

MICHIGAN STATE
UNIVERSITY

01/07: Capstone Overview

The Capstone Experience

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Spring 2013



*From Students...
...to Professionals*

Capstone Overview

➤ Course Logistics

- Client Projects
- Course Logistics (Continued)



CSE 498, Collaborative Design

- “The Capstone Experience”
- Instructors
 - Dr. Wayne Dyksen (“Dr. D.”)
 - Meredith Schmidt
- Class Meetings
MW, 3:00-3:50pm, 1225 EB
- Syllabus
- Web Site
 - capstone.cse.msu.edu
 - Check it often.



Course Goals

(1 of 2)

- Build a Significant Software System
- Work in a Team Environment
- Learn New Tools and Environments
- Build and Administer Systems
- Develop Your Communication Skills
- Develop Interview Talking Points
- Etc...



Course Goals

(2 of 2)

- Teams of Students
- Build Significant Software System
 - Design
 - Develop
 - Debug
 - Document
 - Deliver
- For Corporate Clients
- In 15 (Short) Weeks



Project Deliverables

- Project Plan Document & Presentation
- Alpha Presentation
- Beta Presentation
- Project Software & Documentation
- Project Video
- Design Day

See [Major Milestones](#).

All-Hands Meetings

- Presentations By
 - Dr. D.
 - Teams
 - Status Reports
 - Formal Presentations
 - Project Plan
 - Alpha
 - Beta
 - Project Videos
- Guest Speakers



All-Hands Meeting Agendas

- 01/07: Course Overview
- 01/09: Project Plan
- 01/14: Risks and Prototypes
- 01/16: Schedule and Teamwork
- 01/21: (Martin Luther King Day, No Meeting)
- 01/23: Team Status Report Presentations
- 01/28: Team Project Plan Presentations
- 01/30: Team Project Plan Presentations
- 02/04: Team Project Plan Presentations
- 02/06: Team Project Plan Presentations
- 02/11: Resume Writing and Interviewing
- 02/13: Creating and Giving Presentations
- 02/18: Team Alpha Presentations
- 02/20: Team Alpha Presentations
- 02/25: Team Alpha Presentations
- 02/27: Team Alpha Presentations
- 03/04: (Spring Break, No Meeting)
- 03/06: (Spring Break, No Meeting)
- 03/11: Design Day and the Project Videos
- 03/13: Camtasia Demo
- 03/18: Team Status Reports
- 03/20: Team Status Reports
- 03/25: Team Status Reports
- 03/27: Team Status Reports
- 04/01: Team Beta Presentations
- 04/03: Team Beta Presentations
- 04/08: Team Beta Presentations
- 04/10: Team Beta Presentations
- 04/15: Ethics and Professionalism
- 04/17: Intellectual Property
- 04/22: Project Videos
- 04/24: Project Videos and All Deliverables
- 04/25: Design Day Setup
- 04/26: Design Day
- 05/01: Project Videos



Urban Science Capstone Lab

- 3352 EB
- Door Lock
 - Electronic Keypad
 - Code = #####
- Systems
 - Three PC's per Team
 - Dell Rack-Mounted Server
 - Two Development Machines
 - ❖ 27" iMac
 - ❖ 13" MacBook Pro
 - Team 100% Responsible
 - Building
 - Maintaining
 - Securing
 - Backing Up
- Books
- WiFi
 - SSID: CSE498
 - Key: ????????
- Conference Area
 - Team Meetings
 - Client Conference Calls
 - Google Conference Calendar
- Appliances
 - Water Cooler/Heater
 - Refrigerator
 - Microwave
 - Keurig Coffee Maker
- Lockable Storage
 - One Drawer Per Team
 - Assigned and Labeled
 - Obtain Keys from CSE Office



Scheduled Lab Times

- No Formal Lab Sessions
- “Credit” for Scheduled Weekly Meetings
 - Team Meeting
 - Client Conference Call
 - Triage Meeting with Meredith
- Meeting Times TBA With
 - Team
 - Client
 - Meredith
- Students must be available to meet.



