

CS 510

This page contains the syllabus for CS 510 and is used to keep track of assignments, etc. as well for the most recent offering (fall 2022).

CS 510 is Fast Track Introduction to Programming. The course has no pre-reqs (can be taken by those with no prior CS or programming experience) and is meant to (a) get you programming (in python), and (b) get you ready to pass the admissions interview (python programming and basic algorithms / data structures). CS 510 counts as elective credit towards the MS degree. The course is meant for current ISU students in non-CS programs and for potential incoming CS MS students who need the course to get ready for the CS MS.

For more information on applying to the CS MS program, see <http://cs.indstate.edu/info/apply.html>

Contents

Who Should Register

General Course Information

Announcements/Assignments/Quizzes

- Assignments

- Announcements

Course Description and Content

Grading and Assignments

CS-Specific Items

- CS Course Policies

- Lab Help

- Course Announcements

- Classroom conduct

- Academic Integrity

- Office hours (using Teams)

- Canvas

- Lectures (using Zoom)

- Participating online

ISU Required Syllabus Items

- COVID-19 Information

- Special Needs / Disability Services

- Disclosures Regarding Sexual Misconduct

Who Should Register

Current ISU Students: For ISU grad students who are in non-CS programs, if you do not have much programming experience, CS 510 is your best starting point in CS coursework. If you are already a competent programmer in some language, then you likely would want to start with either [CS 500](https://cs.indstate.edu/~lmay1/courses/#/courses/cs500/home) or [CS 501](https://cs.indstate.edu/~lmay1/courses/#/courses/cs401/home) (<https://cs.indstate.edu/~lmay1/courses/#/courses/cs401/home>). CS 500 is C and data structures and algorithms, while CS 501 is python and data science.

Non-ISU Students: *Domestic students who are not quite ready to start the CS MS (or just aren't sure if they want to do a full MS) can apply to ISU as a Guest/Unclassified student (<https://www.indstate.edu/cgps/graduate/apply/non-degree-application>) and take the course either face to face or online. To do this, click on the Apply button, click to create an account if this is your first time starting an application at ISU, choose Graduate when prompted between Graduate or Undergraduate, for the Field of Interest choose "Guest Admission / Unclassified", and for Program of Study choose "Guest Admission (One Semester Only)". Choose the term that you plan to take the course, and complete the remaining required fields.*

International students outside of the US are not in general allowed to take courses online inside of the US without being enrolled in a degree program. International persons who are in the US on a visa of some type might be allowed to take the course (in particular, those on F2 or H4 likely would be allowed). Those who cannot take courses at ISU can check back here for course info (sample quizzes, reading assignments, programming assignments, tutorials, etc.) that will be posted publicly throughout the fall 2022 term.

For those with no or little prior programming and CS experience, you are highly recommended to take this course to build your programming skills (and for those interested in a CS MS, to get you ready to apply to the CS MS program).

General Course Information

Course website - https://cs.indstate.edu/wiki/index.php/CS_510

Your Instructor

Jeff Kinne (<https://kinnejeff.com>), jkinne@cs.indstate.edu (<http://mailto:jkinne@cs.indstate.edu>)

Office: Root Hall A-142 and in Microsoft Teams, phone 812-237-2126

Instructor Office Hours: MWF 10am-1pm, MTWRF 2-3pm

Lecture, Exam

Lecture: Wed 12-1pm in Root Hall A-186 and over Zoom (in Canvas, see below), and recorded

Mid-term exam: TBA

Final exam: TBA

Asynchronous students: For students who will be mostly participating asynchronously even though the course is being offered synchronously, you should pick a regular time each week to check in with the instructor. Make an appointment with the instructor during the first 2 weeks at this time to make sure you are on track. Each week at this time, write an email or Teams message to the instructor to let them know how things are going and if you have any questions.

Prerequisites - none.

