

Computer Science and Programming Course Offerings 2017-2018

Fall Offerings -

Introduction to Computer Programming: 1-semester course, Fall, 0.5 credit elective

Prerequisites:

1. successful completion of Integrated Math 1

In this introductory course students will work with Python—an industry-standard programming language used in many products including commercial systems, cell phones, and games like *Civilization*. Students use their own laptops to discover how to write programs that will play games, analyze documents and do math homework. They will spend time discovering by trial and error how best to solve problems and practice patience as they discover that things don't always work the first time, that failure with reflection can lead to greater understanding, and that the first solution is not always the best.

Computer Science 1: 1-semester course, Fall, 0.5 credit elective

Prerequisites: None

Starting with a historical perspective on the development of the computer, students examine the hardware inside of computers, the things that get plugged into a computer, and its connections to the outside world. Students develop an understanding of what the different types of components, drives, and cards do, and investigate the software that controls the computer. They will assemble and program inexpensive computers.

Computer-Based Modeling: 1-semester course, Fall, 0.5 credit math or elective

Prerequisites:

1. successful completion of a Precalculus course

AND

2. recommendation of a previous math instructor

In this class students will learn the basics of multidimensional mathematics, often times in the context of modeling physical systems. With the aid of a computer and a little coding knowledge, students will learn to generate programs and/or algorithms which analyze and gain insights into otherwise complicated or counterintuitive systems. During this fall semester course, students will learn concepts of multivariate mathematics and how to use computer programs to model and analyze multivariate systems. They will code in Matlab, a powerful academic and commercially used software package for analysis, plotting, modeling, and programming. While no experience with coding is necessary to take this course, basic coding knowledge is preferred.

Spring Offerings -

Computer Programming and Games Design: 1-semester course, Spring, 0.5 credit elective

Prerequisites:

1. successful completion of Introduction to Computer Programming

This course builds on the Introduction to Computer Programming course as student investigate and improve the games they have been working on in that course. Limited only by their own imaginations, students invent and build their own new features for games - better graphics and sound, scoring systems, level-ups, degrees of difficulty, and two player versions of one player games.

Advanced Computer Programming and Games Design: 1-semester course, Spring, 0.5 credit elective

Prerequisites:

1. successful completion of Computer Programming and Games Design

Students who have completed Computer Programming and Games Design may choose to continue their programming study with this course that meets regularly with Computer Programming and Games Design. Students get a mixture of guidance and free rein to design and develop their own programs. Use of advanced techniques is encouraged and time is spent on college level algorithm writing. *Note: This course may be repeated once for a total of 2 Elective credits.

Computer Science 2: 1-semester course, Spring, 0.5 credit elective

Prerequisites:

1. Computer Science 1

Students will expand their knowledge of computing systems as they explore important topics such as security, encryption, and databases, and the ways in which computing systems handle large quantities of data. They will investigate how computer generated graphics are created, even trying this, on a small scale, themselves. In addition, students practice advanced code algorithms to create the "recipes" that make computers work efficiently.