

**ITT Technical Institute**  
**ET365T**  
**Computer and Electronics Capstone**  
**Project**  
**Onsite Course**

**SYLLABUS**

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**Credit hours:** 4

**Contact/Instructional hours:** 60 (36 Theory Hours, 24 Lab Hours)

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

Prerequisites: Completion of a minimum of 80 credits earned in the program of study including ET315T Electronic Communications Systems II or equivalent and ET355T Microprocessors or equivalent

**Course Description:**

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

# Where Does This Course Belong?

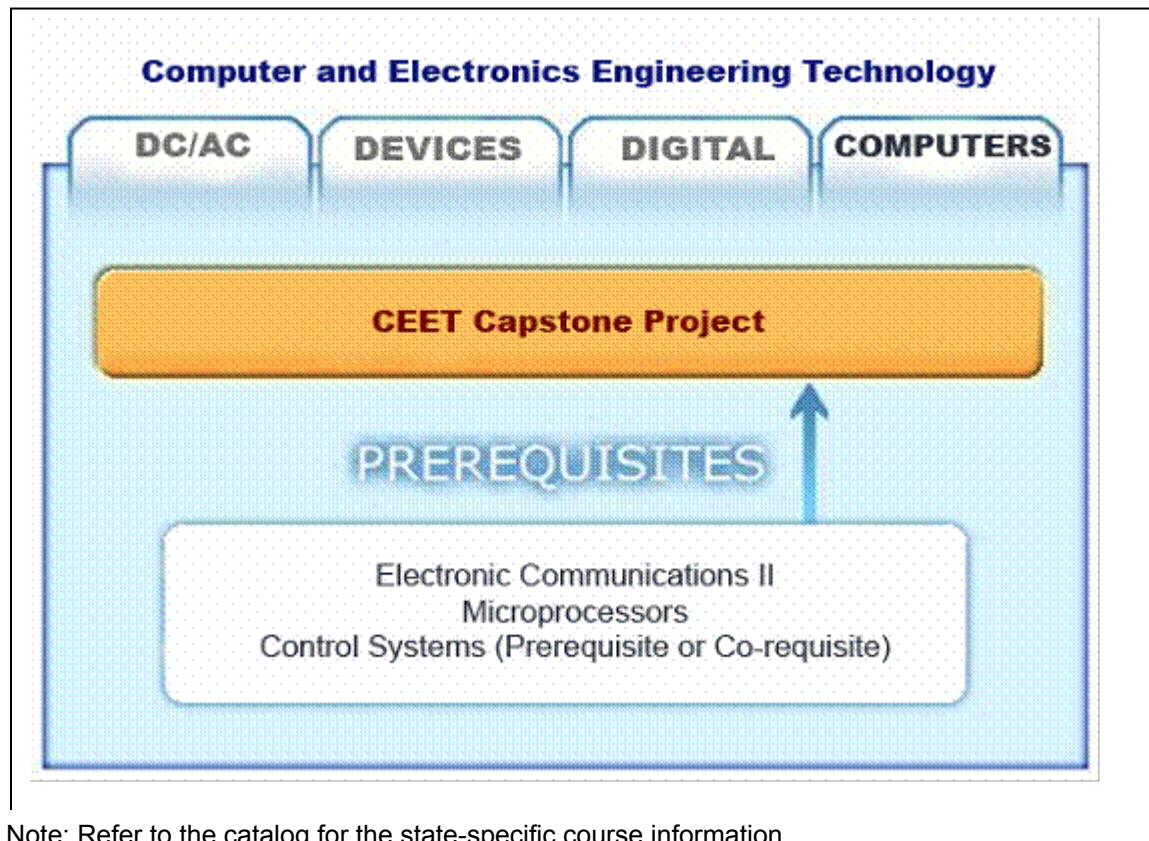
How does this course relate to the program? Take a look!

Computer and Electronics Capstone Project is a course required to achieve Associate of Applied Science Degree in the Computer and Electronics Engineering Technology (CEET) program.

The purpose of this program is to help graduates prepare for career opportunities in a variety of entry-level positions in many fields of electronics and computer technology, such as aviation, communications, computers, consumer products, defense and research and development. The program acquaints students with certain circuits, systems, and specialized techniques used in electronics and computer technology career fields and exposes students to a combination of classroom theory and practical application in a laboratory environment.

Graduates of this program may begin their careers in a variety of entry-level positions in various fields involving electronics engineering technology such as technician, electronics technician, field service representative, and salesperson and computer technician.