CRN numbers - 53503 for the 001 face to face section, 52504 for the 301 online section

Required text

- We will use the following free online sources.
- For python - **Python Official Documentation** (<https://docs.python.org/3/>), **Pandas Official Documentation** (<https://pandas.pydata.org/docs/>)
- For data structures and algorithms - **Open Data Structures** (<https://opendatastructures.org/>) by Pat Morin, **Algorithms** (<http://jeff.cs.illinois.edu/teaching/algorithms/>) by Jeff Erickson
- For math content - **Building Blocks for Theoretical Computer Science** (<https://mfleck.cs.illinois.edu/building-blocks/index-sp2020.html>) by Margaret M. Fleck, **Mathematics for Computer Science** (<https://courses.csail.mit.edu/6.042/spring1>)

[8/mcs.pdf](#)) by Eric Lehman, F Thomson Leighton, and Albert R Meyer

- Additional sources - as needed.

Class notes - Notes during class will mostly be kept in the **CS 510 OneNote notebook** (https://sycamoresindstate-my.sharepoint.com/:o:/g/personal/jeffrey_kinne_indstate_edu/Esopw95fVJZJLZ-cySXQWs4B3ZLC_Vwclet7bWeTaWgD9Q?e=7YDH4i) and might be made available later as a PDF. Note that you will need to authenticate with your ISU account to view the notebook.

Code from lectures - Some code from lectures will be at <https://cs.indstate.edu/~cs510/>

Announcements/Assignments/Quizzes

This section will be kept up to date with announcements of assigned reading, assignments, quizzes, etc. This will be kept as a "stack" with the most recent at the top of the list.

Assignments

- Install Python on your personal computer. Saving for later.
- **Gitlab** - for CS MS students only - create bullet points, etc. that can be used for the Cheat sheet/Vocab part of **Gitlab - Getting Started**. Set up your own repository at gitlab.indstate.edu that can be used as an example for the class. Note that to push content to gitlab.indstate.edu, you will need to have logging in with an SSH key enabled, and you will only be able to do this from on campus (or in the terminal on the CS server). Get this working and create a document that can be used to guide others through the process (which can be incorporated into the wiki). Due Sept 6.
- **GNU Make** - for CS MS students only - working on creating getting started material that can be used in the wiki as documentation for others. This will be incorporated into **Make**. Due Sept 6.
- **Python pandas** - for CS MS students only - work on creating getting started material for the python pandas package that can be used in the wiki and in this course. Due Sept 6.
- Python - fixing some classic mistakes in some programs.
- Python - typing in basic program to demo to lab assistant.
- Python - making edits to some classic beginning programs.
- Python Keywords and Data types. See the practice quiz linked at the bottom of. **Python Keywords, Concepts, Functions**. Due Sept 13.
- Python Operators Quiz. See the practice quiz linked at the bottom of **Python - Operators, Expressions**. Due Sept 13.
- **Text Editors Terminal** assignment. Due Aug 29.
- Hello unix lab. Follow instructions in **Hello Unix Lab**. Due Aug 24.
- Connect to the CS server remotely. See **CS Server - Terminal** for what you need to do. Note that you will be doing both of these two assignments all together. Due Aug 19.
- Login to the CS server. See **CS Accounts and CS Lab Computers** for what you need to do. Your login information will be sent to you by email in the morning. Due Aug 19.

Announcements

- 2022-09-14 - programs we will look at today are at link above for code we look at during lecture (<https://cs.indstate.edu/~cs510/>). Will make an assignment based on these after class.
- 2022-09-07 - two quizzes assigned, see above.
- 2022-08-24 - for those with significant previous experience, I am thinking to have you work on programming contest problems in addition to following along with the regular content for this course.
- 2022-08-24 - note the quizzes mentioned above that will be coming up soon.
- 2022-08-24 - regular meeting time will be Wednesdays 2-3pm. This is not required - it will be recorded, and I'll be posting additional recordings.
- 2022-08-17 - reading assignment - <https://docs.python.org/3/tutorial/introduction.html>

- 2022-08-11 - we will start the term by getting everyone setup to use Python on their personal computers and starting to work through the [tutorial from python.org \(https://docs.python.org/3/tutorial/index.html\)](https://docs.python.org/3/tutorial/index.html)
- 2022-08-11 - creation of this site, including the preliminary list of topics, outcomes, achievements, etc.

