

# ENGR 310

## Project Planning

Lecture 18

28 Mar 2008



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# Elements of the Project Plan

- Cost
  - *Development Cost*
- Performance / Scope
  - Functionality
  - Size of the project
- Schedule
  - Time to complete the project



# The Project Triangle

**Schedule**

**Cost**

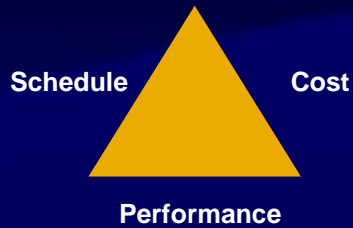
**Performance**



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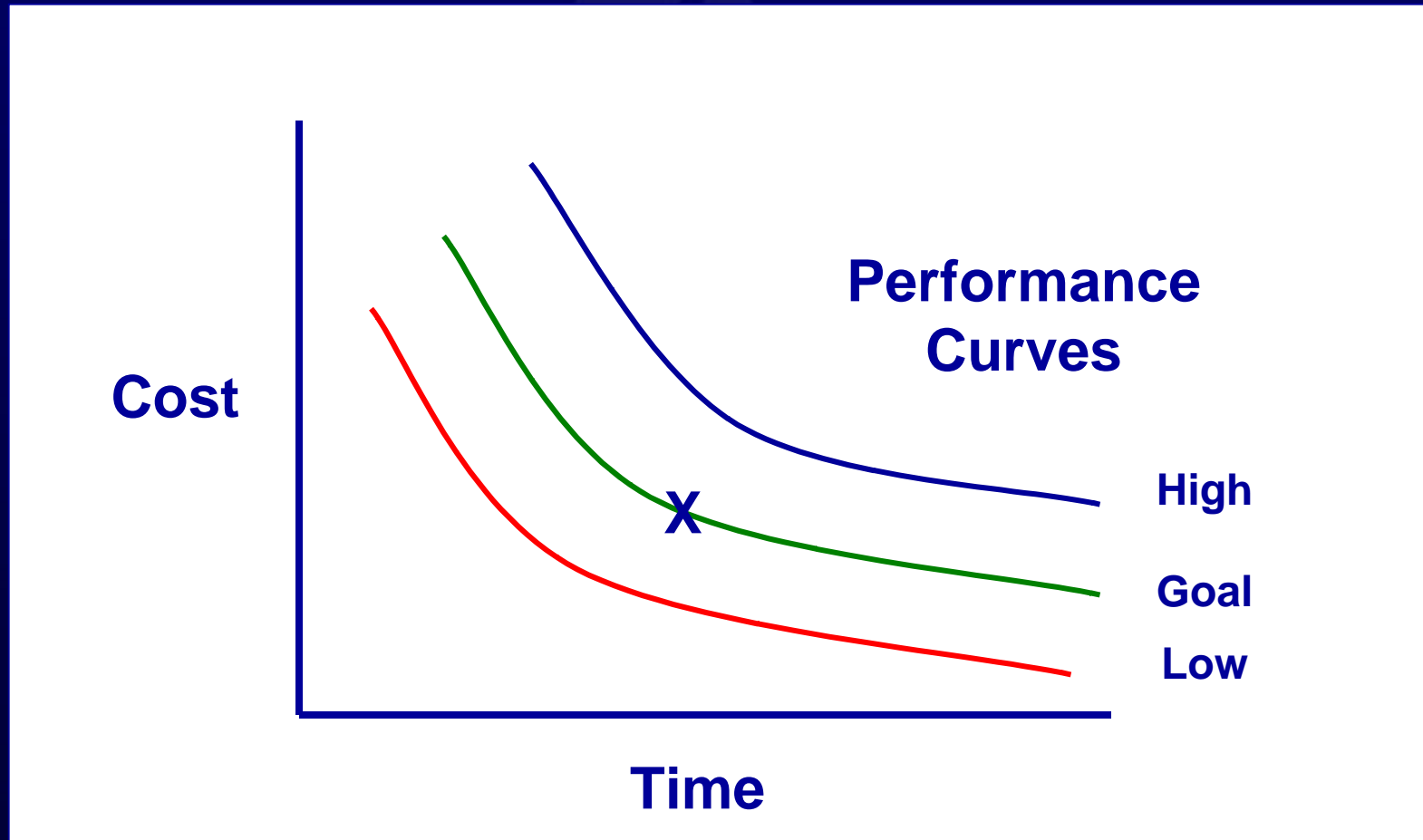


# The Project Triangle

- Changing one element effects the others
- Most projects have one fixed side
- You cannot hold all three sides fixed
- Goal – optimize the triangle by looking for trade offs



# Project Optimization Graph



# Project Planning Approaches

- Dictorial
  - Schedule / Cost / Performance
    - Dictated from above
  - No Buy In from the team
  - Tends to fail almost immediately
  - Expectations don't match reality



# Project Planning Approaches

- Group Consensus
  - Schedule / Cost / Performance
    - Defined by group think
  - Good Team Buy In
  - Poor Management Buy In
  - Schedules tend to be long and expensive
  - Projects either get cancelled or go Dictorial



