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**BESTEAMS Module Implementation Packet (MIP)**

**Topic:** Intermediate *Project Management for Undergraduate Students*

<table>
<thead>
<tr>
<th>Tracks</th>
<th>Personal Knowledge</th>
<th>Interpersonal Effectiveness</th>
<th>Project Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductory</td>
<td>Kolb Learning Styles</td>
<td>Team Formation &amp; Communications Basics</td>
<td>Managing Your Project: Planning &amp; Time</td>
</tr>
</tbody>
</table>

**I. Introduction/Motivation:** This is one of three BESTEAM teamwork training modules for first-year engineering students. The three modules address personal knowledge, interpersonal effectiveness in the team setting, and project management.

This module addresses several key aspects of project management within student project teams. Specifically, students will learn skills fundamental to being able to create and operate a project management schedule. The module is designed for the students to be exposed to the basic tools for creating a Work Breakdown Structure (WBS), a responsibility matrix, and a Gantt chart. Later modules address the principles of scoping and tracking a project, and using the Gantt chart to correct and improve the team process. It also keeps the project in front of them in terms of their commitments in time.

**II. Delivery Plan A: 50 minute class period option**

A. Introduce the module and the objectives

B. Establish class participation by asking students to answer the question: What is a project?. Write the answers on the board. Prior to asking this question, you can ask the class members about their experiences in projects and project management, including timelines etc.

C. Present the principles of project management and why it is important

D. Introduce the phases of project management – stating that this module will focus on the second stage—Developing the Plan.

E. Developing the Plan
   1. Present the steps to developing the plan.

F. Work Breakdown Structure-This is an introductory level discussion of WBS. The point of the slides is to have the students think about the major activities they will need to accomplish in order to complete a project. Then they need to break the activities down into manageable pieces. They can also identify major milestones associated with the project, e.g., homework assignments related to the project, interim submissions, and the final product.
   1. Define and discuss the WBS
2. Give an example (the one provided is the crane, which is an overly simplistic example to make points about the level of detail they may or may not want to include.

3. Discuss the elements of what constitutes completeness of this phase.

4. Have students start making a WBS for their project.
   i. Stop them part way through and generate discussion around their questions, examples, etc.

G. Duration
   1. Each of the tasks will require a certain amount of effort and length of time to complete.
   2. There are various causes for variation of the duration of the task that must be considered during the creation of the project plan.
   3. Have students make of list of resources and durations for each of the tasks.
   4. Dependencies – have the students look to see if any task requires that a previous task be completed prior to initiating that new task (called a dependency). This type of relationship is called a finish-to-start relationship. In later modules we will present more complicated relationships between tasks.

H. Resources
   1. Discuss various resources needed or available to complete the project.
   2. Have them consider the various forms of resources, especially outside of the team.

I. Gantt Chart
   1. Define and discuss how to constitute a Gantt chart.
   2. Go through the steps of building a Gantt chart.
   3. Show them an example of a Gantt chart.
   4. Have the students start to build a Gantt chart for their project.

III. Delivery Plan B: 90+ minute class period option

A. Time management
   1. This material takes students through notions of time management, and stresses the need to manage commitments rather than manage time.

IV. Class Adaptation Strategies:

A. Size: Large classes (200): have students turn to their neighbors (two behind/two in front to create small groups for brainstorming exercises). Then have some responses from the overall group. Use teaching assistant as observer.

B. Content: When possible, try to incorporate the class subject into the lesson. Instructors can do this by using pertinent examples as well as incorporating some of this material into later assessment.

C. Classroom Culture: The instructor might want to identify common assumptions regarding project management prior to the beginning of the lecture.
V. Follow-up Materials:

A. Homework:
   a. Reading assignment: Instructor choice (see instructor readings and references) Prior to the class
      i. Homework: Write up any observation or comments from the reading.
   b. Classroom Follow-up 1: Have them create a Gantt chart and responsibility matrix for their specific project.
   c. Classroom follow-up 2: After 2-3 weeks or so have them review their Gantt Chart and Responsibility Matrix to see how their project is progressing, especially noting any changes in duration, responsibilities, activities. Make up a new Gantt chart showing how it is different than the first.

VI. Assessment Materials: