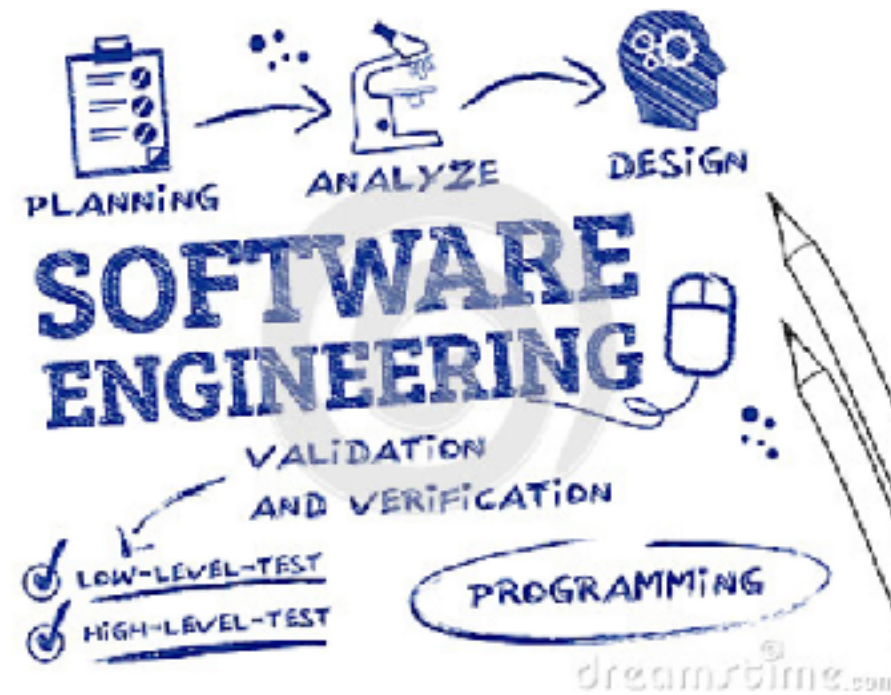


CS – 361

Software Engineering –I



Professor

Anita Sarma

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Office: KEC 3067

Office hours: Wed 11 AM or by appointment

<http://web.engr.oregonstate.edu/~sarmaa/>



A little about me:

Grew up in India,

Worked for 2 years in industry,

Ph.D. from UCI, Post-Doc at CMU,

Professor at University of Nebraska, Lincoln,

At Oregon State University from 2015

Likes: board games, movies, puns

Dislikes: bad weather.....



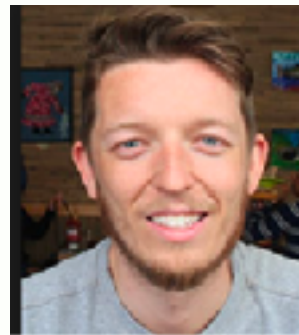
TAs

Caius
Brindescu



Office Hours: TBA

Nicholas
Nelson



Office Hours: TBA

Ayda
Mannan



Office Hours: TBA



History of Software Engineering

- First used in 1968 for a NATO conference
- Margaret Hamilton - Director of programming for APOLLO Space Program



She was Director of the Software Engineering Division¹ of the MIT Instrumentation Laboratory, which developed on-board flight software for the Apollo space program

She began to use the term "software engineering" during the early Apollo missions in order to give software the legitimacy of other fields such as hardware engineering.

Software Engineering Context



26% are
Successful
(Standish 2001)



on State
ersity

- Built by one person
- Requires minimal to no planning
- Design and implementation blend
- Simple tools & construction
- Faults have small consequences

- World Trade center 1
- Teams with different roles
- Scheduling and dependencies
- Models & abstraction
- Specialized languages and tools
- Formal communication
- Large impact of changes and faults
- Domain knowledge

Software Engineering Context



Why do we care?



<https://around.com/ariane.html>

7

Cost: \$500 million

Disaster: Ariane 5, Europe's newest unmanned rocket, was intentionally destroyed seconds after launch on its maiden flight. Also destroyed was its cargo of four scientific satellites to study how the Earth's magnetic field interacts with solar winds.

Cause: Shutdown occurred when the guidance computer tried to convert the sideways rocket velocity from 64-bits to a 16-bit format. The number was too big, and an overflow error resulted. When the guidance system shut down, control passed to an identical redundant unit, which also failed because it was running the same algorithm. ([more](#))

Why do we care?



The U.S. Federal Aviation Administration spent \$2.6 billion trying to upgrade its air-traffic-control system, only to cancel the project in 1994. Gridlocked skies are still with us today.

Why do we care?



gon State
University

9

Cost: Three people dead, three people critically injured

Disaster: Canada's Therac-25 radiation therapy machine malfunctioned and delivered lethal radiation doses to patients.