The following course sequence provides an overview of how the Computer and Electronics Capstone Project fits in the program.



Note: Refer to the catalog for the state-specific course information.

Instructor:	_____
Office hours:	_____

Class hours: _____
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## Major Instructional Areas

1. Project Management Techniques
2. A fundamental review of the basics of electronics in the AASCEET Program
3. Capstone Project
4. Research of current and emerging technology

## Course Objectives

1. Apply important concepts of project management to the actual capstone project proposed for this course.
2. Use Microsoft Office Project to plan and manage a capstone project.
3. Analyze the requirements for the capstone project using the seven steps of the systematic approach.
4. Integrate the knowledge acquired in the program to provide effective technological solutions for given problems.
5. Demonstrate the ability to use team oriented problem solving techniques on a large-scope project to arrive at an optimal solution.
6. Demonstrate the ability to document solutions to a problem by applying critical reading, analytical thinking and resolution skills.
7. Demonstrate the ability to present and defend a proposal in spoken and written formats.
8. Demonstrate the ability to complete a comprehensive skills assessment and fundamental review for the program of study.

## SCANS Objectives

SCANS is an acronym for Secretary's Commission on Achieving Necessary Skills. The committee, created by the National Secretary of Labor in the early 1990s, created a list of skills and competencies that the committee feels are necessary for employees to function in a high-tech job market.

1. Demonstrate the ability to document information to maximize retention and expression of knowledge.
2. Work effectively as part of a team by contributing ideas, suggestions, and effort to the group.
3. Identify how technological systems work and operate effectively.
4. Demonstrate competence in understanding systems.
5. Use interpersonal skills and communication techniques.
6. Demonstrate competence in selecting a technology, including determining the desired outcomes and applicable constraints.
7. Apply decision-making skills to specify goals and constraints.
8. Demonstrate competence in monitoring and correcting performance.
9. Demonstrate competence in configuring, installing, and integrating various hardware and software systems.

## Course Outline

Note: All graded activities, except the Project, are listed below in the pattern of <Unit Number>.<Assignment Number>. For example, Lab 1.5 refers to the 5th lab activity in Unit 1.

Unit	Activities
1— Introduction to the Capstone Project Fundamental Review  Exam 1  Labs	<ul style="list-style-type: none"> <li>• Content Covered:  <i>Wood, Dawn Parrish, and Mary E. Pascarella. Essentials Microsoft Office Project 2007. Upper Saddle River, NJ: Prentice Hall.</i> <ul style="list-style-type: none"> <li>• Project 1, "Taking a tour of Project 2007" pp. 2–26</li> </ul> </li> <li>• Content Covered:  <i>Terrell, David, Fundamentals of DC Circuits. 3 Columbia Circle Box 15015 Albany, NY 12212 Delmar Publishing</i> <ul style="list-style-type: none"> <li>• Ch 1 through 10</li> <li>• DC Electronics Review</li> <li>• Fundamental Review Exam</li> <li>• Lab 1.1 Project Documentation</li> <li>• Lab 1.2 Project related work</li> </ul> </li> </ul>
2— Planning the Project Part I          Fundamental Review       Quiz 1 Labs	<p>Read from <i>Wood, Dawn Parrish, and Mary E. Pascarella. Essentials Microsoft Office Project 2007. Upper Saddle River, NJ: Prentice Hall:</i></p> <ul style="list-style-type: none"> <li>• Project 2, "Specifying Overall Project Settings," pp. 35–52</li> <li>• Project 3, "Entering Tasks and Creating a Project Schedule," pp. 61–83</li> <li>• Project Documentation Project 2 pp. 57-59 Challenge</li> <li>• Project Documentation Project 3 pp. 94-97 Challenge</li> <li>• Project Documentation Unit 2 Word Project Definition Statement</li> <li>• Project Documentation Unit 2 Excel Bill of Materials</li> <li>• Project Demonstration Unit 2 Initial Design</li> <li>• Content Covered:  <i>Terrell, David, Fundamentals of AC Circuits. 3Columbia Circle Box 15015 Albany, NY 12212 Delmar Publishing</i> <ul style="list-style-type: none"> <li>• Chapters 11-18</li> <li>• AC Electronics Review</li> <li>• Unit 2 Fundamental Review Quiz</li> <li>• Lab 2.1 Project Documentation</li> <li>• Lab 2.2 Project related work</li> </ul> </li> </ul>
3— Planning the Project Part II	<ul style="list-style-type: none"> <li>• Read from <i>Wood, Dawn Parrish, and Mary E. Pascarella. Essentials Microsoft Office Project 2007. Upper Saddle River, NJ: Prentice Hall</i> <ul style="list-style-type: none"> <li>○ Project 3, "Entering Tasks and Creating a Project Schedule," pp. 61–83</li> <li>○ Project 4, "Scheduling Resources and Assigning Costs," pp. 99–120</li> <li>○ Project 6, "Modifying Tasks Using the Gantt Chart," pp. 171–191</li> </ul> </li> <li>• Project Documentation Project 4 pp. 129-133 Challenge</li> <li>• Project Documentation Project 6 pp. 201-203 Challenge</li> <li>• Project Documentation Unit 2 Word Final Project Definition Statement</li> <li>• Project Documentation Unit 2 Excel Bill of Materials</li> <li>• Content Covered:</li> </ul>

