ISE 121 Applied Engineering Statistics
Fall 2017

Instructor
Dr. Charalambos Marangos  cm00@lehigh.edu
Office: Mohler Lab Room 205   Ext. 86584    Cell: 610.350.7649
Office Hours: Mo, Tu, Th, Fr 16:00-15:00 or by Appointment

Class Schedule: MWF 11:10 – 12:00; Mohler 451

Prerequisites: ISE 111 or MATH 231 or equivalent.

Course Website: Course materials, assignments and your grades will be posted on Coursesite. You are responsible for keeping track of your grades and general progress in the course, so please visit the site regularly. All due dates for homework and projects, as well as changes to the assignments will be posted on the course site.

Course Description: The application of statistical techniques to solve industrial problems. Regression and correlation, analysis of variance, quality control, and reliability. IE121 is an introductory course in Probability and Statistics for engineering students. The term Statistics deals with the collection, analysis, and presentation of data. The ability to use data correctly is important to every engineer. Whenever random factors are present (which, in real world, is always), statistical methods are indispensable. Statistics, in its turn, is built on the foundation of the Theory of Probability. We will review discrete and continuous (most notably normal) distributions, parameter estimation, confidence intervals, hypothesis testing, regression, analysis of variance, and fundamentals of quality control.

Course objectives:
Upon completion of this course students will:
- know the basic concepts and methods in statistics;
- be able to formulate analytical models to perform hypothesis tests;
- be able to understand and analyze statistics in polling and yield management applications;
- be able to perform regression analysis and think critically about regression models;
- understand the fundamentals of quality control models.


Course Philosophy: I see this course as a partnership between the textbook, lectures, and homework; all of them work to help you learn. Tests serve to ensure that you are learning the material, but they cannot test everything all at once. There will be problems on the homework that are much harder than anything that would be on a test. The homework is supposed to be hard, just like training for a sport. You should allocate enough time for it; ideally, you should start it well before office hours, so you can use office hours efficiently. Since no textbook is perfect, there will occasionally be items presented in lecture that are not in the book. You will be responsible for these topics just as much as the ones that are in the book. Similarly, there are some things in the textbook that are better read than lectured. Just because it didn't appear in lecture doesn't mean it won't be in the homework or on the exams.
**Academic Honesty**: Integrity and Honesty are vital in life, especially for engineers, since the systems we design or modify can improve people’s quality of life, or can do irreparable harm. Using probability and statistics ethically requires that we state all of the facts and assumptions in as clear a manner as possible, to avoid "lying with statistics". We are also bound by honor to give credit where it is due. On quizzes and exams your work should be entirely your own. Violations of academic honesty will result in disciplinary proceedings.

Lehigh University Undergraduate Student Senate Statement on Academic Integrity

We, the Lehigh University Student Senate, as the standing representative body of all undergraduates, reaffirm the duty and obligation of students to meet and uphold the highest principles and values of personal, moral and ethical conduct. As partners in our educational community, both students and faculty share the responsibility for promoting and helping to ensure an environment of academic integrity. As such, each student is expected to complete all academic course work in accordance to the standards set forth by the faculty and in compliance with the University's Code of Conduct.

(https://studentaffairs.lehigh.edu/content/academic-integrity-resources accessed 1/20/2017)

**Homework**: You will have regular homework assignments for most weeks. Homework assignments must be turned in during the class on the assignment due date. No credit will be given to the assignments turned in late. In this class, you might ask others for help with a homework assignment. Once you write up your answer in your own words to turn in, it must be your own work. Naturally, Academic Honesty applies to your homework assignments too. You may be asked to present your answers on the board.

**Class Preparation and Participation**: You are expected to come to class regularly and to be prepared for each class by reading the relevant sections of the textbook ahead of time. I will post notes on Course Site. In addition, you are expected to participate in class discussions and ask questions when you are confused. A portion of your grade will be based on class participation.

**Extended Absences and Missing HWs & Exams**: The material in this class is cumulative, that is, one class builds on the knowledge of previous classes. If you believe you will miss two or more consecutive lectures due to illness, holidays, family emergencies, etc., please contact me as early as possible so that we can develop a plan for you to make up the missed material. Under no circumstances will I give credit for missed homework or exams unless you have discussed your absence with me in advance or in some cases a written excuse from a doctor or the Dean of Students.

**Recording Devices and Cell Phones in the classroom**: Any use of personal devices including cellphones, mp3 players etc. is strictly forbidden. If you have to use personal laptops for note-taking, care must be taken not to distract your fellow students.

**Grading**: Tentatively, your grade will be calculated as follows: Note that these may change based on the number of assignments of each category, and changes will be announced and/or posted.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework assignments</td>
<td>20%</td>
</tr>
<tr>
<td>Tests (2)</td>
<td>40%</td>
</tr>
<tr>
<td>Final Exam (Test #3)</td>
<td>20%</td>
</tr>
</tbody>
</table>
All exams will be closed-book closed-notes unless announced in class.

Homework assignments will be given for most weeks.

Projects will be assigned – will consist of sampling, analysis, and presentation of data – mostly using Minitab and SAS packages, or other appropriate software tools.

**Accommodations for Students with Disabilities:** If you have a disability for which you are or may be requesting accommodations, please contact both your instructor and the Office of Academic Support Services, University Center C212 (610-758-4152) as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted.