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1 Introduction

Welcome to CS15, Introduction to Object-Oriented Programming and Computer Science! CS15 is a standalone course that focuses on introducing students to computer science through object-oriented design and programming in the Java language. Object-oriented programming is a widely-used paradigm in modern CS, focused on writing modular and reusable code.

The course covers methods and parameters before moving on to objects and classes, and the powers of inheritance, interfaces, and polymorphism. Object-oriented programming is then used to teach simple 2D graphics and graphical user interfaces, and the course finishes up with an overview of basic data structures and other important topics in computer science.

CS15 meets Fall semester on Tuesdays and Thursdays from 2:30 to 3:50 pm in DeCiccio Family Auditorium (Salomon 101). It is taught by Professor Andy van Dam with the assistance of Undergraduate Teaching Assistants (UTAs). There are no prerequisites for CS15 and the course expects no prior programming experience and no math beyond basic algebra.

Anyone considering a concentration in Computer Science or contemplating taking other courses in the CS department may also wish to consider CS17 or CS19 as a gateway course. [Click here](#) to see a comparison of the various introductory Computer Science classes offered at Brown for both concentrators and non-concentrators. If you decide to continue in Computer Science after taking CS15, you will continue with CS16 in the spring.

1.1 Initial Mechanics

For CS15 internal registration, if you are even considering taking the course, we need you to register on banner before the first lab section so that you can be given a Brown CS account. If you are a RISD student or a graduate student interested in taking the course, you must email the Head TAs at cs015headtas@cs.brown.edu in order to complete this process (preferably before the first day of class).

You will need to complete the Collaboration Contract at the first lab. If you have concerns about registration or if you miss the introductory lab, please see the HTAs as soon as possible to insure you obtain a department account.

CS15 is essentially a “laboratory course.” The material can only be learned by doing the assignments. Therefore, audit credit is only given for students who complete the assignments up to and including Tetris. Just attending lectures is considered “vagabonding”, not auditing. Anyone intending to audit must identify him/herself to the HTAs by the add/drop deadline.

1.2 Commitment to Diversity and Inclusion

CS15 is committed to providing an introductory computer science curriculum that supports all students in their pursuits of learning, especially students from backgrounds historically underrepresented in computer science and STEM fields. The course staff is actively working to further the department's and the university's goals laid out in their respective Diversity and Inclusion Action Plans, and is dedicated to making the course and the field of computer science accessible to all students. Anyone who wishes to discuss issues of diversity and inclusion is welcome to contact anyone on the course staff or Laura Dobler (ldobler@cs.brown.edu), who coordinates department initiatives related to diversity and inclusion.

2 The Course

2.1 The Professor

Professor Andries van Dam, known as Andy, has been at Brown since 1965. He helped start Computer Science at Brown and was the department's first chairperson. Andy is very informal and encourages student feedback and class participation. His office is Room 465 of the CIT. Andy's office hours are by appointment. His administrative assistant, Lisa Manekofsky (ljm@cs.brown.edu), books his appointments.

2.2 The TAs

Visit the [staff roster](#) on the website to see this year's TAs. The TAs - all of whom are undergraduates at Brown who have taken the course in prior years - have four main functions:

- They evaluate and give critical feedback on your assignments.
- They hold hours (and maintain a Piazza page) to answer your questions. They're there to help with concepts or assignments, and also for clarification of points brought up in class and general questions about Java, the assignments, object-oriented programming, how the class is run, and computer science as a whole. Please don't hesitate to seek help and advice from them.
- They lead weekly 90-minute labs.
- They will lead hour-long design discussions for the last 5 projects.

All regular TAs grade programs, hold TA hours, lab, and section, and have other assorted duties. The Head TAs (who were TAs in previous years) are responsible for the organization and administration of the course. They also supervise the regular TAs in grading programming assignments to ensure consistent grading.

The TAs are not only a resource for technical questions, but are also happy to help with all sorts of questions about the course, the department, or computer science in general.

