IST1990 Probability And Statistics

- **Lecture 1**

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Course Content

This course is an elementary introduction to probability and statistics with applications.

Topics include:

- basic probability models;
- combinatorics;
- random variables;
- discrete and continuous probability distributions;
- with engineering examples.

Course Objectives & Learning Outcomes

Objectives:

- ❑ Improving the mathematical thinking.
- ❑ Shedding light on many phenomena in the nature through engineering processes' modeling using Probability Theory and Statistics.

Learning Outcomes:

After successfully completing this course you should be able to:

- ✓ Perform elementary probability calculations which are encountered in engineering applications.
- ✓ Identify situations where probabilistic models are adequate and useful.
- ✓ Perform elementary statistical analyses of data.
- ✓ Construct a solid theoretical background about random systems.

Course Evaluation System

Activities	Number	Percentage of Grade
Mid-Terms	2	30
Final	1	40
Percentage of In-Term Studies		60
Percentage of Final Examination		40
TOTAL		100

Statistics in Engineering

Statistics is the area of science that deals with collection, organization, analysis and interpretation of data.

- Engineers apply physical and chemical laws and mathematics to design, develop, test, and supervise various products and services.
- Engineers perform tests to learn how systems behave under stress, and at what point they might fail.
- These require data collection and analysis using statistical methods.

Statistics : Major Engineering Areas

Quality control and process control process use statistics as a tool to manage conformance to specifications of manufacturing processes and their products.

Design of Experiments (DOE) uses statistical techniques to test and construct models of engineering components and systems.

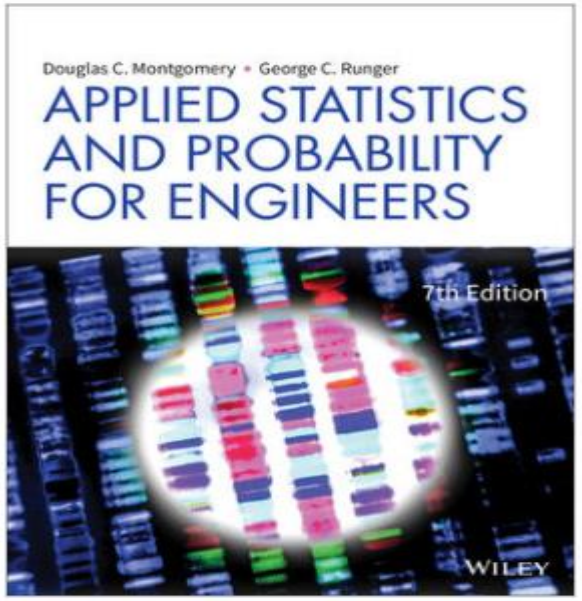
Time and methods engineering use statistics to study repetitive operations in manufacturing in order to set standards and find optimum procedures.

Reliability engineering which measures the ability of a system to perform for its intended function (and time) and has tools for improving performance.

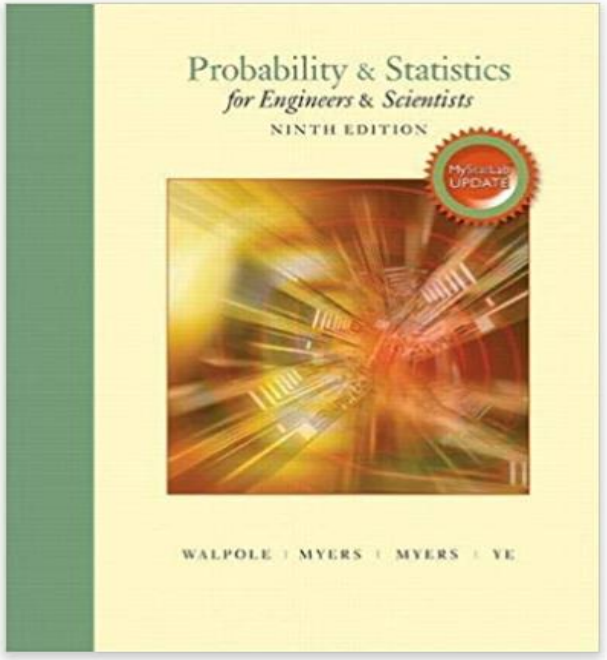
Probabilistic design involving the use of probability in product and system design.

Textbook:

1) "*Applied statistics and probability for engineers*", Montgomery, D.C. and Runger, G.C. John Wiley & Sons, 2010.



2) "*Probability and Statistics for Engineers & Scientists*", 9th Edition, Ronald E. Walpole, et. al., Pearson, 2010.



References

- *Applied statistics and probability for engineers*. Montgomery, D.C. and Runger, G.C., John Wiley & Sons, 2010.
- *Probability and Statistics for Engineers & Scientists*, 9th Edition, Ronald E. Walpole, et. al., Pearson, 2010.
- *Introduction to probability and statistics for engineers and scientists*. Ross, Sheldon M., Academic Press, 2014.
- *Probability and Statistics*. DeGroot, Morris H., and Mark J. Schervish., 3rd ed. Boston, MA: Addison-Wesley, 2002.
- Lecture Notes
- Library & Google ☺

Contact

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Good Luck ☺