

# Computational Science Courses

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## 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)

### **CPS 5320. Advanced Scientific Computing.**

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 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

**CPS 5399. Graduate Thesis.**

Graduate Thesis: Second semester M.S. thesis course.

**Department:** Computational Science

**3 Credit Hours**

**3 Total Contact Hours**

0 Lab Hours

0 Lecture Hours

3 Other Hours

**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

**CPS 6195. Dissertation Seminar.**

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)

**CPS 6320. Advanced Scientific Computing.**

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)