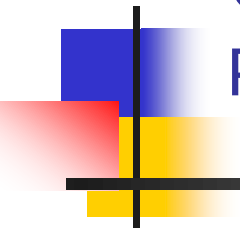
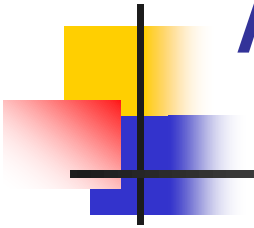
MS Computer Engineering
MS Software Engineering
CMPE 295A, 295B
Project Overview



Agenda



- Master's Project Overview
- CMPE 295A Overview
- CMPE 295B Overview
- CMPE 295A/B Policies

Agenda

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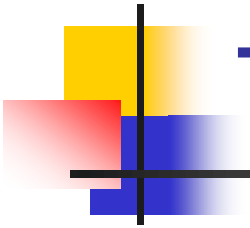


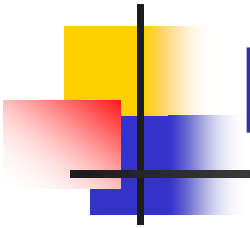
The Master's Project

- Provides the "culminating experience" for your degree program
- Tests a student's ability to:
  - Organize and complete a major piece of work
  - Do independent research, design, implementation, experiments, etc.
  - Communicate effectively using both written and spoken word

Entry Requirements

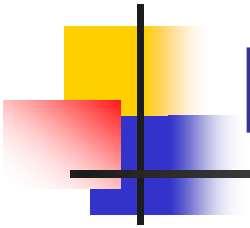
- To be in 295A a student should:

1. Be in good standing and be classified or able to reach classified status
2. Meet your program prerequisites stated at http://cmpe.sjsu.edu/project
3. Has satisfied the University Written English Competency requirement (such as ENGR 200W or CMPE 294) or are taking it concurrently with CMPE 295A
4. Have an existing Project Team with Project Advisor and Project Topic



Project Topic

- Topic selection and scope agreement between you and your project advisor
- The 295A class instructors will review your topic
- Topic choice can serve other purposes beyond just satisfying degree requirements
  - Research an area as a path to a career change
  - Demonstrate your abilities for a new job
  - Develop a base of knowledge for publishing a paper, article, book, etc.

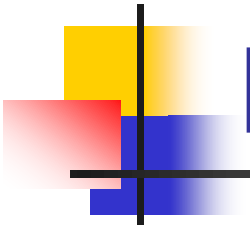


Project Topics (cont.)

- Topic can be a collaborative effort with industry, but avoid pitfalls:
  - Your topic and report must be put in the public domain at the end of your project. Proprietary information is not allowed.
  - You should have an industry sponsor that can work closely with your advisor.

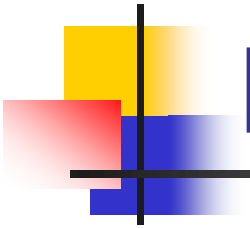
Project Scope

- Topic should have sufficient scope to warrant at least six units of credit
  - Project is the "crown jewel" of your academic career. You (and your advisor) should be proud of your effort at the end.
- Should demonstrate "academic significance"
  - Should push the knowledge envelope for your topic area



Project Participants

- Student(s)
- Project Committee
  - Project Advisor
  - Readers (optional)
  - 295A Instructor (or his delegate)
  - Department Chair



Project Student Participants

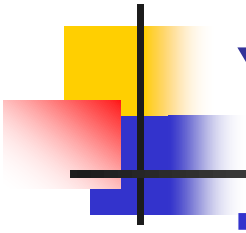
- Projects should be the effort of **four students**. Fewer students requires CMPE 295A instructor approval. Be aware of the following problems that can occur in your project teams:
  - Skills mismatch (can be an advantage if complementary skills)
  - Freerider/freeloader problem
  - Additional dependency
  - Some doubt raised about authorship
  - An existing strong working relationship helps!