Unit	Activities
Fundamental Review  Quiz 2 Labs	<p><i>Floyd, Thomas L. and David M. Buchla. Fundamentals of Analog Circuits, Custom edition taken from 2nd Edition, Pearson Custom, 2002.</i></p> <ul style="list-style-type: none"> <li>• Chapters 1 through 5.3</li> <li>• Electronic Devices review               <ul style="list-style-type: none"> <li>• Unit 3 Fundamental Review Quiz</li> <li>• Lab 3.1 Project Documentation</li> <li>• Lab 3.2 Project related work</li> </ul> </li> </ul>
4— Project Prototyping Part I  Fundamental Review  Quiz 3 Labs	<p>Read from <i>Wood, Dawn Parrish, and Mary E. Pascarella. Essentials Microsoft Office Project 2007. Upper Saddle River, NJ: Prentice Hall</i></p> <ul style="list-style-type: none"> <li>○ Project 5, “Modifying Task Information,” pp. 135–158</li> <li>○ Project 7, “Customizing Microsoft Project and Sharing Information,” pp. 205–231</li> <li>○ Project 8, “Integrating Project Data,” pp. 243–269</li> </ul> <ul style="list-style-type: none"> <li>• Project Documentation Project 5 pp. 166-168 Challenge</li> <li>• Project Documentation Project 7 pp. 239-242 Challenge</li> <li>• Project Documentation Project 8 pp. 276-277 Challenge</li> <li>• Project Demonstration Unit 4 Design Verification</li> <li>• Content Covered:</li> </ul> <p><i>Floyd, Thomas L. and David M. Buchla. Fundamentals of Analog Circuits, Custom edition taken from 2nd Edition, Pearson Custom, 2002.</i></p> <ul style="list-style-type: none"> <li>• Chapters 5.4 through 11</li> <li>• Electronic Devices review               <ul style="list-style-type: none"> <li>• Unit 4 Fundamental Review Quiz</li> <li>• Lab 4.1 Project Documentation</li> <li>• Lab 4.2 Project related work</li> </ul> </li> </ul>
5— Project Prototyping Part II Fundamental Review Quiz 4 Labs	<p>Read from:  <i>Floyd, Thomas L., Digital Fundamentals, Custom edition taken from 8th Edition, Pearson Custom, 2003.</i></p> <ul style="list-style-type: none"> <li>• Chapters 1 through 6, 8, and 15</li> <li>• Digital Electronics review</li> </ul> <p>Unit 5 Fundamental Review Quiz</p> <ul style="list-style-type: none"> <li>• Lab 5.1 Project Documentation</li> <li>• Lab 5.2 Project related work</li> </ul>
6— Project Prototyping Part III Fundamental Review Quiz 5 Labs	<p>Read from:  <i>Floyd, Thomas L., Digital Fundamentals, Custom edition taken from 8th Edition, Pearson Custom, 2003.</i></p> <ul style="list-style-type: none"> <li>• Chapters 7, 9 through 11, and 14</li> <li>• Digital Electronics review               <ul style="list-style-type: none"> <li>• Project Demonstration I</li> <li>• Unit 6 Fundamental Review Quiz</li> <li>• Lab 6.1 Project related work</li> </ul> </li> </ul>
7— Final Assembly —Part I Fundamental Review	<p>Read from:  <i>Anthony, Tom, Bonham, Douglas, Kaeding, Randy, Larsen, Lawrence, Oliphant, John, and Schilling, Teresa. Introduction to Personal Computers. Benton Harbor, MI: Heathkit Educational Systems, 2009</i></p>