Capstone Overview

✓ Course Logistics

➤ Client Projects

• Course Logistics (Continued)

Team / Project Generalities

- Clients
 - Vary in Size and Type
 - Client contacts/mentors are “volunteers”.
- Team Contact Person
 - Picked By Team
 - Main Point of Contact for Client

Team / Project Generalities

- Project Types
 - All Significant Software Development
 - Vary in Specifics
- Project Level of Difficulty
 - Hard Enough
 - But Not too Hard
- Deliverable
 - To the Client
 - By the Due Date

Team / Project Generalities

- Challenges
 - Very Short, Unforgiving Time Line
 - Client Contact
 - Team Dynamics
 - Project Plan (in Three Weeks)
 - Entirely New...
 - Languages
 - Environments
 - API's
 - SDK's
 - Processes
 - Protocols
 - Etc.
 - Project Management
 - Etc...



Project Specifics

- Vary
 - Type
 - Current State of Specificity
- Challenge
 - Connect with Client
 - “Nail Down” the Project
 - Hard Enough
 - Not too Hard
 - Avoid Feature Creep
 - Course Feature, Not Bug



Project Teams/Clients

- Team Auto-Owners
- Team Boeing
- Team Dow
- Team EA
- Team GM
- Team Meijer
- Team Mozilla
- Team MSUFCU
- Team Spectrum Health
- Team TechSmith
- Team Urban Science
- Team Whirlpool



Team Auto-Owners

Project Overview

Events Planning Mobile App

- Functionalities
 - Create, Edit and Track Events
 - Seminars and Classes
 - Social Events
 - ❖ Golf Outings
 - ❖ Tailgates
 - Register Event Attendees
 - Open Events by Web
 - Restricted Events by Email Invitation and Web
- Features
 - Web and Mobile
 - Display Event Information
 - Register for Open Events
 - Respond to Invitations to Restricted Events
 - Provide Mapping and Directions
 - Administrative
 - Create New Event Types
 - Generate Reports
 - Print Name Tags and Table Tents
- Technologies
 - Java
 - JQuery Mobile
 - IBM DB2 Database



Lansing, Michigan

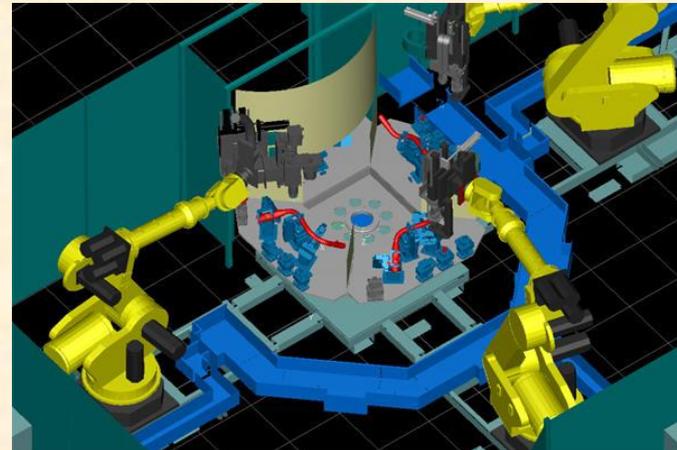


Team Boeing

Project Overview

Airplane Building Game Simulator

- Functionalities
 - Factory Simulation Game
 - Build Paper and Model Airplanes
 - By Team of Humans and Robots
 - Player is Factory “Floor Captain”
- Features
 - Networked
 - Humans and Robots with Moveable Parts
 - Arms
 - Hands
 - Wheels
 - Etc.
 - Airplane Assemblies
 - Paper Planes with 5 Degrees of Difficulty
 - Model Planes with 3 Degrees of Difficulty
 - Assignment of Tasks to Humans and Robots
- Technologies
 - C++
 - 3-D Game Modeling
 - Game Engines
 - Robotics Simulation
 - Physics Modeling