# Project Planning Approaches

- Diplomatic  
Only most important aspects of project set by management

Team optimizes Schedule / Cost / Performance to fit in development window

- Good Team and Management Buy In
- Establishes clear expectations
- Optimizes for best overall result



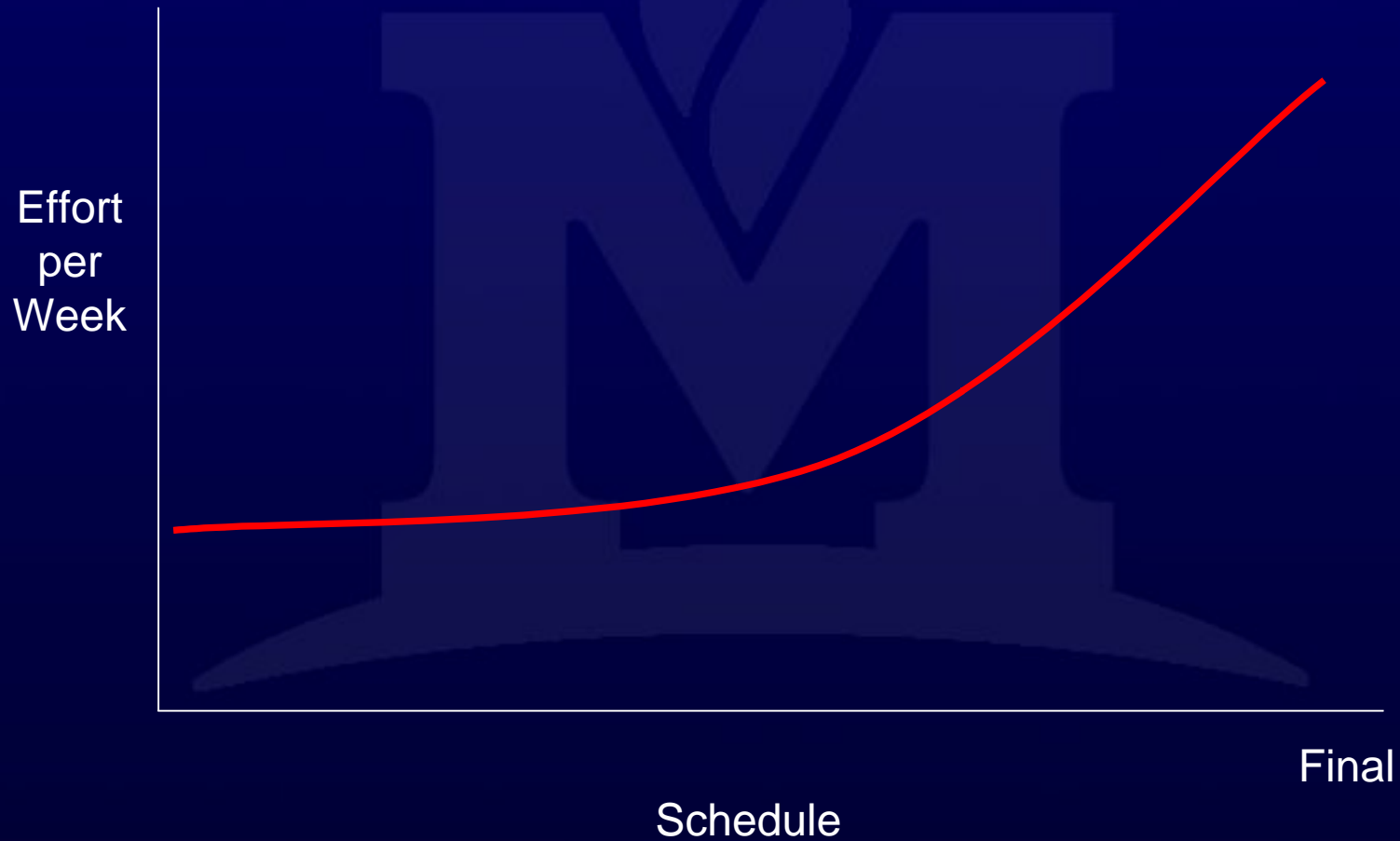


# Project Planning Approach

- The best plan is one created by the team
  - Managerial input
  - Technical input
  - Market Forces
  - Financial constraints
  - Manufacturing requirements



