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Introduction to
Project Management

Senior Design 485/487

What is Project Management?

- Method for organizing tasks
- Structured framework to help a group work productively
- Tools to aid in task sequencing, dependency analysis, resource allocation, scheduling, etc.
- Tools to track progress

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Why do you need project management?

- Complex project needs coordination of:
  - People
  - Resources (labs, equipment, etc.)
  - Tasks – some must precede others
    - Divide and conquer
- When to spend money
- Matching of people/resources to tasks
- Management want to know how it is going.

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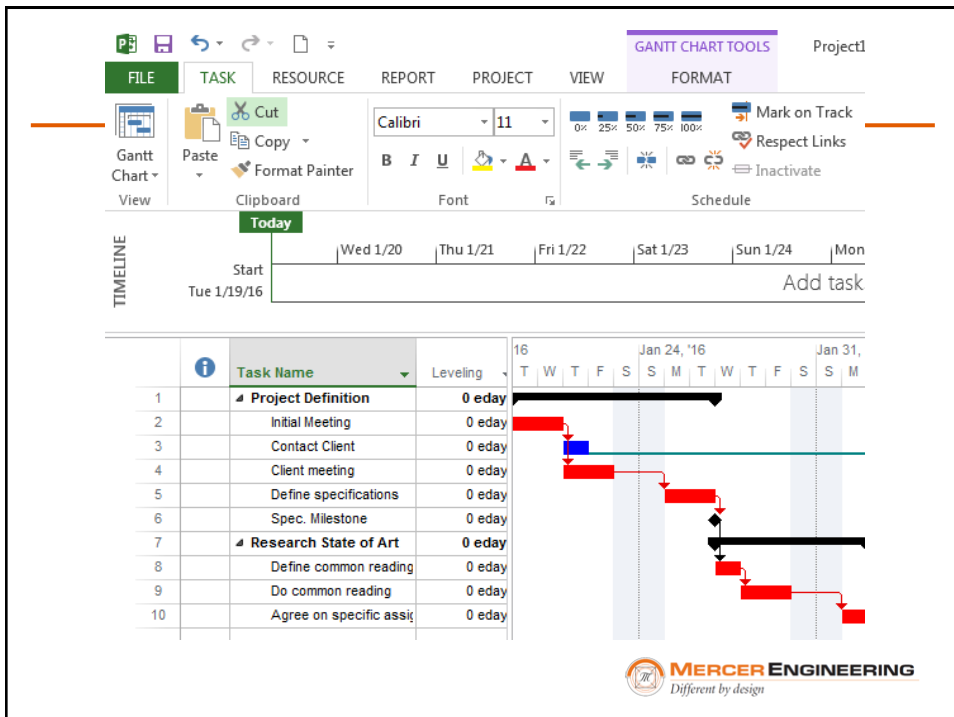*Different by design*

Task dependencies and the critical path

- Sometimes task B cannot be started before task A
- is completed
- Other types of constraints – holidays, person availability, etc.
- *Critical path* – any slippage slips whole project
- Helpful to know what tasks are on the critical path
- Useful to try to shorten the critical path
- ADD time Buffers to your projects around critical tasks

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Visual tools for project management

Gantt charts:
- Tasks (calendar time) vs. linear time, grouped hierarchically, plus milestone events
- Classically, not person-hours or people, nor dependencies, nor critical path, nor progress
- Free Gantt Chart software available online
- Excel or Open Office

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PERT/CPM Charts (aka Network Diagrams)

- PERT = Program Evaluation and Review Technique
- Graph with nodes (events) and arcs (tasks) OR nodes (tasks) and arcs (connection)
- Emphasizes dependency relationships
- Good for initial planning
- Can see *critical path* in a CPM chart
- (Not linear in time… harder to track progress)

Network diagram

- Great for initially planning and linking tasks
- Easy to see what tasks can be done in parallel
- Find critical path
- Start with Goal and work backwards

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Tips on Planning

- Start at the proposal stage (continue throughout the project)
- Begin with END of the project (deliverable)
  - Ask what must be completed BEFORE each step (work backwards).
  - There may be SEVERAL parallel paths.
  - Use Post-it notes to identify tasks and precedence.
- Do not assume all will go well when estimating time.
  - Usually multiply best estimate by 2.
  - Add buffers around task.
- *UPDATE OFTEN*

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Suggested steps in project management

- Generate a formal definition of the project, with goals, constraints, assumptions
- <u>Identify project start/end dates</u>, any mandatory <u>milestones</u>, including reports, signoffs, <u>deliverables</u>, etc.
- <u>List constraints</u> – money, equipment availability, holidays, etc.
- Refine detailed task list, dropping/combining, adding things omitted

Then, for each task in list:

- Estimate time (person hours, calendar period)
- Identify dependencies among tasks
- Identify resources(people, money, parts, etc.)

