

Group Project

Due, 12 August 2016 at 2100 hours EDT

Please upload your final report to Canvas electronically as a DOC(x) file (Schedule and WBS can be uploaded as an .MPP). Only one person in each Group should submit your group project. The project files must be named as follows: **Group_XX_Project_Report_ENCE_320_Summer_2017** (where XX is the number of your project group)

Objective: Reinforce understanding of the learning objectives taught in class by using the tools and techniques from each lesson. Learn to work with a multi-disciplinary team with different backgrounds and experience. Demonstrate understanding of the materials, tools, and techniques presented in class.

Purpose: Encourage teamwork, develop writing and presentations skills by producing a comprehensive report that describes all phases of a complex project.

Deliverables: 1) Final project Report; 2) Briefing Deck; 3) Oral Presentation

Instructions for group project

Project teams of four persons are listed in the attached table (table will be provided on 6 June 2016). Each project team shall develop a comprehensive project report that provides the details of how the team will execute their desired project. The team shall develop a quantified project selection matrix, by which they will choose their final project. For this project assume that you are employees (or owners) of a large multi-national engineering and construction firm. Your firm has multiple divisions that specialize in different engineering design and construction projects including 1) Commercial office and residential buildings, 2) roadway construction, 3) Solar or wind generation power plant (technology is your choice), and 4) software development projects for large applications. The project team shall determine what project they will develop based on their decision matrix. The project can be for anything that the team is interested in developing.

The project must be large enough for the team to demonstrate their understanding of the materials, tools and techniques presented in class. The project meet the following criteria 1) duration must be at least two years minimum, 2) cost must be two million dollars, 3) labor must require five different disciplines (e. g. civil engineer, mechanical engineer, electrician, ironworker, systems engineer, software engineer, etc.), 4) risks must encompass four different areas (e.g. regulatory, weather, stakeholder, performance).

The project team shall complete the group project using the option selected with their decision matrix. Each team should select a team name that they use in the preparation of the report. Each project team shall prepare a group project report and presentation deck in accordance with the following criteria.

Project Report Format

The report shall be prepared as a Word document. Each page shall be 8-1/2 by 11 inch and have 1 inch margins on all sides. For the WBS and project schedule you may use 11 by 17 inch pages, which count as one page each. The type shall be Aerial or Times New Roman font, 12 pt., single spaced. Tables and graphics may use Arial Narrow, 10 pt. The report shall be neatly bound and must have the cover page visible.

1. Cover page

- a. The Cover page must contain the title of your team's project, the class designation ("submitted in partial fulfillment of the requirements for ENCE 320 Spring 2015"), your team or group number, submittal date, and the names of the members of your team
- b. The cover page may contain a background image or team logo (or both). The background image or logo should indicate which project the team selected (i.e. image of an office building, bridge, or power distribution center)

2. Executive Summary (1 page maximum)

The Executive Summary shall provide a one page synopsis of the report including the team's project selection, overview of the proposed approach to the problem, budget, and schedule (start date and duration) and benefits of the project to the stakeholders.

3. Title Page (same information that is on the cover page)

- a. The title page must contain the title of your team's project, the class designation ("submitted in partial fulfillment of the requirements for ENCE 320 Fall 2014"), your team or group number, and the members of your team
- b. The title page must include the date your project is submitted

4. Table of Contents

5. Section 1 – Background (2 pages maximum)

Section 1 shall describe the team's understanding of the group project (Note: This is the project your team selected, for example, we will build a road to handle toll traffic that bypasses downtown Austin, TX during the spring 2015 through the summer of 2019) and the goals and objectives of the project that they will present in the report. Describe the benefits of the project to the stakeholders. Describe the format and lay out of your report.

6. Section 2 – Introduction of the Team (2 pages maximum)

- a. Section 2 shall describe the team, the team name, members of the team including a brief background of each team member, describe who will be the Project Manager for the selected project and provide a brief discussion of the PM's qualifications if the PM is not one of the team members. Note, each team member must describe their current background and experience (i.e., Civil Engineer, FP Engineer, Architect, etc.) then can add other future or fictional experience, MBA, PhD, 10-20 years of experience in the industry.

- b. Section 2 shall include a brief discussion that describes why the team will successfully complete this project and the benefit of the approach the team will take to complete the project.
7. Section 3 – Project Selection (4 pages maximum)

Section 3 shall describe your team's project selection process and decision matrix. Assume that your team was designated to evaluate at least four potential projects and determine which project your company will execute. Present your project decision matrix. Note that you can make certain assumptions about each project such as potential profit, risk, company capacity to perform the work as necessary to complete your decision matrix. The decision matrix must be quantified and you must describe why your team used the decision criteria and how you made the final decision.

