

**ITT Technical Institute**  
**IE1110T**  
**Introduction to Industrial Engineering**  
**Technology**  
**Onsite and Online Course**

**SYLLABUS**

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**Credit hours:** 4.5


**Contact/Instructional hours:** 67 (41 Theory Hours, 26 Lab Hours)

**Prerequisite(s) and/or Corequisite(s):**

None.

**Course Description:**

This course introduces industrial engineering and the evolution of its approach in solving problems. Topics include an overview of industrial engineering, concept and scope of industrial engineering, the evolution of the industrial engineering approach, concepts of manufacturing systems, design of manufacturing systems, operation and management of manufacturing systems, and industrial engineering education, profession and ethics.



## COURSE SUMMARY

### COURSE DESCRIPTION

This course introduces industrial engineering and the evolution of its approach in solving problems. Topics include an overview of industrial engineering, concept and scope of industrial engineering, the evolution of the industrial engineering approach, concepts of manufacturing systems, design of manufacturing systems, operation and management of manufacturing systems, and industrial engineering education, profession and ethics.

### MAJOR INSTRUCTIONAL AREAS

1. What Is Industrial Engineering Technology?
2. Career Choices in Industrial Engineering Technology
3. Industrial Engineering Technology Tools and Techniques

### COURSE LEARNING OBJECTIVES

By the end of this course, you should be able to:

1. Describe the industrial engineering technology profession and engineering ethics, including professional practices.
2. Use technical communication skills to explain the analysis and results of introductory group projects and exercises in engineering technology.
3. Describe the impact engineering technology has on the modern world.
4. Design a simple engineering device, write a design report, and present the design.

## COURSE OUTLINE

### MODULE 1: ENGINEERING ESSENTIALS AND PROJECT MANAGEMENT

#### COURSE LEARNING OBJECTIVES COVERED

- Describe the industrial engineering technology profession and engineering ethics, including professional practices.
- Use technical communication skills to explain the analysis and results of introductory group projects and exercises in engineering technology.

#### TOPICS COVERED

- Project Management in Engineering Technology
- Engineering As a Profession
- Engineering Essentials

| MODULE LEARNING ACTIVITIES  | GRADE D | OUT-OF-CLASS TIME |
|---|---------|-------------------|
| <b>Reading:</b> <i>Engineering Technology:</i> <ul style="list-style-type: none"> <li>• Chapter 1</li> <li>• Chapter 2</li> </ul> | No      | 3 hours           |
| <b>Reading:</b> <i>Thinking Like an Engineer:</i> <ul style="list-style-type: none"> <li>• Chapter 1</li> </ul>                   | No      | 2 hours           |
| <b>Lesson:</b> Study the lesson for this module.  | No      | 1 hour            |
| <b>Short Answer:</b> Submit the short answer titled “Project Management in Everyday Engineering.”                                 | Yes     | 1.5 hours         |
| <b>Lab:</b> Complete the lab titled “Cost Saving Opportunities in Industrial Engineering Technology.”                             | Yes     | N/A               |
| <b>Project:</b> Read and begin the course project.  | No      | 0.5 hour          |
| <b>Quiz:</b> Prepare for Quiz 1.  | No      | 2 hours           |

Total Out-Of-Class Activities: 10 Hours

## MODULE 2: UNDERSTANDING VALUE ENGINEERING

### COURSE LEARNING OBJECTIVES COVERED

- Use technical communication skills to explain the analysis and results of introductory group projects and exercises in engineering technology.

