Course Package: CSC111 Spring 2020
Introduction to Computer Science Through Programming
https://amgrubb.github.io/csc111

Instructor: Alicia M. Grubb, Ph.D.
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Website: https://amgrubb.github.io Office: Ford Hall 355
Student Hours: See course website for times.
For accessibility reasons, we kindly ask that you refrain from wearing any scented products in class, lab, or student hours for CSC111.

Smith College Catalog Description: *Introduction to a block-structured, object-oriented high-level programming language. Covering language syntax and use the language to teach program design, coding, debugging, testing and documentation. Procedural and data abstraction are introduced.*

Welcome to CSC111!

Computer science is an exciting and expanding field that is increasingly becoming imbedded into every facet of life. Having a basic understanding of computational thinking and programming is the first step to contributing to the next great innovation. In this course we focus on fundamental ideas, principles, and methodologies in computer science. To contextualize these ideas we will write programs using Python, but the skills you develop will apply to other languages as well. In the first half of the semester we will discover individual constructs in programming and in the second half we will look at applications as well as an introduction to some data structures.

Learning Promises. By the end of this course, you will be able to:

- Create and document computer programs using correct Python syntax that can be readily understood and used by other programmers.
- Propose algorithms in order to analyze problems that use basic control flow constructs (e.g., if-then statements, loops, functions, lists, simple input-output).
- Demonstrate foundational development techniques, including top-down design, program documentation, modular design, and library usage.
- Understand the high-level internal operation of a computer, including the central processing unit, simple memory management, and the file system.
- Explain core computer science topics, such as complexity, object-oriented programming (OOP), sorting, and recursion.

This course will also help you develop the Essential Capacities for Smith Students.
Like learning anything, it is all about practice. We invite you to participate in class, lab, and self-study, which will lead to the fulfillment of our learning promises. In classes we will develop ideas and introduce best practices. In labs you will work with a partner in deliberate and structured practice with the guidance of our lab instructor (David A. Marshall). In your self-study you will work through additional and complementary problems to deepen your learning. While the core of the material will be covered in class, you are also responsible for material in labs, and self-study. We discuss these activities in detail on the following pages.

In the remainder of this course pack we will introduce the policies and deliverables for the course. Apologies for the length of this document. I wanted to put everything in one place, so that you can refer to it throughout the term.

Course Policies

Prerequisites. This course does not have any prerequisites. In this class, we will not assume that you have prior computer science or programming experience. If initially you find the pace of class too slow and homework too easy, then you are invited to help your peers in the lab, until everyone has caught up to your prior experience. To this end, everyone is expected to respect and honour the unique perspectives each participant brings to this course and work to help one another.

Communication Expectations. All written communication regarding this course will take place via slack (a cloud-based team collaboration tool used by many tech companies for internal communication). Our slack team is "smith-csc111-s20.slack.com". This includes:

- course announcements in the #announcements channel
- questions about the material in the #questions channel
- find a study buddy for assignments & learning quests in the #activity-buddy channel
- share your Smith/Five-College interests (e.g., concerts, club events, sports games) with our community in the #campus-news channel
- share any interesting tech/CS news in the #tech-news channel
- messages between individual students via private Direct Message
- private messages the instructor (via Direct Message to Alicia (Prof)) for individual matters (absences for illness, athletics, travel).

Although I will try my best, I cannot commit to checking Slack after hours (i.e., evenings and weekends), so please ask questions publicly so that your peers can help you. Participants are expected to be good citizens on Slack.
Email is hard to search, response rate is slow, and messages are likely to get lost, please use Slack.
In order that all forms of self-identity can be honored, all participants are expected to be respectful of everyone's name and pronouns both in written and verbal communication.

Course Materials. There is no required textbook for the course, and you do not need to buy any textbook to be successful. Below are textbooks that you may want to review as a resource and some students have found helpful in the past:

1. Allen B. Downey. Think Python; 2nd edition (2015). ISBN: 978-1491939369
   Note: eBook available for **FREE***: http://greenteapress.com/thinkpython2/thinkpython2.pdf .*
2. John M. Zelle. Python Programming: An Introduction to Computer Science. Franklin, Beedle & Associates; 3rd edition (August 8, 2016). ISBN: 978-1590282755
   (*Note: This is the newer edition, but the 2nd edition is also fine as a reference.*)

These books have been put on course reserve at the Young Library.

