

Software Engineering – Spring 2016

Lecture 1

About The Course

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Mission

- Learn some real-world practices & tools

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 - Project Management
- Create a commercial-grade software product
 - Make something useful on the web

Mission, Secondary

- Learn how to write technical proposals/papers
- Learn how to create presentations
- Examine some research in current software engineering
- Learn how to present results on the web
- Impress your friends
- Enjoy yourself!

Not In Scope

- Learning how to program computers
 - Get some Python skills
 - Get some web and small database skills
- General software development skills
- Fear of breaking things

General Approach

- We will be using industry documentation
 - Tutorials
 - Videos
 - Research Papers
- We will be learning how to use things
- Examples in GitHub, open source data
- Making something with the technology
- Examination, homework, etc.

Grading (Since you asked...)

- Weekly homework. Do this. 20%
- Attendance. Get to class. 10%
- One class project. 30%
- One research paper. 20%
- Final exam. Open notes, etc. 20%

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- Plagiarism -100%

Policies – Plagiarism

- Plagiarism will not be tolerated.
- Read the Kent State University policy.
- Visit <http://www.plagiarism.org>

Realities – Plagiarism

- Plagiarism doesn't work.
- Plagiarism makes you seem desperate.
- Plagiarism can get you fired.
- Plagiarism usually makes me disagreeable.

Realities – Plagiarism

- ...but not always. Sometimes it's amusing.

“Specifically, it is vital that information be finished, right, and a la mode as for the outer world.”

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(“*a la mode*”: served with ice cream on it)



Realities – Plagiarism

- ...and then there's this.

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"Bigtable is a **conveyed stockpiling framework** for overseeing organized information that is intended to scale to a substantial size:"

Agreement – Plagiarism

- You will be required to sign an agreement regarding plagiarism.

If you violate the agreement, you will receive a failing grade in the class.

- It's that simple.

Policies – Missing Things

- Missing class is not good. If you miss a lecture or a lab exercise, you will have to get that information and experience somewhere.
- On weekly assignments, there are no makeups. Some grading is automated, and I will discuss the assignments the following week. Get them done.
- On other assignments, except the final, if you are having trouble with a date, see me.

Policies – Class Conduct

- The usual rules about adult behavior apply.
- Kent is serious about academic honesty.
- Keep the laptop and phone distraction to a minimum when we're doing things together.
- I have no problem with snacks and drinks, and I will check on Kent's rules. This is a nice room, and was just remodeled, so keep it clean.
- If you need to leave between breaks, be discreet, please.

Policies – Extremes

- If something unusual is happening at the university, we might not have class if the university is closed.
- If something unusual happens to me, and I'm not here by 7:15, we won't have class.
- If either one of these happens, adjusted homework and lecture notes will be posted on Blackboard within 24 hours. *You will still be responsible for getting assignments done.*

Skills you will need

- Programming basics
 - How to use an IDE, how to debug
 - Basic language skills
 - SQL
 - Python
 - Javascript
- Know your way around a Linux command line
- Some idea of how the web works
- Know how to use Git
- Some way to write scientific English

Stuff you need to get

- A Chrome Browser
 - On any OS
 - On a Chromebook or Chromebox
- A solid web connection
- Accounts on
 - GitHub
 - PythonAnywhere.com (About \$5/mo)
 - Codio.com (About \$15/mo)

Stuff you need to read

- Downloadable/Web industry documentation
- Open source books as assigned
- Various system documentation
- On-line articles and industry commentary
- Research papers regarding engineering
- You can learn from the original sources.

Online Services

- IAAS – Codio.com
 - General purpose Unix boxes
 - Lots of capability
 - Throwaway boxes
- PAAS – PythonAnywhere.com
 - Hardened Unix Server
 - Production Web Capabilities
 - General purpose Python computation
 - Teacher – select “drdelozier” as your teacher

Source Control

- GitHub
 - www.github.com
 - Get an account!
- Class content will be posted there.
 - www.github.com/gregdelozier/softwareengineering
 - .../lectures/<slides go here>
 - .../data/<datasets go here>
 - .../code/<various projects go here>
 - Clone this repo and use it.

