

Outline of ET410 course

Week 1: In the very first week, you will be introduced to the concept of project management and will learn how to become a better project manager. In this week, you will also learn about the relationship between systems engineering and project management. It is important to realize the similarities between the two in order to work out the details in the context of technical and managerial leadership of a project. In this week, you will also perform research and gather information to brainstorm ideas for the capstone project that will solve an engineering design problem. In addition to that, you will also maintain the lessons learned document that you will edit each week based on your observations and lessons learned from that week.

Week 2: In week 2, you will learn about the organizational context, strategic management and project planning. You will prepare a project proposal document (Template provided) and submit it in the course and also to xxxxxxxxxxx@xxxx.edu

Week 3: In this week, you will learn about designing the breadboard circuit for your project. If your project requires a circuit to be built on a breadboard, this week you will design that using a virtual environment to simulate the actual breadboard circuit. After the breadboard design has been completed, a cost analysis should be performed to determine the status of the design relative to the cost goals. You will develop the cost analysis spreadsheet to determine the cost associated with designing your circuit breadboard.

Week 4: In this week, you will learn about the scope reporting, in other words any control system or management of documentation that assess overall status of your project. You will learn about the responsibility assignment matrix, scope management and identifying the requirements for the project. You will be required to identify the requirements for your project. The other part of your work will be to complete the work breakdown structure (WBS) for your project.

Week 5: In week 5, you will work on scheduling. There will be concept of project scheduling and theory of constraints. You will learn about the critical chain project management and scheduling process. You are supposed to add the scheduling in the WBS that is created in week 4.

Week 6: In this week, you will be working on cost estimation and budgeting. You will learn about cost of labor, cost of material, cost of equipment, direct and indirect costs, recurring and nonrecurring costs, and fixed and variable costs. In this week again, you will use the WBS and add the cost and budgeting information for your project.

Week 7: Risk managements is important aspect of project management. In this week, you will learn about five causes of risk and ways to analyze risk using PRAM model. You will need to identify the risks associated with your project and analyze and mitigate the risk using the strategies learned. Resource management is an important task to implement in a project. You will learn about the resource loading, resource leveling and techniques for resource moving. You will prepare the Ganttchart for the resources needed for your project.

Week 8: In the last week of ET410, you will learn about the closeout and termination of the project. Some of the factors that cause the early termination of the project will also be discussed.

Importance of a Lessons Learned document

Throughout the project, you will gather additional information that may be used to limit risk, continually improve the process, and provide a basis for future projects. This knowledge should be kept in a document that is updated by you and other project team members, if relevant, called the Lessons Learned document.

In this course we will utilize a Lessons Learned Document Template that includes notes as to what works well and what does not work well at various phases of the project. Thus, each team member or project participant should contribute to this document at the completion of each phase and milestone.

The lessons learned document will serve as a valuable resource both during the project and upon project completion. The information gathered will become part of historical information that may be referred to in future projects. The availability of historical information greatly reduces the risks associated with estimating. It also helps you to learn about your own strengths and weaknesses and to correct those as you go along.

In summary, a lessons learned document

1. Is important for continuous improvement
2. Provides additional historical context to a project, which can be useful in the project audit phase or in future projects
3. Aids in identifying areas for personal improvement or professional development

WEEK 1

W1 Assignment "The Project Management Institute"

Technical Project Management

The Project Management Institute

Watch first 3 videos of [Microsoft Project Tutorial](#).

Write a 1-2 page paper. In your paper answer the following questions:

Explain in detail what role the PMI plays and what are its requirements for membership.

- When and why was the PMI formed?
- What is the criteria for membership?
- What purpose does it play for the engineer and his future?
- Why become a member?
- What is the CAPM, and what is required for this?

Include a title page and 3-5 references. Only one reference may be from the internet (not Wikipedia). The other references must be from the Grantham University online library. Please adhere to the Publication Manual of the American Psychological Association (APA), (6th ed., 2nd printing) when writing and submitting assignments and papers.

Update the Lessons Learned Document and submit with your proposal. Remember that the template is found in Week 1. You will be using this template as a running document, adding to it as you go through ET410 and ET450.

Brainstorming Activity: (Do not have to submit)

Begin to brainstorm ideas for the capstone project. You can also do this with a teammate if you both plan to take ET450 at the same time. Feel free to use the discussion forum to find out if other students in the course are interested in working on a project together.

Identify an engineering design problem. Investigate existing solutions to the problem. What are alternative solutions to the problem which you can think of which could be the basis for your capstone project? Be sure to review the “Scope of the Capstone Project” to make sure that you are meeting the expectations for the project and that it would be feasible for you to do in the time available and within your budget. As you brainstorm, also be sure to review the tips for researching design problems found in Chapter 5 of Stadtmiller.

