

CSC 216 Course Syllabus

CSC 216 – Programming Concepts - Java

Section 001

FALL 2016

4 Credit Hours

Course Description

The second course in computing, intended for majors. Emphasis is placed on software system design and testing; encapsulation; polymorphism; composition; inheritance; linear data structures; specification and implementation of finite-state machines; interpretation of inductive definitions (functions and data types); and resource management.

Learning Outcomes

Upon successful completion of this course, a student will be able to...

1. Describe the utility of inheritance, abstract classes, interfaces, and polymorphism in object-oriented systems, and design, implement, and test programs which use these language features;
2. Identify the phases of a simple model of the software life cycle, and employ these phases in developing software;
3. Describe basic design modeling techniques, including UML class diagrams and simple design patterns (e.g., model/view/controller), and indicate how and when to use them;
4. Identify and compare the basic kinds of software testing, describe when to use each method, and design and implement test code;
5. Navigate and extract information from the Java API, and employ the Javadoc tool to construct internal documentation of source code;
6. Use software engineering best practices like pair programming, test-driven development, code coverage, static analysis, version control, continuous integration, and documentation with supporting tooling to design, implement, and test object-oriented systems.
7. Design, implement, and test a finite state machine;
8. Identify when recursion is useful, and design, implement, and test recursive algorithms and simple recursive data structures;
9. Implement, test, and use a stack, queue, array-based list, and linked list.

Course Structure

Lecture

Lecture Meetings: You will be presented with several exercises that consist of conceptual questions or short programming tasks. You are encouraged, but not required, to work on these exercises with another class member. At least one member of the pair or team will need to have a laptop computer, or other electronic device, such as a tablet, that can submit answers via a Google form. You (and your partner) will be given credit for correct or mostly correct answers. The exercises provide the opportunity to explore recently covered materials individually or with peers. The exercises are submitted so the instructor can get a feel for the class' comprehension of materials in a timely manner.

Class Attendance: You must submit an answer for at least one exercise per class period to be counted as attending class for that day. If you are absent from class, with an excused university absence, you will not be penalized for missing any exercises associated with the class. See the Attendance section for more details about how attendance factors into your final grade.

Labs

Lab Meetings: You will work with a partner or small team to solve one or more larger design, implementation, and/or testing tasks during lab time. Work completed during labs will be pushed to an assigned GitHub repository and will be evaluated via Jenkins and your lab PTF. The lab activities will build on each other and on

the Guided Projects. Completion of earlier work on Guided Projects and Labs is needed for successful completion of future labs.

Lab Attendance: Attendance to lab is required and will be recorded for each lab meeting. If you are absent from lab, with an excused university absence, you should discuss how to make up the lab with your course instructor.

Guided Projects

An important aspect of CSC216 is using software engineering best practices and the tooling that supports the best practices to deliver high quality software that meets the system requirements. To introduce you to the software engineering lifecycle, best practices, and course tooling, you will complete three Guided Projects. The Guided Projects integrate pieces of guided practice with independent activities. Guided Projects are worth 10% of your final grade and will be averaged together. The Guided Projects and labs will build on each other.

Programming Projects

There are 3 programming projects this semester. Each project is broken into 2 parts that will be due approximately every one to two weeks. Part 1 will be a design and black box testing phase and Part 2 will be an implementation, unit testing, and black box testing phase. All project deliverables must be submitted electronically by the due date and follow the specified formats, submission instructions, and naming conventions. Each project write up will specify the specific submission instructions for the project.

Late Project Submissions: All projects (except Design Proposals and Rationales for Part 1) will be accepted up to 48 hours late through the appropriate submission system. You will lose 1 point every 2 hours the project is late, up to 24 points. No submissions will be accepted after the 48-hour late window without a university excused absence. No submissions will be accepted through email.