Course Description and Content

Course Description

The catalog description for this course is: "A compressed introduction to programming in a specific language for the purpose of assisting student to become competent programmers in the language quickly." **However**, the course is being changed so that it clearly is for an audience without much CS or programming background, and so that one of its outcomes is to help those interested in a CS MS to be able to pass the ISU CS MS admissions interview process.

The following is the plan as we start the semester. As this is the first time for this course to be offered in this way, I will be updating this as we make our way through the term.

Course Outline

- Getting started - system setup, linux, math background, development on your personal computer.
- Python programming basics - operators, reserved words, data types, base systems, overflow.
- Python programming containers - strings, tuples, lists, dictionaries, sets.
- Python programming object-oriented
- Python programming style - good programming style for reliability, readability, extensibility, security.
- Data structures - understanding/use of most important data structures - arrays, linked lists, binary search trees, hash tables, heaps. Implementation of some of these in Python.
- Algorithms - understanding/use of some basic algorithms - sorting (various), binary/linear search (and uses) - including some algorithms that are each of - greedy, heuristic, randomized, brute force / backtracking.
- Vocab - additional terms, algorithms, concepts at a shallow level.

Learning Outcomes

- System setup - personal computer setup for both remote (connecting to CS server with terminal, sftp, X windows) and local development (editor, compiler/interpreter).
- Linux - proficient using the Linux terminal for development.
- Math background - proficient in math background needed for data structures and algorithms.
- Personal computer - is setup for development so you can do coursework from your home computer as well.
- Python programming - understanding of most language features, proficient in writing code using the most common, write code using good programming style.
- Data structures - understanding of operations, efficiency, use cases, can use builtin python data structures and write python code for some data structures that are not included in python.
- Algorithms - understanding of basic algorithms, arguments for correctness and efficiency, can use the algorithms to solve problems efficiently.

Grading and Assignments

We will be trying out what I am calling "achievements-based" grading. There are a series of skills, knowledge, and experiences that I want you to achieve. Your final letter grades will be based strictly on which of these you have completed. For each achievement, you can achieve the rating of incomplete, pass-, pass, pass+. The following will be our starting point for how letter grades will be assigned. I will reevaluate this throughout the term to make sure we are on track. I will also be setting the standards for pass-, pass, and pass+ for each of the achievements as we get to them in the course.

C - lowest passing grade in a grad course

- Pass or higher achievement for *all* of the following
- *Will be filling these out as we make our way through the term and start having assignments.*

B - satisfactory

- In addition to the above...
- *Will be filling these out as we make our way through the term and start having assignments.*

A - good/excellent

- In addition to the above...
- Pass+ rating on most of the above
- Pass or higher achievement for *all* of the following
- *Will be filling these out as we make our way through the term and start having assignments.*

Achievements can be earned based on quizzes, assignments, in-class work, and exams. Rather than having numerical scores for these, I will use them to mark off your achievements. Note that achievements can be "lost" if you demonstrate a skill early in the term and then demonstrate a lack of the skill later in the term. I expect this will not normally be the case, but I will continue to evaluate you based on all of the skills throughout the term.

Late Work - Assignments will generally be available to still handin for around a week after their due date. Once the solutions are posted and discussed, late submissions will no longer be graded. Quizzes will normally need to be taken on the day they are due, or perhaps within a few days of when they are due. Solutions will normally be discussed or posted within a week of their due date. Not accepting late work that is more than about a week old is in part because it takes much longer to grade quizzes/assignments that are no longer super fresh in the instructor's head, and in part to try to keep everyone in the class working on the same material.