# Project Planning Approach



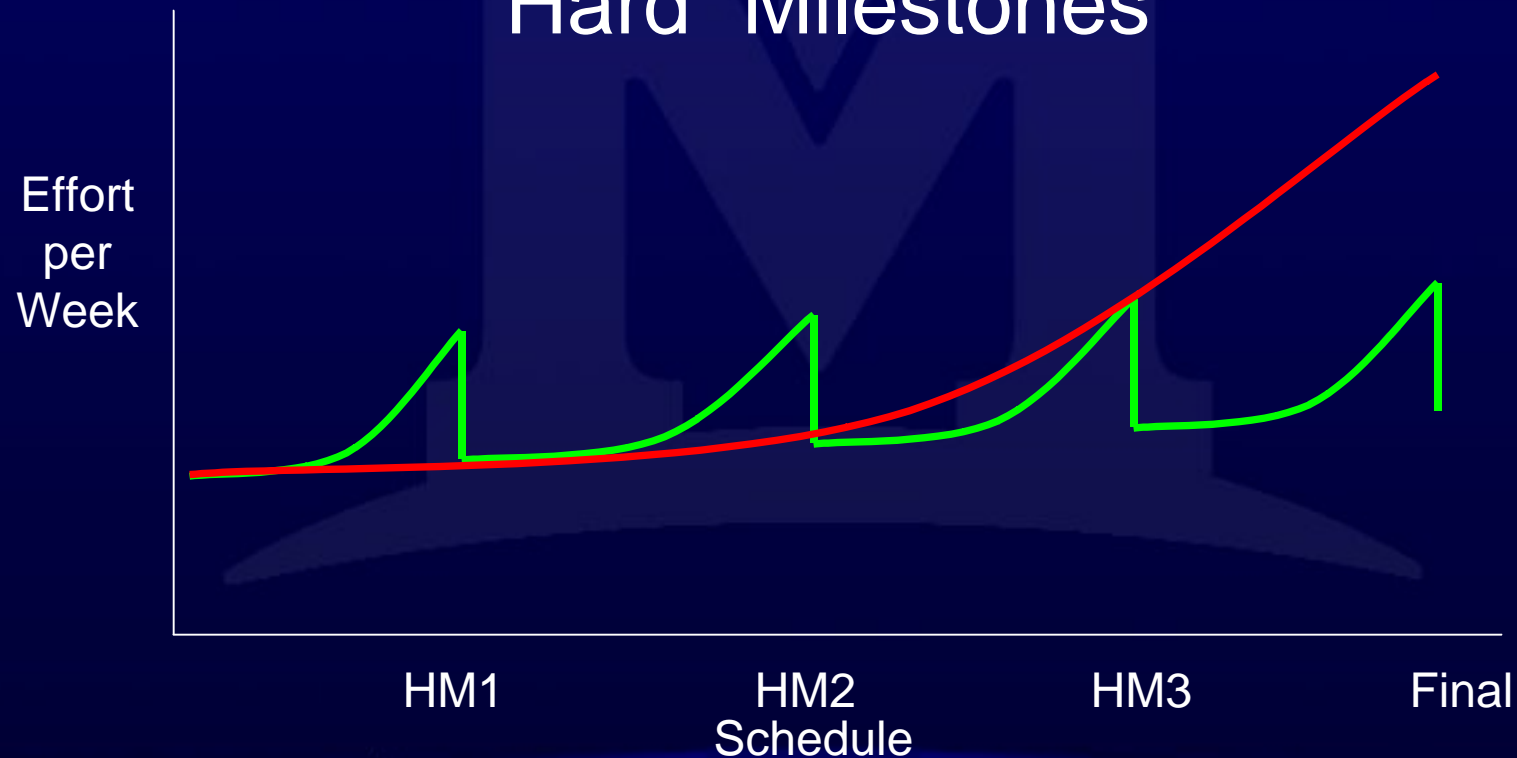
# Project Planning Approach

- Project Manager Sets Multiple  
“Hard” Milestones
- Defined point in the project
  - Meaningful Stage / Outcome
  - Clearly defined deliverables
  - Clearly defined responsibility
  - Immovable date
  - Review attended by management



# Project Planning Approach

- Project Manager Sets Multiple “Hard” Milestones



# Project Planning Approach

*“Once your plan is complete  
the only thing you can be sure of is  
the plan you created is  
The One Thing that won’t happen.”*

- Review Often
- Modify as needed



# Negative Effects on Schedule

- Specification Changes
- Faulty Estimates
  - Overly optimistic or pessimistic
  - Unscheduled demands
  - External delays
- Changing Resources
  - Loss of people, money, tools
- Technical Issues



# Building the Plan

## 1. Develop Work Breakdown Schedule

- Outline of tasks
- Start with major Task Elements
- Add detailed tasks
  - Do not get too detailed
  - Do not get too broad



