CSE 2221—SYLLABUS
Software I: Software Components
Summer 2020 – Online

COURSE OVERVIEW

Instructor

Instructors: Paolo Bucci, Adam Grupa
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Office hours: see section pages at http://web.cse.ohio-state.edu/software/2221/web-sw1/

Course description

Intellectual foundations of software engineering; design-by-contract principles; mathematical modeling of software functionality; component-based software from client perspective.

Levels and credits

U 4 (two one-hour lectures, two one-hour labs)

Prerequisites

CSE 1211 or CSE 1212 or CSE 1221 or ENGR 1221 or CSE 1222 or CSE 1223 or CSE 201 or CSE 202 or CSE 203 or CSE 204 or CSE 205 or EG 167 or CSE Placement Level A; co-req: Math 1151 or Math 1161

General information, exclusions, etc.

Java is taught and used
Course learning outcomes

- Be familiar with the reasons it is important that software be "correct", i.e., why "good enough" is not good enough when it comes to software quality
- Be familiar with the reasons for designing software to minimize the impact of change, and why it is difficult to achieve this
- Be familiar with using design-by-contract principles to write software that uses existing software components based on their interface contracts
- Be familiar with using interface contracts that are described using simple predicate calculus assertions with mathematical integer, string, finite set, and tuple models
- Be familiar with extending existing software components by layering new operations on top of existing operations
- Be familiar with using simple recursion
- Be familiar with using simple techniques to test application software and layered implementations of extensions, including developing and carrying out simple specification-based test plans
- Be familiar with using simple techniques to debug application software and layered implementations of extensions
- Be exposed to using basic algorithm analysis techniques and notations to analyze and express execution times of operations whose implementations involve straight-line code and simple loops
- Be competent with writing Java programs in a procedural style using the basic control structures, primitive value types, character strings, and input/output
- Be familiar with writing Java programs using core language features including interfaces, classes, inheritance, and assertions
- Be familiar with using an understanding of the difference between value types and reference types to trace the execution of simple Java code in situations involving both flavors of types, including their use as parameters to method calls
- Be familiar with writing Java programs that use software components similar to (but simplified from) those in the Java collections framework
- Be exposed to writing Java simple programs with graphical user interfaces
- Be familiar with testing using JUnit
- Be familiar with illustrating key dependencies between software components using UML class diagrams (or similar)
- Be familiar with using the most important features of a modern IDE such as Eclipse
Course topics

- Introduction to Java; introduction to Eclipse; basic input/output; value types; control structures; methods, calls, and parameter passing
- Software components; design-by-contract; packages; interfaces; classes; reference types; equals and toString methods; XMLTree components; NaturalNumber components; introduction to UML class diagrams (or similar)
- Layered implementations of new NaturalNumber methods; introduction to recursion; introduction to specification-based testing and JUnit
- Generics; Sequence components; Queue components; Stack components
- Iterators; Set components; Map components
- Graphical user interfaces (GUIs) using Swing; model-view-controller (MVC) design pattern
- Reasoning about software correctness; loop invariants

HOW THIS COURSE WORKS

Mode of delivery: This course will hold regular Zoom sessions at the scheduled class time Monday through Friday. All sessions are recommended, but not required. The Zoom sessions corresponding to lecture meetings will be recorded and made available to students. The lab sessions will not be recorded.

Pace of online activities: This course follows the schedule posted at http://web.cse.ohio-state.edu/software/2221/web-sw1/schedule.html. Students are expected to keep pace with all lecture topics, and lab, homework, and project assignments.

Credit hours and work expectations: This is a 4-credit-hour course. According to Ohio State policy, students should expect around 4 hours per week of time spent on direct instruction (daily Zoom sessions) in addition to 8 hours of homework (reading, homework, and project assignment preparation) to receive a grade of (C) average.

Attendance and participation requirements: Because this is an online course, your attendance is based on your online activity and participation. The following is a summary of everyone’s expected participation:

- Participating in online activities for attendance: AT LEAST ONCE PER DAY
  You are expected either to attend the live “lecture” Zoom sessions or to view the recording of each session before the next lab day. You are also expected either to attend the live “lab” Zoom sessions and complete the lab activity during the session or complete the lab activity on your own before the next lecture day (and, if needed, get feedback or ask questions during an instructor’s office hours). You should also log in to
the course in Carmen every day. (During most weeks you will probably need to log in many times.) If you have a situation that might cause you to miss several days of class, discuss it with me as soon as possible.

- **Office hours and live sessions**: OPTIONAL
  All live, scheduled events for the course are recommended, but not required.
- **Participation activities**: MULTIPLE TIMES PER WEEK (AS PER SCHEDULE)
  As part of your participation, you are required to submit homework and project assignments by their due dates.

**COURSE MATERIALS AND TECHNOLOGIES**

**Textbooks**

All course materials are provided on-line for free, including the recommended textbook used as a Java reference:

- C.S. Horstmann, *Java for Everyone*, John Wiley and Sons, 2013 (available online for free)

**Course technology**

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the OSU IT Service Desk. Standard support hours are available at [https://ocio.osu.edu/help/hours](https://ocio.osu.edu/help/hours), and support for urgent issues is available 24/7.

- **Self-Service and Chat support**: [http://ocio.osu.edu/selfservice](http://ocio.osu.edu/selfservice)
- **Phone**: 614-688-HELP (4357)
- **Email**: 8help@osu.edu
- **TDD**: 614-688-8743

**BASELINE TECHNICAL SKILLS FOR ONLINE COURSES**

- Basic computer and web-browsing skills
- Navigating Carmen: for questions about specific functionality, see the [Canvas Student Guide](#).

