MET CS 521 Online Course Syllabus (2026 Spring 1) Information Structures with Python

Course Description

This course presents an effective approach to learning Python. With extensive use of graphical illustrations, it will build understanding of Python and its capabilities by learning through many simple examples and analogies. The class will involve active student participation, discussions, and programming exercises. This approach will help build a strong foundation in Python programming that can be applied effectively in real-world settings and in future courses.

Prerequisites: Familiarity with at least one programming language. Understanding of key language constructs and methods. Ability to formulate quantitative information symbolically and numerically.

Learning Objectives

By successfully completing this course, students will be able to:
- Use Python programming language constructs to implement a variety of analytical and computational methods (searching and sorting)
- Explain tradeoffs between different Python methods and data structures in computation
- Apply acquired skills in diverse settings by completing a course project of their choosing
- Present both symbolic and visual results in their course project
- Articulate the advantages and limitations of using Python

To accomplish this goal, course materials are divided into a set of mini-modules corresponding to particular topic(s). These mini-modules will typically include the following:
- Course material with many examples
- Self-test questions
- Sample programming problems, including typical Python job interview questions (collected from various sources on the internet)

Instructor

Guanglan Zhang, Ph.D. guanglan@bu.edu

Dr. Guanglan Zhang holds Master's degrees in Biomedical Engineering and Automatic Control Theory and Application and a Ph.D. in bioinformatics. She is an Associate Professor in Computer Science at Boston University Metropolitan College and the Faculty Coordinator

for the Health Informatics Program. She also leads research activities in the MET Health Informatics Laboratory.

Dr. Zhang has worked in the biomedical informatics field since 1998. The most important aspects of her work include the development and implementation of biomedical databases, computational simulations of laboratory experiments, the development of diagnostic methods for tissue typing, and computational support for vaccine development. Computational tools that she developed are used in the study of immunology, vaccinology,

Original Course Developer: Eugene Pinsky, Ph.D.

Eugene Pinsky received his B.A. in Mathematics from Harvard University and his Ph.D. in Computer Science from Columbia University. He has taught extensively both in academia and industry. His research interests are in performance analysis and computational algorithms in data science and machine learning, with emphasis on computational finance and programmatic advertising.

Materials

Required Book

Contemporary programming languages such as Python have rich online documentation. Indeed, they are built on the premise that programmers are continually in contact with such documentation and are not expected to memorize any but a small fraction of it. The course textbook is listed below. There will be weekly readings from the text. The text will be used in conjunction with the online course modules and online Python documentation.
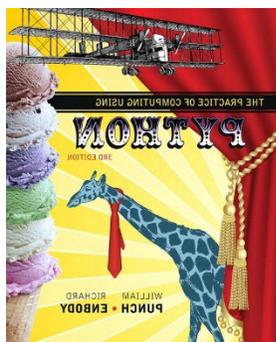
Punch, W. and Enbody, R. (2016). *The Practice of Computing Using Python* **(3rd ed.).**
Pearson. ISBN-13: 978-0-13-437976-0

This book can be purchased from Barnes and Noble at Boston University. An e-book is available at Vitalsource.com. An e-book is available through the BU bookstore.

Note: You do not need to purchase the textbook "with access," also referred to as the "lab" portion of this text. It will not be used in this course.

Running Python Programs
We will use the Spyder IDE (Integrated Development Environment) and the Anaconda Python Distribution. We have these installed in our virtual lab. MET Virtual Labs (VLAB) provides students with all the required software. Most of the examples presented in class will be run in this environment. You can familiarize yourself with the virtual labs with the information from our website: http://www.bu.edu/metit/services/#vlab-target

Additional Resources:

There are many online resources available. This is a partial list:

1. http://www.pythontutor.com/visualize.html - This website is very useful and allows you to run simple Python programs and visualize the execution. Many of the illustrations in the course notes were generated using this website.
2. https://docs.python.org/2/tutorial - an official Python tutorial
3. https://www.tutorialspoint.com/python - a detailed tutorial with many simple examples
4. https://www.learnpython.org - free, interactive tutorial
5. https://www.python.org/community/sigs/current/edu-sig/ - contains links to learning resources, including two free books

Grading Information

Please check the **Study Guide** in the syllabus for Live Classroom dates and specific due dates for assignments and assessments.

Teaching Approach and Goals

I am a strong believer in learning by using many illustrated examples. These examples will help us build a fundamental understanding of Python and how to use it to solve real problems. Many exercises presented in the course will help you develop skills that are needed to use Python effectively in your workplace and in more advanced courses.

Homework, Grading, and Exams

Overall Grading Percentages	
Quizzes	15%
Homework Assignments	35%
Project	20%
Final Exam	30%

Quizzes

There are six 30-minute quizzes (one for each Module). All exams are multiple choice. Quizzes are closed-book and will consist of typical Python questions that one can expect at a job interview.

Homework Assignments

This is a programming class, and students must have practice. Most homework assignments will consist of programming problems.

Project

The project is open-ended, and students may choose the topics. In this project, students will frame and solve problems using Python's quantitative capabilities.

Final Exam

There will be a proctored Final Exam in this course, administered via an online proctoring service accessible through your course in Blackboard. The Assessment Administrator will provide detailed instructions for your proctored exam. You will be responsible for scheduling your own appointment.

The exam will be closed-book and will consist of typical Python questions that one can expect at a job interview.

Homework Assignment Evaluation Criteria

The evaluation criteria for assignments are shown below--otherwise, stated with the assignment.

Letter Grade	Approximate Percentage Grade Range	When To Give
A	95-100	The student's submission is excellent and without defect. The submission demonstrates mastery of the material.
A-	90-94.9	The student's submission is excellent with some minor defects. The submission demonstrates a solid grasp of the material.
B+	85-89.9	The student's submission is good with a few defects. The submission demonstrates a solid grasp of most but not all of the material.
B	80-84.9	The student's submission is above average with some defects. The submission demonstrates a solid grasp of some aspects of the material.
B-	75-79.9	The student's submission is approaching average. The submission demonstrates a grasp and understanding of some aspects of the material.
C+	70-74.9	The student's submission is average and has some moderate defects. The submission demonstrates a minimal grasp and understanding of the material.
C	65-69.9	The student's submission is average and has some major defects. The submission demonstrates a basic understanding of the material but nothing more.

C-	60-64.9	The student's submission is below average and has some major defects. The submission demonstrates a barebones understanding of the material but nothing more.
D	50-59.9	The student's submission is poor. Sections may be missing from the submission. The submission does not demonstrate an understanding of the material at even a basic level.
F	0-49.9	The student's submission is unacceptable. Sections may be missing from the submission. The submission does not demonstrate an understanding of the material in any fashion.

Study Guide and Timeline of Deliverables

This course starts on a **Tuesday**. The modules in this course run from **Tuesday to Monday**.

The following material is collected here for your convenience. The study guides can also be accessed at the beginning of each weekly lecture.

Module 1 Study Guide and Deliverables

Module Theme:
- Introduction to Computing with Python

Readings:
- Chapter 1 (sections 1.1–1.5), Chapter 9 (section 9.6), and Appendix A
- Module Lecture Notes

Topics:
- Introduction to Computing, Program Structure, Running Python, Input/Output, Variable Scopes and Modules

Assignments:
- Assignment 1 due on **Tuesday, January 20 at 6:00 pm ET**

Assessments:
Quiz 1:
- Available **Friday, January 16 at 6:00 am ET**
- Due on **Tuesday, January 20 at 6:00 pm ET**

Live Classrooms:
- Wednesday, January 14 from 7:30-9:00 pm ET
- Thursday, January 15 from 7:30-9:00 pm ET
- Facilitator Session: Sunday, January 18, 9:00 am ET

Module 2 Study Guide and Deliverables

Module Theme:
- Basic Building Blocks for Python Programs

Readings:
- Chapter 1 (sections 1.6–1.9), Chapter 2 (sections 2.2.1–2.2.7), and Chapter 16 (section 16.1)
- Module Lecture Notes