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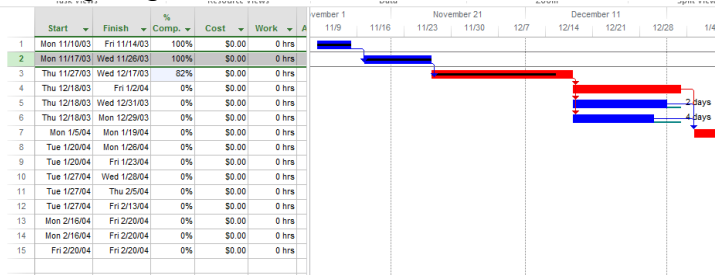*Different by design*

Suggested steps (cont'd.)

As project progresses:

- Monitor, record progress on all tasks, at least weekly – use "Tracking"
- Pay particular attention to those on critical path
- Revise plan as needed to take into account changes, adapt to meet milestones

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Project management using Microsoft Project®

- Allows many different ways of entering and observing information
- Includes many features to help identify problems with a plan
- Regular use can help a group refine plans to make meeting targets more realistic

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Using Microsoft Project®

- Create tasks
  - Specify duration
  - Include milestones (0-day duration task)
- Link tasks
- Organize in groups of subtasks
- Assign/track people/resources
- Track completed tasks / initiate changes

- See online tutorials for more information

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Gantt charts

- Preferred by many
- Easy to see time and delays
- Used to track progress
- Can use spread sheet for some project management if MS Project not used

Management of YOUR project

With your team members:
- Create a plan for the entire project
- Set milestones for tracking progress
- Provide more detail plan for near-term tasks
- Report progress and revise/add detail to plan continually
- Assign specific tasks to team members
- Revise plan and activities as required to achieve objectives

Project plans/schedules

- Use Project, Excel, or simple text doc
  - Gantt chart is a minimum requirement
- Required for proposal
- Required for management reviews
- Required for presentations
  - Group status reports
  - PDR
    - (Past history + Future plans)

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Questions?

- Thanks for your attention.
- Reminders:
  - No class/meetings on Thursday (work on your proposals)
  - Proposals (paper) due NEXT Tuesday before COB (5 pm) at my office

- Next class meeting: Tuesday, January 26.

- Make certain your client has a copy of the proposal
- Client must approve your proposal (not necessarily by next Tuesday)

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REVISED Schedule

Class	Date	Week	Weekday	Topic	Deliverable
1	12-Jan	1	Tues.	First day of class	
2	14-Jan		Thurs.	Scheduled group meetings	
3	19-Jan	2	Tues.	Project Management	
4	21-Jan		Thurs.	No class: work on Proposal	
5	26-Jan	3	Tues.	Design Processes	Proposals, Budget Form Due by COB (5:00 pm.)
6	28-Jan		Thurs.	Meet with client and technical advisors	Team Progress Report Due (email)
7	2-Feb	4	Tues.	Design Applications	
8	4-Feb		Thurs.	Management review meeting	
9	9-Feb	5	Tues.	Codes and Standards; Licensing and FE	
10	11-Feb		Thurs.	Management review meeting	Individual Progress Report Due (email)
11	16-Feb	6	Tues.	Analysis for Engineering Design	
12	18-Feb		Thurs.	Meet with client and technical advisors	Team Progress Report Due (email)
13	23-Feb	7	Tues.	Designing Written Reports	
14	25-Feb		Thurs.	Management review meeting	Individual Progress Report Due (email)
15	1-Mar	8	Tues.	Effective Oral Presentations	Journal/Patent Summaries Due
16	3-Mar		Thurs.	Meet with client and technical advisors	Team Progress Report Due (email)
17	8-Mar	9	Tues.	SPRING BREAK	
18	10-Mar		Thurs.	SPRING BREAK	
	15-Mar	10	Tues.	No class	
	17-Mar		Thurs.	Management review meeting	Individual Progress Report Due (email)
19	22-Mar	11	Tues.	No class	
20	24-Mar		Thurs.	Meet with client and technical advisors	Team Progress Report Due (email)
21	29-Mar	12	Tues.	Team Progress Report Presentations	
22	31-Mar		Thurs.	Management review meeting	Individual Progress Report Due (email)
23	5-Apr	13	Tues.	No Class - PDR week	
24	7-Apr		Thurs.	No Class - PDR week	Last Day for PDRs - Thursday, April 7
25	12-Apr	14	Tues.	Seminar-Test Plans	Respond to PDR comments
26	14-Apr		Thurs.	No class	
27	19-Apr	15	Tues.	Brief Class Meeting	Submit Comprehensive Test Plan
28	21-Apr		Thurs.	No class	
29	26-Apr	16	Tues.	No class	
30	28-Apr		Thurs.	No class	Final: Peer Evaluations Due

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Management Review Meeting Schedule

Thursdays Suite 201

Time slots	Group Name/ members
3:00-3:20	Payne and Haney
3:25-3:45	Davis, Ginn, and Scruggs
3:50-4:10	Thompson, Brettin, Wynn
4:15-4:35	Wise
4:40-5:00	Connor, Page, Reveles

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