Start Assignments and Quiz Studying Early - I suggest attempting an assignment the day it is given, or the day after, so that if you have a problem you can ask early. If you continue to have problems in trying to complete the assignment, you will have time to ask again. Many of the assignments require thought and problem solving, which takes "time on the calendar" not just "time on the clock". By that I mean that spending an hour on 3 consecutive days is likely to be more productive than trying to spend 3 hours at once on the assignment.

Expected Amount of Work - My expectation is that an average student will spend about 5-10 hours OUTSIDE of class each week (that is in addition to class time or viewing lecture videos) WORKING PRODUCTIVELY/EFFICIENTLY (not just staring at the computer) to complete their coursework for this class. Some students may spend less time than this, and some students will spend more.

This is the foundation for the rest of CS, so it definitely pays off to do your best here.

Note - please find a way to spend enough time on this class (the investment will pay off in terms of skills, being able to get a job, etc.).

Grade Meanings - The letter grades are intended to have the following rough meaning. The list of achievements needed for each was chosen with this in mind.

- A+/A: You understand everything and probably could teach the course yourself.
- B+/A-: You understand nearly everything, and should be all set to use this knowledge in other courses or in a job.
- C/C+/B-/B: Some things you understand very well and others you don't (more towards the former for a B and more towards the latter for a C).
- D-/D+/C-: You did put some effort in, and understand many things at a high level, but you haven't mastered the details well enough to be able to use this knowledge in the future. **Note that the lowest grade for grad courses is a C, so**

if you fall in the range below C then your letter grade will be an F.

- F: Normally, students that get an F simply stopped doing the required work at some point.

CS-Specific Items

This section contains items that are generally the same for all CS courses (and in particular those taught by this instructor).

CS Course Policies

Note that this course follows all standard CS course policies. In particular, (a) cheating/plagiarism by graduate students results in an F in the course, (b) and there will be no makeup exams. See <http://cs.indstate.edu/info/policies.html> for details.

Lab Help

We have a few lab assistants who are available to help students in beginning computer science courses. Please see https://cs.indstate.edu/wiki/index.php/Unix_Lab_and_Help for details. The lab hours are in a calendar on the CS homepage, at http://cs.indstate.edu/info/index.php#lab_hours. You can join the lab when working on your programs. You can ask the lab assistants to look at your programs, and you can work with any other CS students that are there (you could use the lab as a regular meeting place to work with your classmates).

Course Announcements

Announcements regarding the course will be made both during class and via email to your @sycamores.indstate.edu email address. You should regularly check this email account or have it forwarded to an account that you check regularly. You can set the account to forward by logging into your indstate.edu email online (if you aren't able to find the option, try a different browser or search online for things like - outlook online forward email setting).

Classroom conduct

You may not use cell phones, iPods/music players, etc. during class. You should be civil and respectful to both the instructor and your classmates, and you should arrive to class a few minutes before the scheduled lecture so you are ready for lecture to begin on time. You may use your computer during class if you are using it to follow along with the examples that are being discussed. You should avoid spending time on email, Facebook, work on other courses, etc. during the lecture for this class (be fully present wherever you are, make the most of each experience).

Academic Integrity

Please follow these guidelines to avoid problems with academic misconduct in this course:

Homework: You may discuss the homework assignments, but should solve and finish them on your own. To make sure you are not violating this, if you discuss with someone, you should DESTROY any work or evidence of the discussion, go your separate ways, SPEND at least an hour doing something completely unrelated to the assignment, and then you should be able to RECREATE the program/solution on your own, then turn that in. If you cannot recreate the solution on your own, then it is not your work, and you should not turn it in.

Note on sources: if you use some other source, the web or whatever, you better cite it! Not doing so is plagiarism.

