Upward Bound Math-Science Research Group

Dr. Marcus Birkenkrahe, Lyon College

May 9, 2023

Title of course

"Game and robotics programming with Snap! and Python"

Instructor name

Dr. Marcus Birkenkrahe, Associate Professor of Computer and Data Science, Lyon College, Batesville, AR, and Professor of Business Informatics, Berlin School of Economics and Law, Berlin, Germany.

Contact information: email birkenkrahe@lyon.edu, phone (501) 422-4725.

Course location

Derby Science Center, Computer Lab, Room 239

Course Begin & End Time

- Classes begin on Monday, June 12th at 9:25 AM

- Each class starts at 9:25 AM and finishes at 10:55 AM (90 min)

- No classes from Monday, July 3rd to Friday, July 7th

- Last class on Thursday, July 13th.

Course description

In this course, you will complete a series of game, animation and robotics projects using the visual, drag-and-drop programming language Snap! and Python (for robotics) You will learn basic computer and data science principles, and understand how computers help us control the world around us. You will graduate from mere consumer and user to powerful programmer while playing around with blocks on the screen. Acquiring programming skills will help you develop your critical thinking. We will meet daily for 90 minutes of practical problem solving and interactive exercises. In between classes, you will work on small assignments, and you will read short textbook chapters or watch short instructional videos. You'll get to present your own work and (optionally) publish your finished projects for the whole world to see, and if things go well, perhaps we'll go to Snap!Con in California next year!

Learning Objectives

Students who complete "Games and Robotics Programming with Snap! and Python" will be able to:

- Create exciting games, animation and media computation

- Learn computer and data science principles by playing with data

- Acquire basic sequential programming skills

- Know how to translate visual Snap! code into procedural Python code

- Know how to operate robots using simple instructions

- Understand the relationship of humans and machines better

- Develop their critical thinking skills

- Know how to effectively present assignment results

Textbook / Materials

Textbook: Joshi, A.B. (2018). Learn CS Concepts with Snap!: Create exciting games and interactive animation in Snap! and learn computer science principles.

See also: Joshi, A.B. (2021). Learn Python in a Snap!: Rapid introduction to Python for those who already know Snap! Programming.

Author's website: abhayjoshi.net.

All other materials will be available online via GitHub or on the Snap! home page at Berkeley U.

Course Calendar

Tentative content per classroom session:

No	DATE	TESTS	ASSIGNMENT	READ TEXTBOOK CHAPTER
1	Mon-Jun-12	Test 1	Program 1	1.1 First Look at Snap!
2	Tue-Jun-13			1.2 Sequence and Sounds
3	Wed-Jun-14	Test 2	Program 2	1.3 Looping and Costumes
4	Thu-Jun-15			1.4 Geometry and Motion
5	Fri-Jun-16	Test 3	Program 3	1.6 Broadcasting
6	Mon-Jun-19			1.5 Animation project
7	Tue-Jun-20	Test 4	Program 4	2.1 Events, Concurrency
8	Wed-Jun-21			2.2 Keyboard Interaction
9	Thu-Jun-22	Test 5	Program 5	3.1 Mouse Interaction
10	Fri-Jun-23			3.2-4.2 Paddle and bricks
11	Mon-Jun-26	Test 6	Program 6	5.1-5.3 Falling objects
13	Tue-Jun-27			6.1-6.2 Flappy Bird
14	Wed-Jun-28	Test 7	Program 7	7.1-7.4 Traffic Light
15	Thu-Jun-29			Beyond the Basics
16	Fri-Jun-30	Test 8	Program 8	From Snap! to Python
17	Mon-Jul-10			Sphero Bolt Robotics I
18	Tue-Jul-11	Test 9	Program 9	Sphero Bolt Robotics II
19	Wed-Jul-12			Final projects I
20	Thu-Jul-13	Test 10	Program 10	Final projects II

Grading

- The tests are multiple choice quizzes available on Canvas and GitHub

- The programs have to be uploaded to the student's project repository at snap.berkeley.edu

REQUIREMENT	UNITS	PPU	TOTAL	% of TOTAL
Tests	10	10	100	25.
Programs	10	10	100	25.
Participation	20	5	100	25.
Project	2	50	100	25.
TOTAL			400	100.

- The (group) project needs to be proposed and defended and the results need to be presented in class.

- Participation is based on presence and engagement in class.

The final grade is computed based on this table:

%	MIDTERM GRADE	FINAL GRADE	POINTS
100-98	A+		
97-96	A	A (passed -	
95-90	A-	very good)	360.
89-86	B+		
85-80	B	B (passed -	
79-76	B-	good)	304.
75-70	C+		
69-66	C	C (passed -	
65-60	C-	satisfactory)	240.
59-56	D+		
55-50	D	D (passed)	200.
49-0	F	F (failed)	

Standards of Student Behavior

- Students are not allowed to wear headphones or use any electronic devices during class.

- Students are not allowed to bring food or drinks into classrooms (excluding water bottles).

- Students are expected to follow the policies in the Student & Guardian Summer Session Handbook at all times.

Make-Up Work Policy

In the event a student is absent due to illness, or if the student does not complete an assignment on time, the student should contact the course instructor for individual arrangements on how to make up/submit missed/late assignments.