COS 333: Advanced Programming Techniques

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COS 333
Course Overview

Robert M. Dondero, Ph.D.
Princeton University

Agenda

- **Introductions**
- Description
- Resources
- Topics
- Graded components

Introductions

- Robert Dondero
  - rdondero @cs.princeton.edu

Introductions

- Graduate student TAs…

Introductions

- Xinran Bi
  - xb4719 @princeton.edu

Introductions

- Raluca Ghilea
  - mg3117 @princeton.edu

Introductions

- Jinrui (Jocelyn) Wang
  - jw5134 @princeton.edu

Introductions

- You! ...

Introductions

- Survey application
  - https://cos333survey.cs.princeton.edu

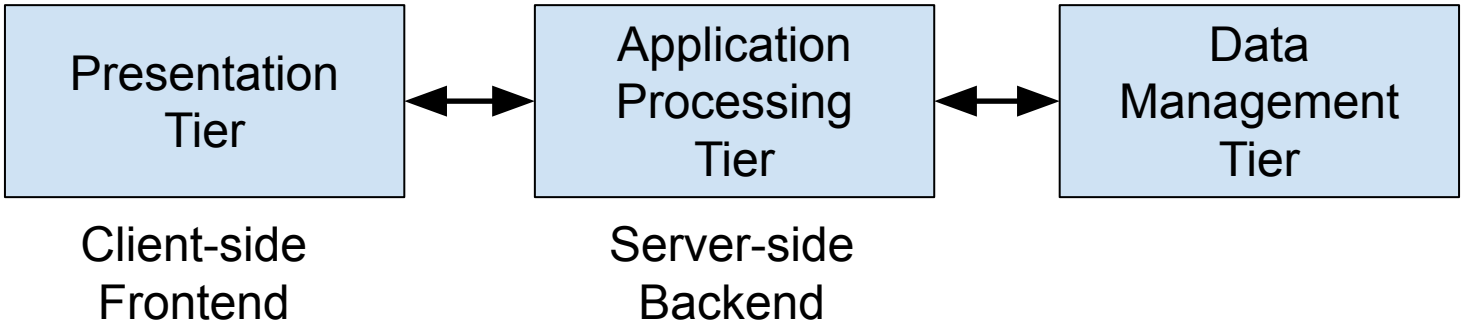
- **Please complete by Fri 1/30 at 5:00PM**

