CSCE 3850 Introduction to Computational Life Science

Instructor: David Keathly
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Semester: Fall 2012
Time: Wed 11:00 am – 12:20 pm
Place: NTDP D201

Course Catalog Description

Survey treatment of the applications of computational paradigms in the natural and physical sciences. Designed to have a broad appeal to natural and physical science students as well as computer science students. (Same as BIOL 3850.)

Course Outcomes

- Understand the interdisciplinary nature of computational life sciences.
- Develop software applications for computational problems in a programming language preferred by computational life science practitioners.
- Understand the axioms and basic theorems of probability and conditional probability as applied in life science problems.
- Learn the fundamentals of agent and mobile agent systems.
- Learn to evaluate various high performance computer architectures in terms of metrics related to performance.
- Understand the fundamental concepts in Visualization including applications in computational life science problems.

Textbook:

Beginning Perl for Bioinformatics: An Introduction to Perl for Biologists, 2001, Tisdall, O'Reilly, ISBN 9780596000806

Prerequisites

CSCE 2100

Course Requirements:

Attendance: Optional, although student is responsible for all materials covered in lecture and class discussion
Exams: Midterm and Final
Project: There will be a number of individual and small group projects in addition to regular individual assignments
Assignments: There will be a few initial individual assignments and small projects throughout the semester

For More information

Faculty Webpage: www.cse.unt.edu/~dkeathly
Class Web Page: http://moodle.cse.unt.edu

Topics

- Agent based simulation of societies and population
- Mathematical modeling
- Computational Chemistry
- Computational Biology
- Models in Environmental Science
- Computational Epidemiology
- Geographic Information Systems
- Remote Sensing and Image Analysis
- Supercomputing
- Grid and Cluster Computing
- Modeling and Simulation
- Data Visualization

Course Calendar (subject to change)

Week	Topics	Readings, Materials and Assignments
Week 1	Lecture: Course Overview Lecture: Intro to Computation Life Science Featuring CompEpi	see lecture notes on class web page
Week 2	Lecture: Data Representation and Visualization Lecture Scientific Visualization	see lecture notes on class web page

Week 3	Lecture: Imaging, Vision and Remote Sensing	see lecture notes on class web page
Week 4	Lecture: PERL	see lecture notes on class web page
Week 5	Lecture: Probability and Statistics Lecture: Modeling and Simulation	see lecture notes on class web page
Week 6	Group Poster Presentations	see lecture notes on class web page
Week 7	Lecture: Bioinformatics (guest)	see lecture notes on class web page
Week 8	Exam Review Midterm Exam	see lecture notes on class web page
Week 9	Lecture: Cellular Automata Lecture: Agents and Mobile Agents	see lecture notes on class web page
Week 10	Lecture: System Modeling and Performance	see lecture notes on class web page
Week 11	Lecture: TBA (guest)	see lecture notes on class web page
Week 12	Lecture: High Performance Computing Lecture: Grid Computing	see lecture notes on class web page
Week 13	Lecture: Computational Epidemiology	see lecture notes on class web page
Week 14	Group Project Presentations	see lecture notes on class web page
Week 15	Misc Topics by Request Exam Review	
Week 16	Final Exam	

Grading Policy

The various components of your grade are weighted as follows:

Team Projects	30%
Individual Assignments	40%
Exams	30%

Course Policies:

- ABSOLUTELY, NO LATE project assignments will be graded, unless specific arrangements are made with the instructor in advance.
- All assignments will be turned in by midnight on the date due. Assignments may be submitted on moodle in the appropriate drop box unless otherwise indicated.
- ALL requests for extensions on assignments must be made prior to the due date, in person, and must be for a valid "emergency" reason. In extreme circumstances, contact after the due date may be accepted if there is a COMPELLING reason.
- Attendance is at your option. However, you are responsible for all discussion, lecture and other information disseminated during the lecture period, regardless of whether you attend or not. You are also responsible for all team assignments made by your team lead and deliverable leads regardless of your attendance.
- Lectures and Project assignments are included in this syllabus. However, you should regularly check the class website, as well as take note of in-class announcements for changes in the schedule or assignments.

Collaboration and Cheating:

Collaboration among students in class is most certainly encouraged, as it is my belief that it provides a better learning environment, and required for team assignments.
For further details and clarifications regarding collaboration and cheating, view the university Student Rights and Responsibilities web page.

Student Evaluation of Teaching Effectiveness (SETE)

The Student Evaluation of Teaching Effectiveness (SETE) is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching. I consider the SETE to be an important part of your participation in this class

ADA:

UNT complies with all federal and state laws and regulations regarding discrimination including the Americans with Disability Act of 1990 (ADA). If you have a disability and need a reasonable accommodation for equal access to education or services please contact the Office of Disability Accommodation.