CSE 160: Computer Science A: Honors (Procedural and object-oriented programming)

Course Information

Spring 2022

Instructor: Dr. Paul Fodor

Stony Brook University

http://www.cs.stonybrook.edu/~cse160
Course Description

• “First part of a two-semester sequence, CSE 160 and CSE 260. An introduction to procedural and object-oriented programming methodology and basic data structures. Topics include program structure, conditional and iterative programming, procedures, arrays, object classes, encapsulation, information hiding, inheritance, polymorphism, file I/O, exceptions and simple data structures, such as lists, queues and stacks” (https://www.cs.stonybrook.edu/students/Undergraduate-Studies/courses/CSE160)

• Prerequisites: Computer Science Honors Program or Honors College or WISE program or University Scholars.

• Corequisite: CSE 161 (Laboratory)

• SBC: TECH

• CSE160: 3 credits + CSE161 (Lab): 1 credit
Course Outcomes

• The following are the official course goals agreed upon by the faculty for this course:
  • An ability to program in a procedural and object oriented language, using concepts such as loops, methods, object classes, encapsulation, inheritance, and polymorphism.
  • An ability to use and define fundamental data structures such as arrays, stack and queues.
  • An ability to program with sound code structure and use systematic software debugging and testing techniques.
Major Course topics

1. Procedural Programming Basics:
   - data types
   - variable declarations
   - assignment statements & expressions
   - input/output
   - textual manipulation & strings
   - conditional (branching) statements
   - iteration = loops and recursion
   - method construction
2. Arrays:
   - collect data in arrays
   - searching
   - sorting
   - array manipulations
3. Object Oriented Programming:
   - designing and constructing classes
   - aggregation
   - inheritance
   - polymorphism
   - abstract classes and interfaces

4. Recursion
Instructor Information

- Dr. Paul Fodor
  214 New Computer Science Building
- Office hours: Mondays and Wednesdays 4:30-6:00PM on Google Meet only:
  https://meet.google.com/xyu-jhq-bdx
- Phone: 1 (631) 632-9820
- Email: paul (dot) fodor (at) stonybrook (dot) edu
  - Please include “CSE 160” in the email subject and your name in your email correspondence
General Information

• CSE 160 Computer Science A: Honors (Lecture): MoWe 6:05PM - 7:25PM, online (see Zoom link on Blackboard).

• CSE 161 Laboratory for Computer Science A: Honors: MoWe 7:50PM - 9:10PM, Computer Science 2120. My TAs will also broadcast it on Zoom.
Textbook

Coursework

- Grading Schema

- Grades will be based on homework and exams according to the following formula:
  - Homework assignments -- 15%
  - Labs -- 10%
  - Midterm exams (2) -- 50% (25% each)
  - Final exam -- 25%
Coursework

• Grade Cutoffs
  • A [95-100], A- [90-95), B+ [87-90), B [83-87),
    B- [80-83), C+ [77-80), C [73-77), C- [70-73), D+ [65-70), D [60-65), F [0-60)

• SPECIAL RULE: If all your grades, including homework assignments, labs and your three exam grades are above the respective class averages, you're guaranteed to receive a grade of C or higher for this class.
Important Dates

• Midterm Exam #1: Wed. 3/9/2022, closed book online exam, during class time (80 minutes) with Respondus LockDown Browser with Monitoring.

• Midterm Exam #2: Wed. 4/20/2022, closed book online exam, during class time (80 minutes) with Respondus LockDown Browser with Monitoring.

• Final Exam: Wednesday, May 11, 2022, 5:30-7:30pm, closed book online exam, during class time (120 minutes) with Respondus LockDown Browser with Monitoring.
Lab exercises

• Simple Coding Exercises
  • TAs will present problems that you must implement and submit by the end of the week of the lab.
  • TAs do not take attendance.
  • Submit your lab work on Blackboard for lab credit due on Blackboard on the Fridays 11:59pm of the week of the lab
    • 0 - student did not submit lab
    • 1 - the solutions have major problems (doesn't compile or does nothing of value)
    • 2 - the solution is partially complete
    • 3 - the solution is complete
  • The students can use either their own computers or the computers in the lab.
Assignments

- Homework assignments due on fixed dates and times
  - no late submission is permitted
- All assignments should be submitted electronically
  - Blackboard
Regrading of Homework/Exams

• Please meet with a grading TA or the instructor and arrange for regrading
• You have one week from the day grades are posted or mailed or announced!
• Late requests will not be entertained
<table>
<thead>
<tr>
<th>Week</th>
<th>Lecture Topics</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction to Computers</td>
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<td>2</td>
<td>Programming and Java, Elementary Programming</td>
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<td>3</td>
<td>Selections</td>
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<td>4</td>
<td>Mathematical Functions, Characters, and Strings</td>
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<td>5</td>
<td>Loops</td>
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<td>6</td>
<td>Methods</td>
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<td>7</td>
<td>Arrays</td>
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<td>Multi-dimensional Arrays</td>
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<td>9</td>
<td>Objects and Classes</td>
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<td>10</td>
<td>Object-Oriented Thinking</td>
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<td>11</td>
<td>Inheritance and Polymorphism</td>
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<td>12</td>
<td>Exception Handling and Text I/O</td>
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<td>13</td>
<td>Abstract Classes and Interfaces</td>
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<tr>
<td>14</td>
<td>Recursion</td>
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If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at sasc@stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website: https://ehs.stonybrook.edu//programs/fire-safety/emergency-evacuation/evacuation-guide-disabilities and search Fire Safety and Evacuation and Disabilities.

