Large-Scale Programming and Testing

Fall 2018 – CSCI 4460/6460 – Syllabus
David Goldschmidt – goldschmidt@gmail.com
Office: Amos Eaton 115
Office hours: Mon/Thu 1:00-2:50PM; Tue 2:30-3:50PM
Contact information

- Instructor: David Goldschmidt
  - Office: Amos Eaton 115
  - Office hours: Mon/Thu 1:00-2:50PM; Tue 2:30-3:50PM
  - Email: goldschmidt@gmail.com

- Teaching assistant (TA): Elizabeth Okromea Kyei
  - Office hours: Wed 1:00-2:50PM; Thu 12:00-1:50PM
  - Email: kyeie@rpi.edu
  - Elizabeth is a new graduate student from the Lally School of Management
Purpose of this course

- This course focuses on software development techniques in support of large-scale software projects and maintenance.
- Specific topics include various programming paradigms and techniques, approaches to testing and automation, debugging, refactoring, and inheriting code.
- Project topics include text processing, building a search engine, and the like.
- Part of the aim here is to prepare you for internships, co-ops, and full-time employment involving any and all forms of software development.
Learning objectives

- At the conclusion of this course, you will be able to:
  - Efficiently identify defects in software systems, in particular in functions, modules, classes, interfaces, designs, code, etc.
  - Demonstrate the ability to scale up, i.e., to refactor and effectively maintain increasingly large-scale code bases
  - Design and implement test plans that ensure high levels of quality
  - Identify (and avoid) anti-patterns in software design, development, and testing

- Note that this course is still under review to be a communication intensive (CI) course
Textbooks and resources

- Textbooks and other resources are recommended (i.e., there are no required textbooks); key texts include:
  - **AntiPatterns: Refactoring Software, Architectures, and Projects in Crisis** by Brown, Malveau, McCormick, and Mowbray, 1998
  - **The Mythical Man-Month** by Brooks, Anniversary ed., 1995
  - **Search Engines: Information Retrieval in Practice** by Croft, Metzler, and Strohman, 2009
Required software and OS

- We will use a variety of programming languages, all of which have compilers and interpreters available for free via the Web
  - Expect to learn and work with C, C++, Java, Python, etc.

- We will use Submitty for many assignments; therefore, it is highly recommended that you have Ubuntu 18.04.1 LTS
  - For Windows: https://www.ubuntu.com/download/desktop
  - General downloads: https://www.ubuntu.com/download
  - Also check out this free cloud-based platform: https://c9.io
    (be sure to download your work often in case the cloud blows up!)

- We may also have server space within the department to play with and implement/integrate our team-based projects
Individual assignments

- There will be three individual homework assignments
  - Homeworks will be submitted and auto-graded via Submitty
  - These will primarily be coding assignments in C
  - Due dates are 9/18, 11/2, and 11/30

- There will be two in-class exams 10/11 and 11/15
  - You may bring one double-sided crib sheet to the first exam
  - You may bring two double-sided crib sheets to the second exam
  - Exams primarily cover programming in C, design approaches, debugging techniques, scaling up, etc.

- There is no final exam in this course!
Team assignments

- Teams will be formed in class on 9/24
  - Team meetings will often occur in subsequent class meetings
- There will be two major project deliverables
  - Project deliverables will be submitted via Submitty
  - Due dates are 10/19 and 12/12
- There will be two sets of team presentations
  - First round of presentations will be 10/22, 10/25, and 10/29
  - Second round of presentations will be 12/3, 12/6, and 12/10
  - Each student is responsible for five minutes of each presentation
Grading criteria

- Grading breakdown is as follows:
  - Homeworks (3) 30%
  - Exams (2) 20%
  - Team Project Deliverables (2) 30%
  - Team Project Presentations (2) 20%

- Late days in Submitty:
  - Late days are intended to cover minor illnesses, hardware malfunctions, schedule conflicts with other assignments, and other minor mishaps
  - Each student will initially be given five late days for the semester
  - To use a late day, simply submit the assignment as per usual via Submitty; you do not need to notify the TA or instructor
  - No more than three late days may be used for any one assignment
Grading policies

- You may appeal a grade by contacting me within five days of grades being announced.

- Course grades are determined by rounding, then applying the following ranges:
  - 93-100 A; 90-92 A-; 87-89 B+; 83-86 B; 80-82 B-; 77-79 C+; 73-76 C; 70-72 C-; 67-69 D+; 60-66 D; 0-59 F

- For students registered for CSCI 6460, the D+ and D grades are replaced with an F.
CSCI 4460 versus CSCI 6460

- For students registered for the graduate-level CSCI 6460 course, please note the following:
  - Various assignments will have additional questions to address
  - Overall grading criteria will essentially be the same; however, there will be no “D” or “D+” course grades (these translate to “F”)
  - All other course policies are the same
- Teams can contain both undergraduate and graduate students
Slack and announcements

- We will use Slack for announcements, team discussions, and posting questions (and answers)
  - The Slack URL: TBD
- You should receive an invitation to join Slack at your RPI email address
- Watch for announcements in the #announcements channel
- Ask (and answer) questions in both the #questions-general and #questions-about-code channels
- And please be sure to check Slack and/or your RPI email at least once per day, especially when we have inclement weather
Attendance/classroom policies

- Attendance is required; please attend class and be prepared to participate in class discussions and team meetings.
- Please remember to turn off cellphones and other non-classroom electronic devices before class begins.
- Please shut your laptops unless you are actively using them to take notes or participate in class activities, team meetings, etc.

**IMPORTANT:** For prescheduled and unforeseen absences, see [http://studentlife.rpi.edu/student-success/excused-absence](http://studentlife.rpi.edu/student-success/excused-absence)
Disability services for students

- From [http://studenthealth.rpi.edu/disabilityservices](http://studenthealth.rpi.edu/disabilityservices):
  - “The Office of Disability Services for Students (DSS) assists Rensselaer students with disabilities in gaining equal access to academic programs, extracurricular activities, and physical facilities on campus. DSS is the designated office at Rensselaer that obtains and files disability-related documentation, assesses for eligibility of services, and determines reasonable accommodations in consultation with students.”

- Contact: [dss@rpi.edu](mailto:dss@rpi.edu) or 518-276-8197 or Academy Hall 4226

- For accommodations, please contact DSS this week
  - Must renew your accommodations each academic year
Academic integrity

- Rensselaer Handbook of Student Rights and Responsibilities:
  - “Intellectual integrity and credibility are the foundation of all academic work. A violation of the Academic Integrity policy is, by definition, considered a flagrant offense to the educational process. It is taken seriously by students, faculty, and Rensselaer and will be addressed in an effective manner.”
  - “If found responsible for committing academic dishonesty, a student may be subject to one or both types of penalties: an academic (grade) penalty administered by the professor and/or disciplinary action through the Rensselaer judicial process described in this handbook.”

Academic integrity policy

- Individual assignments in this course must be the sole work of each individual student; for team-based work, such work must be the sole work of the individual team members.

- You must write your own code; use online resources sparingly.

- If found in violation of the academic dishonesty policy:
  - You will receive a grade of zero on the given assignment.
  - For a second offense, you will receive an “F” in the course.
  - Each incident will be reported to the Dean of Students and Department Head.
  - Cheating may cause you to be ineligible to mentor for the department, participate in departmental organizations, etc.
Questions?