# Introduction to Project Management

# Senior Design 485/487

# What is Project Management?

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

# Why 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.

# 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.
- <u>Critical path</u> – 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

# **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:

  - Gantt Designer 0.9

  - Rational Plan Project Viewer 3.9.0
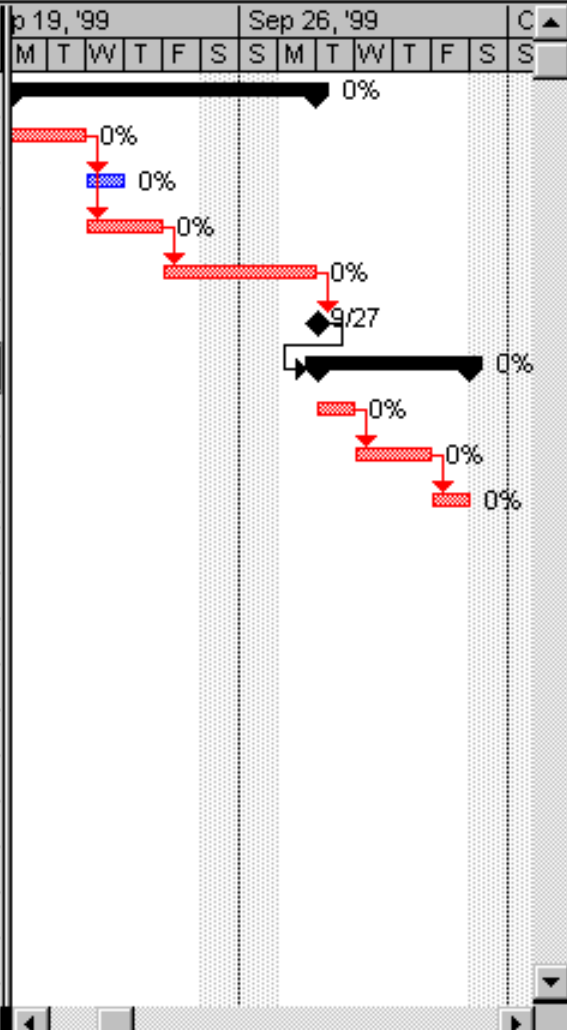
  - Just use Excel  or Open Office

File   Edit   View   Insert   Format   Tools   Project   Window   Help

Arial    8    **B** *I* U    All Tasks

6

| | | Task Name | Duration | Start | Finish | Predecesso |
|---|---|---|---|---|---|---|
| 1 | | **Project definition task** | ###### | **Mon 9/20/99** | **Mon 9/27/99** | |
| 2 | | Initial Meeting of MSU | 2 days | Mon 9/20/99 | Tue 9/21/99 | |
| 3 | | First contact with int. | 1 day | Wed 9/22/99 | Wed 9/22/99 | 2 |
| 4 | | Meet with indust. Spor | 2 days | Wed 9/22/99 | Thu 9/23/99 | 2 |
| 5 | | Disc. spec., whole te | 2 days | Fri 9/24/99 | Mon 9/27/99 | 4 |
| 6 | | Specification Mileston | 0 days | Mon 9/27/99 | Mon 9/27/99 | 5 |
| 7 | | **Research State of Art** | ###### | **Tue 9/28/99** | **Fri 10/1/99** | 6 |
| 8 | | Define common readin | 1 day | Tue 9/28/99 | Tue 9/28/99 | |
| 9 | | Do common reading | 2 days | Wed 9/29/99 | Thu 9/30/99 | 8 |
| 10 | | Agree on spec. assig | 1 day | Fri 10/1/99 | Fri 10/1/99 | 9 |

Sep 19, '99    Sep 26, '99

Calendar
Gantt Chart
PERT Chart
Task Usage
Tracking Gantt
Resource Graph

Ready

EXT   CAPS   NUM   SCRL   OVR

Start   Microsoft Project - D...   Microsoft PowerPoint - [De...   HP DeskJet Toolbox   4:03 PM

# PERT/CPM Charts

- PERT = Program Evaluation and Review Technique

- Graph with nodes (events), edges (tasks) dramatizes dependency relationships

- Good for initial planning

- Can see *critical path* in a chart, called a CPM chart

- (Not linear in time… harder to track progress)