Agenda

- Introductions
- **Description**
- Resources
- Topics
- Graded components

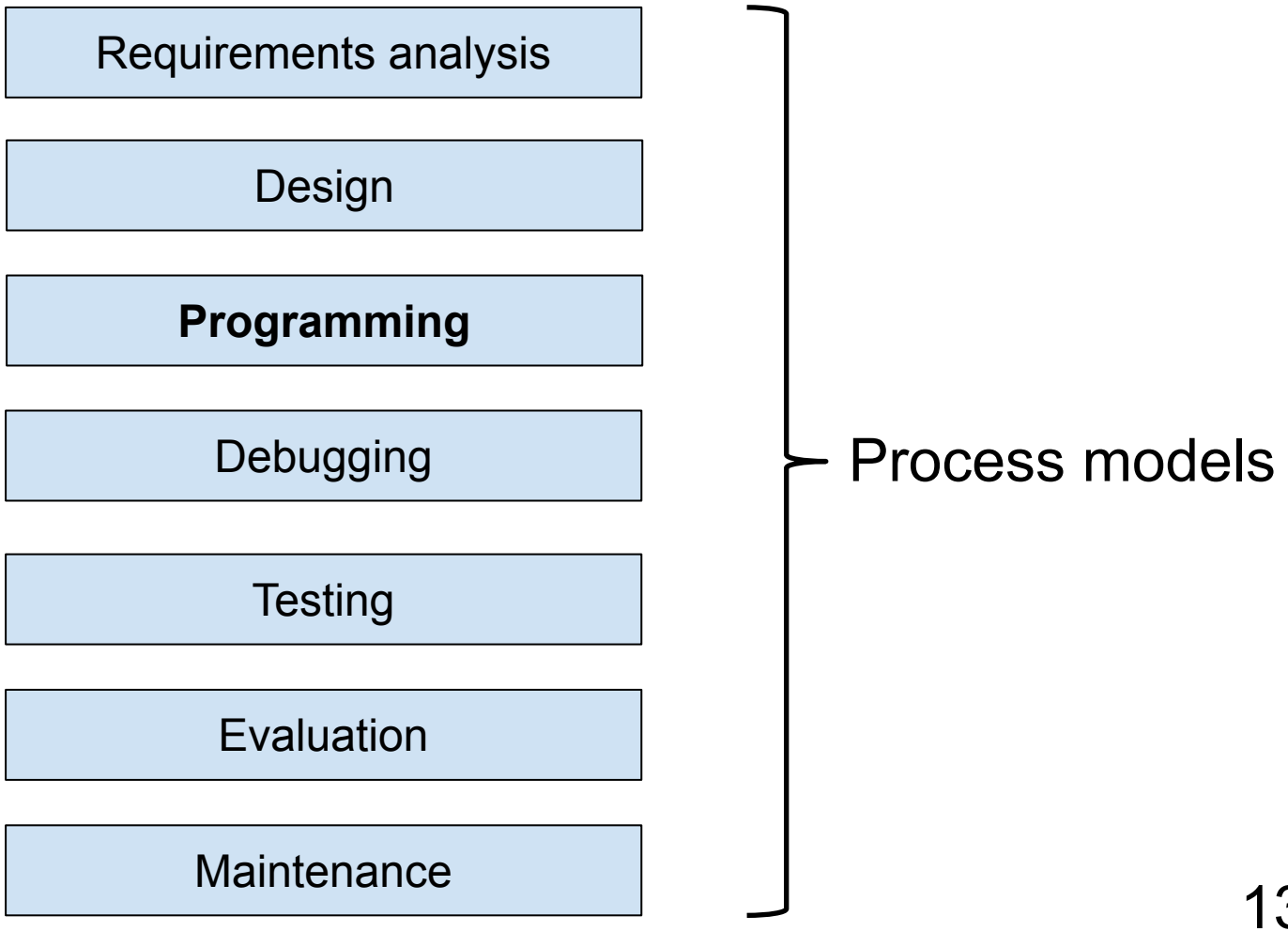
Description

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

Agenda

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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/93806/discussion