Part 1: For Part 1 of each project, you will be given a set of requirements that describe a software system. From the requirements, you will develop a design proposal and rationale document that describes a design for implementing the requirements or compares two alternative designs. Additionally, you will develop a black box test plan that will contain system/functional tests to validate that the future implementation meets the requirements.

Part 2: For Part 2 of each project, all code for the project will be submitted to NC State's GitHub to an instructor provided repository. We will be using a continuous integration program, Jenkins, to automatically compile and test your program (both with your tests and with the teaching staff tests) and provide style feedback. Your grade for Part 2 of that project will be calculated from the last GitHub submission you make before the deadline (even if Jenkins runs after the deadline for that submission) plus additional points for acceptance tests and other related rubric items. The style deductions as derived from Jenkins feedback may be modified by the teaching staff when manually inspecting your comments. For programming portions of the projects, use of the Eclipse Integrated Development Environment (IDE) is required.

Collaboration: Part 1 of all projects will be completed individually. Part 2 of Projects 1 and 2 will be developed individually or in an optional team of 2 or 3 at the instructor's discretion. Part 2 of Project 3 will be developed in a team of 2 or 3. Students will be eligible for participation in a team for a project only if they submit all deliverables for Part 1 of the project.

Academic Integrity: All programs are to be your own work (for paired and team assignments, all work is to be you and your assigned partner's or assigned team mates' own work). See the "Academic Integrity" section of the syllabus for further details. For each paired/team project, a peer evaluation will be required after the project's submission.

Grading: Part 1 is 20% of the project grade and Part 2 is 80% of the project grade. All three projects are worth 40% of the final grade. The lowest project grade will count half as much (20%) as the two higher project grades (40% and 40%). See the grading breakdown section of the syllabus for examples of calculating each individual project grade and the overall project grade.

Exams

There will be three exams counting 40% of your final grade. These exams will cover all materials (readings, lectures, labs, guided projects, projects, guest speakers, etc.) prior to the exam. All exams will be cumulative appropriate to the materials covered prior to the exam date.

Exams test each student's knowledge on course learning outcomes. Problems during the exam may build on a programming scenario. The exam may require writing a class or several methods of code, designing a system using UML, designing a finite state machine, and providing the code, etc.

Time

You are expected to spend, on **average**, 8 to 12 hours per week outside of class preparing and working on assignments. In some weeks, especially those around project deadlines, you may spend more than 12 hours on course work. Please plan and use your time wisely. Do NOT wait until the last minute to complete programming projects!!!

Course Policies

Computers and Electronic Devices

Students are encouraged to use computers and other electronic devices like tablets during class. The teaching staff asks that students respect their neighbors and keep their focus on course materials rather than games, FaceBook, etc. Electronic devices are required for submission of exercises. If the class is utilizing computers in an inappropriate manner, the instructor reserves the right to require that electronic devices are closed or put away during instruction.

You may not record the lecture without express written permission from the instructor.

Electronic Communication

The teaching staff looks forward to receiving emails and message board posts about any questions you have about the class, materials, exams, and assignments. Below are several rules for electronic communication.

Higher education provides you with a training ground prior to entry into the work environment for your chosen career. You will use many of the following rules of "netiquette" when you are communicating with colleagues, your supervisor, or clients once you are in the work world. Although many of the rules of etiquette for electronic communication will be similar in the work environment, we have some specific to this course.

Please observe the following etiquette when communicating with the teaching staff and your peers. The teaching staff receives many emails on a daily basis and the instructor teaches several courses. Please note that a member of the teaching staff will respond to an email or message board within 24 hours on a business day and within 48 hours on a weekend or holiday. Most of the time, we will respond more quickly, but it is not guaranteed.

Also, before sending an email, try to find the answer to the question by using various references already available to you:

- If the question is related to class administration, check the syllabus
- If the question is related to recent information, check previous emails from the teaching staff
- If the question is homework or exam related, check the message board to see if it has already been answered. Also, read your textbook.

