Programming using Python

GEOG - 1180 001

Course Student Learning Outcomes

- Apply variables to store, retrieve and calculate information.
- Apply core programming tools such as functions and loops.
- Apply multi-step tasks like sorting or looping using tuples.
- Create programs that are able to read and write data from files.
- Store data as key/value pairs using Python dictionaries.
- Explain the basics of Object-Oriented Python.
- Apply the Create, Read, Update, and Delete operations to manage databases.
- Describe how data is stored across multiple tables in a database.
- Apply the Google Maps API to visualize data.

Course Prerequisites

None

Required Text or Materials

Title: Python for Everyone
Authors: Dr. Charles R. Severance, PhD
OID: https://www.py4e.com/book

Title: Introduction to Python for Geographic Data Analysis
Authors: Henrikki Tenkanen, Vuokko Heikinheimo, David Whipp
OID: https://pythongis.org/

For more information on textbook accessibility, contact Accessibility & Disability Services at ads@slcc.edu.

Additional Materials

All students will be given a personal license to ArcGIS Pro, along with access to a host of other Esri software including ArcGIS Online, Story Maps, Living Atlas, and more.

Access to a Windows PC, or the ability to run Windows on a Mac is required for the course. If needed, students can access All Access, to gain access to a virtual desktop that contains ArcGIS Pro.

Brief Description of Assignments/Exams

Most of the assignments in this course will focus primarily on learning to code using Python. But the course will also have students learn how to use Python in ArcGIS Pro.

Every assignment will have similar submission processes, where you demonstrate the use of programming using Python. Think of it like submitting a math problem where you must show your work.

Engagement Plan

You don't need any coding background to succeed in this course; just curiosity, persistence, and a willingness to explore. This course is designed to guide you step-by-step, helping you build confidence as you learn to think like a programmer.

Start by engaging with each lesson actively. Follow along with examples, try things out, and don't worry if your code doesn't work perfectly the first time. Mistakes are part of the process—every error is a clue that helps you learn something new.

Practice regularly, even if it's just for a few minutes a day. The more you interact with Python, the more familiar it will feel. Use the course tools, videos, and exercises to reinforce your understanding, and don't hesitate to revisit earlier lessons if something doesn't click right away.

Connect with your classmates and instructors. Ask questions, share ideas, and support each other. You're not alone in this journey, and learning together makes the experience more rewarding.

Keep track of your progress. Whether it's a notebook, a folder of saved code, or a simple checklist, seeing how far you've come can be incredibly motivating. Reflect on what you've learned each week and celebrate small wins.

Most importantly, ask for help when you need it. Coding can feel unfamiliar at first, but you're here to learn—and we're here to support you. With time and effort, you'll be amazed at what you can create.

Academic Integrity

Understanding that artificial intelligence (AI) can be a powerful tool in your studies is essential. It can quickly compile and present information on the Internet in a clearer and conversational format. However, its use must adhere to academic integrity standards. There is both appropriate and inappropriate use of AI. While AI can facilitate your learning by offering quick insights, it is a relatively new technology and may provide inaccurate information on complex issues, especially when addressing current events.

APPROPRIATE USE OF ARTIFICIAL INTELLIGENCE

- **Research Assistance** | AI can gather background information, summarize complex topics, and identify key themes from publicly available sources.
- **Idea Generation** | AI can help brainstorm topics, provide writing prompts, and assist with outlining essays or projects.
- **Learning Suppor**t | AI can explain concepts, provide tutoring assistance, or clarify geography and regional studies concepts.
- **Data Analysis** | AI can assist in interpreting geospatial data, maps, or statistics relevant to geographic studies.

INAPPROPRIATE USE ARTIFICIAL INTELLIGENCE

- **Plagiarism and Unauthorized Assistance** | Using AI to generate full assignments, essays, or reports without proper citation or instructor approval is considered academic dishonesty.

- **Misrepresentation of Facts** | AI may occasionally provide incorrect or outdated information, especially on complex or rapidly changing global events. Always verify AI-generated content with credible sources.
- **Unapproved AI Use in Assignments** | If an assignment explicitly prohibits AI assistance, ensure your work is original and does not incorporate AI-generated content.