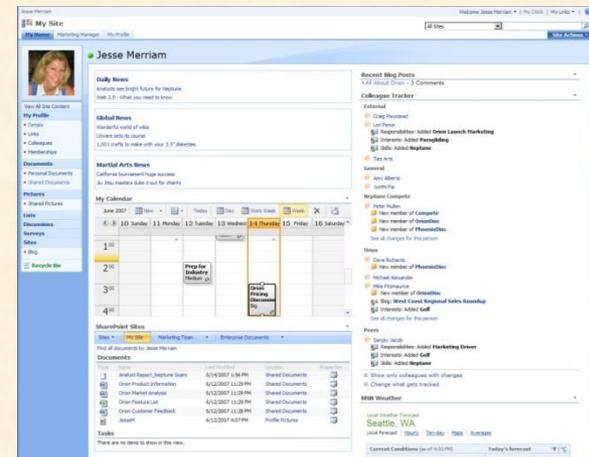
St. Louis, Missouri

Team Dow

Project Overview

Personalized Intranet Portal

- Functionalities
 - Customizable Dashboard
 - Presents Internal Dow Information
 - Based on User's Attributes
 - From SharePoint MySite Profile
- Features
 - Display Corporate News
 - Add and Modify Links
 - Share Document Library
 - Integrate Outlook Tasks or MySite Tasks
 - Display RSS Feeds
 - Information Based on 13 Core Businesses and 5 Functions
- Technologies
 - Microsoft SharePoint 2013
 - Microsoft SQL Server 2012
 - Microsoft Office (Outlook)
 - Visual Studio 2010



Midland, Michigan



Team EA

Project Overview

Android Emulator for EA Games

- Functionalities
 - Android Emulator
 - Streams Mobile Games
- Features
 - Emulator Runs on a PC
 - Communication System and Controller Interface
 - Allows Android Devices to Control Game on PC
 - Interface Based on HTML5
 - Connects Over WiFi
 - Interprets Gestures and Device Tilt Movements
 - Stream Video from Emulator to HTML5 Webpage
- Technologies
 - C++ and C#
 - Android SDK
 - HTML5
 - JavaScript
 - PHP
 - webRTC



Redwood City, California

Team GM

Project Overview

My Conference Room

- Functionalities
 - Enable Impromptu Meetings
 - In Empty Conference Rooms
 - Find or Check Status
 - Book
 - Using Mobile Devices
- Features
 - Based on GM Microsoft Exchange Server
 - Includes all Conference Rooms
 - Cataloged for Searching and Scheduling
 - Accessible Via Exchange APIs
 - Displays All Relevant Room Information
 - Name, Location and Capacity
 - Amenities (Whiteboards, Projector, Etc.)
 - Schedule
 - Supports Room QR Codes
- Technologies
 - CSS, HTML5
 - JavaScript, AJAX
 - Microsoft Exchange 2013
 - Microsoft Outlook 2013 APIs (EWS, etc.)
 - Application Tier (.NET Recommended)



