

ISE 1110 – Introduction to Engineering Science Applications for All

Course Description

Focus on getting students excited about engineering science and introduces students to science, technology, and their roles in society. It provides active-learning team-based application of the foundations of engineering science to real-world practice. Primary application focus in examples from Industrial and Systems Engineering, including project management, operations management, organizational performance, and facilities engineering. Introduces students to science, technology, and their roles in society.

Offered both face-to-face and online
Undergraduate level – 4 credit hours
Corequisite ISE 1110L

Course Learning Objectives

- After completing this course, students should be able to:
- Explain the diversity, need, and applicability of engineering as the profession that solves technical problems and drives technological innovation.
- Identify everyday application of engineering and science and be able to use some common tools and techniques
- Understand basic concepts for management of projects, techniques to formulate solutions to technical problems
- Create professional reports and presentations through the weekly assignments
- Understand what is expected in the professional path of an engineer
- Identify, formulate, and solve simple engineering problems proposed by the instructor by applying principles of engineering, science, and mathematics
- Complete simple experimental tests, analyze and interpret data, and use simple judgment to draw conclusions.
- Function effectively on teams that establish goals, plan tasks, and meet deadlines on course assignments

Course Learning Outcomes

Upon successful completion of this course, students can:

- Explain the diversity, need, and applicability of engineering as the profession that solves technical problems and drives technological innovation.

- Identify everyday application of engineering and science and be able to use some common tools and techniques
- Understand basic concepts for management of projects, techniques to formulate solutions to technical problems
- Create professional reports and presentations through the weekly assignments
- Understand what is expected in the professional path of an engineer
- Identify, formulate, and solve simple engineering problems proposed by the instructor by applying principles of engineering, science, and mathematics
- Complete simple experimental tests, analyze and interpret data, and use simple judgment to draw conclusions.
- Function effectively on teams that establish goals, plan tasks, and meet deadlines on course assignments

Tentative Weekly Schedule

| | |
|--------|-------------------------------------------------------------------------------------------------|
| Week 1 | Introduction to Science and Engineering |
| | Chapter One – History of Engineering Science and Development of Industrial Engineering |
| | No Lab |
| Week 2 | Applications of Engineering in everyday life – Supply Chain, Operations Research and Ergonomics |
| | Role of ISEs in workplace safety |
| | Lab 1 –UI Design fundamentals |
| Week 3 | Introduction to probability, basic statistics, linear regression |
| | Why is it important for engineers to understand statistics and probability, linear regression? |
| | Use of statistics to evaluate information from a variety of sources |
| | Lab 2 – Basic statistics in Excel |
| Week 4 | Mid-term review - Mid Term exam |
| | Mid Term – no Lab |
| Week 5 | Introduction to Operations Management. |
| | Lab 3 - Basic statistics in excel continued |
| Week 6 | Science and technology and recognize their roles in society |
| | Lab 4 - Case studies |
| Week 7 | Guest Lecture/Industry Tour |
| | No LAB – Write up from the guest lecture/lab tour |
| Week 8 | Chapter 6 – Work Design and Organizational Performance. |
| | Lab 5 – Use of Balsamiq |
| Week 9 | Introduction to Information Systems Engineering & Management |
| | Lab 6 – Continuation of Lab 5 |

| | |
|---------|-----------------------------------------------------------------------------------------------------------------|
| Week 10 | Introduction to Facilities Engineering. What are the typical activities in the field of Facilities Engineering? |
| | Lab 7 – Use of excel macro |
| Week 11 | What is the multidisciplinary nature of engineering? |
| | Lab 8 – Application of operations management in OR |
| Week 12 | Guest Lecture |
| | Lab 9 –Introduction to Visio |
| Week 13 | Mid-term 2 Exam Review |
| | Mid-term 2 Exam |
| Week 14 | Advances in applications of engineering in everyday life |
| | Lab 10 – Visual design in Adobe spark |
| Week 15 | Finals week – No class |