Student Hours (a.k.a. Office Hours). I enjoy talking with students in small groups, so I encourage you to come early and frequently to my office. This is important for you to discuss course materials, research opportunities, and future planning.

> **Student Hours** are for all students to discuss questions. We might work out algorithms on a white board or discuss tricky aspects of the homework.
> **Appointments** are 10-15 minute private appointments for students to discuss individual matters. My schedule is at https://tinyurl.com/grubb-app and linked from the course homepage. These must be scheduled at least a day in advance. If none of the available times fit your schedule, send me a private message @Alicia (Prof) on Slack.
> **Technology Teas** are for all Smith students to discuss computer science and technology more broadly, and you are encouraged to attend. Questions about CSC111 will not be entertained during technology teas.

Help Centre: Computer Science Teaching Assistants. CS classes are supported by a team of enthusiastic TAs who share their expertise with students in evening drop-in help sessions. Our CS TAs are dedicated to helping students (especially those who have no prior knowledge of computer science) develop excellent problem-solving and programming skills in a friendly, confidence-building environment. See the schedule of daily office hours at:
http://www.science.smith.edu/classwiki/index.php/Computer_Science_TA_hours

Grading and Late Work Policies. Your final grade in this course will be calculated as follows:

- Labs, homework assignments, and class/lab participation. 60%
- Tests/Exams. 20%
- Course Project. 20%

Due to the number of students enrolled in this course, as well as the pace of the material, no extensions will be given, and no late assignments will be accepted. While this is against my pedagogical instincts, as your instructor, I'm choosing to focus on getting feedback to you in a timely manner. To mitigate this firm late policy, students have the opportunity to gain extra credit in this course by completing Learning Quests.

Technology Policy. I want to create a computer policy that lends itself to accessibility but also respects the important scholarly work we will do as a class. You are most welcome to use your laptop during certain activities in the class for the purpose of taking and reviewing class notes as well as writing programs. We, as a class, will discuss how to create technology-free times and spaces to complement our learning. In past years, the first two rows of the classroom was our designated *technology-free zone*.

Collaboration and Honor Code. In this course, you are expected to uphold the Smith College Honor Code Statement:

> "Students and faculty at Smith are part of an academic community defined by its commitment to scholarship, which depends on scrupulous and attentive acknowledgement of all sources of information and honest and respectful use of college resources. Smith College expects all students to be honest and committed to the principles of academic and intellectual integrity in their preparation and submission of course work and examinations. All submitted work of any kind must be the original work of the student who must cite all the sources used in its preparation." [https://www.smith.edu/sao/handbook/socialconduct/honorcode.php]

Participants in this course are strongly encouraged to work together, form study groups, and to collaborate on assignments, and labs. Each piece of work submitted should contain the following header. Assignments and labs that do not contain the header at the top will not be graded.

```
# ----------------------------------------------------
#        Name:  - your name (and your partners name)
#     Section: L01, L02, L03, or L04
#    Filename: labXX.py or hmwkXX.py
#       Peers:  - names of CSC111 students who you consulted or ''N/A''
#  References:  - URL of resources used
# ----------------------------------------------------
```

Below are some guidelines to follow to help you understand how to collaborate honorably:

- In the header under "Name" write the names of all submitting students.
- In the header under "Peers" write the names of all students who you collaborated with. If you worked alone (or just with your submitting partner), please state: "N/A" or "I did not collaborate with anyone on this assignment."
- In the header under "References" section, with in-line citations to any resources you used. Citations should include page numbers (if a printed resource) or a direct URL (if an online resource). If you did not use any resources in completing the assignment, please state: "N/A" or "I did not use any external resources in completing this assignment."
- Complete the labs primarily with your partner. If you experience problems you can get help from the lab instructors, TAs, and other students. If another student helps you add their name to your header under "Peers".
- Complete the homework assignments alone or with your partner. If two students (who are not partners) want to discuss a homework assignment or the course project, then they may do so as long as: (a) neither is in front of a computer or printed code, (b) neither retains any notes from the conversation, and (c) they discuss the assignment in generalities. If you discuss the assignment with anyone under these conditions, state their names under "Peers".
- Do not post lab or homework assignment answers on Slack.
- When searching for research online, consider what is your intention for searching.
  - It is not honorable to explicitly look for solutions or answers to the lab or homework assignment problems, and you should not search for them.
  - It is honorable to use online resources for your learning. If you search for help on programming constructs or Python syntax (e.g., "python loops", "else if in python") this is acceptable and you do not need to reference these searches.
  - It is honorable to use online Python libraries and packages in this course. If you use the package documentation or advice from other programmers on how to use these packages, you should cite these resources in your header.
  - For the course project, you may want to incorporate an advanced algorithm (i.e., outside the scope of this course) into your code. This is honorable as long as you understand every line of code and you cite the source of the algorithm in your header and at the beginning of the copied code. In this case, you must include comment blocks around the copied code to indicate where it starts and ends.