Topics:
Data Types, Hashing, Mutability, Python Ranges, Copying Objects

Assignments:
- Assignment 2 due on **Tuesday, January 27 at 6:00 pm ET**

Assessments:
Quiz 2:
- Available **Friday, January 23 at 6:00 am ET**
- Due on **Tuesday, January 27 at 6:00 pm ET**

Live Classrooms:
- Wednesday, January 21 from 7:30-9:00 pm ET
- Thursday, January 22 from 7:30-9:00 pm ET
- Facilitator Session: Sunday, January 25, 9:00 am ET

Module 3 Study Guide and Deliverables

Module Theme:
- Building Python Projects

Readings:
- Chapter 2 (sections 2.2.8–2.2.14), Chapter 4, Chapter 6 (sections 6.1–6.5), Chapter 14 (sections 14.1–14.3)
- Module Lecture Notes

Topics:
Strings, Collections, Control Flow, Iterations, Files, Lists

Assignments:
- Assignment 3 due on **Tuesday, February 3 at 6:00 pm ET**

Assessments:
Quiz 3:
- Available **Friday, January 30 at 6:00 am ET**
- Due on **Tuesday, February 3 at 6:00 pm ET**

Live Classrooms:
- Wednesday, January 28 from 7:30-9:00 pm ET
- Thursday, January 29 from 7:30-9:00 pm ET
- Facilitator Session: Sunday, February 1, 9:00 am ET

Module 4 Study Guide and Deliverables

Module Theme:
- Collections in Detail

Readings:
- Chapter 7 and Chapter 9
- Module Lecture Notes

Topics:
> Sets, Tuples, Dictionaries, Stacks, Queues, Singly Linked Lists, Doubly Linked Lists, Sorting, Searching

Assignments:
- Assignment 4 due on **Tuesday, February 10 at 6:00 pm ET**
- Final Project Topic due on **Thursday, February 12** at 6:00 pm ET

Assessments:
> Quiz 4:
- Available **Friday, February 6 at 6:00 am ET**
- Due on **Tuesday, February 10 at 6:00 pm ET**

Live Classrooms:
- Wednesday, February 4 from 7:30-9:00 pm ET
- Thursday, February 5 from 7:30-9:00 pm ET
- Facilitator Session: Sunday, February 8, 9:00 am ET

Module 5 Study Guide and Deliverables

Module Theme:
- Functions in Detail

Readings:
- Chapter 6 (section 6.6), Chapter 14 (section 14.4), Chapter 5, Chapter 8, Chapter 15, and Chapter 16 (section 16.2)
- Module Lecture Notes

Topics:
> Exceptions, Introduction to Functions, Parameter Passing, Generators, Recursive Functions, Functional Programming

Assignments:

- Assignment 5 due on **Tuesday, February 17 at 6:00 pm ET**

Assessments:

Quiz 5:

- Available **Friday, February 13 at 6:00 am ET**
- Due on **Tuesday, February 17 at 6:00 pm ET**

Live Classrooms:

- Wednesday, February 11 from 7:30-9:00 pm ET
- Thursday, February 12 from 7:30-9:00 pm ET
- Facilitator Session: Sunday, February 15, 9:00 am ET

Module 6 Study Guide and Deliverables

Module Theme:

- Classes in Detail

Readings:

- Chapters 11, 12, and 13
- Module Lecture Notes

Topics:

Introduction to Classes, Assignment and Copy, Static vs. Instance Variables, Data Encapsulation, Overloading, Inheritance and Polymorphism, Multiple Inheritance and Abstract Classes

Assignments:

- Assignment 6 due on **Tuesday, February 24 at 6:00 pm ET**

Assessments:

Quiz 6:

- Available **Friday, February 20 at 6:00 am ET**
- Due on **Tuesday, February 24 at 6:00 pm ET**

Live Classrooms:

- Wednesday, February 18 from 7:30-9:00 pm ET
- Thursday, February 19 from 7:30-9:00 pm ET
- Facilitator Session: Sunday, February 22, 9:00 am ET

Module 7 Study Guide and Deliverables

Module Theme:

- Final exam and project presentations

Final Project and Video:

- Term Project due on **Saturday, February 28 at 11:59 pm ET**

Final Exam Details

The Final Exam is a proctored exam available from **Wednesday, February 25 at 6:00 AM ET to Saturday, February 28 at 11:59 PM ET.**

The Computer Science department requires that all final exams be administered using an online proctoring service that you will access via your course in Blackboard. Additional information regarding your proctored exam will be forthcoming from the Assessment Administrator. You will be responsible for scheduling your own appointment within the defined exam window.