Detroit, Michigan

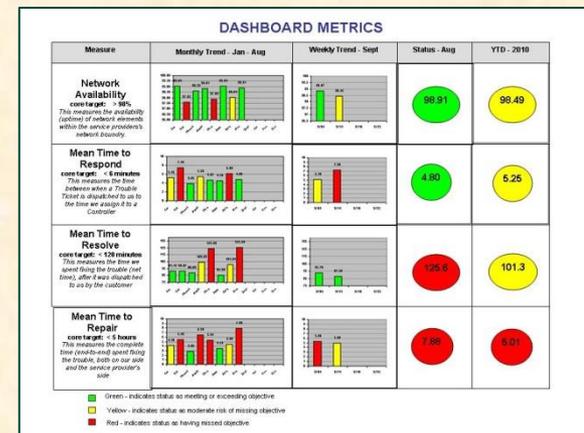


Team Meijer

Project Overview

IT Metrics Repository

- Functionalities
 - Dashboard
 - Visualizes IT Metrics
 - Over Time
 - Possibly with Goals
- Features
 - Create, Enter and Edit
 - Metrics
 - Time Dimensions
 - Goals
 - Create Metric as Function of Other Metrics
 - Enter or Calculate Historical Values
 - Automatically Propagate Unchanged Values
 - Support Various Graphing Capabilities
- Technologies
 - CSS, HTML5
 - JavaScript, jQuery, jQuery UI
 - Microsoft .NET, ASP.NET, C#
 - Microsoft Communication Foundation (WCF)
 - Microsoft Internet Information Services (IIS)
 - SQL Server



Grand Rapids, Michigan



Team Mozilla

Project Overview

Multi-Touch Gestures for Mac OS X Firefox

- Functionalities
 - Multi-Touch Gestures for Mac OSX Firefox
 - Implement New Gestures
 - Improve Existing Gestures
- Features
 - Rotating Images
 - Tab Switching
 - Tap to Zoom
 - Pinch to Zoom
 - History Listing
- Technologies
 - CSS
 - Objective-C
 - C++
 - JavaScript



Mountain View, California

Team MSUFCU

Project Overview

Mobile Information App for Staff

- Functionalities
 - Provides Information About MSUFCU...
 - Events
 - News
 - Announcements
 - To MSUFCU Employees
 - On iPhone, iPad and Android
- Features
 - User Experience (UX)
 - Easy-to-Use
 - Useable by Wide Variety of Users
 - Includes a Calendaring Tool
 - Sign Up
 - Send Text Message Reminders
 - Data Housed on Internal Servers
 - Utilizes SSL Encryption
- Technologies
 - Apple iPhone and iPad (iOS)
 - Google Android
 - Objective-C, Xcode
 - C#
 - Java
 - HTML, PHP, JavaScript
 - Microsoft SQL Server



Team Spectrum Health

Project Overview

SLA Management and Metric Reporting System

- Functionalities
 - Information Services Metrics Dashboard
 - Shows Progress on Internal Projects
 - Via Monthly Scorecards
 - Assists in Evaluation and Decision Making
- Features
 - Create, Edit and Delete Metrics
 - Track Metrics with Approvals
 - Visualize Monthly Scorecards
 - Manage Metrics Issues Log
 - Control and Link All Information Related to a Metric
 - Perform Calculations Based on Metrics
 - Format Data Based on a Set of Parameters
- Technologies
 - Database Technologies
 - Dynamic Web Programming
 - Web Services
 - Data Aggregating and Warehousing

Project	Current Milestone	Issues	Spend To Date	Target
Aphrodite	🕒 Project Plan	7	1.1	Q1 2080
Apollo	🕒 Development	2	12.8	Q2 2080
Ares	🕒 Data Migration	2	19.1	Q1 2080
Artemis	🕒 Launch	0	3.4	Q2 2080
Athena	🕒 Development	0	0.2	Q3 2080
Demeter	🕒 Testing	11	38.2	Q1 2081
Dionysos	🕒 Testing	13	19.7	Q4 2080
Hades	🚫 Security Testing	10	3.2	Q1 2080
Hephaestus	🕒 Testing	6	0.9	Q3 2080
Hera	🕒 Development	0	0.2	Q4 2080

Team TechSmith

Project Overview

American Sign Language Learning App

- Functionalities
 - Learn and Teach American Sign Language
 - Using Microsoft Surface Tablet App
 - Learner
 - Watches YouTube Videos
 - Records Themselves Signing
 - Teacher
 - Watches Learner's Video
 - Responds with a Critique
- Features
 - Create Lesson Plans
 - From YouTube Videos
 - By Teacher and Automatically
 - YouTube Video Tagging (Beginner, Intermediate, Advanced)
 - Teacher Critiquing
 - Quick Ratings
 - Choosing Frames From Learner Video
 - Create New Video with Voice Narration
 - Text and Drawing Annotation
 - Interaction Both Remote and In-Person
- Technologies
 - Window 8, WinRT
 - YouTube API
 - Windows Azure or Ruby on Rails
 - Urban Airship
 - RESTful Web Services