3 Course Material

All course materials can be found on the [course website](#). Slides for the lectures are released the day before, and audio recordings of the lectures are posted following class. Assignments and labs are also posted on the site when they are released. Please check the site often for notices and announcements. Piazza, our online Q and A forum, will also be updated daily with assignment clarifications and pinned posts relating to frequently-asked questions.

3.1 Lectures

CS15 lectures are Tuesday and Thursday, 2:30pm - 3:50pm. You are expected to attend all class hours. A copy of the lecture slides will also be accessible online, from the CS15 homepage. You are responsible for everything said in class.

In case you do need to miss lecture, there are ways of catching up. In particular, you can use the CS15 website to download Andy's notes and listen to audio (recording synced to the corresponding Powerpoint slides) for every lecture.

This year, we are adding participation-based iClicker quizzes that will be worth a grade for 6 of the first content lectures (starting with Intro to Parameters/Math and going through Graphics Pt. I). Participation in all of the questions will earn full credit, and your lowest lecture will be dropped. This will be worth 2% of your final grade. After Graphics Pt. I, there will continue to be iClicker questions in the lectures, but they will not be graded. If you find them helpful to reinforce concepts and stay engaged in lecture, we encourage you to continue answering. We will send out information on getting set up for iClicker questions in the first week of class.

3.2 Labs

CS15 includes 9 mandatory 90-minute labs, held weekly for the first 9 weeks of class. In lab, students will complete small programming assignments with TA support. Labs are graded only on completion and are worth 9% of your final grade (1% each). We will send out an email in the first week of class with instructions for how to sign up for a lab section.

Labs are designed to provide an environment where students can practice coding in Java and using Linux machines with the supervision of 3-4 TAs. They will review lecture concepts and allow you to practice applying them. In addition to programming and Java syntax, labs will include topics such as good program design, debugging tools and skills, and basic algorithms.

To get credit for a lab, you must complete the assignment and get it checked off by

a TA during your lab section. If you do not finish a lab by the end of your lab section, you may finish on it on your own and ask a TA to check you off during the next week's lab section. Attendance will not be taken weekly; as long as you are checked off by the end of the following lab section, you will receive full credit. Otherwise, you will receive no credit.

For example, if you signed up for the Tuesday 4-5:30 lab, you could get checked off for Lab 4 on Tuesday from 4-5:30 during the week the lab was released or on Tuesday from 4-5:30 the following week, but at no other times.

You can only get checked off during the lab section that you are signed up for, unless you've emailed **the TAs for the lab you want to switch into** and obtained permission to switch for that week. Make sure to request permission before the start of that week's labs.

All labs will meet in the Sunlab (CIT 143), on the first floor of the CIT. The Sunlab is also one of the spaces available for you to work on your assignments, and is filled with CS department Linux machines.

3.3 Handouts & Emails

We post a lot of handouts and course materials on the website, and **you are responsible for the contents of all of them**, so read them thoroughly.

The TAs will also send out emails containing useful administrative information and assignment clarifications to the class email list. **You are responsible for information contained in class-wide emails.**

TAs will keep our online Q&A forum, Piazza, updated regularly with assignment clarifications and FAQs based on questions students ask.

3.4 Projects

CS15 has 7 programming assignments throughout the semester, culminating in a final project. The last 5 projects will include a required design discussion.

3.5 Design Discussions

In past years, all projects starting with the TAsafeHouse have included Design Questions, a graded written assignment intended to help students prepare for the project. This year, to prepare for projects, we are switching to a TA-led design discussion format, in which a group of about 10 students and 2 TAs will discuss design options and tradeoffs for each project. This will give students more experience with analyzing program design and more opportunities to ask TAs clarifying project questions. These discussions will take place soon after the projects are released.

We will send out an email before the first design discussion with instructions on how

to sign up or a time slot - you will remain with the same TAs and group of students throughout the semester.