Project Student Participants (cont)

- MSSE and MSCMPE students may be on the same team
  - Advisor must agree and must assure requirements for both programs are met
  - Students must meet requirements for their respective programs

Your Project Committee

- Your Project Committee consists of:
  - Your technical advisor
    - Must be a member of the SJSU faculty
    - Must be skilled in your topic area
  - One or two committee members or readers (optional)
    - SJSU Faculty
    - Industry participation is highly encouraged but should be a person in a supervisory role and willing to work with your advisor
  - CMPE 295A Instructor
  - Department Chair
- Signatures from all members of your committee are required for project approval



Your Project Advisor

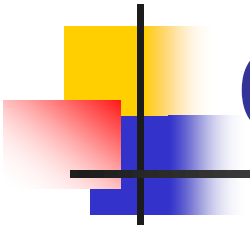
- Role of the advisor
  - Agrees to project topic/scope
  - Provides technical "sounding board"
  - Approves your project items
    - Workbook
    - Report: Title, Abstract, Content
    - Prototype Implementation
    - Presentations
  - Helps determine/acquire project resources
  - Helps to flatten dependencies
  - Is your best friend (or enemy) when it comes to assigning a project grade
- Your advisor is all important to your project's success. Keep him/her informed so there are no surprises. Don't waste your project advisor's time!

Your Project Advisor (cont.)

- Roles you should NOT expect your advisor to play
  - Motivator
  - Planner
  - Referee
  - Source of all information
  - Project leader
  - Copyeditor

Your Project Committee Members (Readers)

- Committee members are supporting cast members on your committee
  - Should be informed of your topic
  - Read your report for technical accuracy and errors
  - May attend your presentation and Project Exposition



