Game Programming with Python

COR 100.09 Y1 Program Fall 2024

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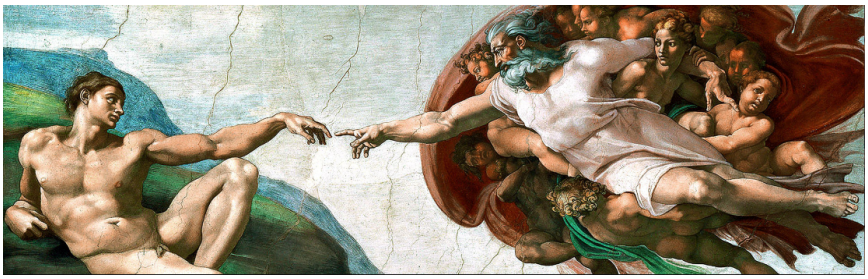
Contents



1 General Course Information

- Meeting Times: Tuesday, 11:00-11:50 hrs
- Meeting place: Lyon Building Computer Lab room 104
- Professor: Marcus Birkenkrahe
- Office: Derby Science Center room 210
- Phone: (870) 307-7254 - cell: (501) 422-4725
- Office hours: by appointment.

2 Course description

This course on "Game Programming in Python" offers a comprehensive introduction to the fundamentals of creating interactive and engaging computer games. Students will learn how to use Python, a powerful and versatile programming language, to bring their game concepts to life, focusing on game logic, graphics rendering, and user interaction. The curriculum covers key programming concepts, game design principles, and the integration of libraries such as Turtle or Pygame, providing a hands-on approach through project-based learning. By the end of the course, participants will have developed several games from scratch, demonstrating their understanding of the game development process and their ability to apply programming skills in a creative context. Acquiring programming skills in Python will not only help you understand how computers can be used to create interactive experiences but also enhance your critical thinking abilities. We will meet weekly for 50 minutes of lectures, practical problem solving and interactive exercises. Between classes, students will work on small assignments, leading to the opportunity to present their work and (optionally) publish their finished projects for the whole world to see at the Humanities, Arts, and Science (H.A.T.S.) symposium at Lyon College.

3 Learning Objectives

- Understand the basics of Python programming, including syntax, data types, and control structures.
- Learn how to use Python libraries such as `turtle` and `pygame` for game development.

- Develop skills in game design and storytelling to create engaging game narratives.
- Master game logic and problem-solving to implement game mechanics and player interactions.
- Gain proficiency in graphics rendering, including working with images, animations, and game environments.
- Explore the development of responsive user interfaces to enhance gameplay experience.
- Practice project-based learning to design, develop, and debug Python games from scratch.
- Enhance critical thinking and analytical skills through practical problem-solving exercises.
- Encourage creativity and innovation in applying programming skills to game development.
- Prepare for presenting and optionally publishing projects at the H.A.T.S. symposium.

4 Sources

- Invent your own games with Python by Al Sweigart (4e), NoStarch 2016, URL: inventwithpython.com/invent4thed.
- The Beginner's Guide to Python Turtle by Nikita Silaparasetty, Feb 26, 2020, URL: realpython.com/beginners-guide-python-turtle.
- PyGame: A Primer on Game Programming in Python by Jon Fincher, Sep 16, 2019, URL: realpython.com/pygame-a-primer/.

5 Grading

DESCRIPTION	IMPACT
Programming assignments	25%
Tests	25%
H.A.T.S. presentation	25%
Participation	25%

Notes:

- To pass you need to get 60% of the available points.
- There will be 10 short programming assignments in Python.
- There will be 10 multiple choice tests to review material.
- The H.A.T.S. presentation is a session developed and executed by the class at the December symposium.
- Participation is the result of being present and engaged with the class.

6 Rubric

Component	Weight	Excellent	Good	Satisfactory	Needs Improvement	Unsatisfactory
Participation and Attendance	25%	Consistently attends and actively participates in all classes.	Attends most classes and participates in discussions.	Attends classes but participation is minimal.	Frequently absent and rarely participates.	Rarely attends classes and does not participate.
Programming assignments	50%	Completes all assignments on time with high accuracy (90-100%).	Completes most assignments on time with good accuracy (80-89%).	Completes assignments but with some inaccuracies or delays (70-79%).	Frequently late or incomplete assignments with several inaccuracies (60-69%).	Rarely completes assignments and shows minimal understanding (0-59%).
Tests	25%	Demonstrates thorough understanding and application of concepts (90-100%).	Shows good understanding with minor errors (80-89%).	Displays basic understanding with some errors (70-79%).	Limited understanding with several errors (60-69%).	Minimal understanding and many errors (0-59%).
H.A.T.S. presentation	25%	Demonstrates comprehensive understanding and application of course concepts (90-100%).	Shows strong understanding with minor errors (80-89%).	Displays adequate understanding with some errors (70-79%).	Limited understanding with several errors (60-69%).	Minimal understanding and many errors (0-59%).

7 Course Schedule

Week	Topic
1	Plato & Programming
2	Plato's Meno & Game Programming
3	Programming as an Art, IPython, Google Colaboratory
4	Manipulating values in Python
5	Hello world program, input/output, using strings
6	Writing a game program: planning, randomness, while
7	Checking conditions, printing results, alterations
8	Dragon realm, flowcharts, functions, Booleans
9	Writing and testing the Dragon Realm program
10	Planning the Hangman game with flowcharts
11	Writing the Hangman code
12	Extending the Hangman game
13	Artificial Intelligence: planning Tic-Tac-Toe
14	Writing and testing Tic-Tac-Toe
15	Preparing the H.A.T.S. presentation
16	H.A.T.S. presentation

See also: 2024-2025 academic calendar.

8 Learning management system

- We use Lyon's Canvas installation for this course.
- Every session will be recorded in Zoom
- The Canvas page contains: calendar, assignments, tests, gradebook

9 Lyon College Standard Policies

Standard Lyon College Policies are incorporated into this syllabus and can be found at the following link: `http://www.lyon.edu/standard-course-policies`.