Northeastern
College of Engineering

# INFO 5002 Introduction to Python for Information Systems

**Course Information**
Course Title: Introduction to Python for Information Systems
Course Number: INFO 5002
Term and Year: Fall 2024
Credit Hour: 4
Course Format: On-Ground

**Instructor Information**
Full Name: Pramod Gupta
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**Teaching Assistant Information**
Full Name:
Email Address:
Office Hours:

**Course Prerequisites**
None

**Course Description**
Studies the Python programming language for application engineering. This hands-on course offers students an opportunity to obtain proficiency in the core concepts of Python and the skills and knowledge for building applications using any of the hundreds of thousands of task-specific Python libraries. Covers the important concepts such as reading and writing to standard IO, using operators, controlling the flow of execution, using functions, reading and writing files, and basic object-oriented programming concepts. Applies tools and techniques to classical software engineering and Python-specific facilities such as code introspection, reuse, built-in sequence types, and iteration.

**Standard Learning Outcomes**

*Learning outcomes common to all College of Engineering Graduate programs:*

1. *An ability to identify, formulate, and solve complex engineering problems.*
2. *An ability to explain and apply engineering design principles, as appropriate to the program's educational objectives.*
3. *An ability to produce solutions that meet specified end-user needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.*

*The Information Systems Program accepts students of different engineering backgrounds with minimum programming skills and produces first class Information Systems engineers that operate at the intersection of real-world complexity, software development, and IT management. Graduating students will be able to construct end-to-end advanced software applications that meet business needs.*

*Specific Learning Outcomes for the Information Systems program:*

1. *Create a strong technical foundation through diverse, high-level courses*
2. *Built crucial interpersonal skills needed to succeed in any industry*
3. *Foster a deep level of applied learning through project-based case studies*

**Required Tools and Course Textbooks.**

Python
The Quick Python Book, Naomi Ceder
Practical Programming: An Introduction to Computer Science Using Python, Paul Gries, Jennifer Campbell, Jason Montojo
Python for Data Analysis: Wes McKinney
Python Data Science Handbook: Jake VanderPlas

**Course Schedule/Topics Covered.**

Welcome to the course & Introduction

Install Anaconda on personal computer

Using Python: pros and cons

Installing the environment with core packages

Overview of Data Science

Data Science Process.

Data Types

int Data Objects

Introspection – dir, type

Python basics: variables, conditionals, loops
Data structures: lists and dictionaries
Reading data into memory
Working with strings
Operators

Arithmetic Operators

Assignment Operator

Text Data Objects – str

Triple Quote

The Dot Operator

Functions And Imports

Function/Method Objects

print Function

Defaulted Arguments

str.format

Return Values

Control Flows Loops

importing and Using Libraries

Catching exceptions to deal with bad data
Writing the data back out again
matplotlib Example

Visualization

Modeling, Regresssion

Statistical Inference, Hypotheis testing

Introduction to OOP, class etc.

**Grading Scale.** Please insert what is applicable for your class. See sample provided below. Additionally, please provide a breakdown of how students' grades will be weighted based on tests, projects, homework, etc.

<table>
<tr><td rowspan="2">95-100% A</td><td>87-89.9% B+</td><td>77-79.9% C+</td><td rowspan="3">69.9% or below F</td></tr>
<tr><td>84-86.9% B</td><td>74-76.9% C</td></tr>
<tr><td>90-94.9% A-</td><td>80-83.9%B-</td><td>70-73.9% C-</td></tr>
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**Academic Integrity**

A commitment to the principles of academic integrity is essential to the mission of Northeastern University. The promotion of independent and original scholarship ensures that students derive the most from their educational experience and their pursuit of knowledge. Academic dishonesty violates the most fundamental values of an intellectual community and undermines the achievements of the entire University.

As members of the academic community, students must become familiar with their rights and responsibilities. In each course, they are responsible for knowing the requirements and restrictions regarding research and writing, examinations of whatever kind, collaborative work, the use of study aids, the appropriateness of assistance, and other issues. Students are responsible for learning the conventions of documentation and acknowledgment of sources in their fields. Northeastern University expects students to complete all examinations, tests, papers, creative projects, and assignments of any kind according to the highest ethical standards, as set forth either explicitly or implicitly in this Code or by the direction of instructors.

Go to http://www.northeastern.edu/osccr/academic-integrity-policy/ to access the full academic integrity policy.

### University Health and Counseling Services

As a student enrolled in this course, you are fully responsible for assignments, work, and course materials as outlined in this syllabus and in the classroom. Over the course of the semester if you experience any health issues, please contact UHCS.

For more information, visit https://www.northeastern.edu/uhcs.

### Student Accommodations

Northeastern University and the Disability Resource Center (DRC) are committed to providing disability services that enable students who qualify under Section 504 of the Rehabilitation Act and the Americans with Disabilities Act Amendments Act (ADAAA) to participate fully in the activities of the university. To receive accommodations through the DRC, students must provide appropriate documentation that demonstrates a current substantially limiting disability.

For more information, visit https://drc.sites.northeastern.edu.

### Library Services

The Northeastern University Library is at the hub of campus intellectual life. Resources include over 900,000 print volumes, 206,500 e-books, and 70,225 electronic journals.

For more information and for education specific resources, visit https://library.northeastern.edu.

### 24/7 Canvas Technical Help

For immediate technical support for Canvas, call 617-373-4357 or email help@northeastern.edu

Canvas Faculty Resources: https://canvas.northeastern.edu/faculty-resources/

Canvas Student Resources: https://canvas.northeastern.edu/student-resources/

For assistance with my Northeastern e-mail, and basic technical support:
Visit ITS at https://its.northeastern.edu
Email: help@northeastern.edu
ITS Customer Service Desk: 617-373-4357

**Diversity and Inclusion**

Northeastern University is committed to equal opportunity, affirmative action, diversity, and social justice while building a climate of inclusion on and beyond campus. In the classroom, members of the University community work to cultivate an inclusive environment that denounces discrimination through innovation, collaboration, and an awareness of global perspectives on social justice.

Please visit http://www.northeastern.edu/oidi/ for complete information on Diversity and Inclusion

**Title IX**

*Title IX of the Education Amendments of 1972 protects individuals from sex or gender-based discrimination, including discrimination based on gender-identity, in educational programs and activities that receive federal financial assistance.*

Northeastern's Title IX Policy prohibits Prohibited Offenses, which are defined as sexual harassment, sexual assault, relationship or domestic violence, and stalking. The Title IX Policy applies to the entire community, including male, female, transgender students, faculty, and staff.

In case of an emergency, please call 911.

*Please visit **https://www.northeastern.edu/ouec** for a complete list of reporting options and resources both on- and off-campus.*