Department of Scientific Computing Classes   SPRING 2016

Course	Title	Instructor	Description	Schedule
ISC 3313 3 Credit Hours	*Introduction to Scientific Computing in C++*	TOMASZ PLEWA	This course introduces the student to the science of computations. Topics cover algorithms for standard problems in computational science, as well as the basics of an object-oriented programming language, to facilitate the students' implementation of algorithms. Prerequisites: MAC 2311, MAC 2312.	**T R 2:00-3:15** **217 HCB**
ISC 4220 4 Credit Hours	*Algorithms for Science Applications I*	CHEN HUANG	Basic computational algorithms including interpolation, approximation, integration, differentiation, and linear systems solution presented in the context of science problems. The lab component includes algorithm implementation for simple problems in the sciences and applying visualization software for interpretation of results. Corequisite: ISC 3222; Prerequisite: MAC 2312.	**T R 9:30-10:45** **217 HCB** **R 3:30-6:00 (Lab)** **152 DSL**
ISC 4244/ISC 4933 4 Credit Hours	*Computer Applications in Psychology/in Social Sciences*	DENNIS SLICE	This course gives the students practical knowledge of a powerful and flexible programming language with application to computational and research elements important in their field. Topics include image and audio manipulation, data analysis, all in the context of using a variety of software tools and packages.	**M W F 10:10-11:00** **499 DSL** **M 11:15-1:15 (Lab)** **A105 PSY**
ISC 4304 4 Credit Hours	*Programming for Scientific Applications*	XIAOQIANG WANG	Provides knowledge of Python, which serves as a front-end to popular packages and frameworks, along with the compiled language C++. Topics include the practical use of an object-oriented scripting and compiled language for scientific programming applications. There is a laboratory component, concepts learned are illustrated in several science applications. Prerequisites: MAC 2312, COP 3014 or ISC 3313.	**T R 11:00-12:15** **217 HCB** **T 3:30-6:00 (Lab)** **152 DSL**
ISC 4933/ISC 5935 3 Credit Hours	*Genomic Sequencing and Analysis*	ALAN LEMMON	After an overview of the emerging DNA sequencing technologies, students will be introduced to algorithms designed to assemble billions of nucleotides of DNA sequence data both with and without a reference genome. Students without programming experience will utilize pre-existing software packages, whereas students with programming experience will develop and implement new algorithms for analysis. Students may also have the opportunity to collect and analyze data using a state-of-the art genome sequencer (Illumina MiSeq).	**M W F 10:10-11:00** **152 DSL**
ISC 5226 3 Credit Hours	*Numerical Methods for Earth and Environmental Sciences*	MING YE	This course looks into the application of numerical methods to the solution of scientific problems for earth and environmental sciences. Prerequisite: MAC 2311, MAC 2312, ISC 5305.	**M W F 9:05-9:55** **152 DSL**
ISC 5315 4 Credit Hours	*Applied Computational Science I*	SACHIN SHANBHAG	Provides students with high performance computational tools to investigate problems in science and engineering with an emphasis on combining them to accomplish more complex tasks. Topics from scientific visualization, linear algebra, interpolation and approximation, numerical quadrature, discrete differentiation, numerical ODEs and Monte Carlo. Prerequisites: ISC 5305, MAP 2302.	**M W F 11:15-12:05** **M 2:30-5:00 (Lab)** **152 DSL**
ISC 5935 3 Credit Hours	*Scientific Computing for Integral Equation Methods*	BRYAN QUAIFE	An alternative approach for solving a partial differential equation (PDE) reformulates it as an integral equation (IE). This approach is naturally adaptive, allows high order approximations, handles complex geometry and divergence-free constraints. Applications will be drawn from scattering, incompressible Stokes flow, Maxwell's equations, and interfacial dynamics.	**T R 2:00-3:15** **422 DSL**