

## Course Description

### “Programming with Processing”

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“Processing” is a free, open source programming language that was developed at MIT by two graduate students (Ben Fry and Casey Reas) for people who do not have a programming background but who wish to include images, animations and other ‘digital’ endeavors into their projects. To quote from the Processing web page: “It is created to teach fundamentals of computer programming within a visual context and to serve as a software sketchbook and professional production tool.” It has become so popular that several hardware controller boards have been developed that utilize the Processing language. Using these boards, one can control motors and other devices.

**Only Pre-requisite: A desire to learn computer programming.**

***NOTE: It is extremely important that every student have access to a computer during class and for doing homework. This is a “hands-on” course and the amount of lecturing is intended to be minimal.***

The course meets twice a week for one hour twenty minutes each session and runs for twenty weeks – except for holidays and special occasions.

Students will learn how to write computer programs (called 'sketches') using Processing that emphasize "visual context". Interspersed with the coding of the programs will be a mixture of computer history and learning something about pioneering scientists and artists who used or continue to use the computer for their creative endeavors.

Many mathematical topics will be introduced. These topics include (among others)

- ASCII (American Standard Code for Information Interchange) hexadecimal,
- Converting from one number system to another such as hexadecimal to decimal and binary notation,
- Trigonometry - with an emphasis on the sine and cosine functions, and
- Pi and other important constants such as e, phi, and tau (refer to <http://tauday.com>).

To introduce the students to the above topics and others (too numerous to mention) the students will create images using the following approaches:

- the student will encode her name to ASCII, convert it to binary, and create an image based on the binary representation of her name,
- create an image similar to one of Joseph Alber's "Homage to the Square" images,
- code a freehand drawing program that utilizes the mouse and keyboard as input devices,
- create an image based on the digits of pi or one of the other mathematical constants,
- use an MP3 music file to create an image,
- learn how to move text on the computer screen,
- create an image based on a Sudoku-like puzzle and animate it,
- learn how to manipulate individual pixels to create a variety of effects,
- learn the basics of creating 3D images, and
- learn the basics of classes and other OOP (Object-Oriented Programming) concepts.

Student evaluation is based on the ability to complete all the sketches in a timely fashion utilizing the creativity of the student.

<http://www.tinicumartandscience.org/>