### TOPICS COVERED

- Value Engineering
- Quality Engineering
- ISO Standards

| MODULE LEARNING ACTIVITIES  | GRADE D | OUT-OF-CLASS TIME |
|---|---------|-------------------|
| <b>Reading:</b> <i>Engineering Technology:</i> <ul style="list-style-type: none"> <li>• Chapter 3</li> <li>• Chapter 4</li> </ul>   | No      | 6 hours           |
| <b>Reading:</b> ITT Tech Virtual Library> Basic Search> <i>ISO 9000 Quality Systems Handbook: Using the Standards as a Framework for Business Improvement.</i> <ul style="list-style-type: none"> <li>• Chapter 10</li> <li>• Chapter 11</li> <li>• Chapter 12</li> </ul> | No      | 2 hours           |
| <b>Lesson:</b> Study the lesson for this module.  | No      | 2 hours           |
| <b>Short Answer 1:</b> Submit the short answer titled “Value Engineering.”  | Yes     | 1.5 hours         |
| <b>Short Answer 2:</b> Submit the short answer titled “Quality Engineering.”  | Yes     | 2.5 hours         |
| <b>Lab:</b> Complete the lab titled “Improvements As a Result of Value Analysis (VA).”  | Yes     | N/A               |
| <b>Project:</b> Continue work on Project Part 1.  | No      | 3 hours           |
| <b>Quiz:</b> Take Quiz 1.   | Yes     | N/A               |

Total Out-Of-Class Activities: 17 Hours

### MODULE 3: LEAN ENTERPRISE AND ESTIMATION

#### COURSE LEARNING OBJECTIVES COVERED

- Use technical communication skills to explain the analysis and results of introductory group projects and exercises in engineering technology.
- Describe the impact engineering technology has on the modern world.

#### TOPICS COVERED

- Lean Principles
- Estimation
- Engineering Comprehension

| MODULE LEARNING ACTIVITIES  | GRADE<br>D | OUT-OF-<br>CLASS<br>TIME |
|---|------------|--------------------------|
| <b>Reading:</b> <i>Engineering Technology:</i> <ul style="list-style-type: none"> <li>• Chapter 5</li> <li>• Chapter 6</li> </ul>   | No         | 3 hours                  |
| <b>Reading:</b> ITT Tech Virtual Library> Basic Search> <i>ISO 9000 Quality Systems Handbook: Using the Standards as a Framework for Business Improvement.</i> <ul style="list-style-type: none"> <li>• Chapter 13</li> <li>• Chapter 14</li> <li>• Chapter 15</li> <li>• Chapter 16</li> <li>• Chapter 17</li> </ul> | No         | 3 hours                  |
| <b>Lesson:</b> Study the lesson for this module.  | No         | 2 hours                  |
| <b>Short Answer:</b> Submit the short answer titled “Lean Principles.”  | Yes        | 2 hours                  |
| <b>Lab 1:</b> Complete the lab titled “Comprehension Check.”  | Yes        | N/A                      |
| <b>Lab 2:</b> Complete the lab titled “Measurements and Estimation.”  | Yes        | N/A                      |
| <b>Project:</b> Submit Project Part 1.  | Yes        | 3 hours                  |

Total Out-Of-Class Activities: 13 Hours

## MODULE 4: ENGINEERING PROFESSIONALISM AND ETHICS

### COURSE LEARNING OBJECTIVES COVERED

- Describe the industrial engineering technology profession and engineering ethics, including professional practices.
- Describe the impact engineering technology has on the modern world.

### TOPICS COVERED

- Engineering Professionalism
- Ethics and Responsibility
- Self-Reliance
- Leadership
- Planning and Time Management

| MODULE LEARNING ACTIVITIES  | GRADE D | OUT-OF-CLASS TIME |
|---|---------|-------------------|
| <b>Reading:</b> <i>Engineering Technology:</i> <ul style="list-style-type: none"> <li>• Chapter 7</li> <li>• Chapter 8</li> </ul>                                 | No      | 4 hours           |
| <b>Reading:</b> <i>Ready for takeoff! A winning process for launching your engineering career:</i> <ul style="list-style-type: none"> <li>• Chapter 24</li> </ul> | No      | 2 hours           |
| <b>Lesson:</b> Study the lesson for this module.  | No      | 2 hours           |
| <b>Lab 1:</b> Complete the lab titled “Ethics.”   | Yes     | N/A               |
| <b>Lab 2:</b> Complete the lab titled “Styles of Conflict Management.”  | Yes     | N/A               |
| <b>Short Answer:</b> Submit the short answer titled “Self-Reliance, Planning, and Time Management.”   | Yes     | 4.5 hours         |
| <b>Project:</b> Continue work on Project Part 2.  | No      | 3 hours           |
| <b>Quiz:</b> Prepare for Quiz 2.  | No      | 2 hours           |

