CSCI 0150: Introduction to Object-Oriented Programming and Computer Science

Course Information and Syllabus
Semester I, 2018–2019

Lectures	K hour: 2:30 pm – 3:50 pm on Tuesdays and Thursdays
Room	Salomon 101
Lecture Notes	http://www.cs.brown.edu/courses/cs015/lectures.html A recording of each lecture will be available soon after it is given.
Text	*None*
Prerequisite	*None*
Instructor	Andries Van Dam (avd@cs.brown.edu) Michael L. Littman (mlittman@cs.brown.edu)
Office	CIT 465, x3-7640
Professor's Office Hours	Please reach out to Lisa Manekofsky (ljm@cs.brown.edu) to schedule an appointment
Head TAs	Amos Jackson (ajacks12), Catherine Habgood (chabgood), Helen Cho (hcho8), Jeff Kennan (jkennan)
UTAs	Aliya Chambless (achamble), Amani Hayes-Messinger (ahayesme), Andy Zhu (azhu20), Angel Rodriguez (arodri36), Ariana Barzinpour (abarzinp), Brantley Leaphart (bleaphar), Camden Baer (cbaer), Christopher Avalos (cavalos1), Connor Brown (kbrown24), Conrad Zborowski (czborows), Danayt Haile (dhaile), David Cabatingan (dcabatin), Erin Simshauser (esimshau), Gary Zhou (xzhou3), Grace Bramley-Simmons (gbramley), Hannah Haas (hhaas1), Irina Su (hsu4), Jacob DiSpirito (jdispiri), Jacob Morse (jmorse1), Janna Jiang (jjiang15), Jeffrey Zhong (jzhong3), Jessy Ma (jma28), Jillian Turner (jt59), Julie Wang (jwang73), Katie Friis (kfriis), Kelvin Yang (kyang35), Kendrick Tan (ktan7), Kevin Nguyen (knguyen7), Laura Wilson (lwilson7), Lina Ruimin Sim (lsim2), Lucy Reyes (lreyes1), Luna Ito-Fisher (litofish), Madison Sampleton (msamplet), Marlene Goetz (mgoetz2), Michael Coppolino (mcoppoli), Michael McDonnell-Diaz (mmcdonne), Noah Korotzer (nkorotze), Peter Harvie (pharvie), Rebecca Zuo (rzuo), Snigdha Sinha (ssinha5), Stanley Yip (syip2), Stephanie Zhang (szhang57), Taylor Auten (wauten), Theodoros Tsivranidis (ttsivran), YJ Kim (ykim106), Zoe Weiss (zweiss3)
TA Office Hours	http://cs.brown.edu/courses/cs015/hours.html

Time Requirements	In addition to 3 hours per week in class, CS15 requires 11 sections, which are 90 minutes each. CS15 also requires that you start working consistently from the time an assignment is handed out. Assignments are closely spaced and each assignment uses concepts from previous work. This makes it very difficult to fall behind on one assignment and still complete the next one. Starting early is the key to successful programming in CS15. Typically, students find that CS15 requires about 15 hours of coursework a week, in addition to attending lectures.
Goals	This course introduces principles of computer science, emphasizing object-oriented design and programming in Java, an effective modern technique for producing modular, reusable, and internet-aware programs. It also introduces interactive 2D computer graphics, user interface design and some fundamental data structures and algorithms. A sequence of successively more complex graphics programs, including Tetris and culminating in a significant final project, helps provide a serious introduction to the field. This course is intended for both potential concentrators and those who may take only a single course. No prerequisites and no prior knowledge of programming are required.