Resources

(4) Email

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

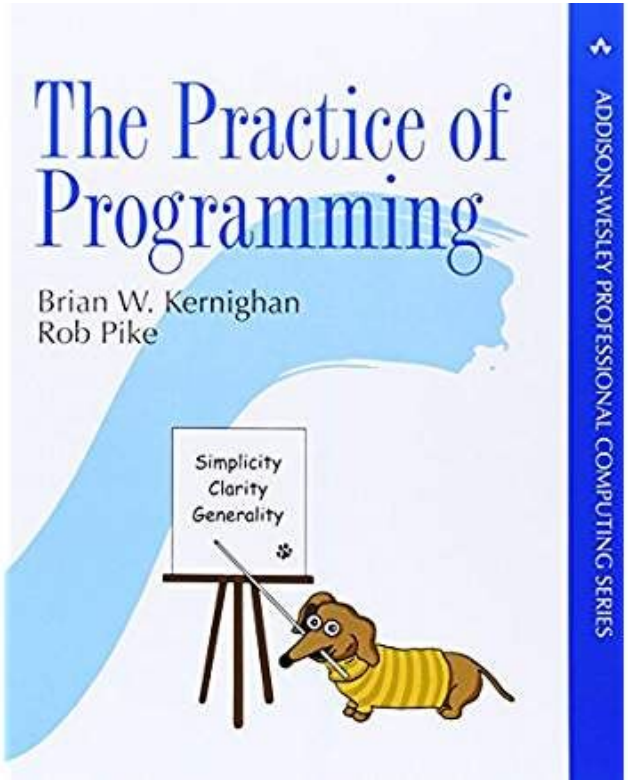
Resources

(5) Instructor meetings

- See *General Information* web page for office hours

Resources

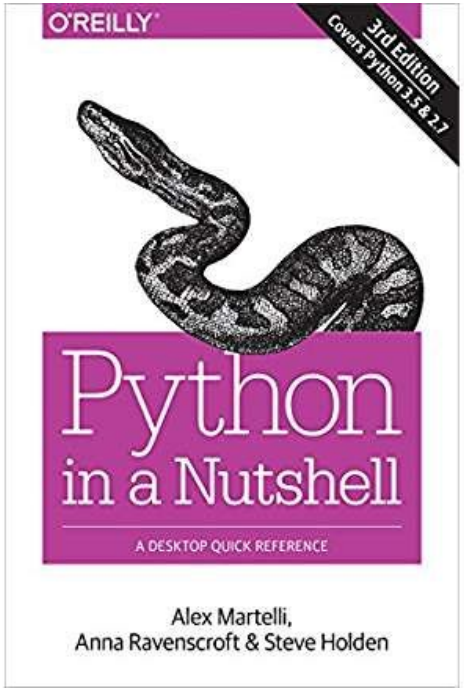
(6) Books



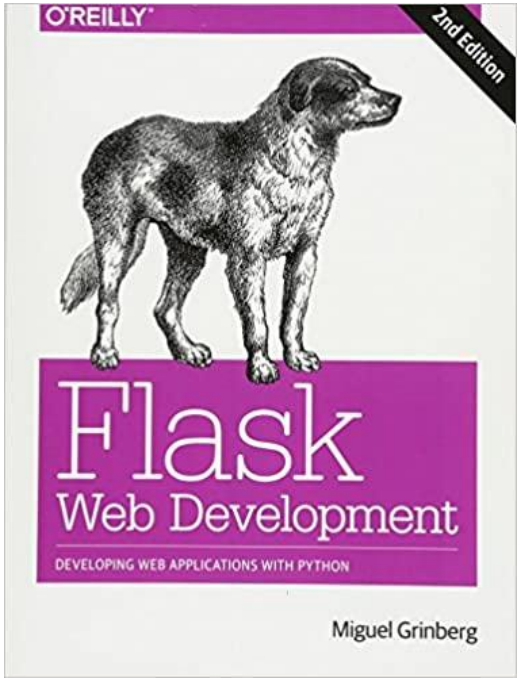
Required

Resources

(6) Books (cont.)



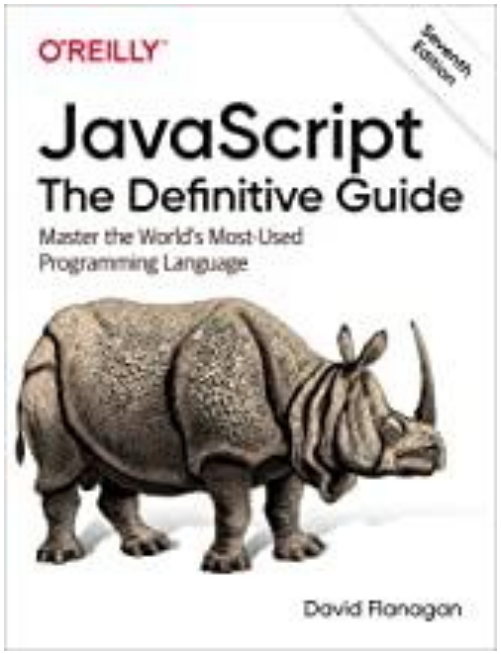
Recommended



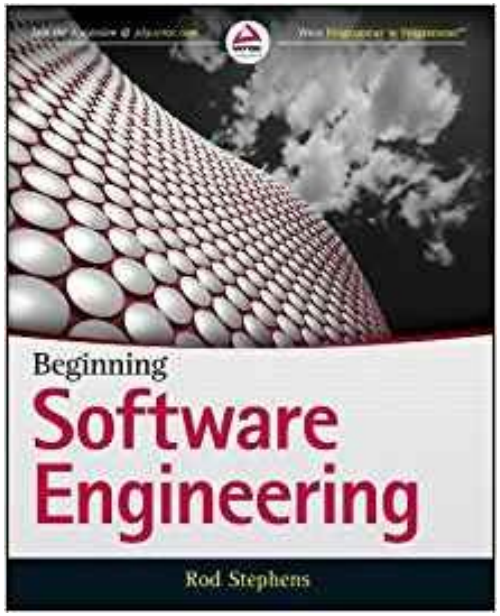
Recommended

Resources

(6) Books (cont.)