# Work Breakdown Structure

## 1.0 Define Specifications

### 1.1 Power System

#### 1.1.1 Battery Life

#### 1.1.2 Measure Current Draw

### 1.2 Display System

## 2.0 Order Materials

### 2.1 Prototype

### 2.2 Final Assemblies

## 3.0 Build Prototype

### 3.1 Complete drawings

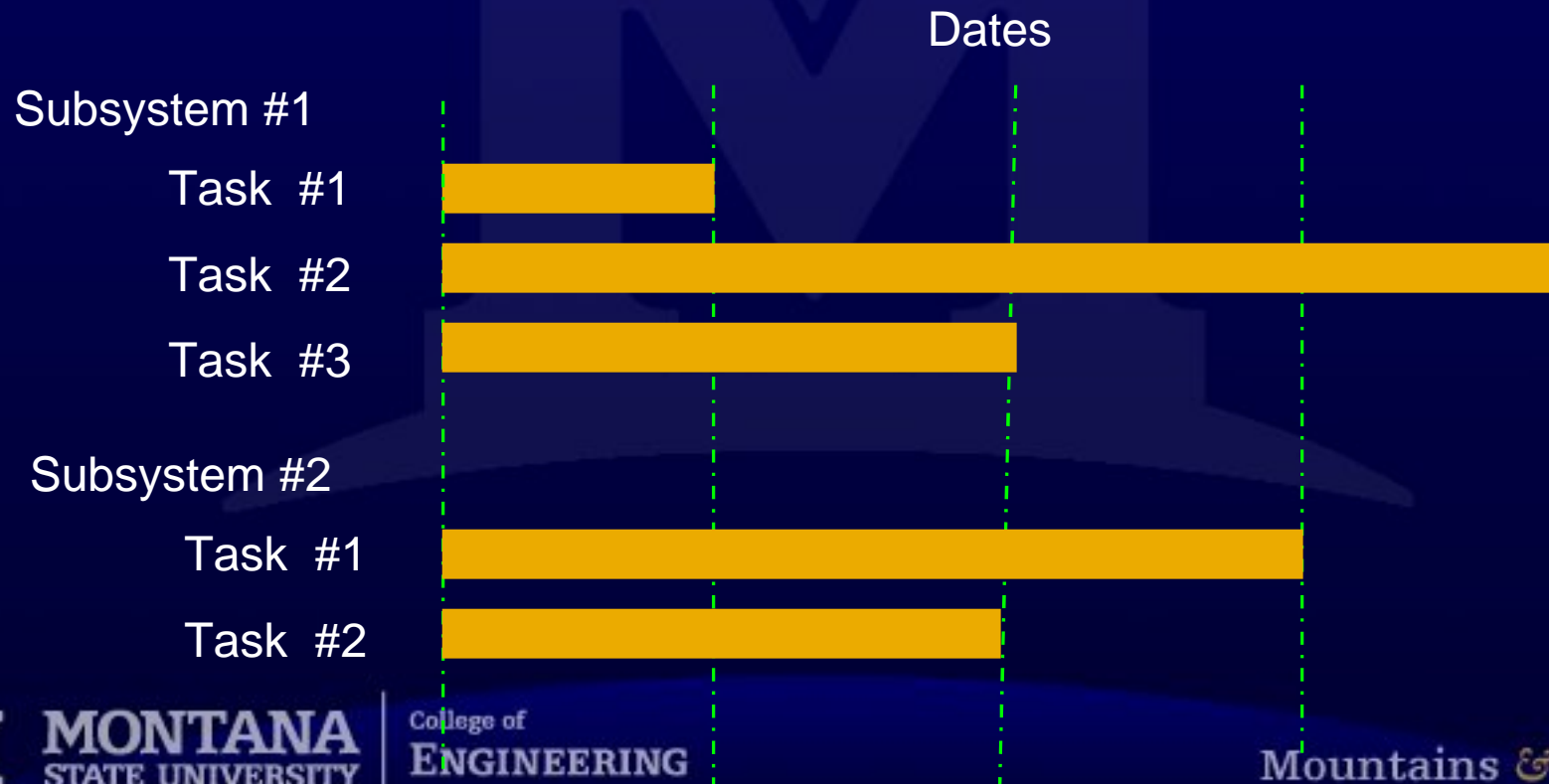




# Building the Plan

## GANTT Chart

### 2. Define length of each task



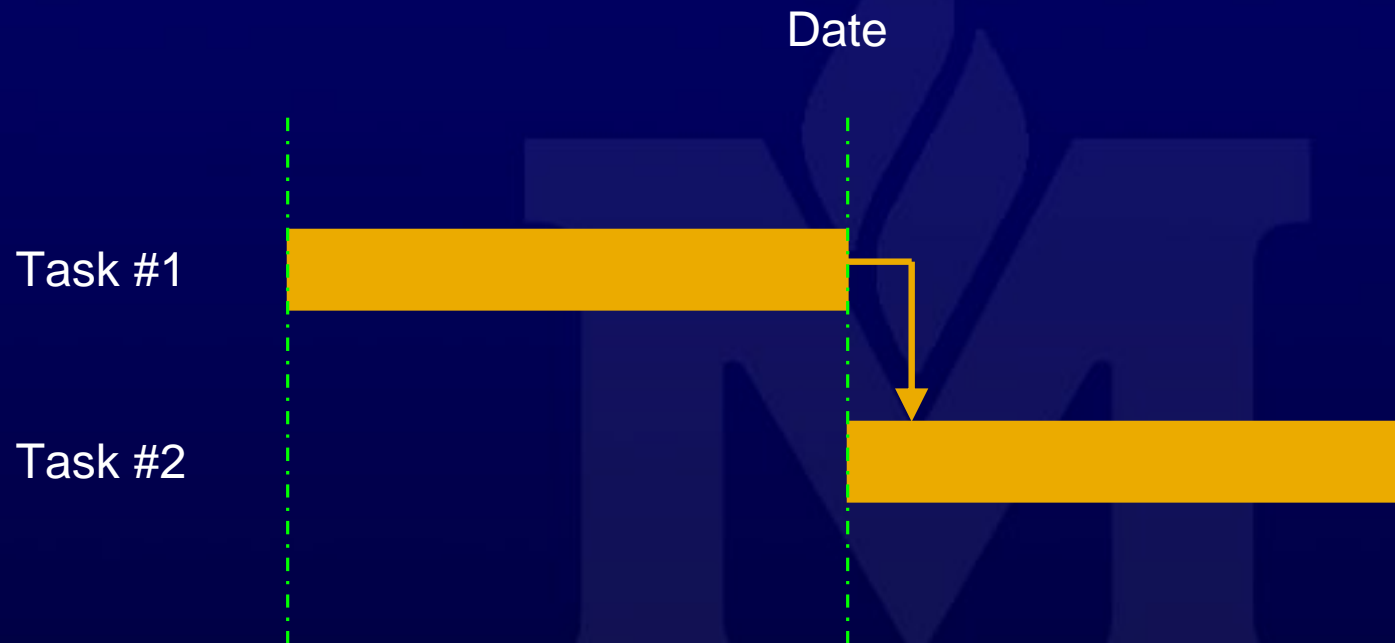
# Building the Plan

## 3. Define Dependencies

- Linking Tasks
- Relationship of one task to another
  - Finish to Start
  - Start to Start
  - Finish to Finish
  - Start to Finish
  - Lead and Lag times