Unit	Activities
Quiz 6 Labs	<ul style="list-style-type: none"> <li>• Personal Computer Review</li> </ul> Read from: <i>Antonakos, James L. and Kenneth C. Mansfield, Jr. Networking Concepts, 2nd Edition, Pearson Custom Publishing, 2003.</i> <ul style="list-style-type: none"> <li>• Networking Concepts Review</li> </ul> Read from: <i>Gaddis, Tony. Starting Out with Programming Logic &amp; Design. Custom Edition. Indianapolis: Pearson Custom Publishing, 2008.</i> <ul style="list-style-type: none"> <li>• Introduction to Programming Review               <ul style="list-style-type: none"> <li>• Unit 7 Project Documentation Gantt Chart Review</li> <li>• Unit 7 Project Demonstration II</li> <li>• Unit 7 Fundamental Review Quiz</li> <li>• Lab 7.1 Project related work</li> </ul> </li> </ul>
8— Final Assembly —Part II Fundamental Review  Quiz 7 Labs	Read from: <i>Miller, Gary M. and Beasley, Jeffrey S., Modern Electronic Communications, 8th Edition, Pearson</i> <ul style="list-style-type: none"> <li>• Ch 1 through 18</li> <li>• Communication Systems Review               <ul style="list-style-type: none"> <li>• Project Demonstration Unit 8 Design Modification</li> <li>• Project Documentation Unit 8 Gantt Chart Review</li> <li>• Unit 8 Fundamental Review Quiz</li> <li>• Lab 8.1 Project related work</li> </ul> </li> </ul>
9— Final Assembly —Part III Fundamental Review  Quiz 8 Labs	Read from: <i>Microprocessors, Heathkit Company</i> <ul style="list-style-type: none"> <li>• Microprocessors Review               <ul style="list-style-type: none"> <li>• Project Demonstration Unit 9 Final Assembly Inspection</li> <li>• Project Documentation Unit 9 Final Assembly Measurements</li> <li>• Project Presentation Unit 9 PowerPoint</li> <li>• Project Presentation Unit 9 Capstone Invitation Distribution</li> <li>• Unit 9 Fundamental Review Quiz</li> <li>• Lab 9.1 Project related work</li> </ul> </li> </ul>
10— Presentation Rehearsal and Final Fundamentals Review  Exam II Lab	Read from: <i>Programmable Logic Controllers, 3<sup>rd</sup> ed. Frank D. Petruzella, McGraw-Hill</i> <ul style="list-style-type: none"> <li>• Ch 1 through 13</li> </ul> Read from: <i>Programmable Logic Controllers, Activities Manual, 3<sup>rd</sup> ed. Frank D. Petruzella, McGraw-Hill</i> <ul style="list-style-type: none"> <li>• Tests on Chapters 1 – 13</li> </ul> Read from: Lab Manual with LogixPro PLC Simulator for <i>Programmable Logic Controllers, 3<sup>rd</sup> ed. Frank D. Petruzella, McGraw-Hill</i> <ul style="list-style-type: none"> <li>• Laboratories on Chapters 1 – 13</li> <li>• Project Presentation Unit 10 PowerPoint</li> </ul>

Unit	Activities
	<ul style="list-style-type: none"><li>• Project Presentation Unit 10 Presentation Rehearsal</li><li>• Oral Final Fundamental Review</li><li>• Final Fundamental review Exam II</li><li>• Lab 10.1 Project related work final preparation</li></ul>
11— Capstone Presentation	Read from <i>None</i> . <ul style="list-style-type: none"><li>• Project Demonstration Unit 11 Final Assembly Submission</li><li>• Project Documentation Unit 11 Final Assembly Measurements Submission</li><li>• Project Documentation Unit 11 Final Written Report</li><li>• Project Presentation Unit 11 PowerPoint Submission</li><li>• Project Presentation Unit 11 Capstone Presentation</li></ul>

## Instructional Methods

The first ten units will focus on the foundations of project management using lectures with notes, handouts, and case studies on principles of project management. You will begin to build your project plans and seek approval for the final project from the instructor. Upon approval of the final project, you will begin the project development phase of the course. Weekly laboratory time will be utilized by hands-on activities on the capstone project.

