CSE 216, Spring 2024, Department of Computer Science, Stony Brook University
Programming Abstractions

Instructor: Christopher Kane, christopher.kane@stonybrook.edu
Office: New Computer Science, Rm. 107
Office Hours: Monday/Wednesday: 3:30 – 5:00 PM; or by appointment – On Zoom Only
Class: Tuesday/Thursday, 4:00 – 5:20 PM; Engineering, Rm. 145

Course Description:
Intermediate-level programming concepts and paradigms, including functional programming, object-orientation, basics of type systems, memory management, program and data abstractions, parameter passing, modularity, and parallel programming. Includes weekly recitations, which provide students with experience in the practice of programming in a variety of high-level languages.
(https://www.cs.stonybrook.edu/students/undergraduate-studies/courses/cse216)

Credits: 4

Prerequisites:
- C or higher in CSE 214; CSE major

Expectations:
This course operates under the assumption that the student has retained the knowledge of (1) data structures and basic algorithms covered in CSE 214 (and its prerequisite classes), (2) basic knowledge of Java, as covered in CSE 114 and CSE 214, and (3) the mathematical and logical concepts covered in CSE 215. Specifically, the following knowledge/skills are expected:
- the ability to write programs of a few hundred lines of code in the Java programming language,
- an understanding of fundamental data structures, including lists, binary trees, hash tables, and graphs, and the ability to employ these data structures in the form provided by the standard Java libraries,
- an understanding of the basic principles of recursion,
- the ability to construct simple command-based user interfaces, and to use basic I/O for input and output of data, and
- a solid foundation of basic mathematical and geometric reasoning using pre-calculus concepts.

Course Outcomes:
The following are the official course goals agreed upon by the faculty for this course:
- An understanding of programming language paradigms and tradeoffs.
- An understanding of functional techniques to identify, formulate and solve problems.
- An ability to apply techniques of object-oriented programming in the context of software development.

Textbooks:

- Scott, Michael L., *Programming Language Pragmatics*. Morgan Kaufmann; 3rd Edition (2009).

For details pertaining to specific programming languages, the recommended material will mostly be from the following:

- Python tutorial: https://docs.python.org/3/tutorial/
- OCaml learning material: https://ocaml.org/learn/

Additional practice problems are not provided separately, as students are expected to utilize the collection of problems provided in the recitations and in the reference book and other learning material. Combined, these resources already provide several hundred practice problems of varying degrees of difficulty.

Course Format:

- **Lectures:** This course will be conducted in a live, in-person format. Lectures will also be broadcast and recorded using the Echo 360 system. Lectures will be accessible on Echo 360 through Brightspace.
- **Recitation:** Recitations are a mandatory component of this course. Weekly recitations will provide practice for the concepts discussed in the lectures. The recitation material will be made available on Brightspace. Ready-made solutions to the recitation problems will not be provided, but students are encouraged to discuss these problems with their peers, during the office hours provided by the teaching staff, or in the discussion forum for this course.
- **Exams:** There will be two midterm exams and a cumulative final.
- **Assignments:** There will be 4 programming assignments. The assignments will be posted to Brightspace.

Online Course Resources:

- Course Homepage: https://www3.cs.stonybrook.edu/~ckane/spring2024/cse216/
- D2L Brightspace: https://brightspace.stonybrook.edu
  Brightspace will be used for most course materials such as slides, assignments, grades, etc.
- PIAZZA: https://piazza.com/stonybrook/spring2024/cse216
  This term we will be using PIAZZA for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TAs, and Professors. All non-personal course-related communication should be posted to the discussion board. If you have questions about assignments, technical problems that need troubleshooting, or other questions that might be of interest to other students, they must be posted to PIAZZA and not emailed to the instructor or TA. If you have any problems or feedback for the developers, email team@piazza.com.

Course Announcements: Course announcements will be posted to Brightspace. You are expected to be aware of all announcements.

Course Outline:
The following topics will be covered in the lectures:

- Programming Paradigms
- The Untyped Lambda Calculus
- Functional Programming
- Types, Type Systems, and Algebraic Data Types
- Polymorphism
- Operational Abstractions: iterations, streams, and thunks
- Subroutines and Control Abstractions: parameter passing and evaluation strategies
- Concurrent Programming

A more detailed schedule of lectures, readings, assignments, and exams will be posted to the course homepage.