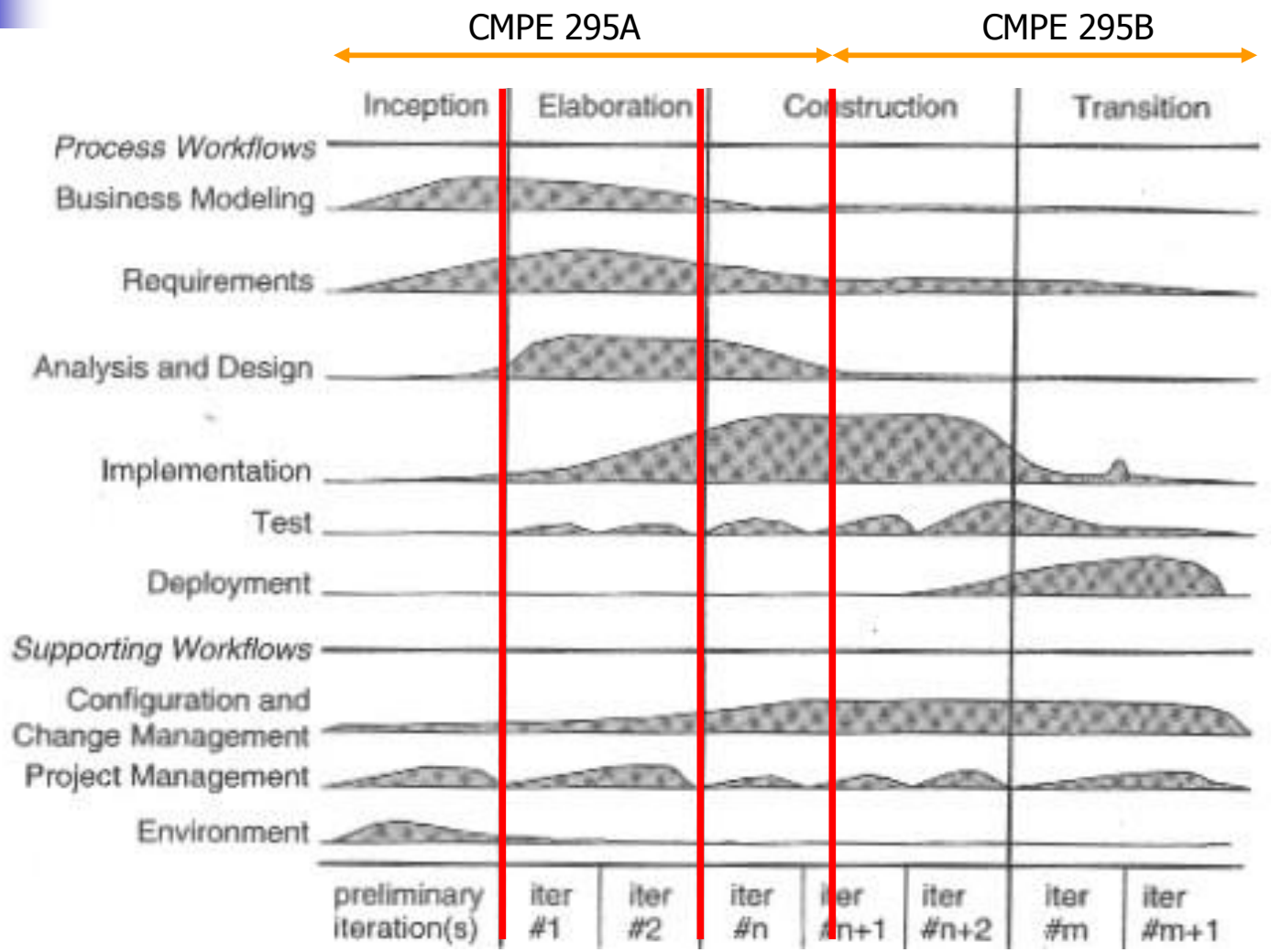
CMPE 295A Instructor

- Default member of your committee
- A CMPE 295A instructor assures consistent quality for CMPE 295A Classes
  - Topic
  - Work scope
  - Report style and content

Department Chair

- Default member of your committee
- Makes sure your report follows university and department guidelines

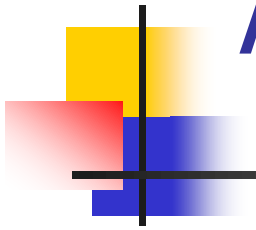
The Project Development Process



Project Outcomes
(listed in order of completion)

- Project Abstract
- Project Workbook (Two Iterations)
- Functional Specifications
- Prototype Project Implementation
- Formal Project Report
- Project Presentation to Advisor
- Project Exposition presentation

Agenda



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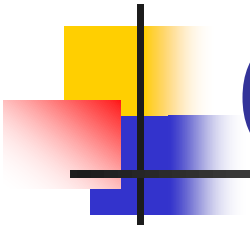
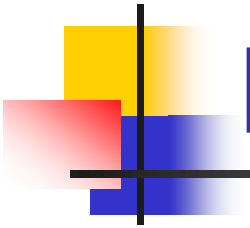
Project Tasks (CMPE 295A)



- Write Abstract
- Workbook 1 & 2 (group)/Functional Spec (individual)
  - Topic Research
  - Requirements
  - Analysis & Design
  - Implementation details
  - Schedule
  - Implementation Proof of Concept
- Write First Draft of Chapters 1 – 2

Project Abstract/Description

- Abstract
  - One Page (double-spaced), Title, Team, Three Paragraphs
    - Eye-catching, descriptive title
    - List of team members
    - Paragraph 1: Generic Project setting
    - Paragraph 2: Project problem identification
    - Paragraph 3: Project solution approach
- Short Presentation
  - Four Pages
    - Project title, advisor, team
    - Project Description in five bullets max
    - Project Deliverables
    - Project Dependencies/Concerns

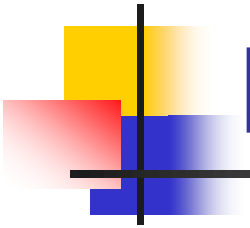


Project Workbook

- Identifies and collects verbose information about
  - Research/state of the art related to project
  - Project Proposal/Justification information
  - Project Requirements
  - Dependencies and deliverables
  - Collects all architecture, design, implementation, testing, and other project decisions
  - Planning/Schedule Information

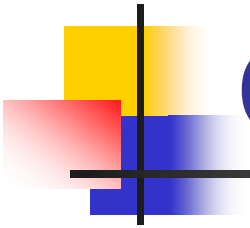
"State of the Art" Research, Academic Contribution

- After you have reached agreement on a topic with your advisor, you should establish the current "knowledge base" or "state of the art" for your topic
  - Do a literature/Web search and keep a list of the information you use for your bibliography
  - Update your advisor and solicit his/her guidance
- You should also be able to identify your academic contribution, i.e., your addition to the state of the art



Requirements/Proposal

- Determine the system requirements of your project
- Establish a business or research justification for your project