To ensure that you retain program-related knowledge, a **fundamental review** will be conducted throughout the course. At the start of Unit 10, you will take a written comprehensive examination, and the instructor will administer an oral comprehensive examination. The purpose of these examinations are to allow you to review knowledge and skills learned in the entire program and enable you to prepare for your job interviews and career success.

A major portion of the course will be devoted to the capstone project. In this project, you will work in teams to develop a computer and electronics device or system designed to solve a specific problem. The project will be evaluated on the demonstration of the device or system, its documentation, and the presentation.

The instructor—or instructors—for this course will perform the roles of an advisor, a consultant, and a supervisor. Students in each group will perform the role of a professional design team designing a device or system in a real-life situation. Meetings will be conducted regularly so that the instructor can provide the student teams consultation and guidance on the project and discuss various implementation and problem-solving strategies.

Complete **project documentation** in accordance with the project management guidelines is required. Grades will be awarded based on the quality and coverage of all the areas and items listed in the Documentation Requirements section.

For **project demonstration**, grades will be awarded based on the quality in the following areas:

- Concept
  - Document the significance of the problem to be solved
  - Explain why this embodiment is the optimal solution
- Performance
  - Demonstrate the device or system solves the problem
  - Demonstrate the device or system operates correctly over the entire range of inputs
  - Demonstrate the embodiment is sufficiently robust

For **project documentation**, grades will be awarded based on the quality in the following areas:

- Microsoft Word Final Report
- Multisim Circuit Schematics
- Software Code
- Microsoft Project Gantt Chart of the entire project
- Microsoft Excel Bill of Materials

For **project presentation**, grades will be awarded based on the quality in the following areas:

- Executive Summary - deliver a PowerPoint presentation demonstrating final project solution to include:
  - Significance of the problem to be solved



- Description of the embodiment
- Defense of the embodiment
- the Microsoft Project Gantt Chart
- the Excel Bill of Materials
- Demonstration of knowledge of the principles of project management and their integration into the business case scenarios
- Engineering Summary – deliver in the same PowerPoint:
  - Explanation of design methodology
  - Clear and complete explanation of the device or system functionality and performance
  - Data to support claims made
  - the Multisim Circuit Schematic
  - the software code
- Dress and Deportment
  - Formal Business attire required
  - Written Invitations are to be delivered to the College Director, his or her staff, DOR, MOR, DFA, Registrar, the entire Career Services Department, all School Chairs, and all CEET faculty.

## Instructional Materials and References

### Student Textbook Package

Wood, Dawn Parrish, Mary E. Pascarella and David R. Foley. *Essentials: Microsoft Office Project 2007, Custom Edition*. Pearson Custom Publishing, 2012

Note: In addition to the textbook *Essentials Microsoft Office Project 2007*, all textbooks for the core CEET courses, especially those for Computer Hardware and Software, Networking, DC and AC Electronics, Electronic Devices, Digital Electronics, Communication Systems, Microprocessors, and Control Systems

### Other Required Resources

In addition to the student textbook package, the following is also required in this course:

### Equipment and Tools

- CEET Toolbox

### References

#### ITT Tech Virtual Library

Log on to the ITT Tech Virtual Library (<http://myportal.itt-tech.edu/library/Pages/HomePage.aspx>) to access online books, journals, and other reference resources selected to support the ITT Tech curricula.

#### Books

You may click “Books” or use the “Search” function on the home page to find the following books.

Books> Ebrary

- Heldman, Kim. *Project Management JumpStart*. 2<sup>nd</sup> ed. San Francisco: Sybex Incorporated. 2007.
- Richman, Larry L. *Project Management Step-by-Step*. New York: AMACOM, 2002.

Books> Books24x7

- Heldman, Kim. *PMP: Project Management Professional Study Guide*. 2<sup>nd</sup> ed. Hoboken, J.N.: Wiley Pub. 2007..
- Lewis, James P. *Fundamentals of Project Management. WorkSmart Series*. New York: AMACOM Books. 1997.
- Westland, Jason. *The Project Management Life Cycle: A Complete Step-by-Step Methodology for Initiating, Planning, Executing & Closing a Project Successfully*. London; Philadelphia, PA: Kogan Page. 2006.

#### Periodicals

You may click “Periodicals” or use the “Search” function on the home page to find the following periodicals.

- None.

#### ITT Tech Virtual Library > Reference > Project Management

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You may click “Reference” or use the “Search” function on the home page to find the following reference resources.

- Microsoft Project  
A tour, list of features, and FAQ's about Microsoft Project.