Class Project

Class Project

- Get 8-12 people
- Form a startup organization
- Create a vision for a product
- Create a business proposal
- Research and define a product
- Design and create that product
- Test and refine that product
- Deploy that product to market

Create a Commercial Product

- Market research – find something useful
- Product proposal
- Requirements analysis
- Creating a work environment
- Story cards and SCRUM
- Deployment

How to Profit

- Charge for using it
- Charge for licensing it
- Place advertising on it
- Put it in your portfolio
 - Consult on similar things
 - Impress a prospective employer
- Build something bigger and better
- Repeat

Create a Commercial Product

- Market research – *expand on a challenge idea*
- Product proposal
- Requirements analysis
- Creating a work environment
- Story cards and SCRUM
- Deployment
- Profit! 😊

Project Challenge

- Create a Sudoku web site
- Challenges:
 - Solve various puzzles
 - Allow visitors to solve puzzles
 - Offer hints and suggestions
 - Allow people to share puzzles
 - Make the user experience enjoyable
 - Include an economic model

Project Challenge

- Create a *better* Sudoku web site
- Considerations
 - We will solicit reviews
 - We will conduct security challenges
 - We will add requirements at a later time
 - We will use responsible practices
 - We will use specific tools and resources

Constraints

- Product must be delivered on the web
 - Web site
 - Web service
- Delivery must be via PythonAnywhere
 - Python
 - Bottle.py
- Use of industry standard tools
 - Github
 - Google Docs

How to Proceed

- Find some people you can work with
- Think about some ideas
- Get familiar with Python and SQLite
- Get PythonAnywhere accounts
- Get GitHub accounts
- Think about Codio, TFS, and other sites
- Sketch out some possibilities
- Details to come

Delivery

- Complete assignments in Blackboard
 - Short documents
 - Links
- Large document deliverables as Google Docs
 - Include a shared link in the assignment
- Internal docs may be in your GitHub wiki
 - Also, include links as necessary
 - Private site if you assign me access to the repo
 - (github id: gregdelozier)

Roles

- President
- Project manager (Scrum master)
- Market analyst / Marketing specialist
- Requirements analyst
- Software Developer
- Test Engineer
- Operations Engineer

President

- Maintain overall vision of the enterprise
- Final approval of business proposal
- Answerable for performance
- Provide motivation
- Arrange role fulfillment
- Does presentations

Market analyst / Marketing specialist

- Identifies business opportunities
- Estimates profitability of ideas
- With president, creates business proposal
 - Potential
 - Risks
 - Profit
 - Timeline
- Markets product before and after deployment

Project manager (Scrum master)

- Manages the todo list and calendar
- Makes sure things are getting done
- Manages the Scrum agile process
 - Assigning small tasks
 - Managing task burndown
 - Managing test coverage
 - Providing status reports to management

Requirements analyst

- Determine the definition of the product
- Write definition in clear, unambiguous terms
- Create customer stories
- Serve as customer representative
- Work with test engineer to verify coverage
- Sign off on requirements met before delivery

Software Developer

- Understand the product being created
- Work with analysts to create stories
- "Task out" stories to create tasks lists
- Execute tasks lists to create software
- Unit test the software to the extent possible
- Deliver unit tested software to QA testing

Test Engineer

- Design testing needed to verify requirements
- Create test plans for verifications
- When software is available, execute tests
- Verify requirements coverage as possible
- Maintain requirements coverage burndown
- Certify production readiness of the product

Operations Engineer

- Specify requirements for environments:
 - Production
 - Testing/QA
 - Development
- Create and support necessary environments
- Create and support development tools
- Manage production deployments
- Ensure security and stability of environments

Demo Time

Reading

- See these pages:
 - https://en.wikipedia.org/wiki/Software_engineering
 - http://en.wikipedia.org/wiki/Engineering_ethics
- And this page:
 - http://en.wikipedia.org/wiki/Waterfall_model
- And this document:
 - <https://www.it.uu.se/edu/course/homepage/acsd/vt08/SE1.pdf>

Office Hours

- I will be setting up online office hours.
- Time suggestions?
- Instructions will be sent out.