CS-401 Software Engineering

Housekeeping

Course overview

In this course we will explore the complete software development process: requirement specification, design, coding, testing and maintenance. Various software engineering methods for the development of large-scale quality software are presented. Software engineering and software project management methods and standards are reviewed from the perspective of the software engineer, including participation in, and management of, software engineering teams.

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Course overview – cont'

There will be a team project - Software development project teams will be formed, consisting of 4-7 members each depending on class size and project complexity. All team members are expected to contribute technically, and some will additionally have management roles. I will choose and assign projects, partially to save churn given the somewhat abbreviated Summer semester schedule.

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Course overview – cont'

The first 2 hours of each class will be devoted to lecture topics. The last portion is for your team project meetings and coordination of project work, and I will be on hand to facilitate. Successful projects will require additional coordination among team members outside of class. Suggested methods include email, on-line source repositories, chat, shared desktop conferencing, etc.

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Course overview – cont'

Each project team will make a minimum of three presentations. Project progress will be reported weekly and those reports will count towards the project grade. Completed projects will be released as open source to the community at large, and as such, will continue as living works, hopefully with continued support of the project team.

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Course overview – cont'

Reading assignments -
With the exception of tonight's class, I expect that reading assignments will be completed as assigned. Sometimes there will be quizzes that cover those assignments. Always, it will be assist you in making the most of the lectures if you have completed the reading assignments.

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Course overview – cont'

Your first assignment will be due by midnight 5/27 (Tuesday). That is -

- Create a professional resume, and submit to D2L Dropbox Resumes folder. Your resume should include

  - coursework and work experience
  - Strengths
  - Professional Interests
  - programming languages and programming experience
  - development projects you've participated in (may be coursework)
  - links to samples of your work
  - mathematics aptitude
  - hobbies
  - available hours outside of class for project work
  - Preferred method of contact and contact information for project teams

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Course overview – cont'

Textbook:

Software Engineering, 9th Edition, Ian Sommerville

IEEE Guide to the Software Engineering Body of Knowledge (SWEBOK)
(available on-line through the NEIU library or as an IEEE member)

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Course overview – cont'

Add'l resources -

IEEE Guide to the Software Engineering Body of Knowledge (SWEBOK) (available on-line through the NEIU library or as an IEEE member)

http://www.computer.org/portal/web/swebok/swebokv3

Capability Maturity Model for Software Version 1.1
https://resources.sei.cmu.edu/asset_files/TechnicalReport/1993_005_00
1_16211.pdf
http://repository/cgi/viewcontent.cgi?article=1622&context=sei

You'll need some sort of scm toolset. Look at git:

http://mozweb.readthedocs.org/en/latest/git.html

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Software Engineering Standards

http://www.acm.org/about/se-code

IEEE

IEEE Computer Society

PMI

ACM

AIAA

EIA

http://en.wikipedia.org/wiki/IEEE_1471

"The ISO/IEC 12207 and 15288 Systems and Software Engineering Package establishes the processes, activities and tasks applicable during the supply, development, operation, maintenance and disposal of software products. This package includes ISO/IEC 15288:2008 and ISO/IEC 12207:2008." - ANSI

http://webstore.ansi.org/RecordDetail.aspx?sku=ISO%2FIEC+12207+and+15288+Systems+and+Software+Engineering+Package

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What's a Software Engineer?

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What's an Engineer?

http://en.wikipedia.org/wiki/Engineering

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A Software Engineer, then:

http://en.wikipedia.org/wiki/Software_engineering

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Software development paradigms