# PERT Charts: Good Place to Start (Begin with Sticky Notes)
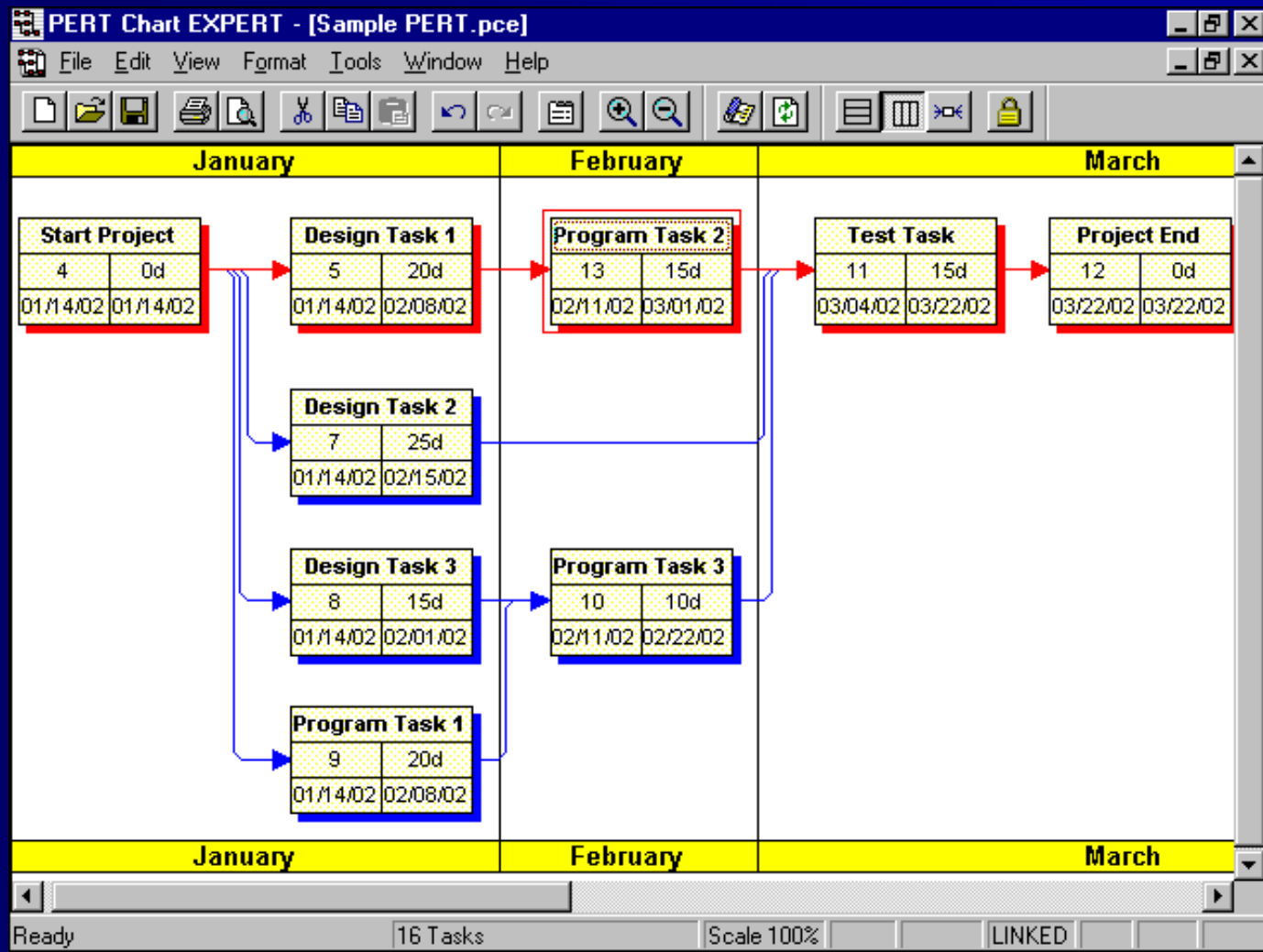
# PERT Charts

- 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

# PERT: 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,
- Do not assume all will go well when estimating time.
  - Usually multiply best estimate by 2.
  - Add buffers around task.
- UPDATE  OFTEN

# State of the Art Methods

- Best features of Gantt, PERT/CPM, and extensions to allow assignment of resources and tracking of progress typically COMBINED

- Example :  Microsoft Project

# Suggested Steps in Project Management

- Generate a formal definition of the project, with goals, constraints, assumptions

- Identify project start/end dates, any mandatory milestones, including reports, signoffs, deliverables, etc.