Resources and Support

College life is a time for discovering one's self, and some students will require support on this journey. I encourage all students to seek the support they need.

Class Deans. Your class dean is here to help you and advice you. She is an excellent resource to help you make the most of your time at Smith.

Jane Stangl *Dean of the First-Year Class*; jstangl@smith.edu, 413-585-4910
https://www.smith.edu/about-smith/class-deans/first-year-dean
Tina Wildhagen *Dean of the Sophomore Class*; twildhag@smith.edu 413-585-4930
https://www.smith.edu/about-smith/class-deans/sophomore-dean
Andrea Rossi-Reder *Dean of the Junior Class, and Ada Comstock Scholars*; arossireder@smith.edu 413-585-4930
https://www.smith.edu/about-smith/class-deans/junior-ada-dean
Danielle Carr Ramdath *Dean of the Senior Class and Associate Dean of the College*; dramdath@smith.edu 413-585-4920
https://www.smith.edu/about-smith/class-deans/senior-dean

To meet with your dean in person, either attend their walk-in hours (listed on their respective websites) or call 413-585-4915 to book an appointment.

Student Affairs. There's more to your time here at Smith than what appears on your academic transcript. Student Affairs is here to help you find that balance and any of the Associate or Assistant Deans can help.

Julie Ohotnicky *Associate Dean of the College/Dean of Students*; johotnic@smith.edu
Becky Shaw *Associate Dean of Students/Director of Residence Life*; rshaw@smith.edu
Marge Litchford *Assistant Dean of Students*; mlitchfo@smith.edu

To meet with one of the deans in Student Affairs call 413-585-4940 or by email directly.

Faculty Advisors. Every student at Smith college is assigned a faculty advisor to help them select courses as well as to help them reach their personal and professional goals. Your faculty advisor can also support you and connect you with resources.

Resources and Self-Care. See https://www.smith.edu/sao/about_support.php for a list of offices and centers that will complement your learning experience and help you make the most of your journey here at Smith.

If you will be absent from class for a faith/nonfaith-based/cultural reason, please share this information with me prior to your absence. If you do not have access to materials, books, a computer, etc., please let me know as soon as possible. Smith College and the Department of Computer Science have additional resources for students who do not have access to laptops.

Accessibility. Smith College is dedicated to making sure the college, courses, and associated content are accessible to all students of all abilities. I work to ensure that all of my teaching materials and my class are accessible. To this end, all PDFs are accessible. This means that you can use a reader software to read out loud the text of the PDF. I provide all of my slides online in PDF format. If you encounter any material that is not easily accessible to you, please let me know right away so that I can find a solution. In addition, the Office of Disability Services at Smith College works with students, faculty, staff, and visitors to "proactively identify and remove barriers to participation wherever possible. We also strive to promote a disability positive and inclusive climate

at Smith that recognizes each person's multiple identities and values the diverse perspectives that contribute to a multicultural living and learning environment. Smith's commitment to providing support and services is balanced with a humanistic and developmental approach that requires student engagement and responsibility in the accommodation process," [https://www.smith.edu/about-smith/disability-services]. **If you require an accommodation in this or any course, please call (413) 585-2071 to arrange an appointment with Laura Rauscher, Director of Disability Services.** You are also encouraged to book an appointment with me (Prof. Grubb) to discuss your unique needs. 20% of students at Smith College have a disability and use the office. There is no stigma in seeking assistance to ensure you have access to events, facilities, course content, etc. Furthermore, Jeanette Landrie, Coordinator for Academic Access, is available to assist all students (independent of disability status) who require assistance with learning strategies. You can email Janette at jlandrie@smith.edu or attend drop-in hours: Thursdays 2–4pm (academic year).

Title IX. I am a responsible employee when it comes to reporting sexual violence. That means I am required to report certain incidents to the Title IX Coordinator. Smith College cares about the safety of students and has created this requirement because sexual violence in all its forms is unacceptable. Your privacy is of utmost importance and Smith will do everything possible to keep all reports private and only share with those who need to know. You will never be forced to share information and your level of involvement will be your choice.