All documentation of disability is confidential.
Academic Integrity

- The following rules are posted in every course syllabus: "Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/"
You can discuss general assignment concepts with other students: explaining how to use systems or tools and helping others with high-level design issues.

You **MAY NOT share** assignments, source code or other answers by copying, retyping, looking at, or supplying a file.

Assignments are subject to manual and automated similarity checking (We do check! and our tools for doing this are much better than cheaters think).

If you cheat, you will be brought up on academic dishonesty charges - we follow the university policy:

- [http://www.stonybrook.edu/uaa/academicjudiciary](http://www.stonybrook.edu/uaa/academicjudiciary)
Examples of Academic Dishonesty

- **Unpermitted collaboration** (on a paper, homework, lab reports, etc.). Unless an instructor has explicitly approved working together, students should assume, for their own protection, that it is not permitted.

- **Helping someone else to plagiarize from one's own homework** (for example, by giving them a copy of yours, or doing it for them)
  - This includes having a public repository on Github that other students can copy from.

- **Representing someone else's source code as one's own.** If another person's code is being used, it must be properly cited.

- **Buying or selling source code.**

- **Using source code or pieces of a paper from the internet without properly citing the source.**
Academic Dishonesty

• The instructor makes a recommendation at the Academic Judiciary office
  • Cheating is cheating! No matter the amount of cheating or if one is the source or destination of cheating.
  • Do not cheat! You are cheating yourself.
  • Our job is the teach you the material and make sure that you learn it.
  • Our recommendation is always F for the cheaters!
Catastrophic events

- Major illness, death in family
- Formulate a plan (with your CEAS academic advisor) to get back on track

Advice
- Once you start running late, it’s really hard to catch up
Class Communication: Piazza

- The Piazza discussion board should be used for all communication with the teaching staff for questions about the course assignments and material.
- Piazza is a forum for additional learning and assistance.
- You are expected to use the Piazza forum for all non-personal, course-related communication.
  - Like questions about what a homework problem is asking, technical problems that need troubleshooting, or other questions that might be of interest to other students must be posted to Piazza and not emailed to the instructor or a TA.
Piazza

- The following are NOT appropriate uses of Piazza:
  - cyber-bullying
  - posting memes
  - complaining about a grade
  - airing concerns/comments/criticisms about the course
  - posting more than a few lines of source code from an attempt at a homework problem
  - posting the solution to a homework problem or a link to a website containing the solution
  - in general, anything unrelated to the course material and student learning
- Anonymous posting is turned off, so we can see who you are.
Email Etiquette

- When emailing your instructor about course private issues, use the following guidelines to ensure a timely response:
  - use your official `@stonybrook.edu` email account (we cannot respond to other emails due to FERPA regulations)
  - use a descriptive subject line that includes "CSE160" and a brief note on the topic
  - begin with a proper greeting, such as "Hi Prof. Fodor"
  - briefly explain your question or concern or request including the course (we are teaching several courses)
  - end with a proper closing that includes your full name, Net ID and SBU ID number
What do you need to get started?

- Blackboard account
  - [http://blackboard.stonybrook.edu](http://blackboard.stonybrook.edu)
- Lecture notes
- Syllabus

  - You should download JDK for your operating system (cost: free)
- Eclipse IDE: [https://www.eclipse.org](https://www.eclipse.org)
  - You should download the Eclipse IDE for Java Developers (cost: free)
    - Latest Eclipse comes with JDK, so you don't need to install it separately

- Learn to use the debugger!!!
Tools for Writing Java Programs

- 1\textsuperscript{st} Approach – the bare minimum
  - edit Java source code in text editor (ex: Notepad or Pico)
  - compile source code into class files from command line: javac
  - run the Java bytecode with the Java Virtual Machine: java
  - can be tedious and poor interactivity

- 2\textsuperscript{nd} Approach – Integrated Development Environment (IDE)
  - combines writing, compiling, running and debugging Java code into a single application
  - makes coding much more efficient and organized
  - Eclipse, NetBeans, IntelliJ IDEA, etc.
    - We can help with Eclipse, but you can use other IDEs on your own
Java: How does it work?

- **Java Source Code:**
  - you write code in ClassName.java files

- Compile your Program:
  
  \texttt{javac ClassName.java} \\
  OR

  \textbf{Build menu option in the Run menu} included in the Eclipse IDE

- The Result is: **Java Executable Code (bytecode)**
  
  \texttt{ClassName.class} files = Java bytecode (binary, not humanly readable)

- Now you can run your java program using the \textbf{Java Virtual Machine (JVM)}:
  
  \texttt{java ClassName} \\
  OR \texttt{Run} button included in the Eclipse IDE
Please

- Please be on time
- Please show respect for your classmates
- Please turn off (or use vibrate for) your cellphones

... 

- On-topic questions are welcome
Welcome and Enjoy!
On a personal note

- My wife and I had our first child this winter, so you could expect some disruption in our course during the semester