- List constraints – money, equipment availability, holidays, etc.

# Suggested Steps, cont.

- 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.)

# **Suggested Steps, cont.**

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
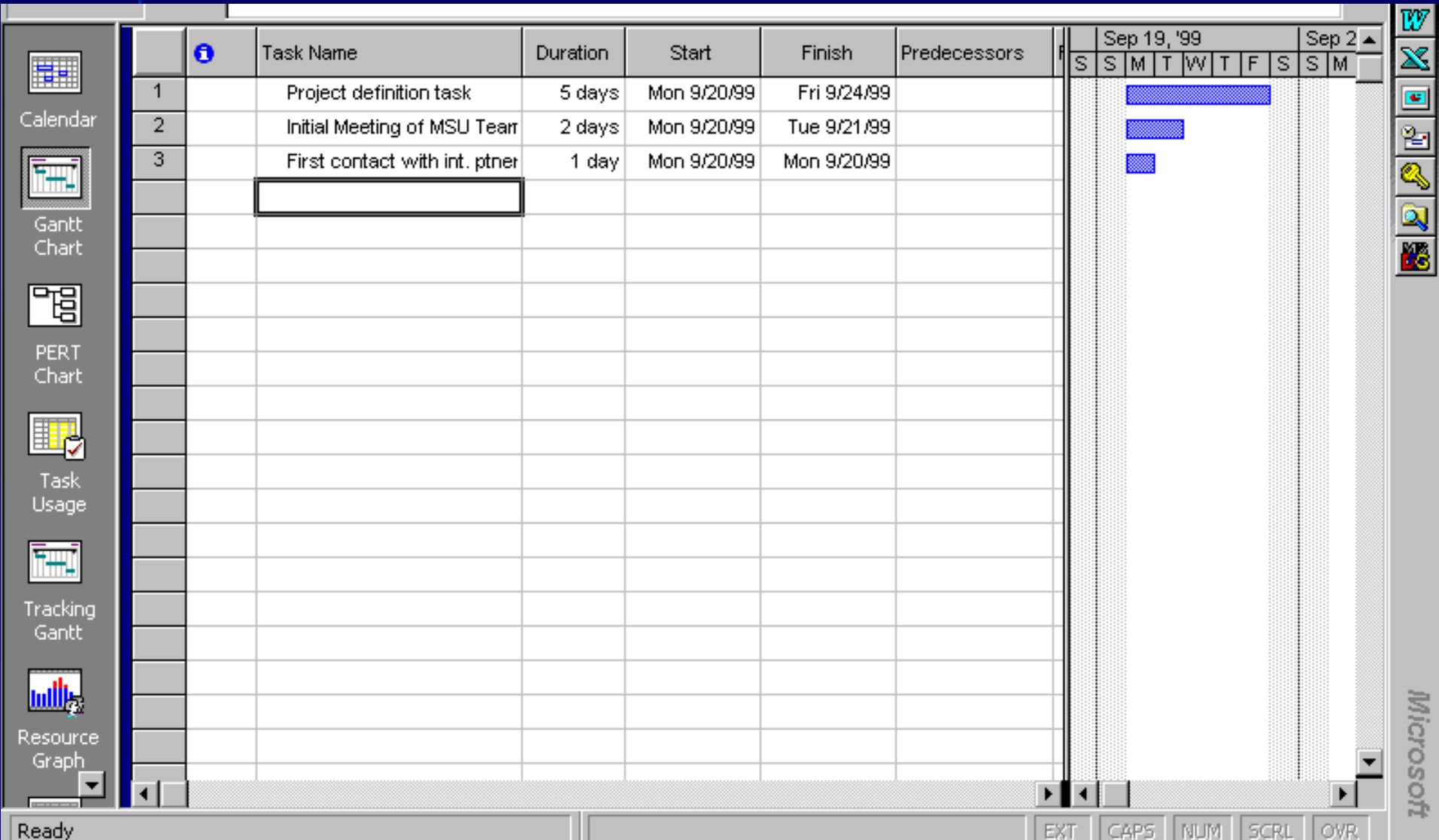
# Project Management Using
## Microsoft Project