There will be a one-hour design discussion for TAsafeHouse, DoodleJump, Tetris, the final project, and Data Structures and Algorithms (which is only a design discussion and mini-assignment, not a full assignment). Cartoon, as it is a project with looser requirements, will have a required 20 minute individual check-in with one of your section TAs instead of a group discussion.

Design discussions will be worth 10% of the grade for each project. 50% of this grade will be based on participation in the discussion; the other 50% will be based on a written mini-assignment, which will be typed and handed in as a PDF before the discussion. Mini-assignments are not very time-intensive and will prepare you for the discussion. They will be due before the start of the first discussion section for the project and can be found on website along with more detailed deadlines. These are graded similarly to homeworks; you will not receive credit for your mini-assignment if it is not handed in on-time.

3.6 Homeworks

CS15 also has two written homeworks to help solidify lecture topics. These, like design discussion mini-assignments, must be typed and handed in as a PDF. You must use the CS15 handin script to turn these in - PDFs that are emailed to us will receive a significant deduction, and other file formats will not be graded. More details about handing in will be included on the assignment handouts.

4 How to be Successful in CS15

While CS15 is challenging, there are many things you can do to stay on top of the work for the course.

4.1 Using TA Hours

CS15 is unusual both in the amount of day-to-day work involved and in the amount of personalized help available. With one TA for approximately every 8 students, this course offers a great deal of help to those who use the TA system wisely. In particular, we offer 180 TA hours per week where you can get one-on-one help.

Read our [TA hours policies](#) (mandatory reading) for information on how to go to hours and a few important policies we have for hours.

Please keep in mind that it is not acceptable to ask a TA a course-related question outside of their regularly scheduled hours, labs, and sections. Follow common sense and do not ask a TA to do your work for you, and make sure to look through handouts, lectures, emails, and Piazza posts before asking questions that might be answered there.

If you have concerns about the class, or are thinking about dropping it, we encourage

you to talk to a Head TA first. Learning to program can be overwhelming at first, so sometimes that little extra help can make it all click. If you cannot make one of their TA hours, feel free to set up an appointment by emailing the HTAs.

4.2 Piazza

Piazza is an online Q&A forum where students can ask questions and get answers from TAs. We encourage you to use Piazza to ask general concept-oriented questions as well as clarifying questions for assignment specifications. Piazza will function as a place to crowd-source common questions for the benefit of the entire class.

Refer to the Collaboration Policy for guidelines on using Piazza. Instructions on accessing the site will be sent out in the first week of class.

4.3 Help Slides

For most projects, help slides will be posted on the website with useful tips and hints for the project. These will be released after the start of the project, in many cases after the last design discussion, and will often contain important information about project design or implementation.

TAs may also offer optional help sessions for miscellaneous computer science topics, for example, how to work locally from your laptop or how to prepare for software engineering interviews.

4.4 Group Review/Q&A Sessions

Especially early on in the course, many students require multiple examples and additional review before programming concepts stick. With that in mind, we are adding conceptual review sessions, to be held twice a week and run by TAs. The TAs will have examples prepared for the sessions, which will review material from that week's lectures, but these sessions will largely be driven by student questions. If you want more practice with the week's material, definitely consider coming to these. Assignments will not be discussed in any way.

We are working in conjunction with Mosaic+, a student group advocating for greater racial diversity and inclusion in the CS department, to create these sessions. We encourage all students to attend these sessions, but they are born out of an understanding that some students' backgrounds better prepare them for an introductory CS class than others.

4.5 The Pace: Keeping Up

In general, CS15 and other programming courses require that you start working consistently from the time an assignment is handed out. This will prevent you from getting

blown away by unexpected bugs, hardware or software problems, a crowded lab, or long lines at TA hours.

STARTING EARLY IS THE KEY TO SUCCESSFUL PROGRAMMING.

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. We will rarely give extensions, and only for truly extenuating circumstances (the pressure of other courses not being one), and will grant incompletes in the course only if formally approved by a dean.

