MICHIGAN STATE UNIVERSITY

01/30: Schedule and Teamwork

The Capstone Experience

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From Students…
…to Professionals

Schedule and Teamwork

➢Schedule

➢Teamwork

Capstone Work Requirements

- Every team member should be working all the time.
- Work on all parts in parallel.
  - Hardware / Software
  - Front End / Back End
  - Web / iOS / Android
- Work in advance.
  - Mitigate risks.
  - Get systems working.
    - Hardware
    - Software

Schedules

- Schedules > Weekly Schedule

- Schedules > Major Milestones
  - 09/10: Status Report Presentations
  - 09/17: Project Plan Presentations
  - 10/10: Alpha Presentations
  - 11/14: Beta Presentations
  - 12/01: Project Videos
  - 12/04: All Deliverables
  - 12/06: Design Day
  - 12/11: Capstone Wrap Up
    (10:00 a.m. – 12:00 p.m.)

Are there fixed milestones in the "real" world?

Project Parts

- Break Down Project
  - Main Parts
  - Sub-Parts
  - Sub-Sub-Parts
  - Etc...
- Categorize
  - Risks
  - Dependencies
    - Particularly Risk Dependencies
    - Determines Schedule Order
  - Priorities
- Worry About
  - Interfaces Between Parts
  - Integration of Parts

Building A Project Schedule

- Start With Fixed Course Milestones
  - See Schedules > Major Milestones
  - Read About Each
- Estimate Times for Tasks for Parts
  - Building
  - Integrating
  - Testing
- Assign Tasks to Team Members
- Must Keep Everyone Busy All the Time
- Use "Short" Deadlines (E.g., 2-3 Days) Why?
- Document and Track
  - Microsoft Project?
  - Collaboration Tool?

Estimating Time for Tasks

- Rough Estimate
  - Intuition
  - Experience
- Refined Estimate
  - Prototype or Partial Build
  - Extrapolation
  - E.g., 2 Days to Build 1 → 6 Days to Build 3
- Keys
  - Be Realistic
  - Include Buffer Time if Unsure
- Adjust Schedule Accordingly

Typical Build Cycle

Until Project Done Do

1. Divide Next Big Task Into Little Tasks
2. Assign Little Tasks to Team Members
3. Complete Little Tasks
   a. Implement
   b. Test
4. Integrate Little Tasks Into Big Task
5. Test Big Task

Very Important

High Priority Risks Get High Priority Scheduling

Version Control

- Versioning
  - Discrete "Internal" Versions (States)
  - May Correspond to Builds
- Version Control Systems
  - Check Code In and Out
  - Mark Specific States as Versions
- Motivation
  - Build Breaks System
  - Revert to Earlier Build
  - Avoid Bridge Burning
- Every team must use MSU's GitLab.
  - Manage All Project Code
  - Instructors must have access.
  - Project sponsors may be granted access.

Can Be
Serious
Problem

Living Schedule

- Schedule Is Dynamic
  - Unforeseen Problems
  - Added Features (Avoid Feature Creep)
  - Etc..
- Track Your Progress
  - Microsoft Project?
  - Collaboration Tool?
- Revisit Schedule Often
  - Weekly Team Meetings
  - Weekly Triage Meetings with TMs
  - Identify Slippage
  - Hold Each Other Accountable (or Contact TMs)
  - Set Corrective Action
  - Adjust Schedule

Schedule and Teamwork

✓Schedule

➢Teamwork

Team Organization

- Up to Each Team
- Organize into Roles
  - Sponsor/Client Contact
  - Program Manager
  - Developer Roles
    - Web
    - Mobile
    - Back End
    - Front End
    - Etc.
  - Tester
  - Systems Administrator
  - Etc...
- Everyone must make significant technical contributions, including significant software contributions. ← **Fair Warning**

Team Dynamics

- Key to Success
- Significant Component of Course Grade
- Potential Teammate Problems
  - Not Attending Team Meetings
  - Not Being Involved
  - Not Responding
  - Not Completing Tasks On Time
  - Submitting Poor Work
  - Leaving Your Work for Others
  - Lying to Teammates about Task Status
  - Etc…
- Address Problems Immediately
  - Within Team
  - With Dr. D., Prof. Mariani, Luke, Griffin, Sam
- Be Ready to Discuss During Interviews

