



COS 333: Advanced Programming Techniques

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Princeton University

COS 333

Course Overview

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Agenda

- **Introductions**
- Description
- Resources
- Topics
- Graded components
 - Participation
 - Assignments
 - Projects

Introductions

- Robert Dondero
 - rdondero
@cs.princeton.edu



Introductions

- Graduate student TAs
 - In alphabetical order by last name...

Introductions

- Raluca Ghilea
 - mg3117
 - @princeton.edu



Introductions

- Jules Mpano
 - jm3230
@princeton.edu



Introductions

- You! ...

Introductions

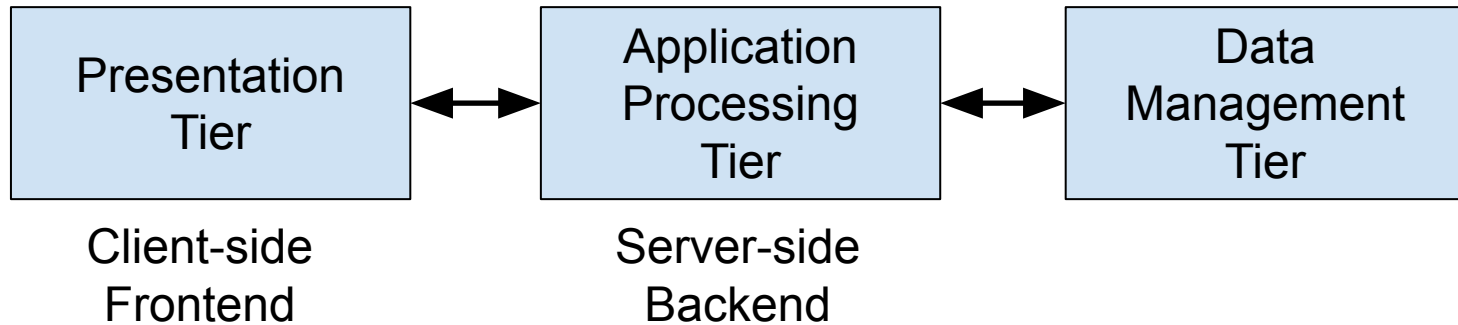
- Survey application
 - <https://cos333survey.cs.princeton.edu>
- **Please complete by Fri 9/4 at 5:00PM**

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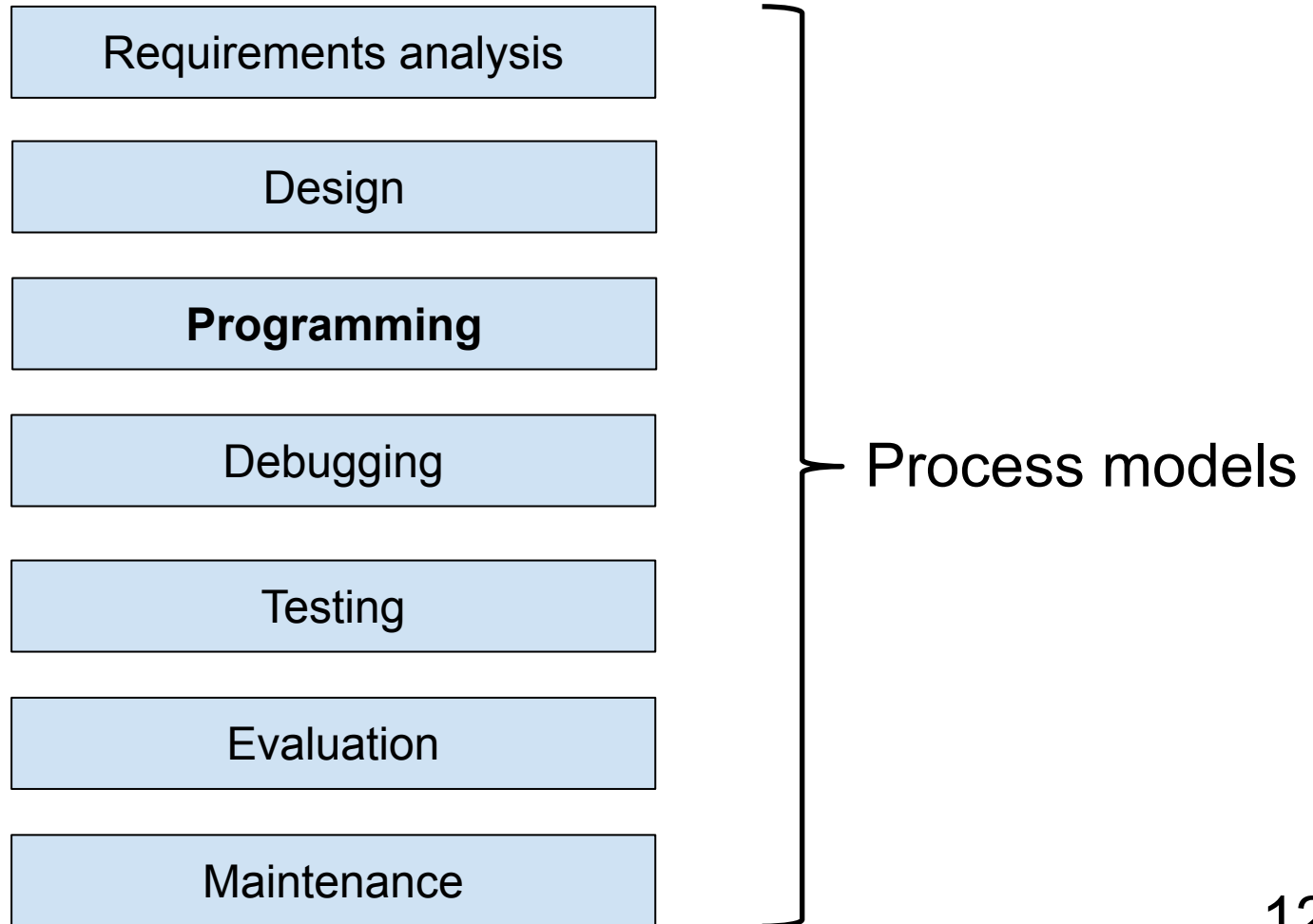
Description