For emails, please identify your course, section, and your name in the subject line (first and last name) along with the subject of the message. For example: "CSC216-002 Jenny Smith - Question about Project 1 Part 1".

Email should include a salutation to identify the recipients of the email. For example, begin an email to your instructor with a salutation such as "Hi Dr. Heckman," or "Dr. Heckman". For emails to the sup list, consider a salutation like "Greetings Teaching Staff,". You now have the attention of the email recipients.

The tone of the email message should be professional. Re-read your email before you press Send and make a judgment as to how you would respond if you were a recipient of the email you are planning to send.

If you have a question that is beyond the scope of an email, consider coming to office hours or scheduling an appointment with a member of the teaching staff. If you are a DE student requesting a phone conference, send at least two times of the day that you are available and your timezone. To help with scheduling, check Dr. Heckman's calendar: <http://people.engr.ncsu.edu/sesmith5/calendar.html>.

If you have several questions or items, please number them for ease of reading. The response will also be easier to understand.

Please spell check and correct mechanical/grammar errors. Avoid emails written only in lowercase and lacking punctuation.

Close your email with your name.

If you have a general question about a homework, post your question to Piazza. If you have a question that is more specific or that involves snippets of code, email it to the sup list for your section: csc216-001-sup@wolfware.ncsu.edu.

Grade Appeals

If at any time you feel an assignment was graded improperly, **fill out** the Regrade Request Form, which is located in the General Course Resources topic on Moodle. The form will email the PTF and the instructors with your regrade request, which will be followed up via email. **All regrade requests must be submitted to the form no later than 1 week after the assignment was returned to you.**

Minimum Grade Requirements

In order to pass the course with a letter grade, assuming a letter grade is earned, you must have a 60+ average on the exams, and you must have a 60+ for your PROJECT programming assignments (where the Project Grade is calculated as described in the Project category, below).

In order to pass the course with a C or better, assuming a C or better is earned, you must have a 65+ average on the exams, and you must have a 65+ weighted average on the overall programming PROJECT assignments grade and GUIDED PROJECT grades.

Instructors

Dr. Sarah Heckman (sesmith5) - *Instructor*

Email: sarah_heckman@ncsu.edu

Web Page: <http://www4.ncsu.edu/~sesmith5>

Phone: 919-515-2042

Office Location: Engineering Building II 2297

Office Hours:

- Mondays from 3:00p-4:00p in EBII 2242
- Tuesdays from 12:20p-1:20p in EBII 2242

Course Meetings

Lecture

Days: MW

Time: 1:30p-2:45p

Campus: Centennial

Location: EBII 1231

This meeting is required.

Lab

Days: MTW

Time: Varies by lab section - Varies by lab section

Campus: Centennial

Location: EBII 1221

This meeting is required.

Meeting Notes

Students are required to attend one lab section associated with their lecture. Each lab is 110 minutes.

Course Materials

Textbooks

Building Java Programs - *Reges and Stepp*
Edition: 3rd
ISBN: 978-0133360905
Web Link: <http://www.buildingjavaprograms.com>
Cost: \$130.45
This textbook is required.

Expenses

None.

Materials

None.

Requisites and Restrictions

Prerequisites

CSC116 with a C or higher

Co-requisites

None.

Restrictions

None.

General Education Program (GEP) Information

GEP Category

This course does not fulfill a General Education Program category.

GEP Co-requisites

This course does not fulfill a General Education Program co-requisite.

Transportation

This course will not require students to provide their own transportation. Non-scheduled class time for field trips or out-of-class activities is NOT required for this class.

Safety & Risk Assumptions

None.