Exams: This should be clear no cheating during exams. Each instructor has different rules for what is allowed on exams in terms of notes, etc. If not noted otherwise, you should assume that a quiz or exam is closed notes, no computer, no calculator.

Projects: You should not copy from the Internet or anywhere else. The project should be your own work. It will be fairly obvious to me if you do copy code from the Internet, and the consequences will be at the least a 0 on the project. If cheating is observed, you will at the least receive a 0 for the assignment (and may receive an F for the course), and I will file a Notification of Academic Integrity Violation Report with Student Judicial Programs, as required by the university's policy on Academic Integrity. A student who is caught cheating twice (whether in a single course or different courses) is likely to be brought before the All University Court hearing panel, which can impose sanctions up to and including suspension/expulsion. See <http://www.indstate.edu/sjp/docs/code.pdf> and <http://www.indstate.edu/academicintegrity/> for more information.

Please ask the instructor if you have doubts about what is considered cheating in this course.

Office hours (using Teams)

Office hours will be through Microsoft Teams by default. If you would like to meet in person you should reserve an appointment using <http://cs.indstate.edu/scheduler> to reserve an in person meeting with Jeff Kinne. I am normally in my office during my listed office hours, but by making an appointment you can be more certain. For meeting through Teams, you should start Teams in your browser or start the application. You should be logged in using your ISU credentials. Once you have Teams open you can message me to ask me questions or to ask to talk. We can use Teams to message (better than emailing back and forth repeatedly if you have questions about something that you just want to write about) or to talk and share screens (e.g., to take a look at your code). I normally have Teams open on my computer all of the time, including during my office hours. During my office hours I will normally reply right away; at other times I will reply when I get a chance.

Canvas

The course has a canvas site. Click <https://indstate.instructure.com/> to go to canvas. You should see this course listed under your courses for the current term. If you don't you may need to click on the Courses icon and then click the "All courses" link. The canvas site is used for giving you your grades, for quizzes/exams, and for getting to online lectures (which are done using Zoom). Announcements will be sent through canvas and to your university email. Links and such will be kept on this website.

Lectures (using Zoom)

Here at ISU section numbers starting with the number 3 (e.g.3xx: 301, 302, etc.) are generally online sections. There are 2 types of online sections, synchronous online and asynchronous online. Sections that are synchronous should be joined at the regularly scheduled time of the course, whereas sections that are asynchronous generally keep up with the material independently without regularly scheduled meetings. In general async sections are more difficult to stay on top of, and require a great deal of self-discipline (it is much easier to think "I can watch the videos tomorrow" and just get behind). So if you are in one of these sections make sure you get off to a strong start, and ask for help sooner rather than later. If you are in an online section, check your course schedule for course meeting times; if you have a meeting time, then your section is synchronous, otherwise it is asynchronous (or there is an error in the system).

This course has a 301 section (synchronous online) and 001 section (face to face). Students in either section can participate in whatever way you need to.

For ISU's links to information on getting started with Zoom, see <https://indstate.teamdynamix.com/TDClient/1851/Portal/KB/ArticleDet?ID=107534>. You can also see the information linked at <https://www.indstate.edu/services/student-success/cfss>. You will get to the lectures for this course by going to Canvas, select this course, click Modules on the menu on the left, and click on the Zoom module. Once there you should see a schedule of lectures and be able to view recorded lectures. Note that you should install the Zoom application for your computer, and you will need to be logged into Zoom with your ISU credentials to be able to connect. Also note that the lectures are recorded and only available to those in our class. Recorded lectures normally appear later the same day as the lecture.

Note that if you have not used Zoom with your ISU account previously, you need to go to <https://indstate-edu.zoom.us> and login with your ISU email address and password to get it setup.

Participating online

If you are participating online, please see the information at <https://www.indstate.edu/services/student-success/cfss> about participating in online courses. You are expected to either join lectures live through Zoom or watch the recordings once they are available. You will complete assignments, quizzes, and exams on the same schedule as the rest of the class. For quizzes and exams you will normally have a 24 hour period during which to take the quiz/exam (note that different students will have slightly different questions and any communication between students about quiz/exam content is academic misconduct).