# GANTT Chart - Finish to Start

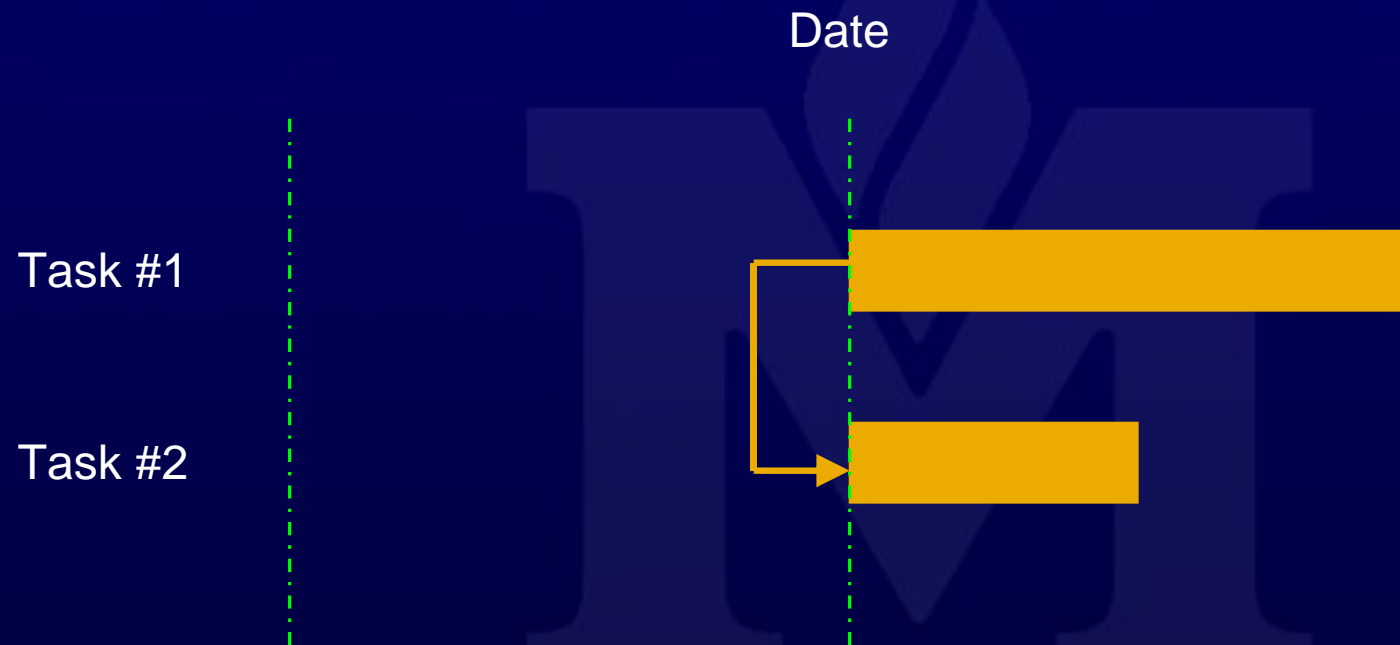


- Most Common Dependency
- One task must finish before another can start

You cannot roof the house until it is built



# GANTT Chart - Start to Start

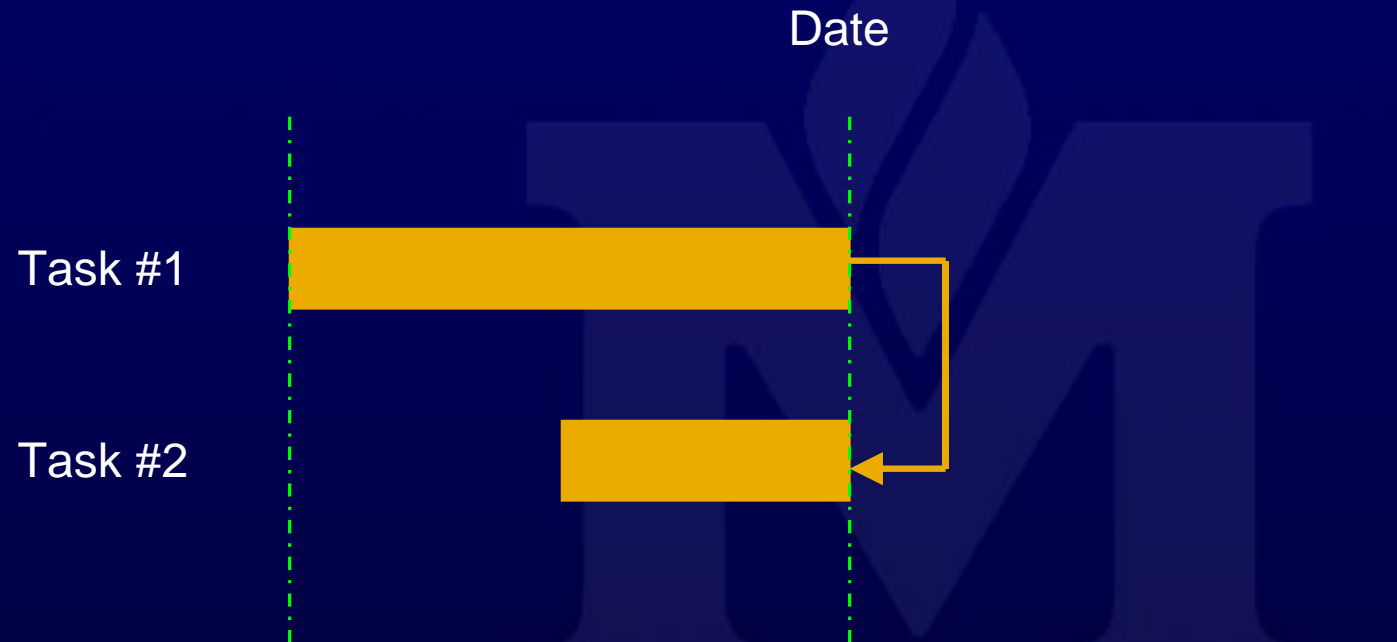


- Task #2 cannot start until Task #1 Starts