- **Project Management Institute**  
The Project Management Institute (PMI) is a not-for-profit project professional association.

management

## Other References

The following resources may be found **outside** of the ITT Tech Virtual Library

### Web sites

- PMOUSA.com  
<http://www.pmousa.com>  
A Web site offering free information to project professionals
- Primavera Systems  
<http://www.oracle.com/us/corporate/acquisitions/primavera/index.html>  
This site offers detailed information about Primavera Project Management software.
- Project Management Forum Project Management eJournal  
<http://www.pmworldtoday.net/>  
This site is an online source for global news and information related to project management.
- Project Management Software Comparison  
<http://www.capterra.com/landing/psaxproj> A Web site providing a list of available project management tools
- The Project Management WWW Site <http://www.projectmanagement.com/>  
A collection of links to project management resources, tools, and news.
- StartWright Resources <http://www.startwright.com/>  
A list of project management links.
- TenStep Project Management Process <http://www.tenstep.com/>  
This site describes a methodology for managing work as a project.
- The Value of Project Lifecycle Methodology  
<http://www.lifecyclestep.com/open/401.0Value.htm>  
A Web site specializing in developing, consulting, and training in business methodologies
- Wideman Comparative Glossary of Project Management Terms  
<http://www.maxwideman.com/pmglossary/> A Web site providing definitions for commonly used terms in project management

All links to Web references outside of the ITT Tech Virtual Library are always subject to change without prior notice.

## Course Evaluation and Grading

### Evaluation Criteria Table

The final grade will be based on the following categories:

CATEGORY	WEIGHT
Capstone Project	70%
• Project Demonstration	35%
• Project Documentation	25%
• Project Presentation	10%

CATEGORY	WEIGHT
<b>Individual Skills Assessment</b>	<b>20%</b>
· Unit Exams	8%
· Quizzes	8%
· Oral Exam	4%
<b>Project Management</b>	<b>10%</b>
Total	100%

Note: Students are responsible for abiding by the Plagiarism Policy.

### Grade Conversion Table

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

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

### ET365—COURSE SNAPSHOT

Grading Category	Grade Book Category Weight (% of Course Total)	Unit	Activity/Graded Deliverable	Grade Allocation (% of Course Total)	Program SLO	Measuring Rubric	Rubric Alias
A. Project Documentation	25%	1	Lab 1.2 : Project-related Work	4%	1	A-1-1	Communication
		2	Lab 2.2 : Project-related Work	3%	1	A-1-2	Project Management
		3	Lab 3.1 : Product Documentation	1%	1	A-1-1	Communication
			Lab 3.2 : Project-related Work	1%	1	A-1-2	Project Management
		4	Lab 4.2 : Project-related Work	4%	1	A-1-2	Project Management
		5	Lab 5.2 : Project-related Work	4%	1	A-1-2	Project Management
		8	Lab 8.1 : Design Modification Evaluation	4%	1	A-1-2	Project Management
		9	Lab 9.1 : Final Assembly	4%	1	A-1-2	Project Management
B. Project Presentation	10%	10	Lab 10.1 : Presentation Rehearsal	2%	1	B-1-1	Communication

		11	Capstone Presentation	8%	1	B-1-1	Communication
D. Project Demonstration	35%	6	Lab 6.1 : Project Demonstration	3%	3	C-3-0	Technological Analysis
				2%	4	C-4-0	Technological Skills
		7	Lab 7.1 : Project Demonstration	3%	3	C-3-0	Technological Analysis
				2%	4	C-4-0	Technological Skills
		11	Demonstrate the Final Assembly	5%	1	C-1-1	Communication
				10%	3	C-3-0	Technological Analysis
10%	4			C-4-0	Technological Skills		
E. Project Management	10%	1	Lab 1.1 : Project Documentation	1%	2	D-2-1	Research
				1%	2	D-2-2	Critical Thinking
		2	Lab 2.1 : Refine the Project Documentation	1%	2	D-2-1	Research
				1%	2	D-2-2	Critical Thinking
		4	Lab 4.1 : Project Documentation	1%	2	D-2-1	Research
				1%	2	D-2-2	Critical Thinking
		5	Lab 5.1 : Project Documentation	1%	2	D-2-1	Research
				1%	2	D-2-2	Critical Thinking
8	Lab 8.1 : Design Modification Evaluation	1%	2	D-2-1	Research		
		1%	2	D-2-2	Critical Thinking		
F. Individual Skills Assessment	20%	1	Written Final Exam I	1%	All	All	
		2	Quiz 1	1%	All	All	
		3	Quiz 2	1%	All	All	
		4	Quiz 3	1%	All	All	
		5	Quiz 4	1%	All	All	
		6	Quiz 5	1%	All	All	
		7	Quiz 6	1%	All	All	
		8	Quiz 7	1%	All	All	
		9	Quiz 8	1%	All	All	
		10	Oral Final Exam	4%	All	All	
10	Written Final Exam II	7%	All	All			
Total	100%			100%			