Total Out-Of-Class Activities: 17.5 Hours

## MODULE 5: ENGINEERING AND PRESENTATION SKILLS

### COURSE LEARNING OBJECTIVES COVERED

- Describe the industrial engineering technology profession and engineering ethics, including professional practices.
- Use technical communication skills to explain the analysis and results of introductory group projects and exercises in engineering technology.
- Describe the impact engineering technology has on the modern world.

### TOPICS COVERED

- Effective Writing and Presentation Skills
- Engineering Communication

| MODULE LEARNING ACTIVITIES   | GRADED | OUT-OF-CLASS TIME |
|--|--------|-------------------|
| <b>Reading: <i>Engineering Technology:</i></b> <ul style="list-style-type: none"> <li>• Chapter 9</li> <li>• Chapter 10</li> </ul> | No     | 4.5 hours         |
| <b>Lesson:</b> Study the lesson for this module.   | No     | 2 hours           |
| <b>Lab 1:</b> Complete lab titled “Effective Presentation and Writing Skills.”   | Yes    | N/A               |
| <b>Lab 2:</b> Complete lab titled “Engineering Communication.”   | Yes    | N/A               |
| <b>Quiz:</b> Take Quiz 2.  | Yes    | N/A               |
| <b>Project:</b> Submit Project Part 2.   | Yes    | 3 hours           |
| <b>Final Exam:</b> Prepare for the final exam.   | No     | 5 hours           |

Total Out-Of-Class Activities: 14.5 Hours

## MODULE 6: INDUSTRIAL TEAMWORK AND DESIGN

### COURSE LEARNING OBJECTIVES COVERED

- Describe the industrial engineering technology profession and engineering ethics, including professional practices.
- Use technical communication skills to explain the analysis and results of introductory group projects and exercises in engineering technology.
- Describe the impact engineering technology has on the modern world.
- Design a simple engineering device, write a design report, and present the design.

### TOPICS COVERED

- Teamwork in Industry
- Design and Teamwork
- Transition to Industry

| MODULE LEARNING ACTIVITIES  | GRADE D | OUT-OF-CLASS TIME |
|---|---------|-------------------|
| <b>Reading:</b> <i>Engineering Technology:</i> <ul style="list-style-type: none"> <li>• Chapter 11</li> <li>• Chapter 12</li> <li>• Chapter 13</li> </ul> | No      | 6 hours           |
| <b>Lesson:</b> Study the lesson for this module.  | No      | 2 hours           |
| <b>Lab:</b> Complete the lab titled “Teamwork and Transition to Industry.”  | Yes     | N/A               |
| <b>Final Exam:</b> Take the final exam.   | Yes     | N/A               |

Total Out-Of-Class Activities: 8 Hours



## EVALUATION AND GRADING

### EVALUATION CRITERIA

The graded assignments will be evaluated using the following weighted categories:

| Category     | Weight |
|--------------|--------|
| Short Answer | 15%    |
| Lab          | 25%    |
| Project      | 25%    |
| Quiz         | 15%    |
| Final Exam   | 20%    |
| TOTAL        | 100%   |

### GRADE CONVERSION

The final grades will be calculated from the percentages earned in the course, as follows:

| Grade     | Percentage |
|-----------|------------|
| A (4.0 )  | 90–100%    |
| B+ (3.5 ) | 85–89%     |
| B (3.0 )  | 80–84%     |
| C+ (2.5 ) | 75–79%     |
| C (2.0 )  | 70–74%     |
| D+ (1.5 ) | 65–69%     |
| D (1.0 )  | 60–64%     |
| F (0.0 )  | <60%       |



## LEARNING MATERIALS AND REFERENCES

### REQUIRED RESOURCES

#### COMPLETE TEXTBOOK PACKAGE

- Millar, D. C., Stephan, E. A., Bowman, D. R., Park, W. J., Sill, B. L., & Ohland, M. W. (2014). *Engineering Technology (Custom Edition)*. Boston, MA.: Pearson Custom.