Acknowledgement: Some of the materials used in this course and this syllabus are derived from previous offerings of this and other courses at Smith College, as well as similar courses taught at other institutions. Appropriate references will be included on all such material.

Course Deliverables

In a typical week in CSC111, you will attend three classes, one two-hour lab, and complete a homework assignment. I describe these activities below. Towards the end of the term, you will work on a course project instead of weekly homework assignments.

Classes. Class is where we introduce new ideas and work through concepts together. When you come to class, you should bring your full attention, desire to participate, and a pen/pencil. In-class discussions are a very important part of your learning, in which all students are expected to be active participants. I define active participation as contribution to group discussions (i.e., sharing half-formed thoughts), intellectual engagement and curiosity, and showing respect for yourself, other students, and the instructor. I will make space in each class for you to ask questions as well. We all learn in different ways; we have different strengths and capabilities. Our *pedagogical partner* (Mariah White) and I strive to create a supportive learning environment. Please feel free to discuss with us any questions or concerns about your particular learning approaches at the beginning of the semester and, indeed, throughout. I also ask that you please do not come to class with cold or flu symptoms. This jeopardizes your own health as well as others in our classroom. This can be particularly debilitating for folks with autoimmune disorders. *If you are sick or have to miss class, send a note to Alicia (Prof) via Direct Message on Slack.* Occasionally, a short reading, podcast, video, or problem will be assigned at the end of a class for the next class. This class prep will take no more than 30 minutes and will be discussed in the next class. See the full schedule of class topics on page 9.

Labs. In labs, you will work with a partner in deliberate and structured practise with the guidance of our lab instructor (David A. Marshall). Labs must be done in pairs, selected each lab (you will work with a different person each week). We will use pair-programming, which entails:

- Two participants using one computer to solve problems together.
- A "driver" typing and a "navigator" giving directions.
- Switching roles every 15–20 minutes.

Each participant must register for one of the four lab sections corresponding to this course. Attendance will be taken at each lab session and your presence is required. Failure to attend four labs will result in failing the course. You will be evaluated based on your active participation; how you collaborate and co-learn with your lab partner and interact with the lab instructor each week. The lab instructor (and TAs) are there to help you learn and can also help with course concepts. You may want to show the lab instructor or the TA the correct operation of any of your programs to get additional feedback/advice. You will then submit your work via Moodle **prior to the end of the day**. After leaving the lab and before the end of the day, you are required to privately review the performance of you and your partner using the *Lab Feedback form* (linked from the course webpage). Most labs are longer than what you can complete in two hours. You are NOT required to complete all steps in each lab in order to receive full credit, though you may wish to complete them on your own time for your own learning. You will not receive feedback on your lab submissions to Moodle, you should get feedback during lab. We may review Moodle submissions to monitor your progress. If you do finish earlier, you will be encouraged to help your peers, or work on your homework assignment. See the full schedule of labs on page 9.

Self-Study. Self-study is important to your own development as a computer scientist. Not everyone learns at the same pace so the amount of attention you need to give to each topic will vary. Since this is a 5-credit course, Smith expects you to devote 15 hours per week to CSC111, which translates roughly to 9+ hours per week outside class/lab. Self-study includes preparing for class, reviewing

class materials, homework assignments, course project, and preparing for exams. If you are working more than this for more than one week, talk to your instructor, lab instructor, or TAs because you may need to study differently rather than dedicate more hours. See a full list of important dates on page 9.

Homework assignments: There are nine homework assignments in this course. Assignments will be posted by class on Monday, and will be due on Moodle (moodle.smith.edu) at 10:00PM (EST) the following Tuesday. Homework assignments are designed to gage your progress in your learning. Although they might feel like a lot of work, by completing and understanding every line of code that you write, you will make progress each week towards your learning promises. Homework assignments should be completed in identified pairs (not more than two students), but can be done individually. You should submit your assignments separately, but you will receive the same grade as your partner.

Moodle practise problems: Work is ongoing to develop a set of additional practise problems. These problems appear as quizzes on Moodle, so that you can check whether you have the correct solution and practise test taking, but you will not receive course credit for completing these practise problems.

Studying for tests/exams: There will be one written midterm examination and one final examination. These exams are intended to evaluate your progress toward learning constructs and complement the labs and homework assessments. More details about the format and content will be given prior to each exam.

Course project: There is one major group project on a topic of your choosing. As a group you will propose a topic and create prototypes of your program throughout the second half of term. You will present your project in the final week of class and reflect on the experience. More details will be given as the term progresses. See page 9 for project dates.