Cause: Because of a subtle bug called a race condition, a technician could accidentally configure Therac-25 so the electron beam would fire in high-power mode without the proper patient shielding.

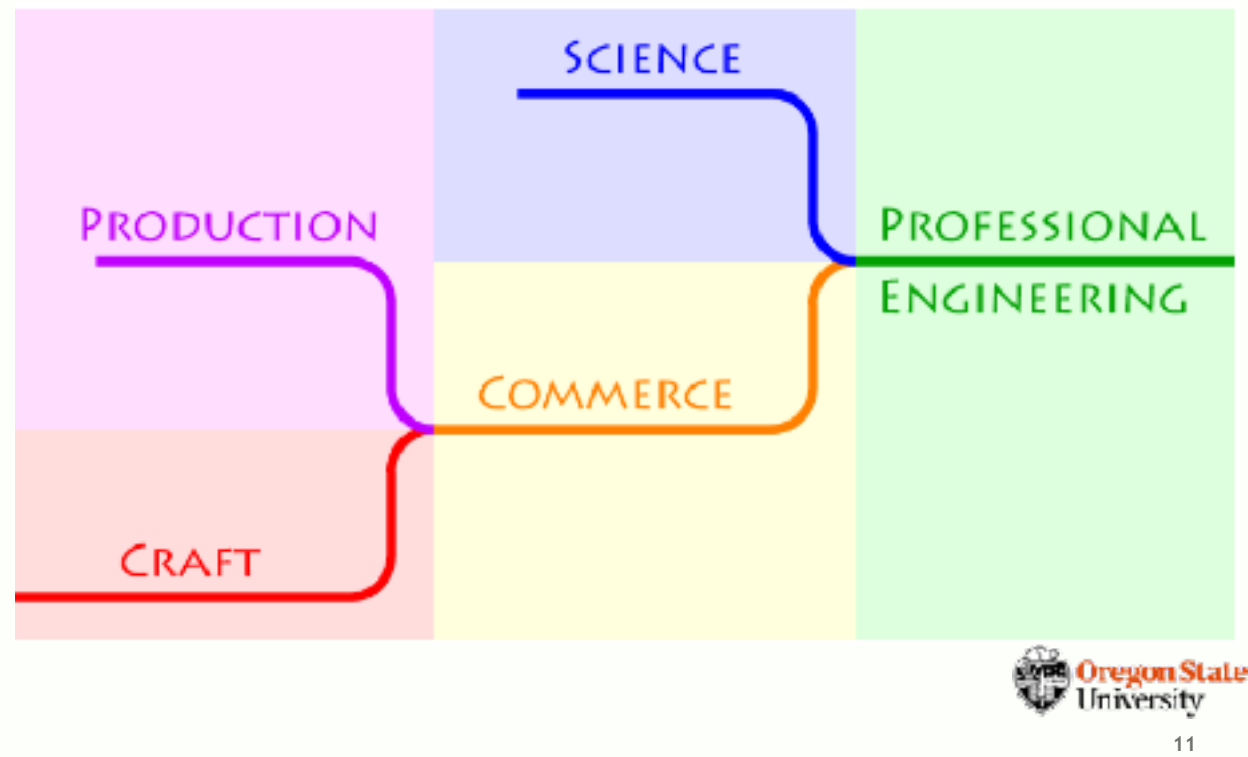
Software Engineering Definition

Creating cost-effective solutions...
... to practical problems ...
... by applying scientific knowledge ...
... building things ...
... in the service of mankind

Definition from Mary Shaw: <https://www.youtube.com/watch?v=S03bsjs2YnQ>



Moving to Professional Engineering



Engineering evolves from craft and commerce; it requires scientific foundations, or at least systematically codified knowledge.

Exploiting technology requires both management and a body of systematic, scientific knowledge.

