**COMPUTATIONAL MOD, SIM, & DATA (CX)**

**CX 1801. Special Topics. 1 Credit Hour.**
Course topics will vary. This course number will be to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**CX 1802. Special Topics. 2 Credit Hours.**
Course topics will vary. This course number will be to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**CX 1803. Special Topics. 3 Credit Hours.**
Course topics will vary. This course number will be to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**CX 1804. Special Topics. 4 Credit Hours.**
Course topics will vary. This course number will be to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**CX 1805. Special Topics. 5 Credit Hours.**
Course topics will vary. This course number will be to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**CX 2801. Special Topics. 1 Credit Hour.**
Course topics will vary. This course number will be to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**CX 2802. Special Topics. 2 Credit Hours.**
Course topics will vary. This course number will be to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**CX 2803. Special Topics. 3 Credit Hours.**
Course topics will vary. This course number will be to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**CX 2804. Special Topics. 4 Credit Hours.**
Course topics will vary. This course number will be to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**CX 2805. Special Topics. 5 Credit Hours.**
Course topics will vary. This course number will be to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**Course topics** will vary. This course number will be used to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**CX 3801. Special Topics. 1 Credit Hour.**
Course topics will vary. This course number will be used to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**CX 3802. Special Topics. 2 Credit Hours.**
Course topics will vary. This course number will be used to prototype new courses and/or offer on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**CX 3803. Special Topics. 3 Credit Hours.**
Course topics will vary. This course number will be used to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**CX 3804. Special Topics. 4 Credit Hours.**
Course topics will vary. This course number will be used to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**CX 3805. Special Topics. 5 Credit Hours.**
Course topics will vary. This course number will be used to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

**CX 4010. Computational Prob Solv. 3 Credit Hours.**
Computing principles, computer architecture, algorithms and data structures; software development, parallelism. No credit for graduate students or undergraduates in Computer Science or Computational Media.

**CX 4140. Comp Model Algorithms. 3 Credit Hours.**
Design, analysis and implementation of algorithms for modeling natural and engineered systems; algorithm experimentation, and optimization.

**CX 4220. Intro High Perf Comp. 3 Credit Hours.**
Design of algorithms and software for high performance computing platforms used in computational science and engineering. Topics include parallelism, locality, machine architectures, and programming.

**CX 4230. Computer Simulation. 3 Credit Hours.**
Algorithms and techniques for creating computer simulations and their realization in software.

**CX 4232. SIM & Military Gaming. 3 Credit Hours.**
Creation and use of modeling and simulation tools to analyze and train students regarding strategic events in international relations.

**CX 4236. Distributed Simulation. 3 Credit Hours.**
Algorithms and techniques used to execute simulations on parallel/distributed computing platforms. Simulations for analysis, virtual environments, and computer gaming.

**CX 4240. Computing for Data Analy. 3 Credit Hours.**
Computational techniques needed for data analysis; programming, accessing databases, multidimensional arrays, basic numerical computing, and visualization; hands-on applications and case studies.

**CX 4242. Data & Visual Analytics. 3 Credit Hours.**
Introduction to the analysis of complex data; theory, applications and practical case studies.
CX 4640. Numerical Analysis I. 3 Credit Hours.
Introduction to numerical algorithms for some basic problems in computational mathematics. Discussion of both implementation issues and error analysis.

CX 4641. Numerical Analysis II. 3 Credit Hours.
Introduction to the numerical solution of initial and boundary value problems in differential equations.

CX 4777. Vector & Parallel Sci Comp. 3 Credit Hours.
Scientific computational algorithms on vector and parallel computers. Speed-up and algorithm complexity, interprocess communication, synchronization, modern algorithms for linear systems, programming techniques, code optimization.

CX 4801. Special Topics. 1 Credit Hour.
Course topics will vary. This course number will be used to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

CX 4802. Special Topics. 2 Credit Hours.
Course topics will vary. This course number will be used to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

CX 4803. Special Topics. 3 Credit Hours.
Course topics will vary. This course number will be used to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

CX 4804. Special Topics. 4 Credit Hours.
Course topics will vary. This course number will be used to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

CX 4805. Special Topics. 5 Credit Hours.
Course topics will vary. This course number will be used to prototype new courses and/or offer courses on topics of timely interest. The final digit in the course number indicates the number of units offered awarded for the course.

CX 4893. Special Topics. 3 Credit Hours.
Special Topics for CX (lecture + lab).

CX 4903. Special Problems. 3 Credit Hours.
An investigation of significant areas of computational science and engineering. Guided study and research.