

**ITT Technical Institute**  
**ET2799**  
**Electrical Engineering Technology**  
**Capstone Project**  
**Onsite and Online Course**

**SYLLABUS**

---

**Credit hours:** 4.5


**Contact/Instructional hours:** 60 (30 Theory Hours, 30 Lab Hours)

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

Prerequisites: Must be taken during the student's final quarter of study, and requires prior satisfactory completion of ET2640 Microprocessors and Microcontrollers or equivalent

**Course Description:**

Final capstone project with fundamental review provides students with a design experience and integration of knowledge in electronics and computers gained in previous coursework, as well as a means to practice problem solving and teamwork, project management, technical writing skills and project presentation skills.



## COURSE SUMMARY

### COURSE DESCRIPTION

Final capstone project with fundamental review provides students with a design experience and integration of knowledge in electronics and computers gained in previous coursework, as well as a means to practice problem solving and teamwork, project management, technical writing skills and project presentation skills.

### MAJOR INSTRUCTIONAL AREAS

1. Fundamental review of the basics of electronics in the ELCT Program
2. Research of current and emerging technology
3. Project management techniques
4. Capstone project

### COURSE LEARNING OBJECTIVES

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

1. Apply project management concepts and techniques to an electronics project.
2. Plan and manage an electronics project using a software application.
3. Create professional documents such as electronics schematics, block diagrams, flow charts, data sheets, and troubleshooting guides.
4. Determine the budget requirements and budget constraints for an electronics project.
5. Design an electronics circuit and/or functional block diagram for a given functionality.
6. Develop and execute a test plan for the electronics project.
7. Demonstrate the operation of the electronics project.
8. Create the necessary documentation for solutions to a problem by applying critical reading, analytical thinking, and resolution skills.
9. Create a professional presentation on the design and functionality of the electronics application.

## COURSE OUTLINE

### MODULE 1: ANALYZING PROJECT REQUIREMENTS

#### COURSE LEARNING OBJECTIVES COVERED

- Apply project management concepts and techniques to an electronics project.
- Plan and manage an electronics project using a software application.
- Create professional documents such as electronics schematics, block diagrams, flow charts, data sheets, and troubleshooting guides.

#### TOPICS COVERED

- Project Settings in Microsoft Project
- Project Definition
- Planning the Project
- Fundamental Review of Electronics
- Employment Trends

MODULE LEARNING ACTIVITIES	GRADE D	OUT-OF- CLASS TIME
<b>Reading:</b> <ul style="list-style-type: none"> <li>• Wood &amp; Pascarella, Projects 1 and 2</li> <li>• ITT Tech Virtual Library&gt; Basic Search&gt; <i>The project management life cycle: A complete step-by-step methodology for initiating, planning, executing &amp; closing a project successfully&gt; Chapters 1 and 2</i></li> </ul>	No	3.5 hr
<b>Lesson:</b> Study the lesson for this module.	No	1 hr
<b>Discussion:</b> Participate in the discussion titled “Career Options in Electrical Engineering.”	Yes	1 hr
<b>Project:</b> Read and begin the project.	No	0.5 hr
<b>Project Documentation:</b> Submit an overview of the project titled “Project Definition.”	Yes	2 hr
<b>Quiz:</b> Prepare for Quiz 1.	No	1 hr

Total Out-Of-Class Activities: 9 Hours

## MODULE 2: DEVELOPING PROJECT DESIGN AND SCHEDULE

### COURSE LEARNING OBJECTIVES COVERED

- Apply project management concepts and techniques to an electronics project.
- Plan and manage an electronics project using a software application.
- Create professional documents such as electronics schematics, block diagrams, flow charts, data sheets, and troubleshooting guides.
- Determine the budget requirements and budget constraints for an electronics project.
- Develop and execute a test plan for the electronics project.

### TOPICS COVERED

- Project Documentation
- Creation of a Project Schedule in Microsoft Project
- Creation of Tasks in Microsoft Project
- Budgeting
- Bill of Materials

MODULE LEARNING ACTIVITIES	GRADE D	OUT-OF- CLASS TIME
<b>Reading:</b> <ul style="list-style-type: none"> <li>• Wood &amp; Pascarella, Project 3</li> <li>• ITT Tech Virtual Library&gt; Basic Search&gt; <i>The project management life cycle: A complete step-by-step methodology for initiating, planning, executing &amp; closing a project successfully&gt; Chapter 3</i></li> </ul>	No	3 hr
<b>Lesson:</b> Study the lesson for this module.	No	1.5 hr
<b>Project Documentation:</b> Submit an overall description of the project titled “Project Tasks and Activities.”	Yes	5 hr
<b>Project Implementation:</b> Submit the first draft of the project design titled “Preliminary Project Design.”	Yes	5 hr
<b>Quiz:</b> Take Quiz 1.	Yes	NA
<b>Quiz:</b> Prepare for Quiz 2.	No	1 hr

Total Out-Of-Class Activities: 15.5 Hours

### MODULE 3: DEVELOPING THE PROTOTYPE-I

#### COURSE LEARNING OBJECTIVES COVERED

- Apply project management concepts and techniques to an electronics project.
- Plan and manage an electronics project using a software application.
- Create professional documents such as electronics schematics, block diagrams, flow charts, data sheets, and troubleshooting guides.
- Determine the budget requirements and budget constraints for an electronics project.
- Design an electronics circuit and/or functional block diagram for a given functionality.
- Develop and execute a test plan for the electronics project.
- Demonstrate the operation of the electronics project.