Leveling the concrete cannot start until you start to pour the foundation.



# GANTT Chart - Finish to Finish

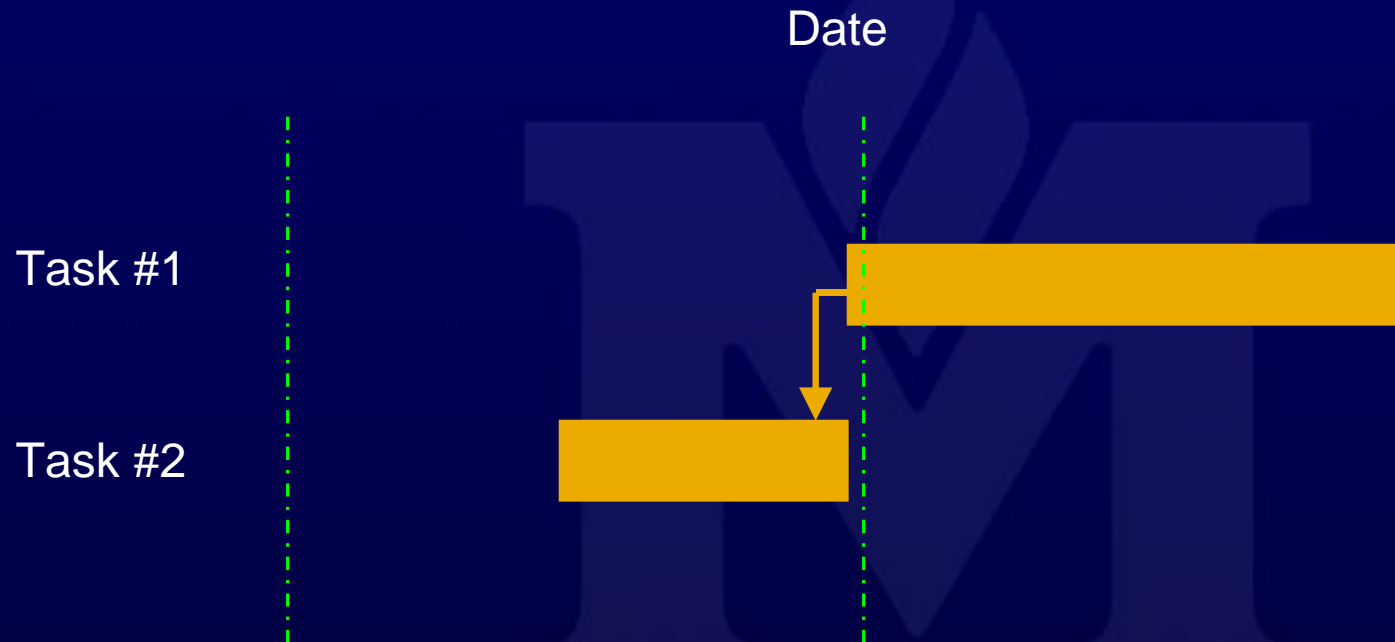


- Task #2 cannot finish until Task #1 finishes

Inspect house wiring cannot finish until all of the wiring is completed.