#### OTHER REQUIRED RESOURCES

- Millar, D. C. (2011). *Ready for takeoff! A winning process for launching your engineering career*. Upper Saddle River, NJ: Prentice Hall. Chapter 24.
- Stephan, E. A., Park, W. J., Sill, B. L., Bowman, D. R., & Ohland, M. W. (2012). *Thinking like an engineer*. Upper Saddle River, NJ: Pearson College Division. Chapter 1.
- ITT Tech Virtual Library> School of Electronics Technology> Databases> Books24x7> Hoyle, D. (2009). *ISO 9000 Quality Systems Handbook: Using the Standards as a Framework for Business Improvement (6th ed.)*. Butterworth-Heinemann. Burlington, MA.

### RECOMMENDED RESOURCES

- Books and Professional Journals
  - Hoyle, D. (2007). *Quality management essentials*. Burlington, MA: Routledge.
  - *Journal of Industrial Engineering and Management*
  - Penzghong, L. (2011). *Supply chain management*. New York, NY: InTech.
  - Pomffyva, M. (2010). *Process management*. New York, NY: InTech.
  - Summers, D. (2011). *Lean Six Sigma*. Upper Saddle River, NJ: Pearson Prentice Hall.

## INSTRUCTIONAL METHODS AND TEACHING STRATEGIES

The curriculum employs a variety of instructional methods that support the course objectives while fostering higher cognitive skills. These methods are designed to encourage and engage you in the learning process in order to maximize learning opportunities. The instructional methods include but are not limited to lectures, collaborative learning options, use of technology, and hands-on activities.

To implement the above-mentioned instructional methods, this course uses several teaching strategies, such as exercises and PowerPoints. Your progress will be regularly assessed through a variety of assessment tools including short answer, lab, project, quiz, and final exam.

## OUT-OF-CLASS WORK

For purposes of defining an academic credit hour for Title IV funding purposes, ITT Technical Institute considers a quarter credit hour to be the equivalent of: (a) at least 10 clock hours of classroom activities and at least 20 clock hours of outside preparation; (b) at least 20 clock hours of laboratory activities; or (c) at least 30 clock hours of externship, practicum or clinical activities. ITT Technical Institute utilizes a “time-based option” for establishing out-of-class activities which would equate to two hours of out-of-class activities for every one hour of classroom time. The procedure for determining credit hours for Title IV funding purposes is to divide the total number of classroom, laboratory, externship, practicum and clinical hours by the conversion ratios specified above. A clock hour is 50 minutes.

A credit hour is an artificial measurement of the amount of learning that can occur in a program course based on a specified amount of time spent on class activities and student preparation during the program course. In conformity with commonly accepted practice in higher education, ITT Technical Institute has institutionally established and determined that credit hours awarded for coursework in this program course (including out-of-class assignments and learning activities described in the “Course Outline” section of this syllabus) are in accordance with the time-based option for awarding academic credit described in the immediately preceding paragraph.

**ACADEMIC INTEGRITY**

All students must comply with the policies that regulate all forms of academic dishonesty or academic misconduct. For more information on the academic honesty policies, refer to the Student Handbook and the School Catalog.

**INSTRUCTOR DETAILS**

|                 |  |
|-----------------|--|
| Instructor Name |  |
| Office Hours    |  |
| Contact Details |  |

*(End of Syllabus)*