#### TOPICS COVERED

- Project Documentation
- Prototype Parts
- Test and Measurement
- Handling Delays

MODULE LEARNING ACTIVITIES	GRADE D	OUT-OF- CLASS TIME
<b>Reading:</b> <ul style="list-style-type: none"> <li>• Wood &amp; Pascarella, Projects 4 and 5</li> <li>• ITT Tech Virtual Library&gt; Basic Search&gt; <i>The project management life cycle: A complete step-by-step methodology for initiating, planning, executing &amp; closing a project successfully&gt; Chapter 4</i></li> </ul>	No	3 hr
<b>Lesson:</b> Study the lesson for this module.	No	1.5 hr
<b>Discussion:</b> Participate in the discussion titled “Challenges in Project Development.”	Yes	N/A
<b>Project Documentation:</b> Submit the updated draft of the project design and progress titled “Project Revisions.”	Yes	5 hr
<b>Project Implementation:</b> Submit the first prototype of the project titled “Project Prototype–I.”	Yes	5 hr

MODULE LEARNING ACTIVITIES	GRADE D	OUT-OF- CLASS TIME
<b>Quiz:</b> Take Quiz 2.	Yes	NA
<b>Quiz:</b> Prepare for Quiz 3.	No	1 hr

Total Out-Of-Class Activities: 15.5 Hours

## MODULE 4: DEVELOPING THE PROTOTYPE-II

### COURSE LEARNING OBJECTIVES COVERED

- Apply project management concepts and techniques to an electronics project.
- Plan and manage an electronics project using a software application.
- Create professional documents such as electronics schematics, block diagrams, flow charts, data sheets, and troubleshooting guides.
- Develop and execute a test plan for the electronics project.
- Demonstrate the operation of the electronics project.

### TOPICS COVERED

- Fundamental Review of Electronics
- Production Phase
- Prototype Testing

MODULE LEARNING ACTIVITIES	GRADE D	OUT-OF- CLASS TIME
<b>Reading:</b> <ul style="list-style-type: none"> <li>• Wood &amp; Pascarella, Project 6</li> <li>• ITT Tech Virtual Library&gt; Basic Search&gt; <i>The project management life cycle: A complete step-by-step methodology for initiating, planning, executing &amp; closing a project successfully&gt; Chapter 5</i></li> </ul>	No	3 hr
<b>Lesson:</b> Study the lesson for this module.	No	1.5 hr
<b>Discussion:</b> Participate in the discussion titled “Overcoming Challenges.”	Yes	N/A
<b>Project Documentation:</b> Submit the first progress report of the project titled “Schedule Adherence and Performance.”	Yes	5 hr
<b>Project Implementation:</b> Submit the updated prototype of the project titled “Project Prototype–II.”	Yes	5 hr
<b>Quiz:</b> Take Quiz 3.	Yes	NA
<b>Quiz:</b> Prepare for Quiz 4.	No	1 hr

Total Out-Of-Class Activities: 15.5 Hours

## MODULE 5: FINALIZING THE PROJECT

### COURSE LEARNING OBJECTIVES COVERED

- Create professional documents such as electronics schematics, block diagrams, flow charts, data sheets, and troubleshooting guides.
- Develop and execute a test plan for the electronics project.
- Demonstrate the operation of the electronics project.
- Create the necessary documentation for solutions to a problem by applying critical reading, analytical thinking, and resolution skills.
- Create a professional presentation on the design and functionality of the electronics application.

### TOPICS COVERED

- Handling Project Delays
- Handling Conflicts in Project
- Testing of Final Electronics Project
- Updating Project Data in Microsoft Project

MODULE LEARNING ACTIVITIES	GRADE D	OUT-OF- CLASS TIME
<b>Reading:</b> <ul style="list-style-type: none"> <li>• Wood &amp; Pascarella, Projects 7 and 8</li> <li>• ITT Tech Virtual Library&gt; Basic Search&gt; <i>The project management life cycle: A complete step-by-step methodology for initiating, planning, executing &amp; closing a project successfully&gt; Chapter 6</i></li> </ul>	No	3 hr
<b>Lesson:</b> Study the lesson for this module.	No	1.5 hr
<b>Discussion:</b> Participate in the discussion titled “Effective e-Portfolio.”	Yes	1 hr
<b>Project Implementation:</b> Submit the final project design and test results titled “Final Project Design.”	Yes	5 hr
<b>Quiz:</b> Take Quiz 4.	Yes	NA
<b>Final Exam:</b> Prepare for the final exam.	No	5 hr

Total Out-Of-Class Activities: 15.5 Hours



## MODULE 6: PRESENTING THE CAPSTONE PROJECT

### COURSE LEARNING OBJECTIVES COVERED

- Create the necessary documentation for solutions to a problem by applying critical reading, analytical thinking, and resolution skills.
- Create a professional presentation on the design and functionality of the electronics application.

