutual respect, and nondiscrimination. SUNY Poly does not discriminate on the basis of race, sex, age, disability, veteran status, religion, sex orientation, color, or national origin. Any suggestions on how to further such a positive and open environment in this class will be appreciated and given serious consideration. If you are in need of accommodations due to a documented disability, please see me as soon as possible. I will need a copy of your current accommodations plan. If you do not have a current plan, please contact Suzanne Sprague ([suzanne.spraguesunyit.edu](mailto:suzanne.spraguesunyit.edu)) in the Disability Services Office located in the Career Services Suite, B101, Kunsela Hall, 315-792-7170, to develop an accommodations plan. This plan must be updated each semester.

**Accommodations for Students with Disabilities:** In compliance with the Americans with Disabilities Act of 1990 and with Section 504 of the Rehabilitation Act, SUNY Polytechnic Institute is committed to ensuring educational access and accommodations for all its registered students seeking access to meet course requirements and fully participate in programs or activities. SUNY Poly students with documented disabilities and medical conditions are encouraged to request these services by registering with the Disability Services Office and discussing your need for accommodations. For information or an appointment contact Suzanne Sprague at the Disability Services Office by phone (315) 792-7170, e-mail [suzanne.sprague@sunyit.edu](mailto:suzanne.sprague@sunyit.edu), or at the Utica office located in room B101 Kunsela Hall.