- 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
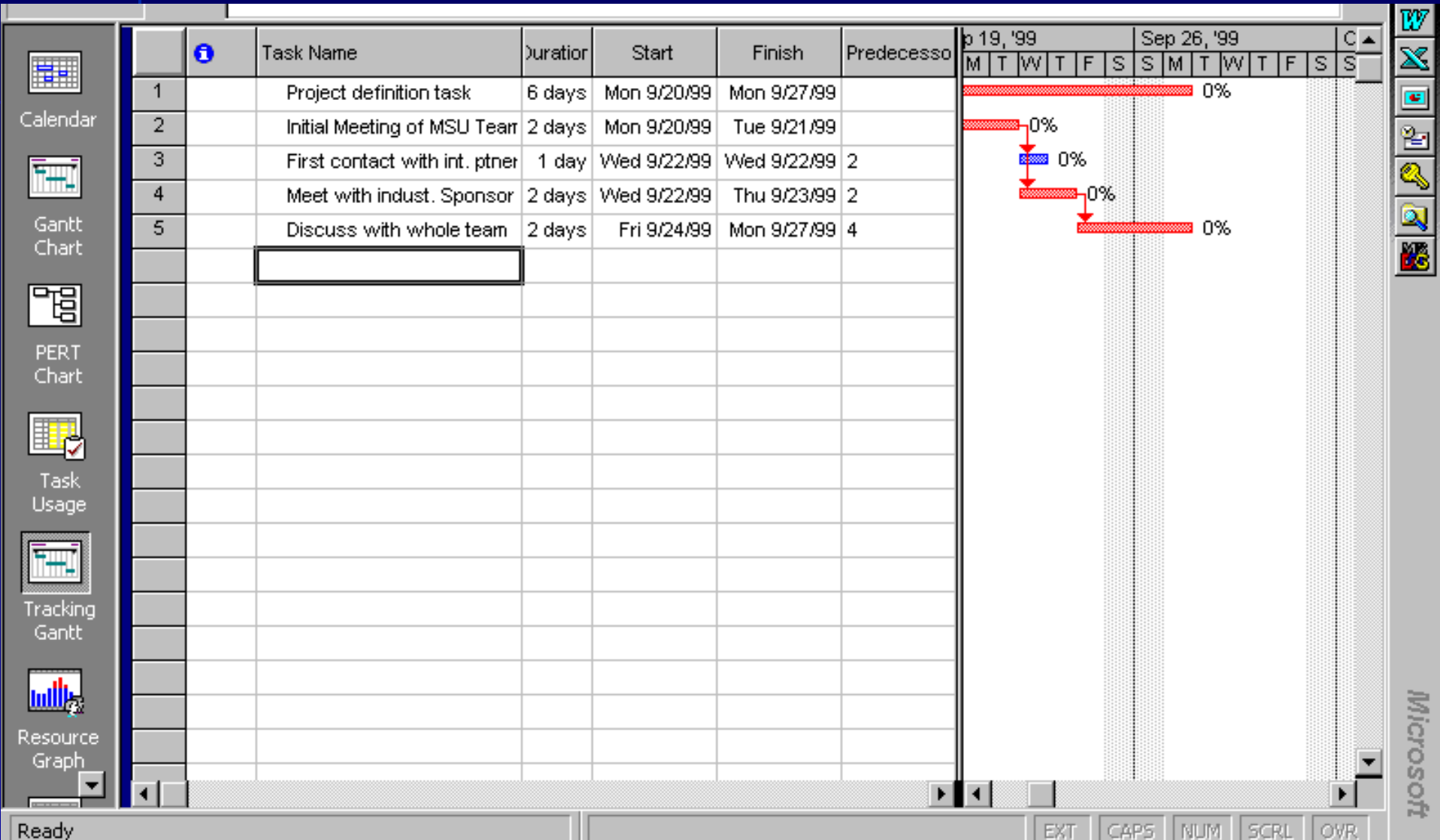
# GANTT Charts