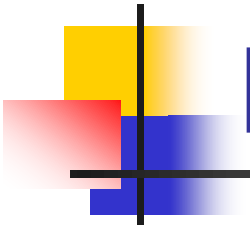


Complete Project Design

- Complete end-to-end design
- Use UML or other design language throughout to describe design
- Mock-up user interface

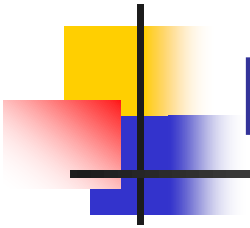
Publish Plan & Schedule

- Establish:
  - Project tasks
  - Start and end dates
  - Milestones
  - Resources/dependencies
- Solicit input from your advisor



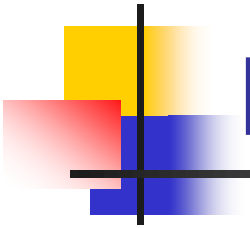
Project Functional Specs

- Individual Assignment
  - Identify functional spec area for each team member in Project Workbook
  - Include Requirements, Design, Implementation, Test, Execution details for a subset of project function
  - Each project member will produce a functional spec



Prototype Project Implementation

- Project prototype should be
  - A substantial coding/implementation effort
  - Well-tested and stable for demonstration purposes
  - Use best-practice techniques for implementation
  - Have an attractive user interface



Prototype Project Implementation

- Proof of concept prototype
- Working prototype
  - Testing
  - Deployment
  - Performance analysis
- Should complete an implementation end-to-end "slice" in CMPE 295A
- Broaden implementation/function in CMPE 295A/B

Project Report

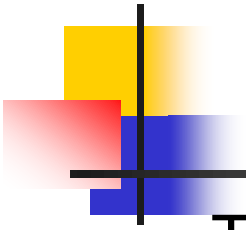
- The Project Report captures the outcome of your effort for perpetuity
  - Single most important outcome of your effort
  - Is **not** a repeat of your workbook information
  - Tells a story about your project that is succinct and interesting to read
- Make your report attractive
  - Follow style guidelines
  - Heavily illustrate your project using diagrams, tables, and screen shots
- Guidelines will be distributed for:
  - Writing style
  - Format
  - Content/Organization

Project Report (cont.)

- **The project report should be grammatically and stylistically correct**
  - Don’t depend on your advisor to correct grammar or discover style problems
  - Hire someone to do copyedit if necessary
  - Poor grammar and inconsistent style can be a barrier to completing your project!

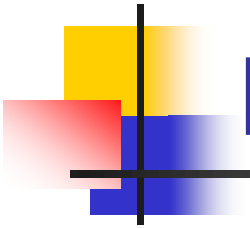
Project Report Content

- Typical Report includes:
  - Title Page
  - Copyright Page
  - Signature Page
  - Acknowledgments
  - Table of Contents, List of Figures, List of Tables
  - Report Body
  - Bibliography
  - Appendices



Project Report Body

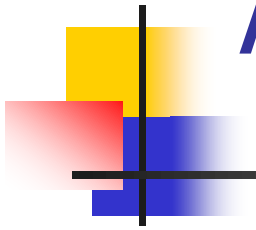
- The outline for your report body can depend on the subject matter
- The body of most project reports will follow an outline as follows:
  - Project description (Chapter 1)
    - Should describe the goals of your project
    - Should describe current state of the art in your topic area
  - Business Modeling, Requirements, Proposed architecture (Chapter 2)
    - Use UML or other design language to describe
      - Include use cases as required
  - Technology background (Chapter 3)
    - Describe technologies that you will use to implement your project
    - Assume your audience has the background of a typical project student



First Two Chapters

- Write the first two chapters of your project report (draft)
  - Describe project in detail
  - Capture literature search and state of the art in topic area
  - Establish business model and requirements
  - Propose architectural solution

Agenda



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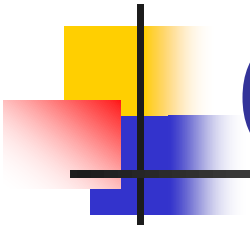
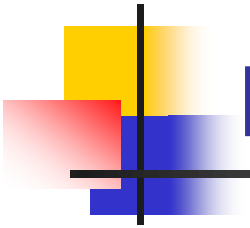
Project Tasks (CMPE 295B)