Team Urban Science

Project Overview

Dealership Consultant Mobile App

- Functionalities
 - Support Urban Science Consultants
 - Meetings with Automobile Dealers
 - Provide and Collect Information
 - Before Meeting
 - During Meeting
 - After Meeting
 - On iPad
- Features
 - Useable During Meeting
 - Provide and Collect
 - Specific Action Plan
 - Dealer's Reaction
 - Meeting Atmosphere
 - Specific Process to be Utilized
 - Dealer Agreements
 - All Information Stored in SQL Database
- Technologies
 - CSS, HTML5
 - PhoneGap
 - Microsoft Bing Maps
 - Web Services
 - SQL Server
 - [Mobile Geography Management](#), Fall 2012



URBAN SCIENCE.

Detroit, Michigan



Team Whirlpool

Project Overview

Guided Cooking and Recipe App

- Functionalities
 - Cooking and Recipe Guide
 - For Web and Mobile Devices
 - Replicates UX (User Experience) of Oven LCD
- Features
 - Cloud-Based SQL Database
 - Import Recipes
 - From Select Websites
 - Map to Whirlpool Database Schema
 - Administrative Interface
 - Edit Database
 - Import Recipes
- Technologies
 - Java
 - JavaScript
 - SQLite and MySQL
 - HTML5, CSS3
 - PHP or Ruby
 - RESTful Web Services



Benton Harbor, Michigan

First Assignments

- Read the Syllabus.
- Check out the Lab (3352 EB).
 - See if you can find it.
 - See if you can get in.
- Check out the Web Site.
- Research Your Project.
 - Client
 - Technologies



What's Next?

- Teams
 - Assignments by Email Tonight or Tomorrow Morning
 - Meet Initially by Tuesday Afternoon
 - Lab Machine Assignments in Lab
 - Start Configuring Lab Machines
 - Team Photos
 - Wednesday 01/09, After All-Hands Meeting
 - Dress Casual (But Appropriate)
- Client
 - Contact by Email by Tuesday COB
 - Conference Call by Phone Wednesday or Thursday
 - Review Project Proposal



Capstone Overview

✓ Course Logistics

✓ Client Projects

➤ **Course Logistics (Continued)**



Urban Science Capstone Lab Machines

- Three Per Team
 - Rack-Mounted Dell Server
 - Connected to the Outside World
 - Keep Secure
 - 27" iMac
 - 13" MacBook Pro
- Operating Systems
 - Run OSX
 - Install VMware Fusion (from [here](#))
 - Create Virtual Machines
 - Windows XP, Vista, 7
 - Linux



Urban Science Capstone Lab Miscellany

- Security
 - Keep Lab Doors Closed
 - Do Not Open Doors For Strangers
 - Email Dr. D. if Door Becomes Unlocked
- Wireless
 - SSID: CSE498
 - Key: ???????
- Coffee
 - Some Provided by Dr. D.
 - Bed, Bath & Beyond (Get 20% Off Coupon)
- Game Playing
 - Not On Monitors Facing Hallway
 - Not If Other Team Members Need Machine



Expectations & Workload

- Extremely High For Both
- Your MSU Career Capstone
- Addition to Your Personal Portfolio
- Experience Viewed Like an Internship
- Interview Talking Points
- Leverage Into a Job Offer



Major Milestones

- 01/23: Status Report Presentations
- 01/28: Project Plan Presentations
- 02/18: Alpha Presentations
- 04/01: Beta Presentations
- 04/22: Project Videos
- 04/24: All Deliverables
- 04/25: Design Day Setup
- 04/26: Design Day