The Final Exam will be **closed book/closed notes** and is accessible only during the final exam period. You can access it from the Assessments section of the course. Your proctor will enter the password to start the exam.

Final Exam duration: **two hours**

Academic Conduct Policy

Please visit Metropolitan College's website for the full text of the department's *Academic Conduct Code*.

A Definition of Plagiarism

"The academic counterpart of the bank embezzler and of the manufacturer who mislabels products is the plagiarist: the student or scholar who leads readers to believe that what they are reading is the original work of the writer when it is not. If it could be assumed that the distinction between plagiarism and honest use of sources is perfectly clear in everyone's mind, there would be no need for the explanation that follows; merely the warning with which this definition concludes would be enough. But it is apparent that sometimes people of goodwill draw the suspicion of guilt upon themselves (and, indeed, are guilty) simply because they are not aware of the illegitimacy of certain kinds of "borrowing" and of the procedures for correct identification of materials other than those gained through independent research and reflection."

"The spectrum is a wide one. At one end there is a word-for-word copying of another's writing without enclosing the copied passage in quotation marks and identifying it in a footnote, both of which are necessary. (This includes, of course, the copying of all or any part of another student's paper.) It hardly seems possible that anyone of college age or more could do that without clear intent to deceive. At the other end there is the almost casual slipping

in of a particularly apt term which one has come across in reading and which so aptly expresses one's opinion that one is tempted to make it personal property."

"Between these poles there are degrees and degrees, but they may be roughly placed in two groups. Close to outright and blatant deceit-but more the result, perhaps, of laziness than of bad intent-is the patching together of random jottings made in the course of reading, generally without careful identification of their source, and then woven into the text, so that the result is a mosaic of other people's ideas and words, the writer's sole contribution being the cement to hold the pieces together. Indicative of more effort and, for that reason, somewhat closer to honest, though still dishonest, is the paraphrase, and abbreviated (and often skillfully prepared) restatement of someone else's analysis or conclusion, without acknowledgment that another person's text has been the basis for the recapitulation."

The paragraphs above are from H. Martin and R. Ohmann, *The Logic and Rhetoric of Exposition, Revised Edition*. Copyright 1963, Holt, Rinehart and Winston.

Academic Conduct Code

I. **Philosophy of Discipline**

The objective of Boston University in enforcing academic rules is to promote a community atmosphere in which learning can best take place. Such an atmosphere can be maintained only so long as every student believes that his or her academic competence is being judged fairly and that he or she will not be put at a disadvantage because of someone else's dishonesty. Penalties should be carefully determined so as to be no more and no less than required to maintain the desired atmosphere. In defining violations of this code, the intent is to protect the integrity of the educational process.

II. **Academic Misconduct**

Academic misconduct is conduct by which a student misrepresents his or her academic accomplishments, or impedes other students' opportunities of being judged fairly for their academic work. Knowingly allowing others to represent your work as their own is as serious an offense as submitting another's work as your own.

III. **Violations of this Code**

Violations of this code comprise attempts to be dishonest or deceptive in the performance of academic work in or out of the classroom, alterations of academic records, alterations of official data on paper or electronic resumes, or unauthorized collaboration with another student or students. Violations include, but are not limited to:

A. **Cheating on examination**. Any attempt by a student to alter his or her performance on an examination in violation of that examination's stated or commonly understood ground rules.