(Extra Credit) Learning quests: To receive extra credit in this course, you are invited to participate in roughly one learning quest each week (up to 10 for the course). There are 20+ quests to choose from and you should only complete each learning quest once. See page **??** for the list of learning quests. You should report your progress each week on the Google form linked from the course webpage.

Programming training groups (new): This year the department of computer science has created an additional help option for CSC111, modeled on the successful Calculus Training Groups. Participants will meet as a peer group weekly with a peer mentor to discuss challenges in the course and focus on their development as programmers. The application is linked from the course webpage.

Schedule & Important Dates

Below is the tentative schedule of topics that will be covered in class and lab, as well as a list of deadlines for course work outside of lab. See Slack (#general channel) for updates about the class schedule.

Week	Dates	Class	Lab	Homework Topic	
1	Jan 27-31	Welcome & First Program	L0: Ready, Set, Go!	A1: Curiosity & Belief	(Feb 4)
2	Feb 3-7	Conditionals & Operators	L1: Cond. & Operators	A2: Operators and Conditions	(Feb 11)
3	Feb 10-14	User Input, String, main()	L2: Strings and Input	A3: Strings and Input	(Feb 18)
4	Feb 17-21	Loops and Random	No Lab - Rally Day	A4: Dubugging and Reading Code	(Feb 25)
5	Feb 24-28	Functions	L3: Loops and Random	A5: Loops	(Mar 3)
6	Mar 2-6	Lists and Dictionaries	L4: Functions	A6: Functions	(Mar 10)
7	Mar 9-13	Review & Recursion	L5: Lists and Dictionaries	A7: Lists and Dictionaries	(Mar 24)
Spring Recess March 16–20					
8	Mar 23-27	Classes	L6: Recursion	P1: Project Proposal***	(Mar 31)
9	Mar 30-Apr 3	Animation	L7: Classes	A8: Recursion	(Apr 7)
10	Apr 6-10	Files and Interactions	L8: Animation	P2: Project Prototype	(Apr 14)
11	Apr 13-17	Sorting	LP: Final Project	A9: Classes	(Apr 21)
12	Apr 20-24	Data Structures	L9: Sorting	P3: Project Prototype II	(Apr 26*)
13	Apr 27-May 1	Demo & Advanced Topics	L10: Review	P4: Project, Video, & Reflection	(May 1**)

* Due at time of Project Demo Sessions (April 27).
** Due on the last day of classes.
*** Proposal is short, it is strongly recommended to complete half of A8: Recursion this week as well.

Tests/Exams.
Test 1: March 6–8
Test 2: April 3–5
Exam: May 5–8

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I am committed to your success in CSC111 and believe strongly that if you commit to this class and your own learning you will be able to:

- Create and document computer programs using correct Python syntax that can be readily understood and used by other programmers.
- Propose algorithms in order to analyze problems that use basic control flow constructs (e.g., if-then statements, loops, functions, lists, simple input-output).
- Demonstrate foundational development techniques, including top-down design, program documentation, modular design, and library usage.
- Understand the high-level internal operation of a computer, including the central processing unit, simple memory management, and the file system.
- Explain core computer science topics, such as complexity, object-oriented programming (OOP), sorting, and recursion.

Additionally, I make the following commitments to you:

- Offering class sessions that are interesting and engaging.
- Providing timely feedback on homework assignments and labs.

In the end, the decision to participate in CSC111 is yours. I hope that you will choose to join me this term.

Best regards,
Alicia M. Grubb

I, _____, have decided to participate in CSC111 and make the following commitments:

- I have read the entire syllabus and understand what is expected of me.
- I will provide the correct pronunciation of my name through Name Coach.
- I commit to attending class and bringing my whole self to class.
- I will engage in class in a productive manner. This means actively listening, limiting unrelated technological distractions, asking questions as they arise, and offering comments that continue and diversify our class discussions.
- I will treat others with respect and use the names and pronouns of my peers.
- I will work collaboratively in lab and not withhold information from my partner or peers.
- I will honestly review the efforts of myself and my partner in lab.
- I will meet the deadlines for labs and homework assignments.
- I will actively contribute to my group in the course project.
- I will seek help from a peer, TA, or the course/lab instructor when I am having difficulties.

In the box below write a short summary of what the Honor Code means to you:

Name: _____ Student Number: _____

Signature: _____ Date: _____