## COURSE GRADING RUBRIC

### ET365—Computer & Electronics Capstone Project

Campus: \_\_\_\_\_  
 Faculty Name: \_\_\_\_\_  
 Student Name: \_\_\_\_\_

**Directions: Please assign a percentage grade on the line for each subcategory.**

**A. Project Documentation (25% of total grade)**

**Unit 11–Project Documentation including Project Proposal, etc.**

\_\_\_\_\_ **A-1-1 Communication:**

- 90-100%: Accurate and concise message effectively delivered through writing and/or speech with clarity, logical organization of thoughts and appropriate format/style for expected understanding by targeted audience
- 80-89%: Accurate message delivered through writing and/or speech with appropriate format/style for expected understanding by the target audience
- 70-79%: Intended message gets across to the target audience in writing or speech with necessary modification and/or polishing
- 60-69%: Most of the intended message gets across to the audience in writing and/or speech with some degree of ambiguity; lack of consistent format/style
- Below 60%: Disorganized thoughts with little evidence of logical structure in writing and/or speech; failure to get the intended message across to the audience

\_\_\_\_\_ **A-1-2 Project Management:**

- 90-100%: Effective execution of clearly defined purposes, conditions and limitations of the project with milestones, resources and deliverables consistently planned and managed using specific tools
- 80-89%: Clearly defined purposes, conditions and limitations of the project with milestones, resources and deliverables with obvious evidence of using systematic tools for planning and management purposes
- 70-79%: Project scope and resources identified with the expected milestones and deliverables using appropriate tools for planning and tracking
- 60-69%: Loosely defined scope of the project with the majority of the expected milestones and deliverables; lack of evidence in applying specific tools for planning and tracking functions
- Below 60%: Vaguely defined purposes for the project; lack of evidence of structured planning and tracking for a project

**B. Project Presentation (10% of total grade)**

**Unit 11–Capstone Presentation**

\_\_\_\_\_ **B-1-1 Communication:**

- 90-100%: Accurate and concise message effectively delivered through writing and/or speech with clarity, logical organization of thoughts and appropriate format/style for expected understanding by targeted audience

- 80-89%: Accurate message delivered through writing and/or speech with appropriate format/style for expected understanding by the target audience
- 70-79%: Intended message gets across to the target audience in writing or speech with necessary modification and/or polishing
- 60-69%: Most of the intended message gets across to the audience in writing and/or speech with some degree of ambiguity; lack of consistent format/style
- Below 60%: Disorganized thoughts with little evidence of logical structure in writing and/or speech; failure to get the intended message across to the audience

### C. Project Demonstration (35% of total grade)

#### Unit 11—Project Demonstration, Final Assembly Submission

##### \_\_\_\_\_ **C-1-1 Communication:**

- 90-100%: Accurate and concise message effectively delivered through writing and/or speech with clarity, logical organization of thoughts and appropriate format/style for expected understanding by targeted audience
- 80-89%: Accurate message delivered through writing and/or speech with appropriate format/style for expected understanding by the target audience
- 70-79%: Intended message gets across to the target audience in writing or speech with necessary modification and/or polishing
- 60-69%: Most of the intended message gets across to the audience in writing and/or speech with some degree of ambiguity; lack of consistent format/style
- Below 60%: Disorganized thoughts with little evidence of logical structure in writing and/or speech; failure to get the intended message across to the audience

### C. Project Demonstration—cont'd

#### Unit 11—cont'd

##### \_\_\_\_\_ **C-3-0 Technological Analysis:**

1. 90-100%: Student displays a thorough understanding and effective analysis of electronic circuits and systems, including analog and digital electronics, electronic communications systems, microprocessors, control systems, and computers, programming, and networking.