B. **Plagiarism.** Representing the work of another as one's own. Plagiarism includes but is not limited to the following: copying the answers of another student on an examination, copying or restating the work or ideas of another person or persons in any oral or written work (printed or electronic) without citing the appropriate source, and collaborating with someone else in an academic endeavor without acknowledging his or her contribution. Plagiarism can consist of acts of commission-appropriating the words or ideas of another-or omission failing to acknowledge/document/credit the source or creator of words or ideas (see below for a detailed definition of plagiarism). It also includes colluding with someone else in an academic endeavor without acknowledging his or her contribution, using audio or video footage that comes from another source (including work done by another student) without permission and acknowledgement of that source.

C. **Misrepresentation or falsification of data** presented for surveys, experiments, reports, etc., which includes but is not limited to: citing authors that do not exist; citing interviews that never took place, or field work that was not completed.

D. **Theft of an examination**. Stealing or otherwise discovering and/or making known to others the contents of an examination that has not yet been administered.

E. **Unauthorized communication during examinations**. Any unauthorized communication may be considered prima facie evidence of cheating.

F. **Knowingly allowing another student to represent your work as his or her own**. This includes providing a copy of your paper or laboratory report to another student without the explicit permission of the instructor(s).

G. **Forgery, alteration, or knowing misuse of graded examinations, quizzes, grade lists, or official records of documents**, including but not limited to transcripts from any institution, letters of recommendation, degree certificates, examinations, quizzes, or other work after submission.

H. **Theft or destruction of examinations or papers** after submission.

I. **Submitting the same work in more than one course** without the consent of instructors.

J. **Altering or destroying another student's work or records**, altering records of any kind, removing materials from libraries or offices without consent, or in any way interfering with the work of others so as to impede their academic performance.

K. **Violation of the rules governing teamwork**. Unless the instructor of a course otherwise specifically provides instructions to the contrary, the following rules apply to teamwork: 1. No team member shall intentionally restrict or inhibit another team member's access to team meetings, team work-in-progress, or other team activities without the express authorization of the

instructor. 2. All team members shall be held responsible for the content of all teamwork submitted for evaluation as if each team member had individually submitted the entire work product of their team as their own work.

L. **Failure to sit in a specifically assigned seat during examinations.**

M. **Conduct in a professional field assignment that violates the policies and regulations of the host school or agency.**

N. **Conduct in violation of public law occurring outside the University that directly affects the academic and professional status of the student, after civil authorities have imposed sanctions.**

O. **Attempting improperly to influence the award of any credit, grade, or honor.**

P. **Intentionally making false statements to the Academic Conduct Committee or intentionally presenting false information to the Committee.**

Q. **Failure to comply with the sanctions imposed under the authority of this code.**

Important Message on Final Exams

Dear Boston University Computer Science Online Student,

As part of our ongoing efforts to maintain the high academic standard of all Boston University programs, including our online MSCIS degree program, the Computer Science Department at Boston University's Metropolitan College requires that each of the online courses includes a proctored final examination.

By requiring proctored finals, we are ensuring the excellence and fairness of our program. The final exam is administered online.

Specific information regarding final-exam scheduling will be provided approximately two weeks into the course. This early notification is being given so that you will have enough time to plan for where you will take the final exam.

I know that you recognize the value of your Boston University degree and that you will support the efforts of the University to maintain the highest standards in our online degree program.

Thank you very much for your support with this important issue.

Regards,

Professor Lou Chitkushev, Ph.D.
Associate Dean for Academic Affairs
Boston University Metropolitan College

Who's Who: Roles and Responsibilities

You will meet many BU people in this course and program. Some of these people you will meet online, and some you will communicate with by email and telephone. There are many people behind the scenes, too, including instructional designers, faculty who assist with course preparation, and video and animation specialists.

People in Your Online Course in Addition to Your Fellow Students

Your Facilitator. Our classes are divided into small groups, and each group has its own facilitator. We carefully select and train our facilitators for their subject-matter expertise and excellence in teaching. Your facilitator is responsible for stimulating discussions in pedagogically useful areas, for answering your questions, and for grading homework assignments, discussions, term projects, and any manually graded quiz or final-exam questions. If you ask your facilitator a question by email, you should get a response within 24 hours, and usually faster. If you need a question answered urgently, post it in one of the urgent help topics, where everyone can see and answer it.