# GANTT Chart - Start to Finish

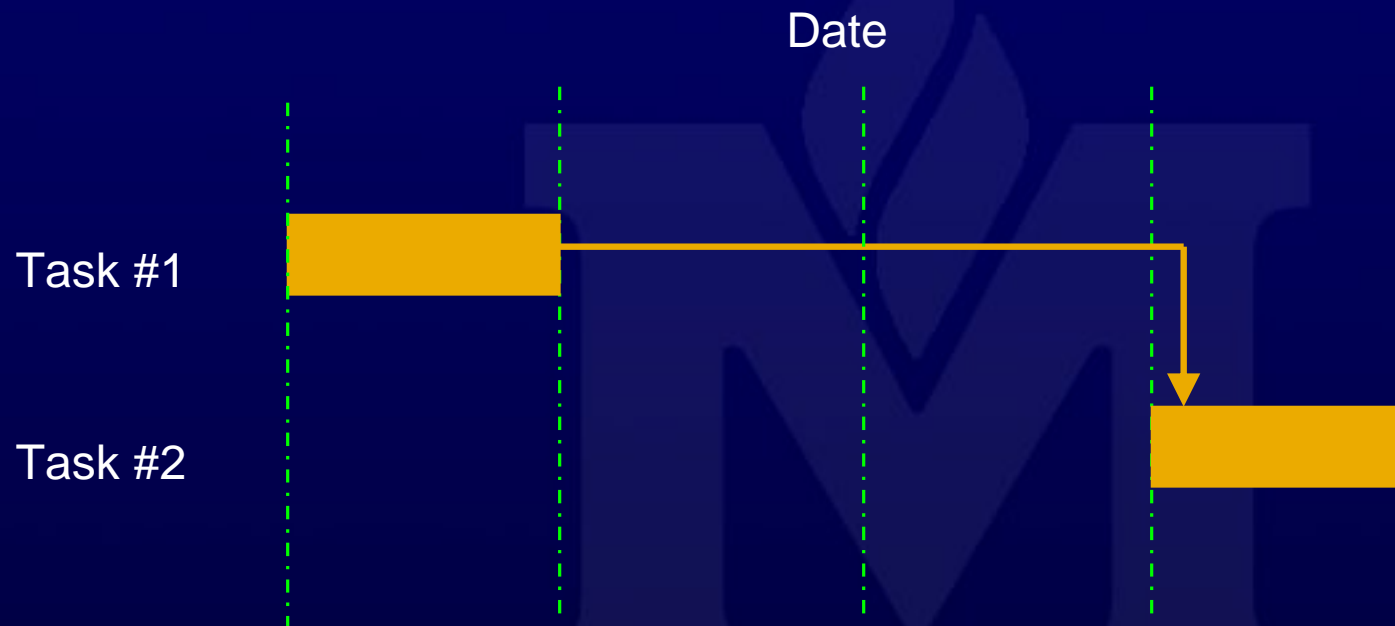


- Task #1 must start before you finish Task #2

Used for Just in Time Scheduling



# Finish to Start (with Lag)



- Lag shows delays in projects that do not use resources

Waiting for supplies to arrive.



# Finish to Start (with Lead)

Date



Task #1

Task #2

- LEAD allows you to show dependency while overlapping tasks



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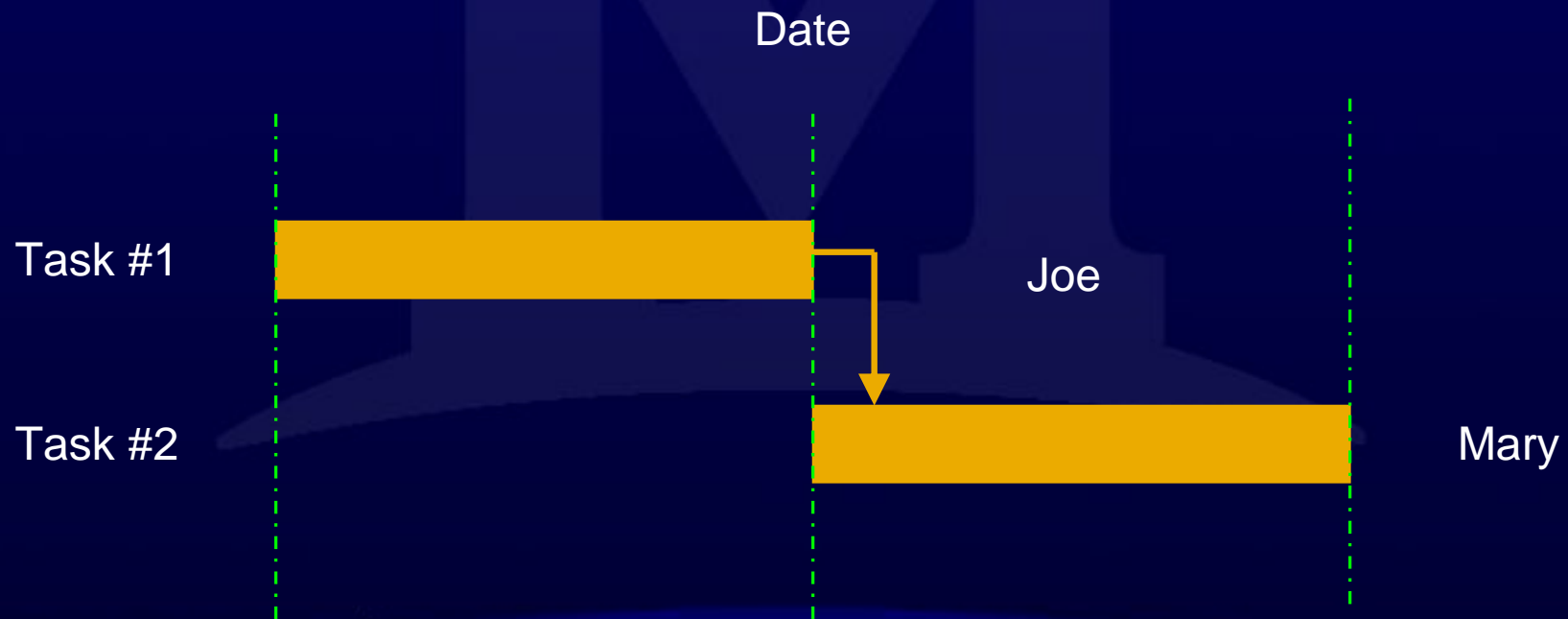
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# Building the Plan