Goal 1: ***Three-tier programming***
Alias ***full stack programming***



Description

Goal 2: ***Software engineering***



Description

- How to achieve those goals?
 - Lectures
 - Programming assignments
 - Semester-long project

Description

- Prerequisites
 - COS 217
 - Must have completed successfully
 - COS 226
 - Should have completed successfully
 - Maybe OK concurrently

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Resources

(1) Course website

<https://www.cs.princeton.edu/courses/cos333>

- General information
- Lectures
- Assignments
- Project
- Schedule
- Policies

Resources

(2) Lectures

- Slides, handouts, and code via *Lectures* page

Resources

(3) Ed (EdStem, Ed Discussion)

- Access through Canvas:
 - <https://canvas.princeton.edu>
- Access directly:
 - <https://edstem.org/us/courses/100918/discussion>

Resources

(4) Email

- See *General Information* web page or previous slides for instructor email addresses

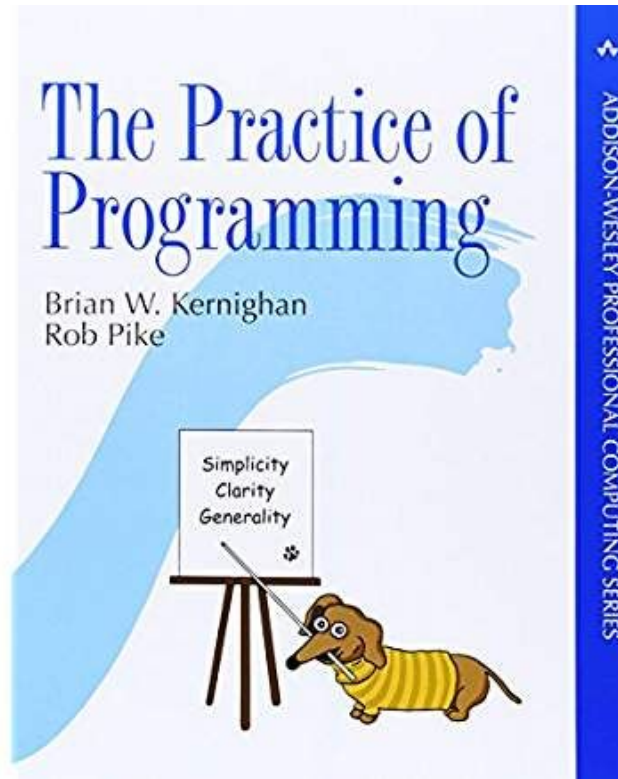
Resources

(5) Instructor meetings

- See *General Information* web page for office hours

Resources