Grading

Grade Components

| Component | Weight | Details |
|------------------------|-----------|---|
| Projects | 40 | <p>There are three projects. Each project consists of 2 parts. Part 1 is a design and black box test planning phase. Part 2 is an implementation and testing phase.</p> <p>Part 1 of a project is worth 20% of the project grade. Part 2 of a project is worth 80% of the project grade. Therefore, if a student receives an 87 on Part 1 of a project and a 93 on Part 2 of the project, the student's grade for the project is:</p> $(87 * .2) + (93 * .8) = 17.4 + 74.4 = 91.8$ <p>The lowest project grade is 20% of the overall project grade. The other two project grades are each worth 40% of the overall project grade. Therefore, if a student receives a 73 on Project 1, a 56 on Project 2, and a 95 on Project 3, the student's overall project grade is:</p> $(73 * .4) + (56 * .2) + (95 * .4) = 29.2 + 11.2 + 38 = 78.4$ <p>All Part 1s will be completed individually. For Part 2, Projects 1 and 2 will be completed individually or may have optional teams at the instructor's discretion. Project 3 will be completed on a team. You will only be placed on a team for Part 2 of a project if you complete Part 1 for that project.</p> |
| Guided Projects | 10 | There will be three Guided Projects that will introduce you to the course technologies and best practices. Portions of the project will be provided through tutorial sections and portions of the project will be completed independently. The Guided Projects will be averaged and are worth 10% of your final grade. |
| Labs | 10 | All labs will have a participation and submission requirement. You will be evaluated on your participation and the quality of the lab deliverable. The lab grade will be the average of your grade for each individual lab. |
| Exam 1 | 12 | Exam 1 will cover material from approximately the first third of the course. |
| Exam 2 | 12 | Exam 2 will cover material from approximately the first two-thirds of the course. |
| Exam 3 | 16 | Exam 3 will cover all materials for the course. |

Letter Grades

This Course uses Standard NCSU Letter Grading:

97 ≤ **A+** ≤ 100
 93 ≤ **A** < 97
 90 ≤ **A-** < 93
 87 ≤ **B+** < 90
 83 ≤ **B** < 87
 80 ≤ **B-** < 83
 77 ≤ **C+** < 80

73 ≤ **C** < 77
 70 ≤ **C-** < 73
 67 ≤ **D+** < 70
 63 ≤ **D** < 67
 60 ≤ **D-** < 63
 0 ≤ **F** < 60

Requirements for Credit-Only (S/U) Grading

In order to receive a grade of S, students are required to take all exams and quizzes, complete all assignments, and earn a grade of C- or better. Conversion from letter grading to credit only (S/U) grading is

subject to university deadlines. Refer to the Registration and Records calendar for deadlines related to grading. For more details refer to <http://policies.ncsu.edu/regulation/reg-02-20-15>.

Requirements for Auditors (AU)

Information about and requirements for auditing a course can be found at <http://policies.ncsu.edu/regulation/reg-02-20-04>.

The grade of "AU" will be awarded to students who take all exams and earn a 60% or higher average on all of the exams. Auditors are required to meet with the instructor during the first two weeks of the course.

Policies on Incomplete Grades

If an extended deadline is not authorized by the instructor or department, an unfinished incomplete grade will automatically change to an F after either (a) the end of the next regular semester in which the student is enrolled (not including summer sessions), or (b) the end of 12 months if the student is not enrolled, whichever is shorter. Incompletes that change to F will count as an attempted course on transcripts. The burden of fulfilling an incomplete grade is the responsibility of the student. The university policy on incomplete grades is located at <http://policies.ncsu.edu/regulation/reg-02-50-3>.

Late Assignments

There is a 48-hour late window for tutorial and programming project submissions, except for Design Proposals. You will lose 1 point for every 2 hours the project is late, up to 24 points. No submissions will be accepted after the 48-hour late window without a university excused absence.

Labs will not be accepted late without a university excused absence.

Exercises will not be accepted late. You will not receive credit for an exercise if the timestamp is later than 5pm on the day the exercise was assigned or if the exercise is submitted after an assigned deadline.

No submissions will be accepted through email.

