Virginia Commonwealth University
College of Engineering
Computer Science

CMSC 144 - Code Beats: Intro to Programming via Hip Hop

Syllabus Fall, 2022

Course Level: Undergraduate Prerequisites: None

Instructors:

Dr. David C. Shepherd, shepherdd@vcu.edu, Office: 2322

Dr. Taylor Barnett, barnettt@vcu.edu, Zoom Office ID: 284 614 3096

Classroom: Engineering Building West, Room 0101 Office Hours: TBD

Meeting day/time: Tuesdays, 7-8:50pm

University Course Description

Semester course; 2 lab hours. 1 credit. Prerequisite: None. An introduction to computer programming in Python by teaching students to create hip hop beats. Teaches fundamental programming concepts including sequencing, syntax, variables, functions, parameters, lists, repetition, and modularization. Teaches just enough music theory to ensure that student-made beats sound great, including fundamental concepts such as melody, rhythm, harmony, chord progression, and orchestration. Students will complete in-class activities that reinforce class concepts and, if completed correctly, demonstrate a clear understanding of the material.

Student Learning Outcomes

- Upon successful completion of this course, the student will be able to:
- Identify the fundamental concepts of computer programming
- Identify the fundamental musical concepts behind hip hop beats
- Write a computer program that creates a novel hip hop beat, from start to finish
- Identify computational courses at VCU that would help them with their major

Major Topics:

Programming

- Sequencing
- Syntax
- Variables
- Parameters
- Functions
- Lists
- Repetition
- Modularization
- Repetition
- Melody

Music

- Harmony
- Rhythm
- Chord Progressions
- Orchestration

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Required materials

- There is no required textbook. Notes and online reading materials will be provided.
- Laptop: The student is expected to bring their own laptop that meets the minimum university computing guidelines.
- Headphones or earbuds.
- Create a free account at https://tunepad.com/

Class Schedule/Topics:

- Week 1: NO CLASS
- Week 2: Introduction, Sequencing and Syntax via Melody
- Week 3: Variables and Constants via Melody, Functions & Parameters via Rhythm
- Week 4: Lists via Chords, Lists & Repetitions via Rhythm
- Week 5: List-Based Repetitions via Harmony, Nested Repetitions via Chord Progressions
- Week 6: Modularization and Parallelization via Orchestration
- Week 7: Final Project Instructions/Templates
- Week 8-14: No class meetings. Students are encouraged to contact the instructors with questions or for feedback on their final project.
- Week 15 (Dec 6): Share final projects with the class!

Evaluation and Grading:

Assignments: Students complete short assignments in TunePad each week, based on the content and activities covered that week. These assignments are graded for good-faith completion.

Final Project: Students will spend the second half of the semester working on an original beat that will meet certain criteria in the musical structure and computer code. A clear grading rubric and project templates will be provided. Students are encouraged to solicit feedback from the instructors during weeks 7-14, when class does not meet in person.

Grade Weight

- Assignments 50%
- Final Project 50%

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Attendance

Attendance is expected from all students in the course. To encourage attendance, the instructor will use periodic, short, in-class activities, which will be graded for completion. While the grade for 1 of these assignments will be dropped from final calculation, a student will not be allowed to complete them after class, except in extenuating circumstances, which will be worked out on a case-by-case basis.

Grading scheme:

A: >= 90%

B: >= 80% and < 90%

C: >= 70% and < 80%

D: >= 60% and < 70%

F: < 60%

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