ETHICAL CONSIDERATIONS REGARDING ARTIFICIAL INTELLIGENCE

- **Academic Integrity** | AI tools can assist students in writing and research, but improper use may lead to plagiarism or a decline in critical thinking skills.
- **Bias and Fairness** | AI models are trained on vast datasets, which may contain biases. If not carefully managed, AI-generated content could reinforce stereotypes or provide misleading information.
- **Privacy and Data Security** | AI systems often collect and analyze student data. Without proper safeguards, sensitive information could be misused or exposed in education.
- **Dependency and Critical Thinking** | Over-reliance on AI for learning may reduce students' ability to think independently and solve problems creatively.
- **Environmental Impact** | Training and running AI models require significant energy, contributing to carbon emissions and resource consumption.

ARTIFICIAL INTELLIGENCE AND LEARNING

- **Personalized Learning** | AI can tailor educational content to individual students' needs, helping those who require extra support while allowing advanced learners to progress at their own pace.
- **Language and Accessibility Support** | AI-powered translation and speech-to-text tools assist students with language barriers, disabilities, or learning differences, ensuring they receive equal opportunities to engage with educational materials.
- **Resource Allocation** | AI can help identify underserved communities and allocate resources more effectively, ensuring students in low-income areas have access to quality education.
- **Bias Detection and Mitigation** | AI can analyze educational materials to identify and reduce biases, ensuring fair representation in curricula and assessments.

- **Teacher Support and Training** | AI can assist educators by automating administrative tasks, providing insights into student performance, and offering professional development opportunities.

BEST PRACTICES OF USING ARTIFICIAL INTELLIGENCE

- Always cross-check AI-generated information with academic sources, peer-reviewed articles, or reliable geographical databases.
- Follow your institution's academic integrity policy regarding AI use.
- If unsure about AI use for a particular assignment, ask your instructor for clarification before proceeding.
- Using AI responsibly can be a valuable tool for enhancing learning. However, students must be mindful of when and how they integrate it into their coursework.

COURSE-SPECIFIC ARTIFICIAL INTELLIGENCE

In this course, specific assignments may permit Artificial Intelligence for research or brainstorming, while others may require independent analysis without AI assistance. Activities where AI use is allowed will be clearly stated in the instructions. Those assignments will also be marked if AI use constitutes cheating or plagiarism.

AI-powered tools and software offer valuable support for learning and writing enhancement. As your instructor, I encourage the responsible use of AI technologies such as ChatGPT, Copilot, Apple Intelligence, and Gemini. AI is increasingly integrated into various applications, providing insights into health and fitness, interpreting photos, generating images, and much more. Given its expanding role, dismissing AI's presence in academia would be inaccurate. However, ethical use is essential, as students must uphold academic integrity and adhere to the student code of conduct.

COURSE APPROVED AI FOR STUDYING AND LEARNING ACTIVITIES

Students may use Speechify as a useful AI tool to study reading material. Speechify is a text-to-speech (TTS) software that converts written text into natural-sounding audio. It helps users absorb information more efficiently, making it particularly useful for students, professionals, and individuals with dyslexia or ADHD. Speechify has evolved into a widely used productivity tool for learning, accessibility, and multitasking.

Key Features of Speechify

- **Multi-platform support** | Available as a mobile app, Chrome extension, and desktop application.
- **AI-generated voices** | Offers high-quality, lifelike narration, including voices from celebrities.
- **Optical Character Recognition (OCR)** | Can scan physical books and printed text, converting them into audio.
- **Adjustable playback speed** | Users can increase reading speed to enhance productivity.
- **Multi-language support** | Supports over 30 languages, making it accessible to a global audience.
- **Integration with web browsers and apps** | Works seamlessly across various platforms.

Grammarly to an external site. is an AI-powered writing assistant designed to help users improve their grammar, spelling, tone, and clarity in written communication. It provides real-time suggestions to enhance writing quality across various platforms, including web browsers, desktop applications, and mobile devices.