2. 80-89%: Student displays an above-average understanding and effective analysis of electronic circuits and systems, including analog and digital electronics, electronic communications systems, microprocessors, control systems, and computers, programming, and networking.
3. 70-79%: Student displays an average understanding and analysis of electronic circuits and systems, including analog and digital electronics, electronic communications systems, microprocessors, control systems, and computers, programming, and networking.
4. 60-69%: Student displays little understanding and analysis of electronic circuits and systems, including analog and digital electronics, electronic communications systems, microprocessors, control systems, and computers, programming, and networking.
5. Below 60%: Student cannot articulate an understanding and analysis of electronic circuits and systems, including analog and digital electronics, electronic communications systems, microprocessors, control systems, and computers, programming, and networking.

\_\_\_\_\_ **C-4-0 Technological Skills:**

6. 90-100%: Student displays an outstanding, effective and skillful ability to implement, maintain, and troubleshoot electronic systems at both component and system levels.
7. 80-89%: Student displays above-average hands-on ability in hardware and software technology to implement, maintain, and troubleshoot electronic systems at both component and system levels.
8. 70-79%: Student displays average hands-on skills in hardware and software technology to implement, maintain, and troubleshoot electronic systems at both component and system levels.
9. 60-69%: Student displays a little ability on hands-on skills in hardware and software technology to implement, maintain, and troubleshoot electronic systems at both component and system levels.
10. Below 60%: Student cannot display hands-on skills in hardware and software technology to implement, maintain, and troubleshoot electronic systems at both component and system levels.

## D. Project Management (10% of total grade)

### Unit 7—Project Scope, Gantt Chart, etc.

\_\_\_\_\_ **D-2-1 Research:**

11. 90-100%: Selection of valid topic with clearly defined problem statement, substantial literature review, appropriate methodology, convincing conclusions, quality documentation and accurate bibliographical format/style
12. 80-89%: Valid topic with clear problem statement, adequate literature review and specific methodology; meaningful conclusions with adequate documentation and proper bibliographical format/style
13. 70-79%: Valid topic with adequate problem statement and minimum literature review; evidence of attempting with certain methodology;

reasonable conclusions with required documentation and proper bibliographical format/style

14. 60-69%: Loosely defined topic with unstructured problem statement and random literature review; weak evidence of specific methodology; lack of conclusion; poor documentation with inconsistent bibliographical format and style
15. Below 60%: Largely undefined topic and no problem statement; little literature review; lack of methodology; no conclusion and no evidence of purposeful documentation

\_\_\_\_\_ **D-2-2 Critical Thinking:**

16. 90-100%: Effective decision making based on qualitative and quantitative analysis of data and convincing reasoning; evidence of original creativity in providing solutions for challenging qualitative and quantitative problems
17. 80-89%: Making decisions based on adequate research and reasoning that require a fair amount of analytical reading and critical thinking; capable of solving qualitative and quantitative problems
18. 70-79%: Evidence of making decisions based on some research and analysis; able to solve normal qualitative and quantitative problems
19. 60-69%: Making decisions by following the status quo; lack of evidence in strenuous research, analysis and reasoning in making a decision or solving qualitative and quantitative problems
20. Below 60%: No evidence of making any decision based on analysis; incapable of solving specific qualitative and quantitative problems

**E. Individual Skills Assessment (20% of total grade)**

\_\_\_\_\_ **Individual Skills Assessment**

**Individual Skills Assessment Scoring Table**

Levels of Knowledge	Number of topics Satisfied	Number of topics failed	Points Earned	Points earned
Synthesis/Evaluation			1	( ) x 1.0 = ____
Application/Analysis			0.8	( ) x 0.8 = ____
Knowledge/Comprehension			0.6	( ) x 0.6 = ____
<b>Total Points Earned</b>				
Divide <b>Total Points Earned</b> by 15 (maximum number of points that can be earned), then multiply by 100 and enter the resulting percentage value in this box. This resulting value is to be copied to the Individual Skills Assessment section of the Grade Book				

For example, the student satisfied 5 questions at the top level, 5 questions at the middle level, 4 questions at the lowest level, and failed to address 1 question (total of 15 questions), this is what he/she gets:

$$5 \times 1 = 5$$

$$5 \times 0.8 = 4$$

$$4 \times 0.6 = 2.4$$

$$1 \times 0 = 0$$

$$5 + 4 + 2.4 + 0 = 11.4 \text{ Total Points Earned}$$

$$(11.4 \div 15) \times 100 = \mathbf{76.0}$$

Enter this number on the line at the top of the page and in the Skills Assessment section of the Grade Book for this student.

*(End of Syllabus)*