The Hong Kong University of Science and Technology

Division of Arts and Machine Creativity (AMC)

AMCC2020, in Spring 2025/26

Course code: AMCC2020 (3 credits)
Course title: Coding for Artistic Expression and Creation
Abbreviated title: Creative Coding
Course instructor: Hongbo Fu
Target students: Undergraduate students (with prior programming knowledge preferred)
Class quota: 30
Grading requirement: Letter grades

Course description:
This course introduces students to the world of creative coding, where technology meets artistic expression. Students will engage in hands-on projects that explore concepts such as randomness, sound art, image processing, and generative art. Through individual assignments and a collaborative final project, students will learn to harness code as a medium for creativity, producing unique art pieces that blend visual, auditory, and interactive elements. While prior programming knowledge is preferred, this course will accommodate students with varying levels of programming experience. However, the emphasis will be on using coding as a tool for artistic expression rather than systematically covering all programming elements.

Enrolment requirement: N.A.

Course Intended Learning Outcomes
On successful completion of the course, students will be able to:
1. Explain the principles and history of creative coding, demonstrating an understanding of its role in contemporary artistic practices.
2. Create code-based artistic works that reflect artistic concepts and aesthetic sensitivity.
3. Apply computational thinking to solve creative challenges, showcasing creativity through the practice of coding.
4. Utilize AI tools to facilitate brainstorming, problem-solving, and coding processes in the creation of artistic projects.
5. Collaborate effectively in teams to conceptualize and present a final art project, integrating various art forms and media.
6. Reflect on the integration of technology in artistic practices and articulate the impact of creative coding on personal artistic expression.

Teaching and learning activities:
1. Lectures
2. Hands-on Workshops (during class hours)

Planned Assessment & Weightings:

Assessment	Percentage
Class Participation (attendance, in-class exercises, and group discussions)	10%
2 Individual Programming Assignments	40%
1 Collaborative Project (up to 3 group members)	50%

- Programming	-	30%
- Report	-	10%
- Presentation (~5 minutes per group)	-	5%
- Peer Evaluation	-	5%

Weekly Course Outline (<mark>TENTATIVE</mark>)

Week	Topics	Briefly outline what this topic will cover *(Include reading assignments if available)*	Indicate which course ILOs this topic is related to *(Write CILO-1, CILO-2, etc.)*
1	Introduction to Creative Coding	- Overview of the history of creative coding and its significance in contemporary art. - Presentation of various examples of art projects based on coding. - Basics of coding, drawing, and interactivity in the chosen platform. - Demonstration of AI tools for creative coding - Reading: Chapter 1, Processing: Creative Coding and Computational Art by Ira Greenberg.	CILO-1, CILO-4, CILO-6
2	Randomness and Noise I	- Introduction to the concept of randomness in coding. - Introduction/review of basic programming concepts. - Exploration of Perlin noise and its creative applications in 1D and 2D contexts.	CILO-1, CILO-2, CILO-3
3	Randomness and Noise II	- Revisiting Perlin noise in the Polar coordinate system. - Introduction to 2D transformations and their applications in creative projects. - Introduction/review of basic programming concepts. - Release **Assignment 1**: Randomness and Noise.	CILO-2, CILO-3, CILO-4
4	Sound Art I	- Exploration of creative applications based on sound parsing techniques. - Presentation of examples to illustrate concepts.	CILO-1, CILO-2
5	Sound Art II	- Focus on sound synthesis and its creative applications. - Revisiting concepts of randomness and noise in sound art.	CILO-2, CILO-3, CILO-4
6	Image Manipulation and Creative Filters	- Introduction to image manipulation techniques and the use of creative filters in coding. - Assignment 1 due - Release **Assignment 2**: Multimedia Art.	CILO-1, CILO-2, CILO-3
7	Painting with Bits	- Introduction to pixel-level image processing and its artistic implications.	CILO-1, CILO-2, CILO-3
8	3D Graphics	- Introduction of 3D graphics including 3D shapes and transformations - Presentation of examples to illustrate 3D art	CILO-1, CILO-2, CILO-3
9	Games and Physics	- Introduction to physics concepts in game design (e.g., Box2D). - Assignment 2 due - Release the Collaborative Final Project: students can work in a group (up to 3 members) to combine techniques learned throughout the course.	CILO-1, CILO-2, CILO-3, CILO-4
10	Generative Art I	- Exploration of generative art concepts, focusing on autonomous agents and cellular automata.	CILO-1, CILO-2, CILO-3
11	Generative Art II	- Introduction to other generative art techniques such as fractals and genetic algorithms.	CILO-2, CILO-3, CILO-4

12	Final Project Production Week	- Dedicated time for students to work on their final projects, applying techniques and concepts learned throughout the course. - Instructors provide guidance and support as students develop their projects.	CILO-2, CILO-3, CILO-4, CILO-5, CILO-6
13	Final Project Presentations	- Students present their final project prototypes to the class. - Discussion and feedback session on the projects, focusing on artistic choices and technical execution.	CILO-5, CILO-6

Student learning resources:

- Shiffman, Daniel. Learning Processing: a beginner's guide to programming images, animation, and interaction. Morgan Kaufmann, 2015.

  BOOK
  Learning processing : a beginner's guide to programming images, animation, and interaction
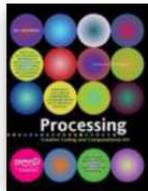 Daniel Shiffman.
  Amsterdam, [Netherlands] : Morgan Kaufmann, 2015.; ©2015

  🔗 Online access >

  ☰ Chapters of this book (38) >

- Greenberg, Ira. Processing: creative coding and computational art. Berkeley, CA: Apress, 2007.

  BOOK
  Processing : Creative Coding and Computational Art
  by Ira Greenberg.
  Berkeley, CA : Apress : Imprint: Apress, 2007.

  🔗 Online access >

  ☰ Chapters of this book (25) >

- Shiffman, Daniel. The nature of code: simulating natural systems with javascript. No Starch Press, 2024.

  BOOK
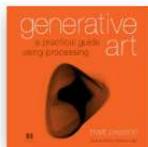 The nature of code : simulating natural systems with JavaScript
  Daniel Shiffman.
  San Francisco, CA : No Starch Press, Inc., [2024]

  🔗 Online access >

  ☰ Chapters of this book (20) >

- Pearson, Matt. Generative art: a practical guide using processing. Simon and Schuster, 2011.

  BOOK
  Generative art : a practical guide using processing
  Matt Pearson.
  Shelter Island, New York : Manning Publications, [2011]; ©2011

  🔗 Online access >

  ☰ Chapters of this book (18) >

- The Coding Train at YouTbue: https://www.youtube.com/@TheCodingTrain