

# FAMILY WEEKEND 2019

HARVEY  
MUDD  
COLLEGE

Thursday, February 7

## Data Structures/Program Development (CSCI070 HM)

1:15-2:30 p.m. | Shanahan Center B442 | Professor Lucas Bang, Professor Christopher Stone

Abstract data types including priority queues and dynamic dictionaries and efficient data structures for these data types, including heaps, self-balancing trees and hash tables. Analysis of data structures including worst-case, average-case and amortized analysis. Storage allocation and reclamation. Secondary storage considerations. Extensive practice building programs for a variety of applications.

## Computer Systems (CSCI105 HM)

1:15-2:30 p.m., 2:45-4:00 p.m. | Shanahan Center 2460  
Professor Beth Trushkowsky

An introduction to computer systems. In particular the course investigates data representations, machine level representations of programs, processor architecture, program optimizations, the memory hierarchy, linking, exceptional control flow (exceptions, interrupts, processes and Unix signals), performance measurement, virtual memory, system-level I/O and basic concurrent programming.

## Software Development (CSCI121 HM)

1:15-2:30 p.m., 2:45-4:00 p.m. | Shanahan Center 3481  
Professor Elizabeth Sweedyk

Introduction to the discipline concerned with the design and implementation of software systems. The course presents a historical perspective on software development practice and explores modern, agile techniques for eliciting software requirements, designing and implementing software architecture and modules, robust testing practices, and project management. Student teams design, develop and test a substantial software project.

## Scientific Computing (CSCI144 HM)

4:15-5:30 p.m. | Shanahan Center B442 | Professor Ali Nadim

Computational techniques applied to problems in the sciences and engineering. Modeling of physical problems, computer implementation, analysis of results; use of mathematical software; numerical methods chosen from: solutions of linear and nonlinear algebraic equations, solutions of ordinary and partial differential equations, finite elements, linear programming, optimization algorithms and fast Fourier transforms.

## Principles of Macroeconomics (ECON053 HM)

2:45-4:00 p.m. | Galileo Hall MCAL | Professor Gary Evans

An introductory course designed to provide a fundamental understanding of the national economy. Topics include theories of unemployment, growth, inflation, income distribution, consumption, savings, investment, and finance markets, and the historical evolution of economic institutions and macroeconomic ideas.

## Advanced Rocketry/Special Topics in Engineering (ENGR190AJHM)

1:15-2:30 p.m. | Shanahan Center 3421 | Professor Erik Spjut

The course will delve into four of the following rocketry topics in some detail: Flight dynamics and modeling, Dynamic equations of motion, Structural dynamics and modeling, Avionics, Telemetry, Sensors and signal conditioning, Kalman filtering and signal processing, Risk and reliability, Propulsion. The course will terminate with a six-week project where students will construct, model, and fly rockets into the supersonic region.

## Chemical & Thermal Processes (ENGR082 HM)

2:45-4:00 p.m. | Shanahan Center 2454 | Professor Anthony Bright

The basic elements of thermal and chemical processes, including: state variables, open and closed systems, and mass balance; energy balance, First Law of Thermodynamics for reactive and non-reactive systems; entropy balance, Second Law of Thermodynamics, thermodynamic cycles and efficiency.

## Intro to Biomedical Engineering (ENGR164 HM)

1:15-2:30 p.m. | Shanahan Center 2450 | Professor Liz Orwin

The application of engineering principles to help pose and solve problems in medicine and biology. Focus on different aspects, particularly biomedical measurements, biosystems analysis, biomechanics and biomaterials.

## Engineering Electronics (ENGR151 HM)

1:15-2:30 p.m. | Shanahan Center B450  
Professor Matthew Spencer

Analysis and design of circuits using diodes, bipolar junction transistors and field-effect transistors, following a brief treatment of solid state electronics and the physics of solid state devices. Analysis and design of single and multi-transistor linear circuits including operational amplifiers.

## Early Modern Europe/Special Topics in History (HIST179K HM)

2:45-4:00 p.m. | Shanahan Center 2421  
Professor Kathryn Wolford

This survey asks why we see the period between 1500-1800 as witnessing and producing what we call the "modern" world. Beginning with Gutenberg's printing press, through primary source readings we will examine the ways changing forms of knowledge gave rise to religious pluralism, empirical science, consumer capitalism, and the nation state. In doing so, we will pay particular attention to the consequences of Europe's exploration of and colonial expansion into Asia, Africa, and the Americas.

## History of Modern Physics (HIST152 HM)

2:45-5:30 p.m. | Shanahan Center Room B450 at 2:45 p.m.  
Shanahan Center Room 2475 at 4:15 p.m.  
Professor Vivien Hamilton

An examination of the cultural and social worlds of physics in the 19th and 20th centuries. Topics include the relationship of experiment to theory, the development of relativity and quantum mechanics, the role of physicists in the atomic bomb project, and the experiences of women in physics.

