Computational Science Courses

Courses

CPS 5195. Graduate Seminar.
Graduate Seminar: Presentation and discussion of topics in computational science by graduate students, faculty, and visitors.
Department: Computational Science
1 Credit Hour
1 Total Contact Hour
0 Lab Hours
1 Lecture Hour
0 Other Hours
Classification Restrictions:
Restricted to class of DR

CPS 5310. Mathematical & Comp. Modeling.
Mathematical and Computational Modeling: Computer simulation of selected practical problems from physics, engineering, geology, biology or chemistry. Students learn to create mathematical models formulate modeling assumptions, select appropriate numerical methods, implement them in the form of a computer program, and visualize the numerical results. Emphasis is given to verification and validation procedures.
Department: Computational Science
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
Classification Restrictions:
Restricted to class of DR
Prerequisite(s): (CPS 5401 w/B or better)

Advanced Scientific Computing: Advanced scientific computing skills including implementation of numerical methods and mathematical models in a scientific programming language, use of parallel numerical libraries, and large-scale scientific data analysis and visualization (techniques and tools).
Department: Computational Science
3 Credit Hours
6 Total Contact Hours
3 Lab Hours
3 Lecture Hours
0 Other Hours
Classification Restrictions:
Restricted to class of DR
Prerequisite(s): (CPS 5310 w/C or better)

CPS 5330. Prof Skills in Science & Tech.
Professional Skills in Science and Technology: Basic business knowledge and communication skills for scientists, engineers, and technologists in industry or government. Students will sharpen their verbal and writing skills necessary for communicating with clients, supervisors, senior management, and members of the media among others. They will develop ability to collaborate and work on a team, and awareness of the basics of project management, the budgeting, accounting, information security, intellectual property and patent laws, marketing strategies, and ethical issues in science and technology.
Department: Computational Science
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours
Classification Restrictions:
Restricted to class of DR
CPS 5396. Graduate Interdisciplinary Res.
Graduate Interdisciplinary Research: A seminar to showcase interdisciplinary group skills for application problem solving.
Department: Computational Science
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours
Classification Restrictions:
Restricted to class of DR

CPS 5397. Graduate Research.
Graduate Research: Individual research of contemporary topics in Computational Science on the graduate level. This course can be taken more than once at the discretion of the Advisor.
Department: Computational Science
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours
Classification Restrictions:
Restricted to class of DR

CPS 5398. Graduate Thesis.
Graduate Thesis: First semester M.S. thesis course.
Department: Computational Science
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours
Classification Restrictions:
Restricted to class of DR

CPS 5399. Graduate Thesis.
Department: Computational Science
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours
Classification Restrictions:
Restricted to class of DR
Prerequisite(s): (CPS 5398 w/P or better)

CPS 5401. Introduction to Comp Science.
Introduction to Computational Science: Introduction to basic computational science skills including UNIX, scientific programming using high level languages, message passing interface, and parallel computer architectures. Experience with a high level programming language is required for success in this course.
Department: Computational Science
4 Credit Hours
4 Total Contact Hours
0 Lab Hours
4 Lecture Hours
0 Other Hours
Classification Restrictions:
Restricted to class of DR
Prerequisite(s): (MATH 5329 w/C or better)
CPS 6185. Graduate Seminar.
Graduate Seminar: Presentation and discussion of topics in computational science by graduate students, faculty, and visitors.
**Department:** Computational Science
1 Credit Hour
1 Total Contact Hour
0 Lab Hours
1 Lecture Hour
0 Other Hours

Dissertation Seminar: Presentation and discussion of advanced topics in computational science which are related to ongoing doctoral dissertations.
**Department:** Computational Science
1 Credit Hour
1 Total Contact Hour
0 Lab Hours
1 Lecture Hour
0 Other Hours

CPS 6310. Mathematical & Comp. Modeling.
Mathematical and Computational Modeling: Computer simulation of selected practical problems from physics, engineering, geology, biology or chemistry. Students learn to create mathematical models formulate modeling assumptions, select appropriate numerical methods, implement them in the form of a computer program, and visualize the numerical results. Emphasis is given to verification and validation procedures.
**Department:** Computational Science
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
3 Lecture Hours
0 Other Hours

**Prerequisite(s):** (CPS 5401 w/B or better)

Advanced Scientific Computing: Advanced scientific computing skills including implementation of numerical methods and mathematical models in a scientific programming language, use of parallel numerical libraries, and large-scale scientific data analysis and visualization (techniques and tools).
**Department:** Computational Science
3 Credit Hours
6 Total Contact Hours
3 Lab Hours
3 Lecture Hours
0 Other Hours

**Prerequisite(s):** (CPS 5310 w/C or better)

CPS 6386. Graduate Interdisciplinary Res.
Graduate Interdisciplinary Research: A seminar to showcase interdisciplinary group skills for application problem solving.
**Department:** Computational Science
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours

CPS 6387. Graduate Research.
Graduate Research: Individual research of contemporary topics in Computational Science on the graduate level. This course can be taken more than once at the discretion of the Advisor.
**Department:** Computational Science
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours
CPS 6396. Graduate Research.
Graduate Research: Individual research of contemporary topics in computational science at the doctoral level.
Department: Computational Science
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours

CPS 6397. Doctoral Project.
Doctoral Project: Research project on a contemporary topic in computational science at the doctoral level, under direct supervision of a CPS faculty member. Student turns in a written scientific report at the end of the course.
Department: Computational Science
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours

CPS 6398. Dissertation.
Dissertation: First semester doctoral dissertation course.
Department: Computational Science
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours

CPS 6399. Dissertation.
Dissertation: Continuous enrollment required while work on dissertation continues.
Department: Computational Science
3 Credit Hours
3 Total Contact Hours
0 Lab Hours
0 Lecture Hours
3 Other Hours
Prerequisite(s): (CPS 6398 w/P or better)

CPS 6401. Introduction to Comp Science.
Introduction to Computational Science: Introduction to basic computational science skills including UNIX, scientific programming using high level languages, message passing interface, and parallel computer architectures. Experience with a high level programming language is required for success in this course.
Department: Computational Science
4 Credit Hours
4 Total Contact Hours
0 Lab Hours
4 Lecture Hours
0 Other Hours
Prerequisite(s): (MATH 5329 w/C or better)