Your Professor. The professor for your course has primary responsibility for the course. If you have any questions that your facilitator doesn't answer quickly and to your satisfaction, then send your professor an email in the course, with a cc to your facilitator so that your facilitator is aware of your question and your professor's response.

Your Lead Faculty and Student Support Administrator, Jennifer Sullivan. Jen is here to ensure you have a positive online experience. You will receive emails and announcements from Jen throughout the semester. Jen represents Boston University's university services and works for BU Virtual. She prepares students for milestones such as course launch, final exams, and course evaluations. She is a resource to both students and faculty. For example, Jen can direct your university questions and concerns to the appropriate party. She also handles general questions regarding Online Campus functionality for students, faculty, and facilitators, but she does not provide tech support. She is enrolled in all classes and can be contacted within the course through Online Campus email as it is running. You can also contact her via email at jensul@bu.edu or call (617) 358-1978.

People Not in Your Online Course

Although you will not normally encounter the following people in your online course, they are central to the program. You may receive emails or phone calls from them, and you are welcome to contact them.

Your Computer Science Department Online Program Coordinator, Michelle Younger. Michelle administers the academic aspects of the program, including admissions and registration. You can ask her questions about the program, registration, course offerings,

graduation, or any other program-related topic. She can be reached at metcsol@bu.edu or (617) 353-2566.

Professor Guanglan Zhang, Computer Science Department Chairman. You can reach Professor Zhang at guanglan@bu.edu or at 617-358-5688.

Professor Lou T. Chitkushev, Associate Dean for Academic Affairs, Metropolitan College. Dr. Chitkushev is responsible for the academic programs of Metropolitan College. Contact Professor Chitkushev with any issues you believe have not been adequately addressed. The customary issue-escalation sequence after your course facilitator and course faculty is Professor Zhang, and then Professor Chitkushev.

Professor Tanya Zlateva, Metropolitan College Dean. Dr. Zlateva is responsible for the quality of all the academic programs at Boston University Metropolitan College.

Technical Support

Boston University IT Help Desk can be reached via email (ithelp@bu.edu), phone (617-353-4357), or by filling out the support form on their website. For IT Help Desk hours of operation, visit the contact page. If you are contacting IT outside of business hours, you will receive a response the following day. Visit the BU Information Services & Technology (IS&T) news page for announcements and system-wide alerts.

Technology Requirements and Resources

To successfully view all content in your course, it is important that your computer setup meets the necessary minimum technical requirements. Certain courses with specific functionality or educational tools may require additional technical requirements; these details can be found on the Course Resources or Materials page in the Syllabus.

System Requirements

- Access to reliable, high-speed internet: Check your internet connection speeds
- Learning Management System (Blackboard): System Requirements
- Synchronous live classroom sessions (Zoom): System requirements for Windows, macOS, and Linux
- Two-factor authentication service for BU applications: Duo Security

Downloads

- Recommended web browsers: Mozilla Firefox or Google Chrome
- Synchronous live classroom sessions (Zoom): Zoom download center
- Two-factor authentication service for BU applications (Duo Security): optional Duo Mobile download for iOS or Duo Mobile download for Android

Recommended Hardware

- A desktop or laptop computer is recommended for the best experience. Some course functionality, including proctored exams, is not compatible with phones or tablets
- Headset with built-in microphone for high-quality audio during live classroom sessions
- Webcam (required for proctored exams)
- Working computer speakers (required for proctored exams)

Clearing Your Browser Cache

It is recommended that users periodically clear their browser cache to ensure they are viewing the most current course content. Completing this step often resolves login issues and problems viewing course materials.

Disability and Access Services

In accordance with university policy, every effort will be made to accommodate students with disabilities in speech, hearing, vision, or other areas. Any student who needs an accommodation for a documented disability should contact Disability and Access Services at 617-353-3658 or access@bu.edu to request review and approval.

Once a student receives their accommodation letter, they must send it to their instructor and/or facilitator each semester. They must also send a copy to their Faculty & Student Support Administrator, who may need to update the course settings to ensure accommodation is in place. Accommodation cannot be implemented if the students do not send their letters.