CS15 is a standalone course which introduces computers, systematic analysis of problems, and object-oriented design and programming techniques. The course may be taken by anyone, with or without previous computing experience. No math background beyond basic algebra is required. CS15 will teach you object-oriented design and programming in Java and the use of graphical user interfaces. It will also introduce you to some of the important concepts in computer science, such as data structures and computational efficiency. In doing so, the course takes an interactive, graphical approach to programming assignments and an equally interactive approach to lectures. Andy's lectures are supplemented by skits performed by the UTAs (Undergraduate Teaching Assistants) to teach course concepts and to make the class fun and enjoyable! |
| **Diversity: All are Welcome** | Our intent is that this course provide a welcoming environment and community for all students taking CS15. Our TAs have undergone training in diversity and inclusion; all members of the CS community, including faculty and staff, are expected to treat one another in a professional manner. If you feel you have not been treated in a professional manner by any of the course staff, please contact either Prof. Van Dam (the instructor), Ugur Cetintemel (Dept. Chair), Tom Doeppner (Vice Chair) or Laura Dobler (diversity & inclusion staff member). We take all complaints about unprofessional behavior seriously. CS15 aims to be a community for students within the department, and cultivating an open and inclusive environment is a critical part of this effort. |
| **iClickers** | The course uses iClicker quiz questions to allow students to actively engage with material during lecture. These questions can be answered online or using an app, both of which are available on the iClicker website. Alternatively, students can pick up a physical remote from CIS, located in JWW 510, and register it online. iClicker responses will be graded on a 0-3 scale, where a correct response receives 3, an incorrect response 2 and no response 0. These responses will, in total, be worth 5% of your grade. |

Collaboration Policy	CS15 has a Collaboration Policy that provides specific guidelines for what you can and cannot do in regard to working with other students. This policy is based on Brown's Academic Code of Conduct, but it is specific to CS15. A copy of the full policy is available on the course website, and you are responsible for reading and understanding it in detail. In short, while students may discuss concepts in the context of the lecture material and written homework assignments, **collaboration on any stage of a programming assignment (e.g., designing, coding or debugging) is a violation of our policy.** The course staff takes violations of the collaboration policy very seriously and will prosecute them with the standing committee on the academic code as necessary.
Grading	Like many courses in the Computer Science department, CS15 relies heavily on the role of its Undergraduate Teaching Assistants. In addition to holding approximately 200 TA office hours per week and facilitating programming labs, the CS15 Undergraduate TAs also grade all student work (with supervision from the Head TAs and Andy). TA hours, held by your undergraduate peers who know the course and the assignments intimately, are there to insure that you get targeted help with your problems. Your grade in this course will be based solely on your performance on the assignments and iClickers, as there are no tests, quizzes, papers, or final exams. Assignments are weighted, each growing in complexity and weight as the semester goes on. Once your work has been graded by a TA, with supervision from the head TAs, you will receive a grade report, with comments, by email. Your final grade will be based upon assignment, lab and design section, and iClicker scores. Cutoffs will not be determined until the end of the semester. If you are on the borderline between letter grades, factors such as consistently handing in assignments, a general upward grade trend throughout the semester, and a strong finish to the course will be taken into account. Students will receive course credit only if they submit minimally functional (MF) versions of all assigned projects. Details of MF are on each project handouts. However, your grade for a particular assignment is determined by how well it meets the standards set in the course and the assignment specifications, not simply by whether or not it works. Part of the art of programming involves a structured, disciplined approach to solving problems. Conventions for programming are stated explicitly in the CS15 Style Guide and in lecture slides through examples. For each project, a large part of the grade will be based on design and style. The table below shows the approximate relative weight of each assignment used in calculating the final grade. Note that the weights may change slightly over the semester. **Assignment | Weight** HW1 - 1% AndyBot - 2% HW2 - 1% LiteBrite - 5%