You are encouraged to review the week 2 course work assignments to understand the expectations.

WEEK 2

W2 Discussion "Strategic Management"

Technical Project Management

Strategic Management

How does defining a project relate to project planning?

1. Why is it important to develop a strategic vision and sense of mission before proceeding?
 2. Why is it important to politically know the key stakeholders and ensure they are in agreement before proceeding?
 3. Why is it important to understand the purpose, goals and objectives, success criteria, and project scope before proceeding?
- Discuss how each of these elements are important in understanding the challenge of project management.

Should be 75 to 150 words, but may go longer depending on the topic. If you use any source outside of your own thoughts, you should reference that source. Include solid grammar, punctuation, sentence structure, and spelling.

W2 Assignment "Prepare Your Project Charter"

Technical Project Management

Prepare Your Project Proposal

1. Use the [Project Proposal Template](#)
2. Fill out completely and turn in to the course instructor in Blackboard and also email it to xxxxxxx@grantham.edu from your Grantham email address. The subject line for the email should be "Capstone YourGID - Term". If you need assistance, please contact the instructor prior to the due date.
3. Update the Lessons Learned Document and submit with your proposal. Remember that the template is found in Week 1. You will be using this template as a running document, adding to it as you go through ET410 and ET450.

WEEK 3

W3 Discussion "Types of Design Reviews"

Technical Project Management

Types of Design Reviews

Look up articles on different types of design review processes for engineering projects on the EBSCO host and IEEE online Library resources from Grantham. Reserve one of the articles to discuss the significance of the selected design review process. Please make sure to provide a link to the article.

Should be 75 to 150 words, but may go longer depending on the topic. If you use any source outside of your own thoughts, you should reference that source. Include solid grammar, punctuation, sentence structure, and spelling.

W3 Assignment "Developing Requirements and SDR Documents"

Technical Project Management

Developing Requirements and SDR Documents

1. Based on the lectures, the Engineering Design text (especially 2.2, 6.1, 6.3, 7, and 8), and your research, do the conceptual design (as explained in Chapter 2 and also above) for your project. Two or three alternative designs should be considered with functional block diagrams for all of them. You may submit your **Conceptual Design Review** or **System Design Review** document as a powerpoint presentation or as a written document. You may use templates as a guide by doing a search of "conceptual design review template" or "system design review template."
2. Create a **Project Requirements Document** for your chosen design. It should include a functional block diagram of the design along with the functional specifications. This should be a written document. It is worthwhile to look for templates to guide you by doing a search of "project requirements document" or "requirements specification template" or "specification document template."
3. Update your Lessons Learned Document.
4. Be sure to save these documents along with the one last week as you will need to submit these in Week 1 of ET450.
5. Submit these in the dropbox.

Update the Lessons Learned Document and submit with your proposal. Remember that the template is found in Week 1. You will be using this template as a running document, adding to it as you go through ET410 and ET450.

WEEK 4

W4 Discussion "The Work Breakdown Structure (WBS)"

Technical Project Management

The Work Breakdown Structure (WBS)

Discuss the purposes of the work breakdown structure and how it might apply to your specific project.

Should be 75 to 150 words, but may go longer depending on the topic. If you use any source outside of your own thoughts, you should reference that source. Include solid grammar, punctuation, sentence structure, and spelling.

W4 Assignment "Developing a Work Breakdown Structure"

Technical Project Management

Developing a Work Breakdown Structure

1. Watch [videos 9 thru 13B](#) of the Microsoft Project Tutorial.

Read the tutorial and get the link to download [Microsoft Project HERE](#) immediately if you did not start the process last week.

- - Using Microsoft Project software develop a WBS for your project
 - Include tasks for such things as equipment specifications for vendors, vendor bidding packages, evaluation of bids and vendor selection
- 2. Include a title page and any references you used.
- 3. Update your Lessons Learned Document.

Note: Break down your tasks to the lowest level possible. The more detailed your WBS is, the more accurate your scheduling and budget will be!

Update the Lessons Learned Document and submit with your proposal. Remember that the template is found in Week 1. You will be using this template as a running document, adding to it as you go through ET410 and ET450.

WEEK 5

W5 Discussion "Time Management"

Technical Project Management

Time Management

Discuss some of the reasons why individuals routinely over-estimate the time for project activities. How is this behavior detrimental to the schedule and project?

- Are some of these reasons more prevalent in your own experience than others?

Should be 75 to 150 words, but may go longer depending on the topic. If you use any source outside of your own thoughts, you should reference that source. Include solid grammar, punctuation, sentence structure, and spelling.