Science often arises from progressive codification of practice

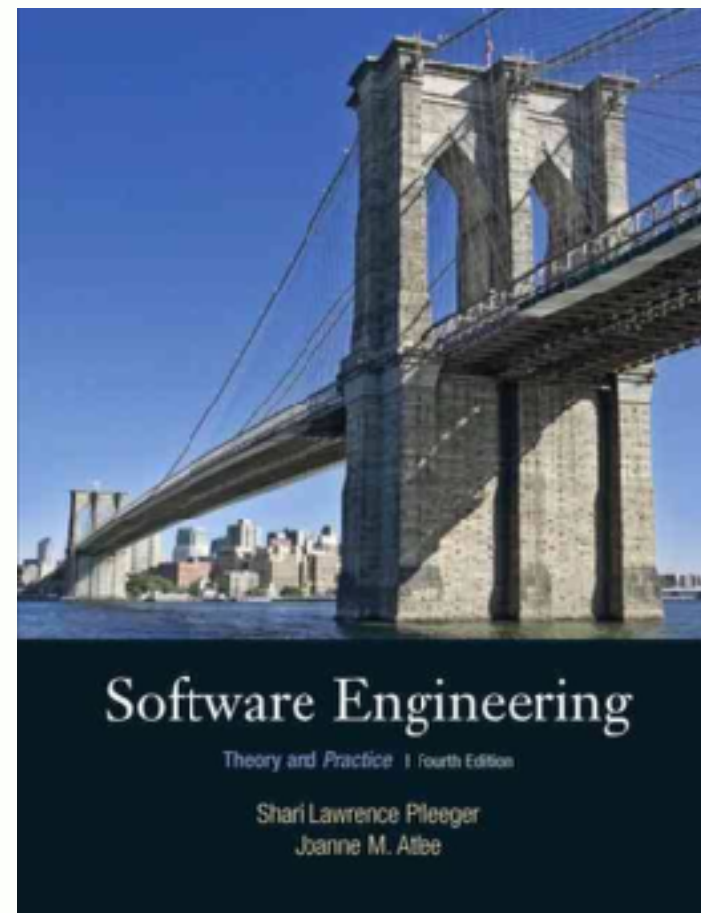


What are our goals for this class

Some of the things we will cover in class

- **Requirements:** a description of what software should do and should be
- **Design:** a description of something that could be created
- **Validation:** making sure that you are headed the right direction
- **Notations:** the rules for describing requirements, designs, and systems
- **Cost and Schedule:** the amount of money and time expended on creating a system
- **Teamwork:** people striving toward a common goal

**Recommended
Textbook**



How to succeed in the class

- Learning by doing
- Peer-work and peer learning
- Participate in class and in-class activities
- Know and follow the instructions and processes that we have created

Grading Components

- Group project - 60%
- Final - 20%
- Quizzes- 10%
- Class participation - 10%

Group Project (60%)

- Learn by Doing - you will develop a cards game
 - MVC app Built on Java with some Javascript/HTML
 - Team Project - size of 4
 - Use GitHub
 - Two week Sprints - 4 sprints in total + sprint 0 for setup
 - Sprint 0 - Next Friday (Sep 29)
-
- Aces Up Solitaire
 - Lateness: 2 floating days (in entire term). Inform before due date

Final (20%)

- Will be held during finals slot for our class
 - Dec 7 @ 6:00 - 8:00 PM
- Comprehensive
- Closed book

Quizzes (10%)

- From week 2
- Likely to be every Thursday
- Will drop your lowest quiz
- Using clickers

In Class Participation (10%)

- Answer questions that are clicker-based
 - Drop the lowest 3 scores
- Answer questions when called upon
- Participate in group activities
- Write down (Skype) interview questions
- Be ready to discuss readings and exercises

Course Logistics

- Questions about lectures or assignments should be asked on Canvas
 - Create logical headers - we have created Sprint 0
- Email only for personal or specific grading questions
 - Subject line: CS361
 - **CC all TAs and the instructor**, so everyone is on the same page
- Canvas will be used for posting grades.
- Assignments and readings will be posted on Canvas
- Assignments will be submitted via GitHub

Canvas - Quick Peek

Coming Up

- Form group in Canvas (Sept 27)
 - People-> Project Teams: place your name in a team
 - We will assign leftovers on Thursday - random basis
- Sprint - 0

Sprint - 0

This assignment is the only individual assignment; Project Stages 1-4 will be group assignments. Each student is expected to complete this assignment on their own. Please review all instruction steps, and the grading rubric section, before beginning the assignment. Prioritize your efforts accordingly.

1. Sign-up for a [GitHub](#) account (preferably using your school email). If you already have a GitHub account, you can skip this step.
2. Post your GitHub username to the Discussion thread titled [GitHub Usernames](#) (see thread for instructions on finding your username).
3. Fork the [cs361fall2017/project0](#) repository.
4. Clone the `<your_username>/project0` repository to your local system.
5. Add your name to the `students.txt` file and commit it to your local git repository.
6. Push the current version of your local git repository to your remote GitHub repository (`<your_username>/project0` repository).
7. Create a new pull request from your remote GitHub repository (`<your_username>/project0` repository) to the [cs361fall2017/project0](#) repository.

Grading Rubric

Item	Points
Posted GitHub username to Discussion thread	5 points
Added name to text file	5 points
Added commit to git repository	5 points
Created pull request to course repository	5 points
Total Points:	20 points

Next Week - Lectures

- Collaboration
 - Git
 - GitHub

Participation Quiz

- Note: answers are not graded

CS 361 - Prepares you for

- large-scale software development
 - including group dynamics, management
- working with other people's code, designs
 - software processes
 - coordination of effort
 - design techniques
 - quality assurance