Attendance Policy

For complete attendance and excused absence policies, please see <http://policies.ncsu.edu/regulation/reg-02-20-03>

Attendance Policy

Attendance to lecture and lab is mandatory!

Absences Policy

Excused absences are defined in the NC State Academic Policy on Attendance Regulations (<http://policies.ncsu.edu/regulation/reg-02-20-03>). **Documentation of the absence is required to excuse an absence.**

- Exam makeups will only be given with a documented excused absence.
- Project extensions will only be given with a documented excused absence. If the project solution has already been released (in the case of teaching staff designs) an alternative assignment may be assigned
- Lab makeups will only be allowed with a documented excused absence.
- Exercise waivers will only be given with a documented excused absence.

All anticipated absences must be presented to the instructor no later than one week before the absence. All emergency absences must be turned in no later than one week after the student's return date. All other absences will be unexcused.

A maximum of 4 class periods per semester may be missed due to excused absences. Any number of excused absences beyond four will only be allowed with special permission of the instructor.

If you miss more than 4 lectures during the semester with an unexcused absence, a **5 point penalty** will be applied to **your final grade**. Missing a lab with an unexcused absence will result in a **zero for that lab**, even if you complete the lab work outside of lab. Missing **four labs** with an unexcused absence will **result in a grade of F for the course**.

Makeup Work Policy

All projects and exams must be made up within one to two weeks of the absence and the timeframe will be determined through discussion between the instructor and student. If a project has moved forward in such a way that the missed project cannot be completed, the instructor may request the student to complete an alternative assignment. No exercises will be made up.

Additional Excuses Policy

None.

Academic Integrity

Academic Integrity

Students are required to comply with the university policy on academic integrity found in the Code of Student Conduct found at <http://policies.ncsu.edu/policy/pol-11-35-01>

All work that you turn in for grading must be your own! This means that all work must be an independent and individual creation by you or in the case of paired/team assignments; all work must be an independent and individual creation by you and your assigned partner or assigned teammates. Any attempt to gain an unfair advantage in grading, whether for yourself or another, is a violation of academic integrity. You may only work on an assignment with another student(s) in the class if explicitly stated in the assignment.

Students who cheat on a homework, exercise, or exam will receive a -100 for the assignment!!!

Cheating is worse than not turning in the assignment. All cases of academic misconduct will be reported to the Office of Student Conduct. A first offense will place the student on *Academic Probation* for the remainder of their academic career. A student's status on *Academic Probation* **may** affect financial aid and be reported to groups that request the information from the Office of Student Conduct, like Park Scholars, ROTC, graduate schools, employers, etc.

The Computer Science department uses software that detects cheating violations for programming projects. Do not use other student's code, do not share your code, do not copy or use code from someone who took the class X semesters ago, do not use code from online.

The only people that you MAY receive help from are your instructor, the PTF(s) for CSC216, and for paired/team assignments, you may receive help from your assigned partner or your assigned teammates. For exercises, you may work with any of your neighbors that are physically present in class. You may use any of the resources provided by the teaching staff on the course website.

You MAY also reference your textbook, the textbook website, the Java API, and other third party APIs as appropriate for an assignment (for example, you may use the JUnit API to help you with writing JUnit tests).

You MAY NOT receive help from anyone or anything else.

Examples of Cheating (this list is NOT exhaustive):

- It is cheating to give any student access to any of your work which you have completed for individual class assignments.
- It is cheating AND plagiarism to use another person's work and claim it as your own. You are expected to complete all assignments on your own, unless otherwise specified in the assignment.
- It is cheating to interfere with another student's use of computing resources or to circumvent system security.
- It is cheating to email, ftp, post on the Internet, bulletin boards, message boards, etc. your work for others to obtain. Do NOT use sites that allow you to "anonymously" post code. Those sites are searchable, and others may find your code (like the teaching staff).
- It is cheating to ask or pay another person or persons to complete an assignment for you.
- It is cheating AND plagiarism to decompile any compiled code and use the decompiled source code as your own. You may also break the law by decompiling code.
- It is cheating AND plagiarism to use code that you find online.
- It is cheating to give another student access to your account (NC State account or others that you use for university work) or to give them your account password.

