Current

35L. Software Construction Laboratory. (2)

Laboratory, four hours; outside study, two hours. Enforced requisite: course 31. Fundamentals of commonly used software tools and environments, particularly open-source tools to be used in upper division computer science courses. Letter grading. Mr. Eggert (F,W,Sp)

CM124. Computational Genetics. (4)

(Same as Human Genetics CM124.) Lecture, four hours; discussion, two hours; outside study, six hours. Enforced requisites: course 32 or Program in Computing 10C with grade of C– or better, and one course from Biostatistics 100A, 110A, Civil Engineering 110, Electrical Engineering 131A, Mathematics 170A, or Statistics 100A. Designed for engineering students as well as students from biological sciences and medical school. Introduction to computational analysis of genetic variation and computational interdisciplinary research in genetics. Topics include introduction to genetics, identification of genes involved in disease, inferring human population history, technologies for obtaining genetic information, and genetic sequencing. Focus on formulating interdisciplinary problems as computational problems and then solving those problems using computational techniques from statistics and computer science. Concurrently scheduled with course CM224. Letter grading. Mr. Sankararaman (Sp)

132. Compiler Construction. (4)

Lecture, four hours; discussion, two hours; outside study, six hours. Enforced requisites: courses 131, 181. Compiler structure; lexical and syntactic analysis; semantic analysis and code generation; theory of parsing. Letter grading. Mr. Palsberg (F)

M276A. Pattern Recognition and Machine Learning. (4)

(Same as Statistics M231.) Lecture, three hours. Designed for graduate students. Fundamental concepts, theories, and algorithms for pattern recognition and machine learning that are used in computer vision, image processing, speech

Proposed

35L. Software Construction Laboratory. ~~(2)~~ (3)

Laboratory, four hours; outside study, ~~two~~ four hours. Enforced requisite: course 31. Fundamentals of commonly used software tools and environments, particularly open-source tools to be used in upper division computer science courses. Letter grading. Mr. Eggert (F,W,Sp)

CM124. Computational Genetics. (4)

(Same as Human Genetics CM124.) Lecture, four hours; discussion, two hours; outside study, six hours. Enforced requisites: course 32 or Program in Computing 10C with grade of C– or better, Mathematics 33A, and one course from ~~Biostatistics 100A, 110A,~~ Civil Engineering 110, Electrical Engineering 131A, Mathematics 170A, or Statistics 100A. Designed for engineering students as well as students from biological sciences and medical school. Introduction to computational analysis of genetic variation and computational interdisciplinary research in genetics. Topics include introduction to genetics, identification of genes involved in disease, inferring human population history, technologies for obtaining genetic information, and genetic sequencing. Focus on formulating interdisciplinary problems as computational problems and then solving those problems using computational techniques from statistics and computer science. Concurrently scheduled with course CM224. Letter grading. ~~Mr. Sankararaman~~ Mr. Halperin (Sp)

132. Compiler Construction. (4)

Lecture, four hours; discussion, two hours; outside study, six hours. Enforced requisites: course~~s~~ 131~~, 181~~. Compiler structure; lexical and syntactic analysis; semantic analysis and code generation; theory of parsing. Letter grading. Mr. Palsberg (F)

M276A. Pattern Recognition and Machine Learning. (4)

(Same as Statistics M231.) Lecture, three hours; discussion, one hour. Designed for graduate students. Fundamental concepts, theories, and algorithms for pattern recognition and machine learning that are used in computer vision, image

recognition, data mining, statistics, and computational biology. Topics include Bayesian decision theory, parametric and nonparametric learning, clustering, complexity (VC-dimension, MDL, AIC), PCA/ICA/TCA, MDS, SVM, boosting. S/U or letter grading. Mr. Zhu

processing, speech recognition, data mining, statistics, and computational biology. Topics include Bayesian decision theory, parametric and nonparametric learning, clustering, complexity (VC-dimension, MDL, AIC), PCA/ICA/TCA, MDS, SVM, boosting. S/U or letter grading. Mr. Zhu

M186LS. Systems Biomodeling & Simulation Basics (4)

(Same as Bioengineering M186LS and Molecular, Cell, & Developmental Biology M186LS). Lecture, three hours; discussion, one hour; laboratory, one hour. 2. Enforced Requisites: Mathematics 31B; or Mathematics 3B; or Life Sciences 30A. Recommended co-requisite: Mathematics 32A; or Mathematics 3C; or Life Sciences 30B. Introductory-level "how-to" modeling and simulation of dynamic biosystems, using basic engineering systems concepts and methods, with minimal math, and animated graphing tools. The course is directed primarily toward undergraduate students in life sciences and engineering, as a first exposure to "explicit modeling of biological systems". Integrated lectures and discussion present how the biology, biochemistry and physiology underlying dynamic systems biomodeling (form, structure and function) are morphed into system diagrams and graphs – providing accessible and useful modeling formalisms in and of themselves – for refining conceptual understanding of their form and function. These structural models are then pedagogically morphed further into simple first-order differential equations, and implemented in simulation diagrams for quantifying and exploring biosystem properties. Explicit biosystem models bring greater clarity to the nature of biosystem phenomena under study, providing a more precise framework for formulating questions and new ideas for researching them. Letter grading. Mr. DiStefano (W)