Final Exam: Thursday, May 9th, 2024, 5:30 PM – 8:00 PM

Grade Distribution:

- Recitations: 10%
  (10 Recitations, 1% each)
- Programming Assignments: 40%
  (4 assignments, 10% each)
- Midterm 01: 15%
- Midterm 02: 15%
- Final Exam: 20%

Course Grade Cutoffs:

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A  [93 – 100], A- [90 – 93), B+ [87 – 90),  B  [83 – 87),
B- [80 – 83),  C+ [77 – 80), C  [73 – 77),  C- [70 – 73),
D+ [67 – 70),  D  [63 – 67), F  [0 – 63)
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Course Policies:

- Attendance is expected and highly encouraged.
- Students are responsible for all missed work, regardless of the reason for the absence. It is also the absent student's responsibility to obtain all missed notes or materials.
- Students are expected to work independently. Offering or accepting solutions from others is an act of plagiarism, which is a serious offense, and all involved parties will be penalized according to the Academic Honesty Policy. Discussion amongst students is encouraged, but when in doubt, direct your questions to the professor or TA.
- Assignments must be turned in on the day they are due. Students are urged to plan ahead to avoid problems such as congestion or failure of computer facilities at the last minute. If your assignment is incomplete turn in whatever you have or accept the consequences of late submission. A few other things to keep in mind regarding assignment submissions:
  1. Code that does not compile will receive no credit, no matter how minor the reason behind the compile error may be.

2. Do not send file timestamps screenshots as "evidence" of having done the assignment on time. File timestamps can be manipulated extremely easily, and the teaching staff will not consider such things for grading (and/or re-grading, grade disputes, etc.).
3. Make sure that you double-check what you are submitting. It is absolutely worth spending one extra minute to make sure that you are not submitting compiled binaries, for example. Always keep a time-window in mind, and do not submit in a hurry.
4. Make sure your submission process is complete. Otherwise, the teaching staff cannot see your files. As a result, it cannot be graded.

- **Late Policy**: All assignment submissions will incur a 10%-point penalty per day for missing the submission deadline. This penalty will be imposed strictly, and without any further sub-division in the penalization. For example, if a homework is due by 11:59 pm tonight, then a submission at 12:00 am or 12:01 am (i.e., just one or two minutes later) will be treated as delayed by one day. If you receive, say, 94/100 in that homework, your grade will thus become 84/100.
- **Grading Issues:** All issues with grading must be emailed to the relevant TA/Grader or Instructor within 1 week of the return of the graded assignment or exam. Any requests/concerns after this date will not be considered. The email must include a detailed explanation of the specific grading issues and reason/correction. We believe students often learn by investigating and understanding their mistakes. Therefore, it is the responsibility of the student to determine the issues, not the grader/instructor/TA.
- Exams are closed book, closed notes.
- **Makeup exams will be given only for reasons outlined in the Undergraduate Bulletin, or at the discretion of the instructor.** Please inform the instructor as soon as you know or suspect you will not be able to attend the exam as scheduled.

Etiquette:

PIAZZA: PIAZZA is a forum for additional learning and assistance. It is not the place for cyber-bullying, memes, grade complaints, concerns/comments/criticisms about the course, or in general, anything unrelated to the course material. Improper behavior will result in the deactivation of PIAZZA and reporting of the individual's behavior to the University Office of Community Standards.

Students are expected to use the PIAZZA forum for all non-personal, course-related communication. If you have questions about assignments, technical problems that need troubleshooting, or other questions that might be of interest to other students, they should be posted to PIAZZA and not emailed to the instructor or TA.

Email: Almost all questions concerning the course should be posted to PIAZZA. The following list gives exceptions for which students should email me directly:

- If you cannot come to office hours and need to set up an appointment to meet at another time; in this case, you must include your availability for the upcoming week.
- Making arrangements for disability accommodations.
- To discuss private, personal matters that are impacting your coursework, such as physical or mental illness, death in the family, etc.
- Questions about the grading or evaluation of your assignments and exams.

- If the instructor asks you to email them something relating to a previous conversation.

When emailing, please use the following guidelines to ensure a timely response:

- Use your official Stony Brook (@stonybrook.edu) email account.
- Use a descriptive subject line that includes “CSE 216”, identifies the item you are emailing about, and a brief description of the topic of your email.
- E.g., “CSE 216: A1 Submission error", “CSE 216: A2 Brightspace Grade"
- Begin with a proper greeting, “Hello Prof. Kane,”
- Please be direct and concise in explaining the issue.
- End with a proper salutation that includes your full name, netid, and SBU ID number.

Student Accessibility Support Center Statement
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.

Academic Integrity Statement
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. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. 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/index.html

Critical Incident Management
Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Student Conduct and Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.