

Interdisciplinary Capstone Design

Project Schedule

Assignment Goal

To create and maintain a *complete* schedule of your capstone design project activities, capturing all current and forecasted tasks and activities required to complete the project as planned.

Learning Outcomes

As a result of completing this assignment, you should be able to:

- Create and illustrate a work breakdown structure for the tasks required to complete the project in the form of a simple Gantt chart.
- Estimate the duration of each task and identify tasks which can be done in parallel to create an achievable action plan.
- Demonstrate ongoing monitoring of the project schedule to confirm it is on track to be within target.

Relevant ABET Learning Outcomes

1. An ability to communicate effectively with a range of audiences.
2. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

Rationale

In the real world, every project must have a proposed schedule before the project is officially approved and initiated. Once a project is approved and underway, we need to have a mechanism to track all activities and update the schedule as new information becomes available. All activities must be continually monitored to ensure that the project will remain within the target timeline. A Gantt Chart format enables you to visually report the project schedule easy and concisely.

Task

Working in your capstone team, you are assigned to draft and maintain a detailed project schedule throughout the duration of your project.

The suggested approach for **drafting** your first schedule at the beginning of the project is:

- 1) Identify the high-level tasks that need to be accomplished for the project. For most capstone projects, these are typically:
 - Define the requirements
 - Brainstorm concepts and conduct a Concept Design Review
 - Develop or build some form of a rapid prototype
 - Design the solution to the problem/challenge
 - Create drawings, BOM, and Manufacturing Plan and conduct Engineering Release Review.
 - Fabricate a functional prototype of your design
 - Conduct testing on the prototype to validate that it meets the requirements
 - Report the results and deliver the solution (device and documentation) to your client.
- 2) Estimate the duration of time (usually in weeks) each task above will likely entail.
- 3) If the above tasks are done in series, will the overall duration fit within the project timeline?
 - If not, evaluate how you can adjust the timeline, through:
 - Conducting activities in parallel
 - Revising the scope of the project
 - Challenging the team to shorten the duration of certain tasks

- Once the high-level activities fit within the project timeline, establish intermediate target dates for each major milestone.
- 4) Next, breakdown the work required to for each activity above with individual tasks and assign each task to one individual on the team. Some considerations:
 - Avoid being so specific that you are managing hour-to-hour or day-to-day activities
 - Avoid assigning a single task to EVERYONE on the team. There is saying, “if everyone is in charge, then no one is in charge.”
 - Ensure each task is achievable and clear and there is one champion for each task
 - Delegate and distribute the workload among teammates

Once you have a draft schedule in place to start the project, you **MUST** maintain the schedule (i.e. Gantt Chart) frequently through the duration of the project. The suggested approach for **maintaining** the schedule is:

- 1) Choose one team member to be the “owner” and steward of the schedule.
- 2) Review the schedule during your team meetings at least monthly (although weekly is not an unreasonable frequency).
 - a. Confirm all activities in the past are completed.
 - b. Confirm all activities scheduled to be in progress are actively underway. Ensure the “owner” of the task is aware of what is expected of them.
 - c. If a task is falling behind schedule, determine methods to recover, such as:
 - i. Enlist other team members to help the task “owner” with completion.
 - ii. Evaluate if other tasks may be done in parallel.
 - d. Evaluate future planned activities. Is the team on track to start these activities on time?
 - e. Discuss and create mitigation plans ahead of time, before problems arise and before the project falls behind schedule.
- 3) If any of the above review items are not in alignment with the existing schedule, **then update the schedule to reflect the current reality**.

Other notes:

- a) The schedule is always changing as new information is continually becoming available to the team. As a result, **it is fully expected that the schedule will change throughout the project.**
- b) If you draft a schedule, then file it away and never look at it again, it will quickly become obsolete and unhelpful to the team.
- c) A simple Excel Gantt Chart template is available on Mindworks, but many are also downloadable from the internet.

Assessment

Teams should plan to present the schedule (current and future activities) at every project milestone, including:

- Snapshot Days
- Concept Reviews
- Engineering Release Reviews
- Final Project (EXPO) presentations

Each of these milestones include assessment criteria for Project Management and Documentation of the project. During these milestone events, it is helpful to demonstrate that the team has a work breakdown structure, but I also important to clearly highlight upcoming milestone dates to convey a simple overview of the schedule.