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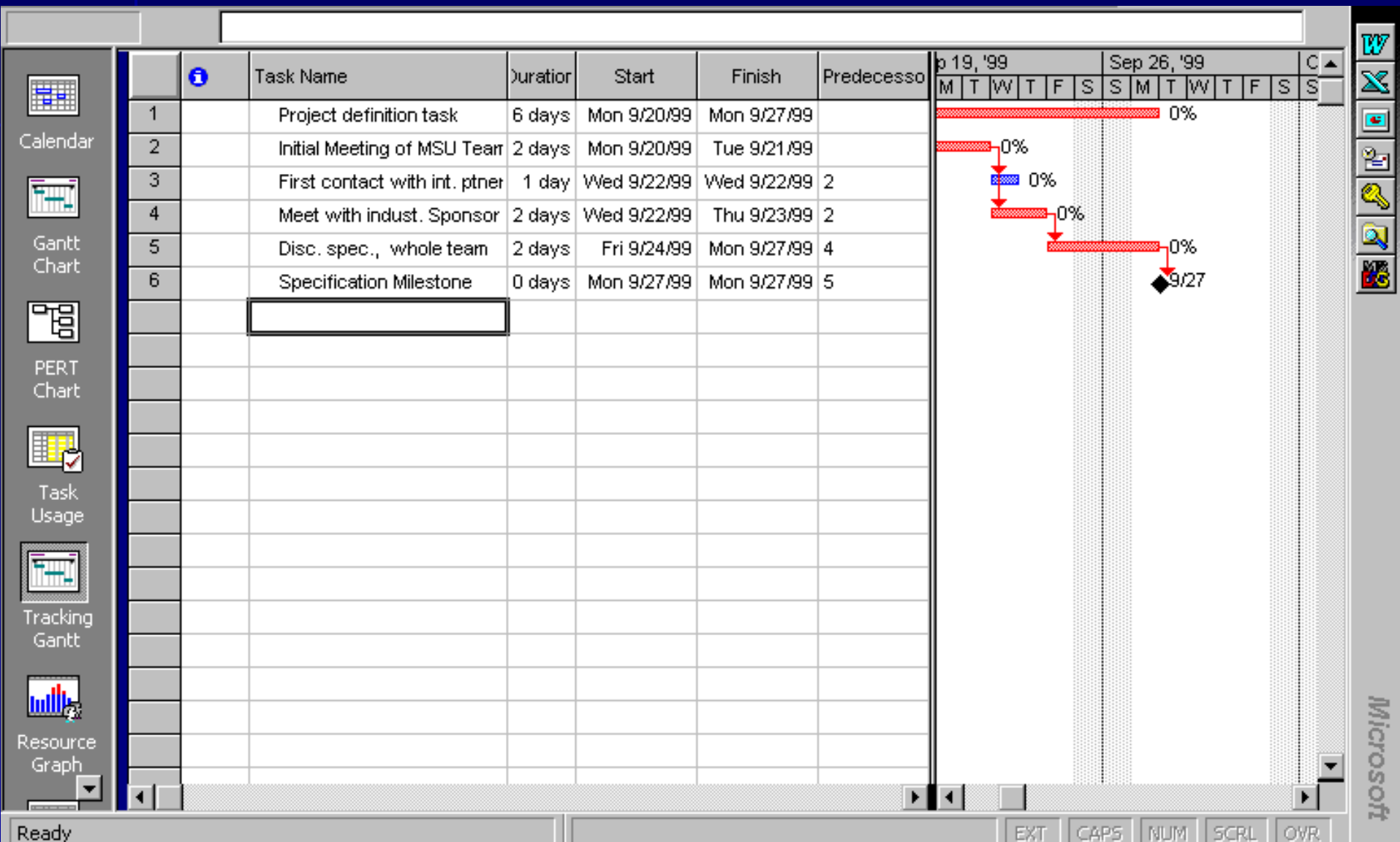- Can use spread sheet for some project management if MS Project not used
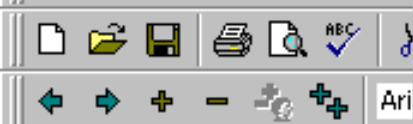
# Create Tasks