Key Features of Grammarly

- **Grammar & Spell Check** | Identifies and corrects spelling, punctuation, and sentence structure errors.
- **Tone and Clarity Adjustments** | Helps refine writing to match the intended audience and purpose.
- **Plagiarism Detection** | Scans text against a vast database to ensure originality.
- **Generative AI Capabilities** | Assists in drafting content based on prompts.
- **Multi-platform Integration** | Works with Google Docs, Microsoft Word, email clients, and social media platforms.

Grading Scale

GRADE	SCORE RANGE

A	100 to 94 percent
A-	93 to 90 percent
B+	89 to 87 percent
B	86 to 84 percent
B-	83 to 80 percent
C+	79 to 77 percent
C	76 to 74 percent
C-	73 to 70 percent
D+	69 to 67 percent
D	66 to 64 percent
D-	63 to 60 percent
E	Less than 60 percednt

Assignment Schedule

Due Date	Assignment Name	Assignment Type	Points
	Introduce Yourself	Discussion	0
	Introduce Yourself	Discussion	0
	Q&A Forum: Imagery for Time and Space	Discussion	0
	Roll Call Attendance	Assignment	100

Transfer/Certification/Licensure/Employment Information

According to the U.S. Department of Labor and Bureau of Labor Statistics, geospatial technology stands out as one of the nation's rapidly growing industries. Job opportunities in surveying, mapping technicians, photogrammetrists, and cartography represent key entry points within this dynamic field.

This employment sector exhibits remarkable diversity and interdisciplinary applications, finding relevance in numerous industries such as local, state, and federal agencies;

nonprofit organizations; private sector roles; business and marketing; geography; urban planning and transportation; architecture; public utilities; public safety; military and Homeland Security; geospatial intelligence; criminal justice and law enforcement; public health; forestry and agriculture; environmental science and wildlife conservation; energy management; natural resource management; history, archaeology, and anthropology; sociology; military operations; disaster response and mitigation; surveying; computer science and information systems; photography, videography, and more.

For further insights into the expansive scope of geospatial technology applications, click here.

This course is required for those interested in the following programs of study at SLCC:

- Earth and Environmental Science AS
- GIS and Drones AAS
- GIS Certificate of Proficiency
- Small Unmanned Aerial Systems Certificate of Proficiency

How to Navigate to Canvas

Online Tutoring

Students at SLCC have access to online tutoring through Canvas. From your Canvas course click Online Tutoring in the course navigation and follow the steps to set up an appointment. If this is your first time using the Online Tutoring we recommend you click "Take a Tour" to familiarize yourself with the service.

Note that students only receive 480 minutes of tutoring time each semester. After that we encourage you to use the resources found through this link: https://www.slcc.edu/tutoring/index.aspx

If you have any additional questions reach out to elearningsupport@slcc.edu.

Institutional Policies

As members of our academic community, we would like to invite you to review the Institutional Syllabus which covers important policies and procedures. This document contains important links for students on the code of student rights and responsibilities, academic integrity, and grading policies, Title IX and other important acknowledgements. By familiarizing yourself with this information, you can help us create a safe and respectful environment for everyone.

For more information, navigate to the Institutional Policies tab on the Institutional Syllabus page.

Learning Support and Tutoring Services

We are pleased to offer a range of tutoring and learning support services to help you achieve your academic goals. Whether you need assistance with a specific subject or want to improve your study skills, you have many options for tutoring or other support.

To learn more about the services we offer and how to access them, visit the Institutional Syllabus page under the Tutoring and Learning Support tab. We encourage you to take advantage of these resources to help you succeed in your studies. If you have any questions or would like to schedule a tutoring session, please don't hesitate to reach out to us. We are here to support you in any way we can.

Advising and Counseling Support Services

At our institution, we are committed to supporting your academic and personal growth. That's why we offer a range of advising and counseling services to help you navigate the challenges of college life. To learn more about the resources available to you and how to access them, visit the Institutional Syllabus page under the Advising and Counseling Support Services tab. Our advising team and the support centers across campus are here to support you in achieving your goals and overcoming any obstacles you may face.

Student Academic Calendar

As students you should be aware of all important dates in the semester, such as the day that courses begin and end, as well as the drop date and the last day to withdraw. To learn more about those dates, navigate to the Student Academic Calendar below:

SLCC Student Academic Calendar