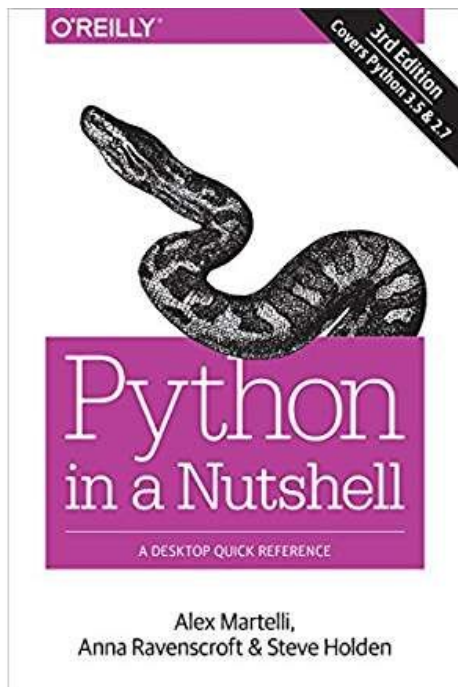
(6) Books



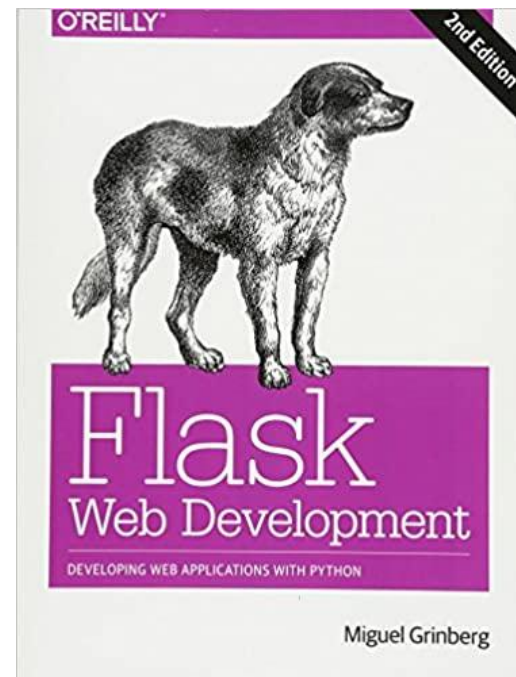
Required

Resources

(6) Books (cont.)



Recommended



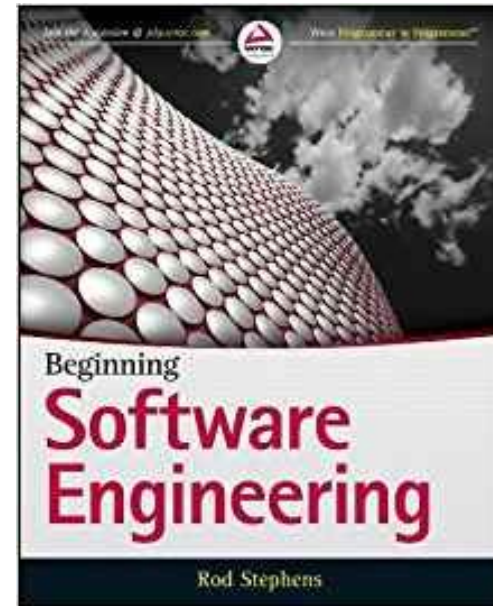
Recommended

Resources

(6) Books (cont.)



Recommended



Recommended

Resources

(7) The Web (beyond the course website)

- With some restrictions when doing assignments; stay tuned

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Topics

- Subject to change...

Topics

- Version Control Systems
 - Material provided, not covered in lectures
 - See *Version Control Systems* lecture slides
 - See *Git and GitHub Primer* document



Topics

- The Python Language



Topics

- Database Programming



Topics

- Network Programming



{JSON}

Topics

- Concurrent Programming



Topics

- Web Programming



Topics

- Server-Side Web Programming: Python



Topics

- AI Programming



Topics

- Web App Deployment



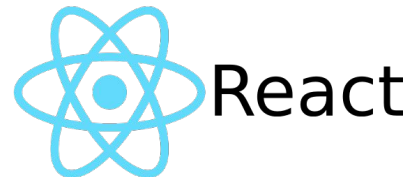
Topics

- The JavaScript Language



Topics

- Client-Side Web Programming:
JavaScript



Topics

- Client-Side Web Programming:
Cascading Style Sheets (CSS)



