COURSE SYLLABUS
CMPT 815: COMPUTER SYSTEMS AND PERFORMANCE EVALUATION

Catalogue Description
Provides a comprehensive overview of the quantitative aspects of computer systems with a particular focus on performance evaluation. Topics include performance measurement, the analysis and interpretation of measurement data, workload characterization and modeling, the design and evaluation of performance experiments, and the design and application of analytical techniques. A variety of application domains will be considered.

Prerequisite(s): No formal prerequisite

Class Time: M W, 10:00-11:30
The course will be adopting the synchronous remote delivery mode. Class meetings will be held during the scheduled class time (M W, 10:00-11:30), using Zoom

Website: Moodle

Instructor Information
Instructor: Derek Eager
Contact: Email: eager@cs.usask.ca
Feel free to email me at any time with questions, or to make an appointment for a Zoom meeting

Course Overview and Objectives
This offering of CMPT 815 will provide an introduction to computer systems performance modeling and optimization. The course will cover basic concepts and techniques in this area, with emphasis on their application rather than on details of the underlying theory. Illustrative applications will be drawn from topics in computer architecture, Internet applications, cloud and cluster computing, and network protocol design.

Student Evaluation
There will be 3 equally-weighted assignments (likely approximate due dates – early October, late October, and early November) consisting of modelling and data analysis exercises. Students will be expected to complete a project on a mutually-agreeable topic in the computer systems performance modeling and optimization area, with due date in mid-December. Evaluation will also be based on the extent of participation in class discussions, short summaries of papers from the reading list, and a paper presentation.

Grading Scheme

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Participation</td>
<td>5 %</td>
</tr>
<tr>
<td>Paper Summaries</td>
<td>10 %</td>
</tr>
<tr>
<td>Paper Presentation</td>
<td>10 %</td>
</tr>
<tr>
<td>Assignments (3)</td>
<td>30 %</td>
</tr>
<tr>
<td>Project</td>
<td>45 %</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Note: All students must be properly registered in order to participate in and receive credit for this course.
Reference Materials
A reading list will be provided.

Schedule of Topics
- Characterizing Measurement Data
  - important types of probability distributions including Pareto, Zipf, exponential and others; Poisson processes; correlation, stationarity; case studies
- Analytic Models
  - simple models based on Amdahl’s law, bound and bottleneck analysis; queueing models; case studies
- Machine Learning Based Approaches
  - reinforcement learning; case studies

Policies

Paper Summaries
Credit will be given only for paper summaries submitted prior to the discussion of the respective paper.

Late Presentation/Assignments/Project
Requests for extensions will only be considered by the instructor when such requests are received in advance of the presentation date or assignment/project due date.

Missed Presentation/Assignments/Project
Students who do not submit anything for an assignment or the project by the due date (possibly as extended by the instructor), or do not do a paper presentation, will receive a grade of zero for it.

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 past the final examination date 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 class which factors in the incomplete coursework as a zero, along with a grade comment of INF (Incomplete Failure) if a failing grade.

In the case where the student has a passing percentile grade but the instructor has indicated in the course outline that failure to complete the required coursework will result in failure in the course, 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 assigned final percentage grade. The grade change will replace the previous grade and any grade comment of INF (Incomplete Failure) will be removed.

A student can pass a course on the basis of work completed in the course provided that any incomplete course work has not been deemed mandatory by the instructor in the course outline and/or by College regulations for
achieving a passing grade.” (https://policies.usask.ca/policies/academic-affairs/academic-courses.php)

For policies governing examinations and grading, students are referred to the Assessment of Students section of the University policy “Academic courses: class delivery, examinations, and assessment of student learning” (https://policies.usask.ca/policies/academic-affairs/academic-courses.php)

**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 (https://secretariat.usask.ca/student-conduct-appeals/academic-misconduct.php) as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals (https://secretariat.usask.ca/student-conduct-appeals/non-academic-misconduct.php) Academic honesty is also defined and described in the Department of Computer Science statement on Academic Honesty (https://www.cs.usask.ca/students/current-students/academic-honesty.php).

For more information on what academic integrity means for students see the Student Conduct & Appeals section of the University Secretary Website at: https://secretariat.usask.ca/student-conduct-appeals/index.php

**Examinations with Access and Equity Services (AES)**

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Access and Equity Services (AES) if they have not already done so. Students who suspect they may have disabilities should contact AES for advice and referrals. In order to access AES programs and supports, students must follow AES policy and procedures. For more information, check https://students.usask.ca/health/centres/access-equity-services.php, or contact AES at 306-966-7273 or aes@usask.ca.

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

**Student Supports**

**Student Learning Services**

Student Learning Services (SLS) offers assistance to U of S undergrad and graduate students. For information on specific services, please see the SLS web site https://library.usask.ca/studentlearning/.

**Teaching, Learning and Student Experience**

The Teaching, Learning and Student Experience Unit (TLSE) focuses on providing developmental and support services and programs to students and the university community. For more information, see https://students.usask.ca.