## 4. Assign Resources

- People, Facilities, Tools
- Every task needs a person assigned



# Building the Plan

5. Review for Over Allocation
  - One person doing multiple things at the same time



# Building the Plan

1. Develop Work Breakdown Schedule
2. Define length for each task
3. Define Dependencies
4. Assign Resources
5. Review for Over Allocation

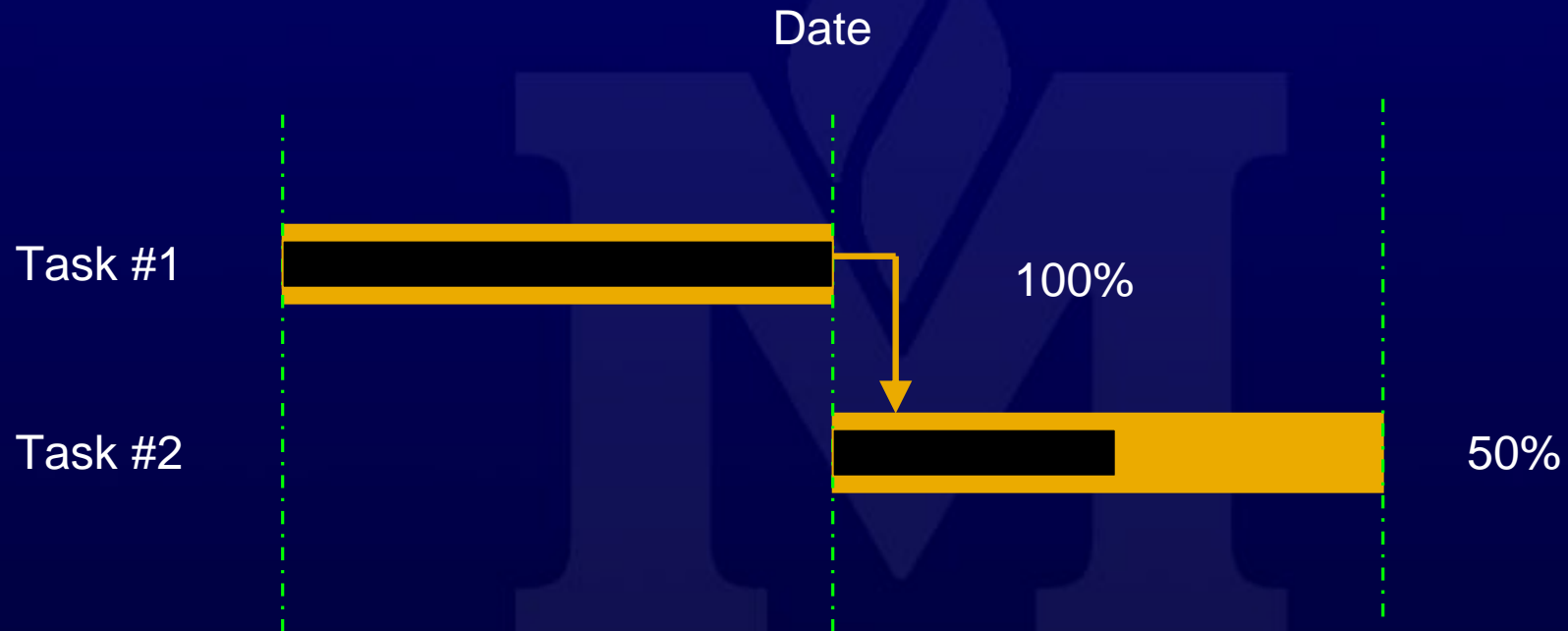


# Update the Plan

- Review Often
- Adjust Resources as needed
- Insert Tasks as needed
- Track Progress



# Update Progress



# Going Forward with your TA

- Build your plans
- Define scope clearly
- Show tasks to solve Risk elements
- Define Hard Milestones
- Show timeline and resources
- Update the plans regularly





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