## Mathematical Analysis I (MATH131 HM)

1:15-2:30 p.m. | Shanahan Center 2440 | Professor Lisette de Pillis

This course is a rigorous analysis of the real numbers, and an introduction to writing and communicating mathematics well. Topics include properties of the rational and the real number fields, the least upper bound property, induction, countable sets, metric spaces, limit points, compactness, connectedness, careful treatment of sequences and series, functions, differentiation and the mean value theorem, and an introduction to sequences of functions.

## Discrete Mathematics (MATH055 HM)

1:15-2:30 p.m., 2:45-4:00 p.m. | Shanahan Center 3485  
Professor Michael Orrison

Topics include combinatorics (clever ways of counting things), number theory, and graph theory with an emphasis on creative problem solving and learning to read and write rigorous proofs.

## Animal Media Studies (MS120 HM)

1:15-2:30 p.m. | Shanahan Center 2465 | Professor Rachel Mayeri

This course will examine representations of animals in film - wildlife documentaries, animated features, critter cams, scientific data, and video art - to address fundamental questions about human and animal nature and culture. Animal Studies is an interdisciplinary field in which scholars from philosophy, biology, media studies, and literature consider the subjective lives of animals, the representations of animals in media and literature, and the shifting boundary line between human and animal. In readings, screenings, and discussions, we will consider the cultural and material lives of humans and animals through the lenses of science, art, literature, and film.

Friday, February 8

## Ecology & Environmental Biology (BIOL108 HM)

9-9:50 a.m. | Shanahan Center 2421 | Professor Stephen Adolph

Principles of organization of natural communities and ecosystems, including population dynamics, species interactions and island biogeography. Modern experimental and mathematical approaches to ecological problems. Application of ecological principles to conservation biology, human demography and harvesting of natural resources.

## Introduction to Biology (BIOL052 HM)

10-10:50 a.m., 11-11:50 a.m. | Shanahan Center 2450/2460  
Professor Eliot Bush

Genes, genomes and human health: topics in evolution, molecular genetics, and computational biology.

## Introduction to Biology (BIOL052 HM)

10-10:50 a.m., 11-11:50 a.m. | Shanahan Center 2454  
Professor Matina Donaldson-Matasci

Genes, genomes and human health: topics in evolution, molecular genetics, and computational biology.

## Introduction to Biology (BIOL052 HM)

10-10:50 a.m., 11-11:50 a.m. | Shanahan Center 2475  
Professor Erika Danae Schulz

Genes, genomes and human health: topics in evolution, molecular genetics, and computational biology.

## Group Theory/Quant Chem/Spectroscopy (CHEM052 HM)

9-9:50 a.m. | Shanahan Center 3465 | Professor Robert Cave

Chemical group theory. Introduction to quantum mechanics with application to atoms and molecules. Applications of group theory and quantum mechanics to spectroscopy.

## Inorganic Chemistry (CHEM104 HM)

9-9:50 a.m. | Shanahan Center 2407 | Professor Adam Johnson

Systematic study of the preparation, properties, structures, analysis and reactions of inorganic compounds.

## Carbon Compounds (CHEM056 HM)

10-10:50 a.m. | Shanahan Center 3460 | Professor William Daub

A systematic study of the chemistry of carbon-containing compounds, emphasizing synthesis, reaction mechanisms, and the relation of structure to observable physical and chemical properties.

## Advanced Analytical Chemistry (CHEM114 HM)

10-10:50 a.m. | Shanahan Center 2407 | Professor Lelia Hawkins

Fundamentals of modern instrumental design, application, and usage with an emphasis on the underlying principles of operation. Chemometrics.

## Operations Research (ENGR187 HM)

11-12:15 p.m. | Honnold/Mudd Library M234  
Professor Susan Martonosi

Linear, integer, non-linear and dynamic programming, classical optimization problems, and network theory.

## Intro to Linear Algebra (MATH040 HM)

8-8:50 a.m., 9-9:50 a.m. | Shanahan Center 1430  
Professor Francis Su

Theory and applications of linearity, including vectors, matrices, systems of linear equations, dot and cross products, determinants, linear transformations in Euclidean space, linear independence, bases, eigenvalues, eigenvectors, and diagonalization.

## Number Theory (MATH175 HM)

11-11:50 a.m. | Shanahan Center 2440 | Professor Arthur Benjamin

Properties of integers, congruences, Diophantine problems, quadratic reciprocity, number theoretic functions, primes.

## Quantum Physics (PHYS052 HM)

11-11:50 a.m. | Shanahan Center 3481  
Professor Ann Esin, Professor John Townsend

The development and formulation of quantum mechanics, and the application of quantum mechanics to topics in atomic, solid state, nuclear and particle physics.