# Link Tasks

# Add Milestones

# Organize in Groups of sub-tasks

File   Edit   View   Insert   Format   Tools   Project   Window   Help

**Task Information**

| General | Predecessors | Resources | Advanced | Notes |

Name: Discuss, define conc. des. activ., dur.    Duration: 2d    OK

Percent complete: 0%    Priority: Medium    Cancel

**Dates**

Start: Mon 9/20/99

☐ Hide task bar

☐ Roll up Gantt bar to summary

| ◄ | September 1999 | ► |

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|-----|-----|-----|-----|-----|-----|-----|
| 29 | 30 | 31 | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Today: 9/2/99

| 1 | ⊟ Pr |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | ⊟ Re |
| 8 | Defin | Mon 9/27/99 | Mon 9/27/99 | | 0% |
| 9 | Do c | Tue 9/28/99 | Wed 9/29/99 | 8 |
| 10 | Agre | Thu 9/30/99 | Thu 9/30/99 | 9 |
| 11 | Complete spec. res. Assignm | 5 days | Fri 10/1/99 | Thu 10/7/99 | 10 |
| 12 | Discuss, define conc. des. activ., | 2 days | Mon 9/20/99 | Tue 9/21/99 | |

Calendar

Gantt Chart

PERT Chart

Task Usage

Tracking Gantt

Resource Graph

EXT   CAPS   NUM   SCRL   OVR

Start   Microsoft Project - D...   Microsoft PowerPoint - [De...   HP DeskJet Toolbox   4:13 PM

# Assign/Track People/Resources

| | ⓘ | Resource Name | Initials | Group | Max. Units | Std. Rate | Ovt. Rate | Cost/Use | Accrue At | Bas |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | Joe | J | | 100% | $0.00/hr | $0.00/hr | $0.00 | Prorated | Star |
| 2 | | Tina | T | | 100% | $0.00/hr | $0.00/hr | $0.00 | Prorated | Star |
| 3 | | Bill | B | | 100% | $0.00/hr | $0.00/hr | $0.00 | Prorated | Star |
| 4 | | Barb | B | | 100% | $0.00/hr | $0.00/hr | $0.00 | Prorated | Star |

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Ready

EXT CAPS NUM SCRL OVR

Start | Exploring - GoodmanProje... | Microsoft Project - D... | Microsoft PowerPoint - [De... | 11:29 AM