Grading

- Team (70%)
  - Project Plan Document & Presentation   10
  - Alpha Presentation   10
  - Beta Presentation   10
  - Project Video   10
  - Project Software & Documentation   <u>30</u>
  - Total   70
- Individual (30%)
  - Technical Contribution   10
  - Team Contribution   10
  - Team Evaluation   05
  - Meeting Attendance, Preparation & Participation   <u>05</u> ← Can Be Negative
  - Total   30

Grading

- Final Grade Sum Of…
  - Individual Total
  - % of Team Total Based on Team Contribution
- Grand Total =

(Individual Total)

+

(Team Total) * (Team Contribution) / 10.0

- *Nota Bene*: Your Team Contribution will have a very significant effect on your final grade.

Grading

Effect of Team Contribution					
Technical Contribution	Team Contribution	Team Evaluation	Meeting Attendance	Team Total	Grand Total
10	10	5	5	70	100
10	9	5	5	70	92
10	8	5	5	70	84
10	7	5	5	70	76
10	6	5	5	70	68
10	5	5	5	70	60
10	4	5	5	70	52
10	3	5	5	70	44
10	2	5	5	70	36
10	1	5	5	70	28
10	0	5	5	70	20
Nota Bene: Assumes Perfect Score In Every Other Category					

Grading

- Every student must earn the following required minimal grades in each grading category.
- Failure to earn the required minimal grades in any of the grading categories is grounds for receiving a final grade of 0.0 for the course.
- Minimal Team Grade Requirements
  - Project Plan Document & Presentation   5.0 / 10.0
  - Alpha Presentation   5.0 / 10.0
  - Beta Presentation   5.0 / 10.0
  - Project Video   5.0 / 10.0
  - Project Software & Documentation   15.0 / 30.0
- Minimal Individual Grade Requirements
  - Technical Contribution   5.0 / 10.0
  - Team Contribution   5.0 / 10.0
  - Team Evaluation   2.5 / 05.0
  - Meeting Attendance, Preparation & Participation   0.0 / 05.0

Grading

- In the capstone course, absence does <u>not</u> make your teammates' hearts grow fonder.
    - Nonresponsive
        - Email
        - Slack
        - Microsoft Teams Messages
    - Miss Meetings
        - All-Hands
        - Triage
        - Client
        - Team
    - Miss Work ← **Key**
        - In Lab and/or Online with Teammates
        - During Sprints
        - Before Major Milestones
    - Miss Deadlines
        - Other team members may be forced to do your work.
        - We may tell other team members they no longer need to assign you work.

NB: Your teammates will be evaluating you weekly and at the end of the semester.

GitLab

- Every team must use MSU's GitLab.
  - Manage All Project Code
  - Instructors must have access.
- Access by External Project Sponsors
  - Can Accommodate
  - Contact James
- To Receive Credit for Code, Student Must
  - Commit Code
  - Using Student's GitLab Account
- Read the syllabus.

Team Contribution

- Based on Variety of Factors Including But Not Limited to…
  - Attendance and Participation
    - Team Meetings
    - Project Sponsor Meetings
    - All-Hands/Split-Hands Meetings
  - Completion of Tasks
    - Correctly
    - On Time
  - Willingness to Take on New Tasks
  - Making Significant Technical Contribution
- Read the syllabus.

Technical Contribution

- Required of Everyone
- Significant Work and Code
- Does Not Include Code…
  - Committed to GitLab by Someone Else
  - That Does Not Work
  - That Was Copied from the Internet
  - Not Included In The Project
  - For CheckInCount = 1 to 100 {Modify Code Slightly; Checked Code In Again}
  - Etc…
- Necessary, but Not Sufficient
  - Doing Research
  - Creating UI/UX Designs
  - Creating Documents
  - Giving Presentations
- Read the syllabus.

Technical Contribution

- Pair Programming
  - Writing Code Together
  - <u>Not</u> Watching Someone Else Write Code
  - Must Decide When Committing Who Gets Credit for What
  - Receive Credit Only for Code Checked Under Your Account
- Demonstrating and Explaining Software
  - By Author
  - Any Time
  - In-Person
    - Lab iMacs
    - Person Laptop
  - If Not Able, Assume Not Working

Technical Contribution

- Significant Effect on Team Contribution
- Project Software == 43% Team Grade
- No Significant Technical Contribution
  - No Credit for Project Software
  - Maximum of 57% of Team Grade
  - Maximum Team Contribution of 5.7/10.0
  - Most Likely Will Not Pass CSE498
- Read the syllabus.

