CSC 261 – Introduction to Computational Science  
Centre Term 2015

Monday, Tuesday, Wednesday, Thursday, & Friday from 8:50 AM to 10:20 AM and 12:30 PM to 2:00 PM

Classroom: Young Hall 213

Professor: David ("Dave") Toth, Ph.D.  
Office: Olin Hall 114  
E-mail: david.toth@centre.edu  
Phone: 859-238-5405 (extension 5405 on campus)  
Home Phone: 859-324-1509 (please don’t call before 8 AM or after 9 PM)

Office Hours
Monday, Tuesday, Wednesday, Thursday, & Friday: 10:30-11:00 and 2:00-2:30  
AND by appointment AND whenever I’m in my office and the door is open

Course Web Page: Everything you need for the course will be available here:  
http://web.centre.edu/david.toth/courses/csc261_winter_2015/. You can always find that page easily by simply going to http://davetoth.com/ and clicking the courses link on the left side of the page.

Course Description

This course will use real science problems from biology, chemistry and physics to introduce students to computational technologies to solve those problems. Upon completion of this course, students will have rudimentary programming skills, be able to model scientific processes, understand the algorithms behind search programs and know the advantages and pitfalls of computer generated solutions to complex mathematical problems. Prerequisite: MAT 145 or MAT 170 and one of the following: BIO 110, CHE 131 or PHY 110 or permission of the instructor.

Course Goals & Objectives

- To become familiar with some major ideas in computational science:  
  o dynamic models for representing systems that change over time  
  o computational methods for solving difference equations and differential equations  
  o random processes  
  o cellular automaton simulations  
- To gain experience with the modeling process:  
  o how to create a model  
  o how to experiment with the model  
  o how to visualize and analyze the output from the model  
- To gain an appreciation of the errors which can be introduced into the modeling process  
- To gain experience with a variety of tools:
- *Vensim* for systems dynamics models based on difference equations
- *Panther* for elementary programming
- *AgentSheets* for experimenting with models built from the viewpoint of individual agents
- To implement and experiment with models from a variety of disciplines

**Prerequisites**

MAT 145 or MAT 170 and one of the following: BIO 110, CHE 131 or PHY 110 or permission of the instructor.

**Required Materials**


**Software:** You may need to purchase the AgentSheets software. It costs $20 for the student edition using the coupon below:

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**Student Take-Home Coupon for Version 4.0**

*It was fun creating your own games at school, right?*

*You can make more games at home! Buy AgentSheets 4.0 for only $20 using this coupon.*

Go to our online store and use this code **TH41CBCC79F** to get your Take-Home price!

Class Participation

You are expected to participate in class by taking part in all activities. Remaining actively engaged during class time is important for learning the material and developing as a student. I strongly encourage you to ask questions and answer questions. You are expected to respect your classmates. Please don't interrupt them.

Grades

It's important to understand that your course grade is what YOU EARN. I do not "give grades." You "earn your grade" by demonstrating a level of mastery of the material through various assignments (listed below). Please understand that if you come to me at any point in the semester or after the semester and are unhappy with your grade, there's nothing I can do about it. YOU control the grade you earn, not me. There is NO EXTRA CREDIT! Your grade in the course will be determined by the table below.

<table>
<thead>
<tr>
<th>Lab Activities</th>
<th>20 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notebook Assignments</td>
<td>20 %</td>
</tr>
<tr>
<td>Short Programs</td>
<td>15%</td>
</tr>
<tr>
<td>Short Essay On Convocation (1/15/15)</td>
<td>5%</td>
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<tr>
<td>Course Project</td>
<td>20 %</td>
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<tr>
<td>Final Exam</td>
<td>20 %</td>
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</tbody>
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The college has made provisions for excused absences for official college-sponsored activities, for verified medical illness, for religious observances, for grief, and for personal or family emergencies. If you will miss class for these reasons, you must follow the procedures established by the college, which include contacting both me and Associate Dean Beth Glazer-McDonald. There are details about absences and policies in the student handbook.

Part of my responsibility as your professor and mentor is to help prepare you for the real world, where you must meet deadlines. No late homework or programs will be accepted and missed exams will receive a zero. There is 1 exception to this policy:

1 – In the case of any excused absence as listed on pages 18-19 in the student handbook, we will make arrangements to allow you to make up the item in question. If you are unable to turn in something on time due to religious holidays or other excused absence reasons, exceptions can be made.

There are people here to help you, including the counselors in the Parsons Health Center. Counseling is available if you need it.

Academic Integrity

You are responsible for not cheating on any assessment and not helping anybody else cheat. Any instances of academic dishonesty will be dealt with as described in the student handbook.
Disability Statement

I encourage students with disabilities, including but not limited to such disabilities as chronic diseases, learning disabilities, and mental illnesses, as well as students dealing with other exceptional circumstances to speak with Centre College's Assistant Dean for Advising Mary Gulley, to obtain support services. I will happily follow Dean Gulley's recommendations.

Centre College is committed to making its programs accessible to all. In the higher education setting, the student is responsible for informing the college of disabilities that require accommodations and they should initiate the process for obtaining appropriate accommodations at the beginning of the term. Accommodations for disabilities cannot always be granted at the last minute and will not be granted after the fact. For further details concerning the academic aspects of disability services, see the student handbook.