# Assigning people to tasks

# Track completed tasks/initiate change
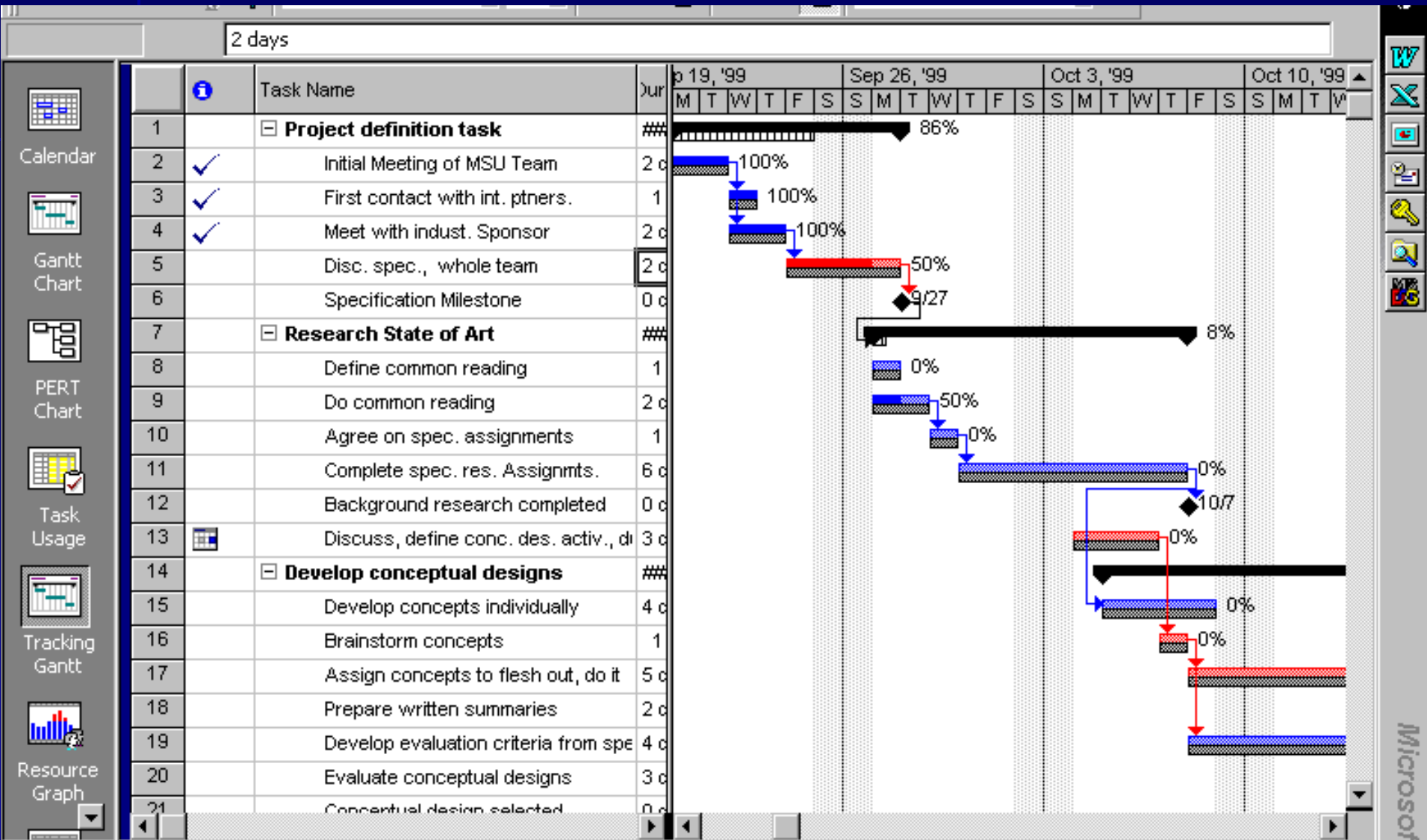
# Management of YOUR Project

## 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
- Required for proposal
- Required for management reviews
- Required for presentations
  - Group status reports
  - PDR
  - (Past history + Future plans)

# Questions?

- Thanks for your attention.
- Reminder:
  Proposals (paper) due this Friday
    before 3pm
      at Dr. Jenkins office

*Next class meeting: Tuesday, Sept. 3.*
*3:05 pm, SEB Auditorium*

# Proposals

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

# Groups A: Dr. Jenkins

| | Name | Major | Tech Ad. | Proj | Client |
|---|---|---|---|---|---|
| | **TEAMS 487 Fall 2013** | **Dr. Jenkins** | | | |
| 1 | Johnson, Jewl | Computer | Choi | Robotics E-Catalog | Choi |
| | Markman, Melanie | IDM | Schultz | | |
| | | | | | |
| 2 | Caviness, Carl | Computer | Ekong | Bio Sensor to Smart Phone | Hyun |
| | Hanson, Kristina | BME | Hyun | | |
| | | | | | |
| 3 | Aquino, Carl | Computer | Choi | Autonomous Kayak | Choi |
| | Callier, Matthew | EVE | Lackey | | |
| | Wright, Kyle | Computer | Choi | | |
| | | | | | |
| 4 | Flanders, Amanda | EVE | Lackey | Gray water bench cleaner | McCranor |
| | Hockenberger, Rache | EE | Barnett | | |
| | Misra, Tapas | EE | O'Brien | | |
| | | | | | |
| 5 | Moten, Darious | MAE | Moses | Power switch | Juang |
| | Lu, Xiaotian | EE | Barnett | | |
| | Abraha, Yoseph | EE | Barnett | | |
| | | | | | |
| 6 | Bartholomew, Ryan | EE | Barnett | self-scan shopping cart | Choi |
| | Ngo, Kelly | ME | MacNeil | | |
| | Russ, Keith | Computer | Mahaney | | |
| | | | | | |
| 7 | Austin, Briaunna | BME | O'Brien | Wireless bio sensor signals | O'Brien |
| | Morrison, Brittany | BME | O'Brien | | |
| | Timmons, Katrina | EE | | | |
| | | | | | |
| 8 | Mason, James | MAE | Bubacz | Quad-copter enclosure | Choi |
| | Volk, Dillon | MAE | Bubacz | | |
| | Williford, Weslie | MAE | Bubacz | | |
| | | | | | |
| 9 | Deese, Taylor | COMPUTER | Choi | Excer. Bike for Amputee | Hyun |
| | Belachew, Gellela | BME | O'Brien | | |
| | Permaul, Alaysia | MAE | Kunz | | |
| | | | | | |
| 10 | Brett, Emily | BME | Vo | Lower Limb Rehab Device | Vo |
| | Grimm, Caleb | ME | Kunz | | |
| | Manning, Evan | BME | Vo | | |
| | | | | | |
| 11 | Adams, Wesley | MAE | Sumner | MTS Cooling System | Bubacz |
| | Drabek, Benjamin | EVE | McCreanor | | |
| | Scott, Haydn | MAE | Sumner | | |
| | | | | | |
| 12 | Dumas, Mike | COMPUTER | Choi | portable home solar power | Radha/Juang |
| | Ingende Wa Boway, | COMPUTER | Choi | | |
| | Tention, Kei'Shawn - | COMPUTER | Choi | | |
| | Thompson, Mary | EE | Barnett | | |