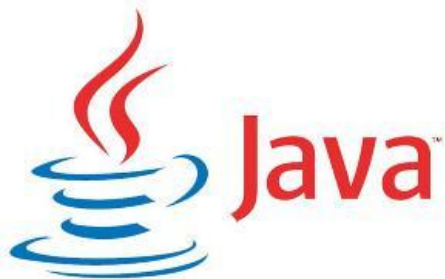
Topics

- Security Issues in Web Programming



Topics

- Server-Side Options (if time)
 - Other options for doing **server-side** programming



Topics

- Client-Side Options (if time)
 - Other options for doing **client-side** programming



Topics

- Software engineering
 - Requirements analysis
 - Design (UML, design patterns)
 - Programming
 - Debugging
 - Testing
 - Evaluation
 - Maintenance (profiling, refactoring)
 - Process models

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Graded Components

Course Component	Grade Weight
Participation	~10%
Assignments	~40%
Project	~50%

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Graded Components: Participation

- Lecture participation
 - Quantity and quality of answers to questions
 - Must miss a lecture => tell me ahead of time
- Adjustment
 - Were you helpful/detrimental to the course as a whole?

Agenda

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 - Projects

Graded Components: Assignments

- Purpose
 - Reinforce the lecture material
 - Provide experience that might help with your project

Graded Components: Assignments

Num	Assignment
1	Registrar's office: baseline version
2	Registrar's office: networked version
3	Registrar's office: web version 1
4	Registrar's office: web version 2

Graded Components: Assignments

- Computing environment
 - See document: *A COS 333 Computing Environment*
 - <https://www.cs.princeton.edu/courses/cos333/lectures/01overview/ComputingEnv.pdf>

Graded Components: Assignments

- Policies
 - See ***Policies*** web page for details
 - Some highlights:
 - Teams of 2
 - Understand all work
 - Use the lecture material
 - No assignment solutions of others

Graded Components: Assignments

- Policies (cont.)
 - See **Policies** web page for details
 - Some highlights (cont.)
 - **No generative AI**
 - **StartPage** (<https://www.startpage.com>) search
 - Simple editor, or IDE without AI code completion or AI chat

Agenda

- Introductions
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- **Graded components**
 - Participation
 - Assignments
 - **Projects**

Graded Components: Projects

- Purpose
 - Give you a real-world software engineering experience
- Format
 - Teams of 3-5
 - Networked three-tier application

Graded Components: Projects

When?	Deliverable
Now	Entry in ProjectFinder app
Early	Project approval meeting; <i>Project Overview</i> doc
Mid	Weekly meetings with adviser; weekly updates to <i>Timeline</i> doc; wireframes, prototype, alpha, beta
Late	Project presentation; <i>Grader's Guide</i> doc; <i>Product Eval</i> doc; <i>Project Eval</i> doc; your application

Graded Components: Projects

- *ProjectFinder App*
 - <https://cos333projs.cs.princeton.edu>
- **Your initial entry is due Sun 9/6 at 5:00PM**

Graded Components: Projects

- Policies
 - See **Policies** web page for details
 - Some highlights:
 - Essentially your own
 - Understand all work
 - Use the lecture material (as appropriate)
 - Use **any sources you want**
 - Use generative AI to some extent
 - Cite your non-lecture sources

Graded Components: Projects

- Notes
 - **Lectures** are aligned with **assignments**
 - **Lectures** are not necessarily aligned with **your project**

In closing...

Action Items

- By Fri 9/4 5:00PM
 - Use ***Survey App*** to express your expertise and interest in course topics
 - <https://cos333survey.cs.princeton.edu>

Action Items

- By Sun 9/6 5:00PM
 - Use ***ProjectFinder App*** to indicate your project status and interests
 - <https://cos333projs.cs.princeton.edu>

Action Items

- Before the Tuesday 9/8 lecture
 - Create a COS 333 computing env for assignments
 - <https://www.cs.princeton.edu/courses/cos333/lectures/01overview/ComputingEnv.pdf>

Action Items

- Soon
 - **Read course website**, esp. *Policies* and *Projects* pages
 - <https://www.cs.princeton.edu/courses/cos333>

Action Items

- Soon
 - Make sure you're comfortable with Git and GitHub
 - *Version Control Systems* lecture slides
 - <https://www.cs.princeton.edu/courses/cos333/lectures/02versionctrl/02versionctrlslides.pdf>
 - *Git and GitHub Primer* doc
 - <https://www.cs.princeton.edu/courses/archive/spr25/cos333/lectures/02versionctrl/GitGitHubPrimer.pdf>

Summary

- In this lecture we covered:
 - Introductions
 - Description
 - Resources
 - Topics
 - Graded components
 - Participation
 - Assignments
 - Projects