Recommended



Recommended

Resources

(7) The Web (beyond the course website)

- With some restrictions when doing assignments; stay tuned

Agenda

- Introductions
- Description
- Resources
- **Topics**
- Graded Components

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

Topics

- Concurrent Programming

Topics

- Web Programming

Topics

- Server-Side Web Programming: Common Gateway Interface (CGI)

Topics

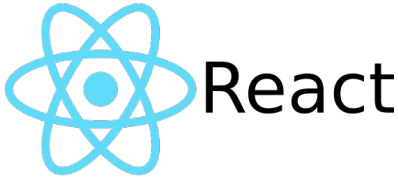
- Server-Side Web Programming: Python Web Server Gateway Interface (WSGI)

Topics

- The JavaScript Language

Topics

- Client-Side Web Programming: JavaScript



Topics

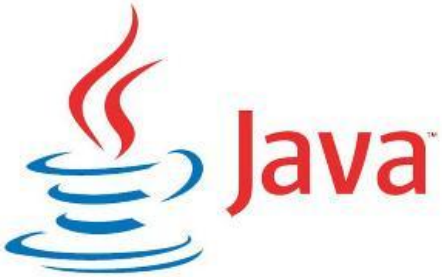
- Client-Side Web Programming: Cascading Style Sheets (CSS)

Topics

- Security Issues in Web Programming

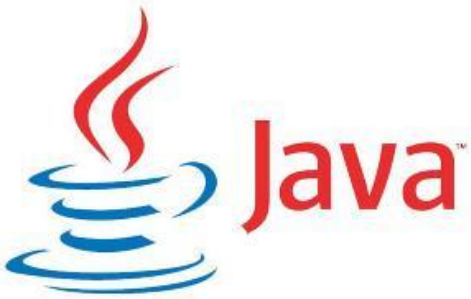
Topics

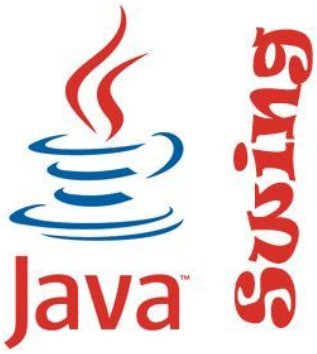
- Server-Side Options (if time)
  - Other options for doing **server-side** programming



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

Agenda

- Introductions
- Description
- Resources
- Topics
- **Graded components**

Graded Components

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

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 to the course as a whole?
    - Were you detrimental to the course as a whole?

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:
      - We encourage you to work in teams of two
        - » Same teammate for all assignments
      - You must understand all of the work that you and your teammate submit

Graded Components

- **Assignments**
  - Policies
    - Some highlights (cont.):
      - We encourage/expect you to use the lecture material
        - » You must cite your non-lecture sources (penalties applied)
      - You may not use these sources:
        - » Assignment (partial) solutions composed by others
        - » Generative AI
          - ChatGPT, Google search, smart IDEs, …

Graded Components

- **Project**
  - Teams of 3-5
  - Networked three-tier application

Graded Components

Project

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

Graded Components

- **Project**
  - ***ProjectFinder App***
    - https://cos333projs.cs.princeton.edu
  - **Your initial entry is due Sun 2/1 at 5:00PM**

Graded Components

- **Project**
  - Policies
    - See *Policies* web page for details
    - Some highlights:
      - The work must be essentially your own
      - You must understand the code that you submit
      - We encourage you to use the lecture material (as appropriate)
      - You may use any source you want
      - You must cite your non-lecture sources

Graded Components

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

In closing…

Action Items

- Before the Thursday 1/29 lecture
  - Create a COS 333 computing env for assignments
    - https://www.cs.princeton.edu/courses/cos333/lectures/01overview/ComputingEnv.pdf

Action Items

- By Fri 1/30 5:00PM
  - Use ***Survey App*** to express your expertise and interest in course topics
    - https://cos333survey.cs.princeton.edu

Action Items

- By Sun 2/1 5:00PM
  - Use ***ProjectFinder App*** to indicate your project status and interests
    - https://cos333projs.cs.princeton.edu

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