# Groups B: Dr. Wright

| | TEAMS 487 Fall 2013 | | Dr. Wright | | |
|---|---|---|---|---|---|
| | **Name** | **Major** | **Tech Ad.** | **Proj** | **Client** |
| 1 | Holderman, Michael | ME | Sumner | Wind/Solar Monitor Sy | Sumner |
| | Santiago, Louis | Computer | Choi | | |
| | Vazquez, Edwin | EE | Juang | | |
| | | | | | |
| 2 | Danley, Bryan | MAE | Mahaney | Mars Rover | Choi |
| | Estevez, Daimen | Computer | Choi | | |
| | Isom, Tyler | EE | Barnett | | |
| | | | | | |
| 3 | Borah, Brandon | Computer | Choi | Modify Submarine | Choi |
| | Holcomb, Randy | MAE | Sumner | | |
| | Josey, Scott | EE | Barnett | | |
| | | | | | |
| 4 | Goldsberry, Alexander | MAE | Mahaney | Rehab device for child | Vo |
| | Grose, Emma | BME | Vo | | |
| | Owens., Virgenal | BME | Vo | | |
| | | | | | |
| 5 | Elias, Wilson | MAE | Bubacz | Quadcopter Ag Use | Choi |
| | Minch, Emily | Computer | choi | | |
| | Thompson, Tanner | EE | Barnett | | |
| | | | | | |
| 6 | Brett, Mitzi | EVE | Lackey | Bio-Sand Filter Design | Lackey |
| | Hutchison, Christie | EVE | Lackey | | |
| | McAnally, Jess | COMPUTE | Choi | | |
| | | | | | |
| 7 | Barker, Brandon | EVE | McCreano | Storm Water System/ | Dr.Andrew Sil |
| | Oliver, Jordan | EVE | McCreanor | | |
| | Lacey, Edward | EVE | McCreanor | | |
| | | | | | |
| 8 | Lopez, Geneve | ISE | Burtner | MCCG Process Improve | MCCG |
| | Charles, Marsalis | ISE | Burtner | | |
| | Rodriguez, David | IDM | Burtner | | |
| | | | | | |
| 9 | Galczynski, Andrew | BME | Vo | Orthotic/Gate Trainer | Vo |
| | Le, Trung | BME | Vo | | |
| | McDeed, Benjamin | BME | Vo | | |
| | Yin, Matthew | BME | Vo | | |
| | | | | | |
| 10 | Albogami, Saud Raja | EE | O'Brien | IEEE-2014 Competition | Ekong |
| | Johnson, Jennifer | COMPUTE | Choi | | |
| | Sizemore, Matthew | EE | Barnett | | |
| | | | | | |
| 11 | Deremer, Joshua | EE | Barnett | RC Robot for Vehicle | Choi |
| | Newell, Alexander | COMPUTE | Choi | | |
| | Swinton, Jake | MAE | Kunz | | |