- It is cheating for you and another student to work collaboratively on an assignment, unless otherwise specified by the assignment.
- To circumvent the intention of the assignment and/or the automated grading system (e.g., by hardcoding test case solutions).

Examples of NOT Cheating (this list is NOT exhaustive):

- Using the code from the class website (with citations in the comments).
- Using code from other programs YOU wrote.
- Using code from other programs that YOU and a partner wrote as part of assigned exercises.
- Help from TAs or instructor (with citations in the comments).
- Using code from the textbook or textbook website (with citations in the comments).

Example Citations

/* (In method or class level comments)

* I received help from Dr. Heckman on *date* during her office hours. We discussed X.

*/

/*

* The code for this method is based on Exercise Y that I completed with Z on date.

*/

Protecting Yourself

- Do not leave papers lying around your workstation.
- Do not dispose of important papers in the lab recycling bins and trash cans until after the assignment is graded.
- Do not give out your password.
- Do not leave your workstation unattended or forget to log yourself out.
- Do not leave your laptop unattended.
- Do not give other students access to any of your workspace or email them any code.
- Do not give other students access to your course materials or your personal computer.
- Do not email, ftp, or post your code on the Internet, message boards, etc.
- Keep all copies of final and intermediate work until after the assignment is graded.
- Keep all graded assignments until after you receive the final grade for the course.
- Do not discuss implementation details of the assignment with your peers.

Forum Use

The forum is available to ask questions about assignments and tests. **Do NOT post any code to the forum unless the post is private!** The teaching staff reserves the right to edit any student's forum post for inappropriate content. Additionally, use of the forum is a privilege. Improper use for the forum may result in a ban from posting or reading.

Posting Code

While your deliverable is your work, the project requirements and design are the intellectual property of the instructors and the university. You may not post a project solution to a public code repository during or after the semester.

Academic Honesty

See <http://policies.ncsu.edu/policy/pol-11-35-01> for a detailed explanation of academic honesty.

None.

Honor Pledge

Your name on any test or assignment **or** the electronic submission of an assignment through Moodle or other class courseware system indicates, "I have neither given nor received unauthorized aid on this test or assignment."

Electronically-Hosted Course Components

Students may be required to disclose personally identifiable information to other students in the course, via electronic tools like email or web-postings, where relevant to the course. Examples include online discussions of class topics, and posting of student coursework. All students are expected to respect the privacy of each other by not sharing or using such information outside the course.

Electronically-hosted Components: The following materials are electronically-hosted for use by students through a combination of Moodle, Wolfware Classic, Google Docs (through NC State), GitHub, Jenkins, Piazza, and TPEGS (on NCSU servers): lecture notes, message boards, electronic submission of assignments, electronic submission of exercises, electronic evaluation of exams.

Accommodations for Disabilities

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, student must register with the Disability Services Office (<http://www.ncsu.edu/dso>), 919-515-7653. For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation at <http://policies.ncsu.edu/regulation/reg-02-20-01>.

Non-Discrimination Policy

NC State University provides equality of opportunity in education and employment for all students and employees. Accordingly, NC State affirms its commitment to maintain a work environment for all employees and an academic environment for all students that is free from all forms of discrimination. Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation is a violation of state and federal law and/or NC State University policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or NC State University policy and will not be tolerated. Retaliation against any person who complains about discrimination is also prohibited. NC State's policies and regulations covering discrimination, harassment, and retaliation may be accessed at <http://policies.ncsu.edu/policy/pol-04-25-05> or http://www.ncsu.edu/equal_op/. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the Office for Equal Opportunity (OEO) at 919-515-3148.

Course Schedule

NOTE: The course schedule is listed on Moodle and subject to change.