	Fruit Ninja - 8% Cartoon - 10% DoodleJump - 13% Tetris - 18% Final Project - 25% Sections (Labs and Design) - 12% iClicker - 5% Total - 100% See the [Course Missive](#) on the course website for further details.
Due Dates	Projects must be handed in by 11:59 pm on their due dates unless otherwise stated. Homeworks must be handed in by 1:00 pm on their due dates unless otherwise stated. Labs are due before the completion of the next lab section. All due dates (including early and late hand-in dates) will be clearly written under the title of the assignments.
Minimum Functionality Requirements	To pass CS15, you must complete each of the 7 programming projects with at least "minimum functionality" (MF), meaning you'll have to hand in an acceptable version by the end of the semester. Requirements for meeting MF for each project are detailed on each project handout. If you do not meet MF the first time (you will be notified when grades are sent out), you will have to re-submit a working version by the end of the semester to pass, even if your absolute grade is high enough (you must obviously also have a passing final grade to pass the course). Note that only meeting MF requirements will not be enough to earn full credit on a project.
Late Policy	For written assignments, our late policy is that no handins will be accepted after the due date printed on the assignment. There are no "late days" for these assignments. Our late policy for programming assignments is as follows: • Most projects have a "late deadline", posted on the assignment handout on the course website. Programs handed in after the due date but before the late deadline will be penalized 8% of the possible points for that assignment. (A late submission of a program that would have received 94 out of 100 points would instead receive 86 points.) They will also not be eligible for extra credit. • You are entitled to one "free" late pass during the semester. The late pass allows you to turn in one program by the late date without penalty, though you will still not be eligible for extra credit on the assignment. Note that you CANNOT use your late pass on the final project. At the end of the semester, we will apply your late pass to the program for which it will be most beneficial to your grade. • Anything handed in after the late deadline will receive an NC. Late passes will not be accepted. • Assignments without a late deadline must be handed in by the regular deadline, otherwise they will receive an NC. See the [Course Missive](#) on the course website for further details.
Extra Credit	Those of you who may have extra time and a strong interest in computer science are welcome to augment your already-working programs with extra credit extensions. Later project handouts will include a list of possible extra credit

	extensions that you should keep in mind when designing your programs (but you can invent your own, too). Extra credit is only to be done after the original assignment has been fully completed - if you have not met the requirements, you will not receive extra credit. Extra credit may not redefine the original assignment. Make sure to document anything you believe is extra credit in your header comments. Extra credit is capped at 10 points per project.
More Information	For more in-depth information about the course, refer to the [Course Missive](#) and [Collaboration Policy](#) linked from the course website.
Accommodations	If you feel you have physical, psychological, or learning disabilities that could affect your performance in the course, we urge you to contact SEAS (https://www.brown.edu/campus-life/support/accessibility-services/). We will do whatever we can to support accommodations recommended by SEAS.
Mental Health	CS15 cares deeply about student health. If you feel as though you are under too much pressure or there are psychological issues that are keeping you from performing well at Brown, we encourage you to contact Brown's Counseling and Psychological Services (CAPS: https://www.brown.edu/campus-life/support/counseling-and-psychological-services/). They provide confidential counseling.
Lecture Topics	Throughout the semester, CS15 will cover Object-Oriented Programming Fundamentals, Arithmetic and Flow of Control, Data Structures and Algorithms, and other advanced topics. Below are the specific topics for each lecture. 1. 9/6/18: A Gateway to Computer Science - Welcome to CS15 2. 9/11/18: Calling and Defining Methods in Java 3. 9/13/18: Introduction to Parameters and Math 4. 9/18/18: Working with Objects 5. 9/20/18: Interfaces/Polymorphism 6. 9/25/18: Inheritance/Polymorphism 7. 9/27/18: Math and Making Decisions 8. 10/02/18: Introduction to 2D Graphics in JavaFX 9. 10/04/18: Building Your Own Custom Graphics 10. 10/9/18: 2D Graphics, Part III 11. 10/11/18: Loops 12. 10/16/18: Arrays and ArrayLists 13. 10/18/18: Design Patterns and Tradeoffs 14. 10/23/18: Recursion 15. 10/25/18: Big-O Complexity and Sorting 16. 10/30/18: Linked Lists 17. 11/01/18: Stacks and Queues 18. 11/06/18: Trees 19. 11/08/18: Hashing 20. 11/13/18: Final Project Overview 21. 11/15/18: Final Project Help Sessions

	22. 11/20/18: Computer History, Programming Languages, and Computer Architecture 23. 11/27/18: Computer Graphics 24. 12/04/18: (Head TA Lecture) Unix Features and Additional Topics
Required Reading	If you decide to take CS15 (and we hope you do!), you will also be held responsible for all of the information in the documents in the 'Required Reading' section of the course website, including our course missive and collaboration policy, and for any class announcements made in lecture or via email. Course Missive: http://cs.brown.edu/courses/cs015/docs/missive.pdf Collaboration Policy: http://cs.brown.edu/courses/cs015/docs/CS15CollaborationPolicy2018.pdf Pair Programming Guide: http://cs.brown.edu/courses/cs0150/docs/PairProgrammingGuide2018.pdf Style Guide: http://cs.brown.edu/courses/cs015/docs/styleGuide.pdf