- Final Implementation (Coding, Hardware) started in CMPE 295A
- Testing
- Deployment
- Complete Project report
- Write/Present Project presentation
- Attend Student Exposition
  - Mandatory requirement



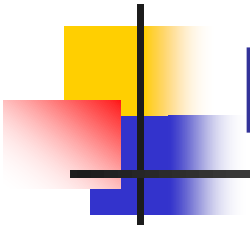
Project Report Body (cont)

- Complete the body of your project reports … (cont.)
  - Project Analysis and Design
    - Use UML or other design language to describe classes and data
      - Include class and interaction diagrams as required
    - Mock up user interfaces
  - Project Implementation and Testing
    - Describe implementation details
    - Give code or other implementation examples
    - Describe testing strategy and execution
  - Project deployment, performance analysis
    - Provide operational (deployment and change management) and performance details
    - Include any analysis

Project Report Body (cont)

- The body of most project reports … (cont.)
  - Conclusions
    - Describe how your project goals were met and what conclusions you reached
    - Future research

- **The organization of your project report is ultimately up to your advisor with input from CMPE 295A instructors**

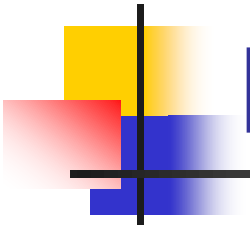


Project Presentation

- Presentation is given to your advisor and should include
  - PowerPoint presentation
  - Answer all of your advisors questions
  - Software/Hardware prototype demonstrations

Write/Give Project Presentation

- Use PowerPoint to succinctly describe your project
  - Draw from material in your report
  - Make liberal use of diagrams
  - Limit the number of slides to < 30
- Give your project presentation to your advisor
  - Budget your time wisely
  - Clearly answer all questions posed to you
  - Be prepared to answer questions that probe into the depth of your knowledge of your topic area



Project Presentation Content

- Project description
- What you hoped to achieve
- How did you go about doing:
  - Research
  - Analysis & Design
  - Implementation
- What did you learn from the project?
- Future research recommendation

Make Report Corrections/Get Advisor Approval

- Gather all report corrections from your advisor
  - Other committee members may also contribute corrections
- Incorporate into your report
- Get signature from your advisor

Bind and Submit Final Report

- Submit final report to CMPE 295B Instructor
  - Include original signature page with signature space for:
    - Your advisor
    - CMPE 295B Instructor
    - The Computer Engineering Department Chair
  - Use Velo-binding with a clear front cover and black opaque back cover

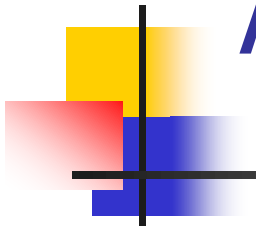
Prepare for Project Exposition

- Poster board describing project. Must include at a minimum:
  - Project title
  - Project advisor
  - Project team members (including the degree program for each)
  - Problem statement
  - Approach to solving the problem
  - Results and conclusions
- Demonstration of project hardware/software prototype

Attend Project Exposition

- **Attending the Project Exposition is a university and department requirement. You must attend and a project exposition and demonstrate your project before you can graduate**
  - **This is also true for all students that extend their project**

Agenda



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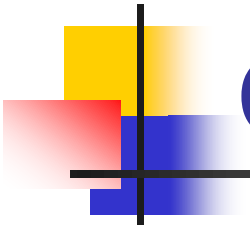
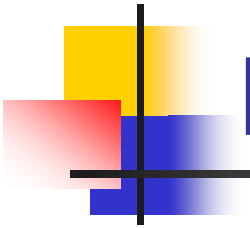


Grading

- A grade will be assigned in both CMPE 295A and CMPE 295B based on assignment rubrics values assigned by your advisor and instructors
- Grades will be assigned based on a curve
- Each individual will be given a grade
  - There should be identifiable portions of the project that each person has accomplished
  - Project members may be asked to identify the accomplishments of other team members
- Projects will also be reviewed during the Project Exposition
- Grades will be recorded by CMPE 295A and CMPE 295B instructors



Misc CMPE 295A/B Policy

- Must complete project in two consecutive semesters
  - After two semesters, students can repeat CMPE 295B (with consent of your advisor) to extend your project
- Changing advisors means retaking 295A and/or 295B