**REQUIRED TECHNOLOGY SKILLS SPECIFIC TO THIS COURSE**

- Zoom for live sessions (lectures, labs, office hours)
REQUIRED EQUIPMENT

- Computer: current Linux, Mac (macOS 10.13+), or PC (Windows 8+) system with high-speed internet connection.
- Authentication device: a mobile device (smartphone or tablet), or landline, or security key (e.g., YubiKey, Feitian) to use for BuckeyePass authentication.
- Scanner: a camera, smartphone, tablet, or document scanner for scanning and uploading hand-written documents such as homeworks and exams.
- Webcam: built-in or external webcam, fully installed and tested.
- Microphone: built-in laptop or tablet mic or external microphone.

REQUIRED SOFTWARE

- Lab activities and project assignments will require the use of a Java SE JDK and of Eclipse IDE for Java Developers with appropriate plugins; instructions on downloading and setting up these tools on your own computer are available at http://web.cse.ohio-state.edu/software/2221/web-sw1/extras/instructions/environment-setup/home-setup.html.
- Recommended: Microsoft Office 365. All Ohio State students are eligible for free Microsoft Office 365 ProPlus through Microsoft’s Student Advantage program. Full instructions for downloading and installation can be found at go.osu.edu/office365help.

CARMEN ACCESS

You will need to use BuckeyePass multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click “Enter a Passcode” and then click the “Text me new codes” button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the Duo Mobile application to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and the IT support staff will work out a solution with you.
GRADING AND FACULTY RESPONSE

How your grade is calculated

<table>
<thead>
<tr>
<th>ASSIGNMENT CATEGORY</th>
<th>POINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework Assignments (many)</td>
<td>10%</td>
</tr>
<tr>
<td>Project Assignments (several)</td>
<td>40%</td>
</tr>
<tr>
<td>Quizzes/Exams (5-6, one every couple of weeks)</td>
<td>50%</td>
</tr>
<tr>
<td>Total</td>
<td>100%</td>
</tr>
</tbody>
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Late assignments

Homework assignments are due *by the start of class* on the due date. Late homework submissions will not be accepted and will not receive any credit.

Project assignments are due *one hour before the start of class* on the due date. Maximum credit of 10 points is reduced by 2 points for each day (24 hours), or part thereof, the assignment is late. After a project assignment is 48 hours late, no credit is given.

Please refer to the schedule for due dates.

Grading scale

93–100: A  
90–92.9: A-  
87–89.9: B+  
83–86.9: B  
80–82.9: B-  
77–79.9: C+  
73–76.9: C  
70 –72.9: C-  
67 –69.9: D+  
60 –66.9: D  
Below 60: E
Faculty feedback and response time

I am providing the following list to give you an idea of my intended availability throughout the course. (Remember that you can call 614-688-HELP at any time if you have a technical problem.)

- **Grading and feedback:** For homework assignments, you can expect feedback within a few days. For project assignments, you can generally expect feedback within 5-6 days.
- **Email:** I will reply to emails within 24 hours on days when class is in session at the university.
- **Discussion board:** I will check and reply to messages in the discussion boards every 24 hours on school days.

OTHER COURSE POLICIES

See [http://web.cse.ohio-state.edu/software/web/policies.html](http://web.cse.ohio-state.edu/software/web/policies.html) for course official policies.

Discussion and communication guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style:** While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. A more conversational tone is fine for non-academic topics.
- **Tone and civility:** Let’s maintain a supportive learning community where everyone feels safe and where people can disagree amicably. Remember that sarcasm doesn't always come across online.
- **Citing your sources:** When we have academic discussions, please cite your sources to back up what you say. (For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.)
- **Backing up your work:** Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.

Academic integrity policy

See [http://web.cse.ohio-state.edu/software/web/policies.html#ccpe](http://web.cse.ohio-state.edu/software/web/policies.html#ccpe).
OHIO STATE’S ACADEMIC INTEGRITY POLICY

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University’s Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University’s Code of Student Conduct and this syllabus may constitute “Academic Misconduct.”

The Ohio State University’s Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: “Any activity that tends to compromise the academic integrity of the University, or subvert the educational process.” Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University’s Code of Student Conduct is never considered an excuse for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University’s Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages (COAM Home)
- Ten Suggestions for Preserving Academic Integrity (Ten Suggestions)
- Eight Cardinal Rules of Academic Integrity (www.northwestern.edu/uacc/8cards.htm)

Copyright disclaimer

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.
Statement on Title IX

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been sexually harassed or assaulted, you may find the appropriate resources at http://titleix.osu.edu or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu

Your mental health

A recent American College Health Survey found stress, sleep problems, anxiety, depression, interpersonal concerns, death of a significant other, and alcohol use among the top ten health impediments to academic performance. Students experiencing personal problems or situational crises during the quarter are encouraged to contact Ohio State University Counseling and Consultation Service (614-292-5766; www.ccs.osu.edu) for assistance, support and advocacy. This service is free and confidential.

ACCESSIBILITY ACCOMMODATIONS FOR STUDENTS WITH DISABILITIES

Requesting accommodations

If you would like to request academic accommodations based on the impact of a disability qualified under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, contact your instructor privately as soon as possible to discuss your specific needs. Discussions are confidential.

In addition to contacting the instructor, please contact the Student Life Disability Services at 614-292-3307 or ods@osu.edu to register for services and/or to coordinate any accommodations you might need in your courses at The Ohio State University.

Go to http://ods.osu.edu for more information.
Accessibility of course technology

This online course requires use of Carmen (Ohio State's learning management system) and Zoom (academic audio and web conferencing tool at Ohio State) and possibly other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- Carmen (Canvas) accessibility
- Zoom accessibility

COURSE SCHEDULE

See http://web.cse.ohio-state.edu/software/2221/web-sw1/schedule.html.