### TOPICS COVERED

- Creating the Final Project Presentation
- Creating a Portfolio

MODULE LEARNING ACTIVITIES	GRADE D	OUT-OF- CLASS TIME
<p><b>Reading:</b> ITT Tech Virtual Library&gt; Basic Search&gt;</p> <ul style="list-style-type: none"> <li>• <i>The project management life cycle: A complete step-by-step methodology for initiating, planning, executing &amp; closing a project successfully&gt; As needed to help you prepare for your project</i></li> <li>• <i>The Top Performer's Guide to Speeches and Presentations: Essential Skills that Put You on Top&gt; As needed to help you prepare for your project</i></li> </ul>	No	3 hr
<b>Lesson:</b> Study the lesson for this module.	No	1 hr
<b>Project Documentation:</b> Submit the final project design documentation titled "Project Synopsis."	Yes	5 hr
<b>Project Presentation:</b> Submit the final project presentation titled "My Project Presentation."	Yes	3 hr
<b>Final Exam:</b> Take the final exam.	Yes	NA

Total Out-Of-Class Activities: 12 Hours

## EVALUATION AND GRADING

### EVALUATION CRITERIA

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

CATEGORY	WEIGHT
Discussion	10%
Project Documentation	20%
Project Implementation	25%
Project Presentation	15%
Quiz	15%
Final Exam	15%
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

- Wood, D., & Pascarella, M. (2012). *Essentials of Microsoft® Office Project 2007 (Custom ed.)*. (D. R. Foley, Ed.) Boston, MA: Pearson Custom.
- Wood, D., & Pascarella, M. (2012). *Essentials of Microsoft Project 2007 Student Data Files DVD (Custom 2nd ed.)*. (D. R. Foley, Ed.) Boston, MA: Pearson Custom. Contents available at [http://media.pearsoncmg.com/pls/us/itt-tech/NT2799\\_125698633X/msproject2007datafiles.zip](http://media.pearsoncmg.com/pls/us/itt-tech/NT2799_125698633X/msproject2007datafiles.zip)

#### OTHER REQUIRED RESOURCES

- Course textbooks for NT1110, ET1210, NT1210, ET1220, ET1310, ET1410, ET2530, ET2560, ET2640, ET2750

#### OTHER ITEMS

- Microsoft Project 2007
- Electronic Kit, PLCs or Micro-controllers
- Micro-controller Software or RS Logix

### RECOMMENDED RESOURCES

- ITT Tech Virtual Library (accessed via Student Portal | <https://studentportal.itt-tech.edu>)
  - Basic Search>
    - Ursiny, T. E., DeMoss, G., & Morel, J. (2007). *The top performer's guide to speeches and presentations: Essential skills that put you on top*. Naperville, IL: Sourcebooks.
    - Westland, J. (2006). *The project management life cycle: A complete step-by-step methodology for initiating, planning, executing & closing a project successfully*. London: Kogan Page.
- Other References
  - Current NATE Members–The National Association of Tower Erectors  
<http://natehome.com/membership/current-nate-members/>
  - Orientation to the Electric Industry | EPCE  
<http://epceonline.org/orientation-electric-industry>

- Overview of Cell Phone Technology  
[http://www.mat.ucsb.edu/~g.legrady/academic/courses/03w200a/projects/wireless/cell\\_technology.htm](http://www.mat.ucsb.edu/~g.legrady/academic/courses/03w200a/projects/wireless/cell_technology.htm)
- Pad2Pad–Custom Printed Circuit Board Manufacturer, Mahwah NJ | General | Main  
<http://www.pad2pad.com/?gclid=CPOYqpLCg8MCFQNgMgodwn8A3g>
- Printed Circuit Board Design Software | PCB123–Sunstone Circuits  
<http://www.sunstone.com/pcb-products/pcb123>
- TheLearningPit–PLC Simulators and Resources for Training  
<http://www.thelearningpit.com/>
- Your Personal PLC Tutor Site  
<http://www.plcs.net/chapters/links.htm>

## 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 critical thinking, discussions, and comprehensive skills assessment. Your progress will be regularly assessed through a variety of assessment tools including discussions, project implementation, project documentation, project presentation, quizzes, and a 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)*