W5 Assignment "Adding a Schedule"

Technical Project Management

Adding a Schedule

1. Watch [videos 14 thru 21](#) of Microsoft Project Tutorial
- - Using Microsoft Project software amend your WBS to include the schedule of time required to complete your project.
 - Be sure when you add your schedule, you check the sequence of activities. In the real world many tasks can be performed in parallel or concurrently
 - Don't forget you must schedule all tasks assigned under the WBS
- 2.
 3. Include a title page and any references.
2. Update your Lessons Learned Document.

Update the Lessons Learned Document and submit with your proposal. Remember that the template is found in Week 1. You will be using this template as a running document, adding to it as you go through ET410 and ET450.

WEEK 6

W6 Discussion "Cost Estimation and Budgeting"

Technical Project Management

Cost Estimation and Budgeting

An important aspect of cost budgeting is personnel. A current professional issue in the engineering field is companies using contract engineers like employees but refusing to actually make them employees. Thus, they effectively work for a company for years in a contract status rather than in a full-time employee status. Labor and tax law may motivate the employer and perhaps the 'employee' to maintain a contingent status. On the other hand, there can be an ethical issue with refusing to transition an 'employee' to full-time status. Discuss what motivates an employer to use temporary or contingent employees, and explain the ethical implications on the individual, society, and the profession of keeping an individual in that status. What criteria might be used to determine when to change an individual's status? Consider ethical problem solving strategies from ET100 where appropriate. You MUST have references.

Should be 75 to 150 words, but may go longer depending on the topic. If you use any source outside of your own thoughts, you should reference that source. Include solid grammar, punctuation, sentence structure, and spelling.

W6 Assignment "Adding a Budget"

Technical Project Management

Adding a Budget

1. Watch videos 22 thru 30 of [Microsoft Project Tutorial](#).
- Using Microsoft Project software amend your WBS to include your **project budget**
 - Make sure that you use your **resource sheet** in Microsoft project to list all materials, work classification units and resource units
 - Make sure you show totals for all major headings and the project total itself
Include a title page and references you used.

Update the Lessons Learned Document and submit with your proposal. Remember that the template is found in Week 1. You will be using this template as a running document, adding to it as you go through ET410 and ET450.

WEEK 7

W7 Discussion "Risk Variables"

Technical Project Management

Risk Variables and Critical Resources

Question 1:

What are some of the typical risk variables of your project? Discuss any additional risks that are most likely to occur in your project? How will you mitigate these risks?

Question 2:

For most projects, the key resources to be managed are the project team personnel. Explain in what sense project team personnel are often the projects most critical resource?

W7 Assignment- "Risk Factors and Gantt Chart"

Technical Project Management

Risk Factors and Gantt Charts

Question 1: Project Risk factors

- List the major risk factors for your project and the possible ways to mitigate this risks for your project.

Question 2: Resource Evaluation

- Produce and complete a Gantt Chart using MS Project software.
- Using the Table below enter the information into MS Project software. Assume that each resource has been assigned to the project activity on a full-time (8 hours /day or 40 hours per week) basis

Activity	Duration	Predecessors	Resource Assigned
A. User Survey	4	None	Gail Wilkins
B. Coding	12	A	Tom Hodges

C. Debugging	5	B	Wilson Pitts
D. Design Interface	6	A,C	Sue Ryan
E. Develop Training	5	D	Reed Taylor

Include a title page and adhere to the Publication Manual of the American Psychological Association (APA), (6th ed., 2nd printing) when writing and submitting assignments and papers.

Update the Lessons Learned Document and submit with your proposal. Remember that the template is found in Week 1. You will be using this template as a running document, adding to it as you go through ET410 and ET450.

WEEK 8

W8 Discussion "Closeout Process "

Technical Project Management

Closeout Process

Discuss what is meant by the closeout process and what elements do you think would apply to your project?

W8 Assignment "Tunnel Cost Comparisons"

Technical Project Management

Tunnel Cost Comparisons

Question 1:

1. **Write a 1 - 2 page paper.** In your paper discuss the following:
 - a. Search the internet for the link to the Boston tunnel, "the Big Dig" or the "Channel Tunnel," and London's Millennium Dome. In spite of their poor cost performance, why do you think these projects were supported to their conclusion? What would it take to kill a high visibility project such as these?
 - b. Provide a comparison of the projects, what extent were the cost overruns and how were the overruns handled by the authorities.
 - c. Include a title page and adhere to the Publication Manual of the American Psychological Association (APA), (6th ed., 2nd printing) when

writing and submitting assignments and papers. Make sure to provide references.

Question 2:

Submit a document with the following documents compiled in one. Save it as "ET410 Final Report_GID.docx". Remember that you will be submitting this in ET450.

- Project Proposal
- Requirements Document and Systems Design Review Document
- Final Schedule
- Final Budget
- Lessons Learned Document

Update the Lessons Learned Document and submit with your proposal. Remember that the template is found in Week 1. You will be using this template as a running document, adding to it as you go through ET410 and ET450.