Team Problems

- Can Be
  - Really Hard
  - Awkward
  - Frustrating
- Addressing Problems
  - ASAP
  - Directly
  - Respectfully
  - Maturely
- Resolving Problems
  - Internally First
  - TMs
  - Dr. D. and Prof. Mariani
- "Bad" Team Not an Acceptable Excuse
- Managers
  - Can Help
  - Have Limited Experience with Time Travel

We don't have one of these.

Schedule and Teamwork

- ✓ Schedule

- ✓ Teamwork

What's ahead?

- Upcoming Meetings
  - 02/04, Tu: Team Project Plan Presentations
  - 02/06, Th: Design Day Booklet Process
  - 02/11, Tu: Team Project Plan Presentations
  - 02/13, Th: No Meeting
  - 02/18, Tu: Creating and Giving Presentations
  - 02/20, Th: Alpha Presentations
  - 02/25, Tu: Alpha Presentations
  - 02/27, Th: Alpha Presentations

What's ahead?

- Design Day Booklet Process
  - 02/04, Tu: Team Project Plan Presentations
  - 02/06, Th: Discuss in All-Hands
  - 02/10, Mo: First Draft Due **←11 Days**
  - 02/11, Tu: Team Project Plan Presentations
  - 02/14, Fr: Artwork Clinic **←2 Weeks from Friday**
    - Why: Provide Artwork Feedback
    - Where: Dr. D.'s Office
    - What: Design Day Booklet Team Page
    - Who: Team Members Responsible for Artwork
    - When: Same Schedule as Team Photos
  - 02/15, Sa: Final Draft Due **←2 Weeks from Saturday**

What's ahead?

Artwork Clinic Schedule, Friday, February 14
→Put On Calendar ←

- 10:00 AM: UWM
- 10:10 AM: Corewell Health
- 10:20 AM: HAP
- 10:30 AM: Auto-Owners
- 10:40 AM: Whirlpool
- 10:50 AM: Meijer
- 11:00 AM: Stryker IST
- 11:10 AM: GM
- 11:20 AM: RPM
- 11:30 AM: WK Kellogg Co
- 11:40 AM: Launch
- 11:50 AM: Anthropocene Institute
- 12:00 PM: Henry Ford eLUG
- 12:10 PM: Magna
- 01:10 PM: Urban Science

- 01:20 PM: NetJets
- 01:30 PM: Henry Ford RSE
- 01:40 PM: MSUFCU
- 01:50 PM: Amazon
- 02:00 PM: TechSmith
- 02:10 PM: Ally
- 02:30 PM: Delta Dental 3DADPH
- 02:40 PM: MSU CSE RJC
- 02:50 PM: Volkswagen
- 03:00 PM: MSU CSE SDRC
- 03:10 PM: Union Pacific
- 03:20 PM: McKesson
- 03:30 PM: Henry Ford RSVP
- 03:40 PM: Delta Dental dSLATE
- 03:50 PM: MSU Linguistics

What's ahead?

- Alpha Presentation
  - Th: 02/20, Tu: 02/25, Th: 02/27
  - Purpose: Demonstrate Your Team
    - Has Mitigated All Risks
    - Able to Meet All Specifications
    - Will Deliver Your Project on Time
  - Presentation
    - Rehearsed
    - Time: 14-Minutes
    - Demonstrate Working Software ←**Note**
  - 10% of Team Grade
  - Both Due Midnight, Wednesday, 02/19 ←**3 Weeks from Th**
  - Presentation Schedule Posted Evening Before First

What's ahead?

- Capstone Due Dates / Deadlines
  - Published at Start of Semester
    - See Weekly Schedule
    - See Major Milestones
  - Immovable
    - Your team depends on you.
    - You must get your tasks done on time.
    - Plan well in advance.
    - If you are "stuck," ask for help sooner rather than later.
    - If you are not going to complete your tasks…
      - …tell your team well in advance of the deadline.
      - ….another team member will complete your task.
      - …your team may be told they no longer need to depend on you.

Questions?