

## Course Description

### CMPT 463-810 Advanced Algorithms

#### Class Time and Location:

MWF 1:30-2:20 in Geology 265

#### Brief Learning Objectives

To learn and be able to apply network work flow algorithms. To learn and be able to create computational geometry algorithms. To learn and be able to apply and create some advanced graph algorithms. To learn and be able to apply some parallel algorithms.

#### Instructor Information

Mark Keil  
Thorv 281.8  
[keil@cs.usask.ca](mailto:keil@cs.usask.ca)

Office Hours: After class or by appointment, send me email.

#### Student Evaluation

##### Grading Scheme

- **4 Assignments 40%**
- **Project 20% (CMPT 810 40%)**
- **Final Examination 40% (CMPT 810 20%)**

**Note: All students must be properly registered in order to attend lectures and receive credit for this course.**

##### Final Exam Scheduling

The Registrar schedules all final examinations, including deferred and supplemental examinations. Students are advised not to make travel arrangements for the exam period until the official exam schedule has been posted.

*Note: All students must be properly registered in order to attend lectures and receive credit for this course.*

#### Textbook Information

**Textbook** Computational Geometry Algorithms and Applications  
3rd Ed. de Berg, Cheong, van Kreveld, Overmars  
This book is available as an online book through the library website.

## **Outline**

- **Augmenting Algorithms**
  - **Network Flow Algorithms**
  - **Matching**
- **Computational Geometry**
  - **Convex Hulls**
  - **Line Segment Intersection**
  - **Triangulations**
  - **Linear Programming**
  - **Orthogonal Range Searching**
  - **Point Location**
  - **Voronoi Diagrams**
  - **Arrangements and Duality**
  - **Delaunay Triangulations**
  - **Geometric Data Structures**
- **Graph Algorithms**
  - **Algorithms on Special classes of graphs**
- **Parallel algorithms**
- **Student Presentations**

## **Policies**

### **Missed Examinations**

1. "Students who have missed an exam or assignment must contact their instructor as soon as possible. Arrangements to make up the exam may be arranged with the instructor. Missed exams throughout the year are left up to the discretion of the instructor if a student may make up the exam or write at a different time. If a

student knows prior to the exam that she/he will not be able to attend, they should let the instructor know before the exam."

2. "Final exams - a student who is absent from a final examination through no fault of his or her own, for medical or other valid reasons, may apply to the College of Arts and Science Dean's office. The application must be made within three days of the missed examination along with supporting documentary evidence. Deferred exams are written during the February mid-term break for Term 1 courses and in early June for Term 2 and full year courses."

(<http://artsandscience.usask.ca/undergraduate/advising/strategies.php>)

### **Incomplete Course Work and Final Grades**

"When a student has not completed the required course work, which includes any assignment or examination including the final examination, by the time of submission of the final grades, they may be granted an extension to permit completion of an assignment, or granted a deferred examination in the case of absence from a final examination. Extensions for the completion of assignments must be approved by the Department Head, or Dean in non-departmentalized Colleges, and may exceed thirty days only in unusual circumstances. The student must apply to the instructor for such an extension and furnish satisfactory reasons for the deficiency. Deferred final examinations are granted as per College policy.

**In the interim, the instructor will submit a computed percentile grade for the course which factors in the incomplete course work as a zero, along with a grade comment of INF (Incomplete Failure) if a failing grade. In the case where the instructor has indicated in the course outline that failure to complete the required course work will result in failure in the course, and the student has a computed passing percentile grade, a final grade of 49% will be submitted along with a grade comment of INF (Incomplete Failure).**

If an extension is granted and the required assignment is submitted within the allotted time, or if a deferred examination is granted and written in the case of absence from the final examination, the instructor will submit a revised computed final percentage grade. The grade change will replace the previous grade and any grade comment of INF (Incomplete Failure) will be removed.

For provisions governing examinations and grading, students are referred to the University Council Regulations on Examinations section of the Calendar.

(2011 University of Saskatchewan Calendar/Academic Courses Policy)

### **Academic Honesty**

The University of Saskatchewan is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Student Conduct & Appeals section of the University Secretary Website and avoid any behavior that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University.

All students should read and be familiar with the Regulations on Academic Student Misconduct (<http://www.usask.ca/secretariat/student-conduct-appeals/StudentAcademicMisconduct.pdf>) as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals (<http://www.usask.ca/secretariat/student-conduct-appeals/StudentNon-AcademicMisconduct.pdf>)

Academic honesty is also defined and described in the Department of Computer Science Statement on Academic Honesty (<http://www.cs.usask.ca/undergrad/honesty.php>).

For more information on what academic integrity means for students see the Student Conduct & Appeals section of the University Secretary Website at:

<http://www.usask.ca/secretariat/student-conduct-appeals/forms/IntegrityDefined.pdf>

### **Examinations with Disability Services for Students (DSS)**

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Disability Services for Students (DSS) if they have not already done so. Students who suspect they may have disabilities should contact DSS for advice and referrals. In order to access DSS programs and supports, students must follow DSS policy and procedures. For more information, check <http://www.students.usask.ca/disability/>, or contact DSS at 966-7273 or [dss@usask.ca](mailto:dss@usask.ca).

Students registered with DSS may request alternative arrangements for mid-term and final examinations. Students must arrange such accommodations through DSS by the stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by DSS.