Meeting Attendance

- Required
 - All-Hands (Class) Meetings
 - Team Triage Meetings
 - 5% of Final Grade
 - Late == Absent
 - Almost No Excuses Accepted
 - One or Two Excused Possible for Interviews
 - Must Provide Information In Advance (Date, Company, Recruiter Name & Contact Info)
 - Must Attend (No Excuses Accepted)
 - Your Team Presentations
 - All Project Video Viewing
 - Design Day
- Do NOT Schedule Interviews
Do NOT Schedule ANYTHING



Team Organization

- Up to Each Team
- Organize into Roles
 - Client Contact
 - Program Manager
 - Developer
 - Tester
 - Systems Administrator
 - Etc...
- Everyone Must Make Technical Contributions



Team Dynamics

- Key to Success
- Significant Component of Course Grade
- Address Problems Immediately
 - Within Team
 - With Dr. D. and/or Meredith
- Be Ready to Discuss During Interviews



Grading

(1 of 3)

• Team (70%)	
▪ Project Plan Document & Presentation	10
▪ Alpha Presentation	10
▪ Beta Presentation	10
▪ Project Video	10
▪ Project Software & Documentation	25
▪ Design Day	<u>05</u>
▪ Total	70
• Individual (30%)	
▪ Technical Contribution	10
▪ Team Contribution	10
▪ Team Evaluation	05
▪ Meeting Attendance	<u>05</u>
▪ Total	30



Grading

(2 of 3)

- 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

(3 of 3)

- We reserve the right to make changes with sufficient notice.
- No special consideration will be given for final grades including but not limited to
 - status in any academic program including CSE,
 - financial aid,
 - rank in the armed forces,
 - job,
 - graduation,
 - mortgage,
 - wedding,
 - visa status,
 - or anything else.



Integrity of Scholarship

- MSU's policies will be enforced.
- Individual and team work must be original.
- Violators...
 - ...will be referred to the appropriate deans.
 - ...may receive a grade of F in the course.



IP & NDA's

- IP: Intellectual Property
 - By Default, Owned by You
 - Client May Request
 - Right to Use
 - Assignment of Ownership
 - Etc.
- NDA: Non-Disclosure Agreement
 - May Be Required by Client
 - You will...
 - ...respect/protect intellectual property.
 - ...respect/protect source code.
 - ...etc.
- Normally Not an Issue
- Always Contact Dr. D. Before Signing Anything



Using Resources

- Ok For “Help”
 - People
 - Past Capstone Teams
 - Other Capstone Teams
 - Faculty Members
 - Articles
 - Sample Code
 - Etc...
- Not Ok For “Entire” Project
- If Unsure, Ask Dr. D. and/or Meredith



Using Existing Code

- Ok
 - Examples
 - Prototypes
 - Open Source Code
 - Fragments
 - Libraries
 - Utilities
- Not Ok
 - Vast Amounts of Your Project
 - Not Open Source
- Document and Report All Existing Code Used
- Be Careful!
- If Unsure, Ask Dr. D. and/or Meredith



Design Day

- College of Engineering Event
 - Engineering Building
 - Friday, April 26, 2013
- Displays (Booths) of Design Projects
 - CSE Capstone
 - ECE Capstone
 - ME Capstone
 - Etc...
- Presentations and Awards
 - Panel of Judges
 - CSE Team Project Videos



VISA

- Verified Individualized Services and Accommodations
- Let us know immediately.
- We will work with you.

Office Hours

- Any Time...
 - Visit: 3149 EB
 - Call: 353-5573
 - Email: (dyksen@cse.msu.edu)
- Make Appointment

Capstone Overview

✓ Course Logistics

✓ Client Projects

✓ Course Logistics (Continued)

Questions?



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UNIVERSITY

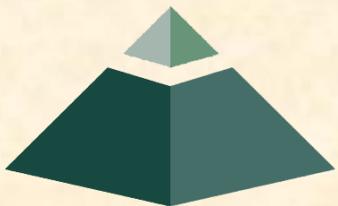
01/09: Project Plan

The Capstone Experience

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