Because assignments are released many days to weeks in advance of deadlines, we won't grant exemptions for religious holidays. We will do our very best to get assignments released sufficiently early so that those of you who will be away can still meet the deadline.

5 Grading

Your grade in this course will be based solely on your performance on the assignments, as there are no tests, quizzes, papers, or final exams. Assignments are weighted, with the more difficult and important assignments due later in the semester. 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.

5.1 Grade Complaints and Late Work

Any questions or complaints regarding grading must first be addressed to the TA who graded your particular assignment, by email or at their hours. No other TA can answer questions pertaining to your specific grade. If you are unable to resolve an issue with a TA, you may take your concerns to the HTAs, and then to Andy if your problem is still not resolved. On a related note, your graders are happy to discuss your programs with you further at their hours, after they have been graded.

You should not be overly concerned with initial grades, which are weighted very low in this course, but we encourage you to seek out help if the trend continues.

5.2 Minimum Functionality Requirement

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.

5.3 Grading Standards

As we stated before, your final grade will be based upon assignment, lab, design discussion, and iClicker scores. Cutoffs will not be determined until the end of the semester. If you are on the borderline between letter grades, whether you have consistently handed in assignments, a general upward trend throughout the semester, and a strong finish will be taken into account. **To reiterate: in addition to these grades, students will receive course credit only if they submit minimally functional versions of all assigned projects.**

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. The weights may change slightly over the semester.

Assignment	Weight
HW1	1%
AndyBot	2%
HW2	1%
LiteBrite	5%
TASafeHouse	8%
Cartoon	10%
DoodleJump	13%
Data Structures and Algorithms Discussion	5%
Tetris	19%
Final Project	25%
Labs	9%
iClicker Quizzes	2%
Total	100%

Note that for the last 5 programming assignments, the design discussion will be worth about 10% of the grade for that project.

5.4 Early Handin Incentive

Students who hand in their projects by the "Early Deadline" listed on the handout will receive extra credit worth 4% of the total value of that program (e.g., a score of 80 on a program worth 100 points would become an 84).

We will only count the last handin that you submit. If you hand in early and then revise your program and hand in on time or late, your early handin will be ignored.

Note: Programming assignments that are not submitted through our electronic handin script will receive no credit.

Written homeworks do not have early deadlines.

5.5 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 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.

5.6 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.

5.7 Extensions, Incompletes, and Complaints

All due dates in this course will be rigorously enforced according to the mechanics described above. If you need an extension on an assignment for medical reasons or other circumstances beyond your control, you should contact the HTAs as early as possible before the assignment is due. No extensions will be granted on the day a program is due, barring a dean’s note. We will only grant extensions due to sickness, injury, or serious

personal or family problems. We also require an official note from Health Services, your doctor, or a dean.

Incompletes in the course will only be given to a student if they have formal permission from a dean.

If one of your assignments has not been returned, you should contact the HTAs and the situation will be rectified.

If at any time you have complaints about policy or feel you have been treated unfairly, by all means, contact an HTA. If the HTAs are unable to resolve your problem, please feel free to see Andy about what's bothering you. We know we have a lot of policies, and they all have reasons behind them, so feel free to ask us if you don't understand why we have a certain policy.

5.8 Retake Policy

We offer a retake option for those who drop or do not pass the course this year. You can find it [here](#).

6 Collaboration

Please read our [Collaboration Policy](#) carefully and be prepared to complete the Collaboration Contract in your first lab. This policy is extremely important; read the document to make sure you understand our policy and to minimize your chances of breaking it.

7 Changes and Feedback

CS15 is a constantly evolving course. Changes are made every year in order to adapt both to technological advancements, which are inevitable in the field, and to student concerns and needs. We will email out several surveys throughout the semester, and we really appreciate your constructive criticism on any topic. In short, if you don't tell us, we will assume everything is just fine, which may not be an accurate impression - so if you have any problems, please speak up!