So also the General Information section at the top of this page for setting up a normal check-in time with the instructor.

ISU Required Syllabus Items

The items in this section are required and are the same for every ISU course.

COVID-19 Information

Information specific to CS courses - [Start of Term Announcements](#)

Standard ISU language required in all syllabi (read this all once, then skim for your other courses)...

Students are expected to adhere to course attendance policies, as stated in the course syllabus. Documented COVID-related absences will be treated like any other serious medical issue. Following University policy, students with a documented, serious medical issue must contact the Office of the Dean of Students for assistance. The Office of the Dean of Students will supply documentation for faculty. Students with a documented serious medical issue should not be penalized and will be given a reasonable chance to complete exams or assignments. Once notification is made, faculty will make reasonable efforts to accommodate the student's absence and will communicate that accommodation directly to the student. Please note that faculty are not required to accommodate a serious medical issue with virtual content options, like streaming or recorded lectures. To avoid the potential of missing significant class time, students are strongly encouraged to receive the COVID vaccination that has been made available on campus. For more information about the vaccines or to find a vaccination site, go to: <https://ourshot.in.gov>. The ISU Health Center also administers COVID-19 vaccines by appointment.

Students should contact the Office of the Dean of Students with questions by calling 812-237-3829.

The information provided in this section of the syllabus is subject to modification based on guidance by public health authorities. Changes to Covid-related policies or updated information will, as always, be posted on the ISU website and communicated in multiple ways.

Special Needs / Disability Services

Standard ISU language required in all syllabi...

Indiana State University recognizes that students with disabilities may have special needs that must be met to give them equal access to college programs and facilities. If you need course adaptations or accommodations because of a disability, please contact us as soon as possible in a confidential setting either after class or in my office. All conversations regarding your disability will be kept in strict confidence. Indiana State University's Student Support Services (SSS) office coordinates services for students with disabilities: documentation of a disability needs to be on file in that office before any accommodations can be provided. Student Support Services is located on the lower level of Normal Hall in the Center for Student Success and can be contacted at 812-237-2700, or you can visit the ISU website under A-Z, Disability Student Services and submit a Contact Form. Appointments to discuss accommodations with SSS staff members are encouraged.

Once a faculty member is notified by Student Support Services that a student is qualified to receive academic accommodations, a faculty member is obligated to provide or allow a reasonable classroom accommodation under ADA.

Disclosures Regarding Sexual Misconduct

Standard ISU language required in all syllabi...

Indiana State University Policy 923 strictly prohibits discrimination on the basis of: age, disability, genetic information, national origin, pregnancy, race/color, religion, sex, gender identity or expression, sexual orientation, veteran status, or any other class protected by federal and state statutes in ISU programs and activities or that interferes with the educational or workplace environment.

Title IX of the Educational Amendments of 1972 prohibits discrimination based on sex, including sexual harassment. Sexual harassment includes quid pro quo harassment, unwelcome verbal or physical conduct, sexual assault, dating violence, domestic violence, and stalking.

If you witness or experience any forms of the above discrimination, you may report to:

Office: Equal Opportunity & Title IX; (812) 237-8954; Rankin Hall, Room 426

Email: ISU-equalopportunity-titleix@mail.indstate.edu

Online: https://cm.maxient.com/reportingform.php?IndianaStateUniv&layout_id=10

Disclosures made to the following confidential campus resources will not be reported to the Office of Equal Opportunity and Title IX:

ISU Student Counseling Center: (812) 237-3939; Gillum Hall, 2nd Floor

Victim Advocate: (812) 237-3829; HMSU 7th Floor

UAP Clinic/ISU Health Center: (812) 237-3883; 567 N. 5th Street

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