Waterfall
v
Formal
v
Agile

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Software development paradigms
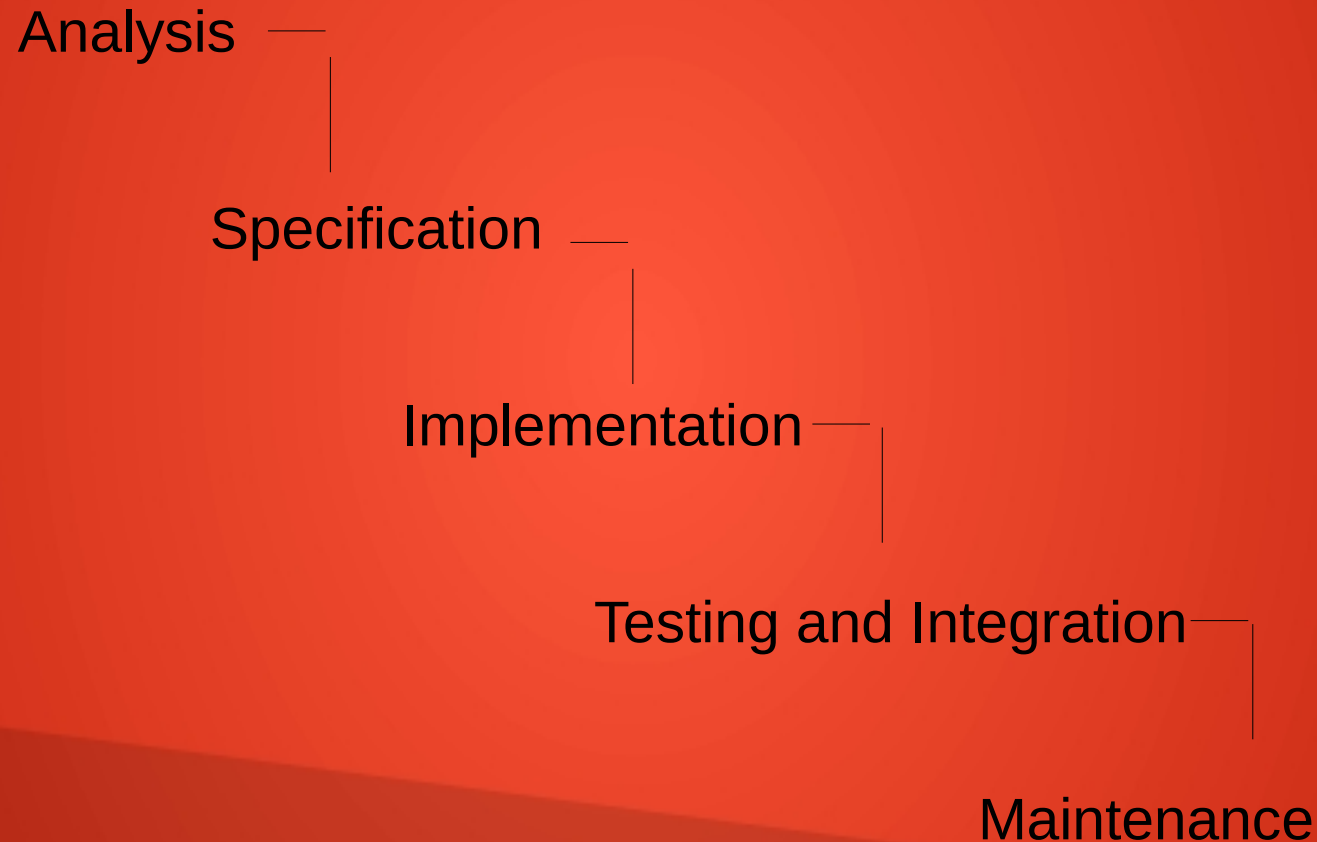
Waterfall

Misnamed
Never really works that way
Waterfall with feedback probably more realistic

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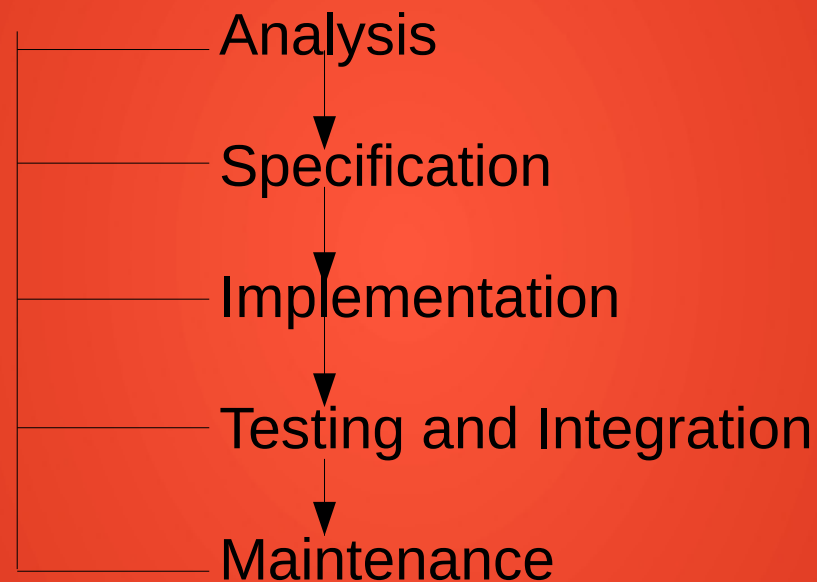
Software development paradigms

Waterfall

Analysis

Specification

Implementation

Testing and Integration

Maintenance

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Software development paradigms

Waterfall

Analysis

Specification

Implementation

Testing and Integration

Maintenance

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Software development paradigms

Formal Methods

Everything is reduced to math

Severely "Formal"

Essential for Life-critical systems

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Software development paradigms