Department of Scientific Computing Classes **SPRING 2020**

ISC 1057 3 Credit Hours	***Computational Thinking***	JANET PETERSON	This introductory course considers the question of how computers have come to imitate many kinds of human intelligence. The answer seems to involve our detecting patterns in nature, but also in being able to detect patterns in the very way we think. We will look at some popular computational methods that shape our lives, and try to explain the ideas that make them work. This course has been approved to satisfy the Liberal Studies Quantitative/Logical Thinking requirement.	**ONLINE @ https://canvas.fsu.edu**
ISC 3313 3 Credit Hours	***Introduction to Scientific Computing***	TBA	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 student's implementation of algorithms. The computer language will be Fortran. Prerequisites: MAC 2311, MAC 2312.	**M W F 1:25-2:15 152 DSL**
ISC 4220C 4 Credit Hours	***Continuous Algorithms for Science Applications***	SACHIN SHANBHAG	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.	**M W F 9:05-9:55 499 DSL T 3:30-6:00 (Lab) 152 DSL**
ISC 4302/5307 3 Credit Hours	***Scientific Visualization***	XIAOQIANG WANG	This course covers the theory and practice of scientific visualization. Students learn how to use state-of-the-art visualization toolkits, create their own visualization tools, represent both 2-D and 3-D data sets, and evaluate the effectiveness of their visualizations. Prerequisite: ISC 5305.	**M W F 12:20-1:10 152 DSL**
ISC 4304C 4 Credit Hours	***Programming for Science Applications***	PETER BEERLI	Provides knowledge of a scripting language that serves as a front end to popular packages and frameworks, along with a compiled language such as C++. Topics include the practical use of an object-oriented scripting and compiled language for scientific programming applications. There is a laboratory component for the course; concepts learned are illustrated in several science applications. Prerequisites: MAC 2312, COP 3014 or ISC 3313.	**T R 9:30-10:45 152 DSL M 2:30-5:00 (Lab) 152 DSL**
ISC 4933/5227 3 Credit Hours	***Survey of Numerical Partial Differential Equations***	TOMASZ PLEWA	This course provides an overview of the most common methods used for numerical partial differential equations. These include techniques such as finite differences, finite volumes, finite elements, discontinuous Galerkin, boundary integral methods and pseudospectral methods. Prerequisite: ISC 5305.	**T R 11:00-12:15 152 DSL**
ISC 4933/5935 3 Credit Hours	***Genome Sequencing and Analysis***	ALAN LEMMON	This course will provide students with training in the current algorithms used to process next-generation sequence data. After lectures designed to bring students up to speed on the cutting edge DNA sequencing technologies, students will develop new algorithms for efficient processing of large amounts of genome-scale data.	**M W F 8:00-8:55 152 DSL**
ISC 4933/5935 3 Credit Hours	***Molecular Dynamics: Algorithms and Applications***	CHEN HUANG	This course provides a comprehensive introduction to molecular dynamics simulation algorithms and their corresponding applications in molecular sciences. Prerequisite: MAC 2311, MAC 2312, ISC 5305.	**T R 12:30-1:45 152 DSL**
ISC 4943 3 Credit Hours	***Practicum in Computational Science***	ANKE MEYER-BAESE	This practicum allows students to work individually with a faculty member throughout the semester and meet with the course instructor periodically to provide progress reports. Written reports and an oral presentation of work are required. May be repeated to a maximum of six semester hours, with a maximum of only three semester hour credits allowed to be applied to the Computational Science degree.	**T R 12:30-1:45 499 DSL**
ISC 5316 4 Credit Hours	***Applied Computational Science II***	TOMASZ PLEWA	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 include numerical methods for partial differential equations, optimization, statistics, and Markov chain Monte Carlo methods. Prerequisite: ISC 5315.	**T R 9:30-10:45 422 DSL R 3:30-6:00 (Lab) 152 DSL**