8. Section 4 – Technical approach (12 pages maximum)

- a. Section 4 shall describe your team's technical approach to the project, your plan to complete the project, and the details of your approach. You may use the twelve page limit as you desire. As a minimum you shall provide the information described in items b-g. Your team shall describe the important elements of each section and the benefit of using the material in the section.
- b. Overall technical approach – provide a brief (1-2 page) discussion of how your team plans to execute the project and why this approach is sound. Describe the key activities of your approach and milestones.
- c. WBS – Your technical approach shall provide a work breakdown structure for your project. The WBS shall be at a level 3 (minimum) that enables your team to develop work packages (not required for this assignment) and completely defines your solution to the project. The WBS shall be included as an indented list NOT as an organizational chart format. You may put a level 1 or 2 WBS in this section to make the report easier to read and to simplify your discussion of the WBS. The level 3 WBS should be included in the Appendix.
- d. Responsibility Matrix – Provide a responsibility matrix that shows the linkages between your company's organization and your project WBS.
- e. CPM Schedule – Build a CPM schedule that includes all of your WBS elements. The schedule shall show both the early and late starts and finishes for all tasks. The Schedule shall identify the float for each task and shall show the critical path. Your schedule shall be presented in tabular form that we discussed in class. Include this table in the Appendix. Discuss the overall project schedule, duration, key milestones, and critical path in this section. You must use MS Project for this task and include the Gantt chart schedule in the Appendix to the report (not counted in the page limit). Include a discussion of the CPM schedule that highlights the critical issues and demonstrates your understanding of CPM.
- f. PERT or probabilistic Schedule – Build a PERT or probabilistic schedule from your WBS. The schedule shall identify the float for each task and shall identify the critical path. Use

an asymmetric distribution for your optimistic and pessimistic durations so that the overall schedule duration is not the same as the duration calculated using the CPM method. Include a discussion of the PERT schedule that highlights the critical issues and demonstrates your understanding of PERT. Discuss the reason the two scheduling techniques give different project durations and why the project manager would use one or both of these scheduling techniques.

- g. Budget – Your report shall present the project budget for activities identified in the WBS. The project budget shall include the appropriate indirect costs described in the project scenarios. The budget shall include any other items that the project team determines is important to complete the project objectives. Include separate line items for risk management (contingency), and profit.
9. Section 5 – Risk Management (3 pages)
- a. Section 5 shall describe your team’s risk management approach. Discuss how you will manage and control risks for the project.
 - b. This section shall present your team’s project risk matrix, which shall include at least eight clearly stated risks, the potential impact of each risk, the probability of occurrence for each risk, the risk trigger and the risk response. At least four of the risks must be quantified. Note, you can use an 11x17 fold out page for the risk matrix.
10. Section 6 – Project Management (2 pages)

Section 6 shall describe your team’s approach to managing the project. This section shall state the type of organization structure of your company (one or two sentences only), the project team organization including key project team members, and how your management approach benefits the client. You shall identify your project manager (you can make up a name and resume/credentials [NOTE: your professor has a fulltime job, in addition to teaching this class, and is not available to be your PM for this project]) and how he or she will lead the project team. Your management approach shall describe the experience of the project manager, how he or she will manage the project, control costs and schedule and manage risks.

11. Section 7 – Project team work contributions and actions (4 pages, one page per person)

Section 7 shall be used to describe how the group performed this assignment and the contributions from each team member. Each team member shall describe his or her contributions to the group project, how they worked with the team, and what they learned from completing this assignment. Each team member shall evaluate the relative contributions of the other team members and the team must include a summary statement that evaluates the relative contributions of each team member. Note that I will grade this section as part of the overall project grade and then may adjust the individual team member score based on the comments from this section. Each team member must provide a write-up for his or her contributions. This means that some team members (or the entire team) may get a score above 100 for the project. For Example:

Example 1: All team members contributed the items for which they were responsible from the Responsibility Matrix and were mostly on time. We believe that we all earned the same grade.

Example 2: Susan was clearly our team leader and she went above and beyond in the work she contributed. She helped the team succeed and we all benefited from her excellent leadership. We believe that Susan earned five or ten points more than the other team members who all earned equal scores.

Example 3: Our team worked well together except for Bill. He barely contributed and we had to make up for his lack of work. He did not meet his commitments to the team and we all had to do additional work to complete the project. We believe Bill earned a twenty point lower score than the rest of the team.

12. Appendix – This section shall include all backup documentation, references, calculations, notes, or MS project schedules or other information that the team wants to include for each of the sections of the report. This section must include your team’s project schedule for the group project, responsibility matrix (which team member was responsible for which section of the report), and summary of work completed by each team member, including due dates and actual date delivered (from PD #3). This section has no page limit and all information will be considered to increase the team’s grade.

Group Project Presentation

Project Report Format

1. Title Slide (Name of Project and Team members)
2. Slide 1 – Background
 - Slide 1 shall describe the team's understanding of the group project (Note: This is the project your team selected, for example, we will build a ten mile section of a roadway from Hobbs, NM to El Paso, TX during the spring and summer of 2018) and the goals and objectives.
3. Slide 2 – Project Selection
 - Describe your team's project selection process and decision matrix.
4. Slide 3 – Technical approach
 - Describe your team's technical approach to the project, your plan to complete the project, and the details of your approach.
5. Slide 4 – WBS
 - Slide 4 shall provide a work breakdown structure for your project.
6. Slide 5 – CPM Schedule
 - Build a CPM schedule that includes all of your WBS elements. The schedule shall show both the early and late starts and finishes for all tasks.
7. Slide 6 – PERT or probabilistic Schedule
 - Build a PERT or probabilistic schedule from your WBS. The schedule shall identify the float for each task and shall identify the critical path.
8. Slide 7 – Budget
 - This slide shall present the project budget for all activities identified in the WBS. The project budget shall include the appropriate indirect costs described in the project scenarios. The budget shall include any other items that the project team determines is important to complete the project objectives.
9. Slide 8 – Risk Management
 - This slide shall present your team's project risk matrix.

Group

- 1
- 1
- 1
- 1
- 2
- 2
- 2
- 2
- 3
- 3
- 3
- 3
- 4
- 4
- 4
- 4
- 5
- 5
- 5
- 5
- 6
- 6
- 6
- 6
- 7
- 7
- 7
- 7
- 8
- 8
- 8
- 8