

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 & Location: M W, 10:30-11:50, Spinks 371
Website: Moodle

Instructor Information

Instructor: Derek Eager
Contact: Email: eager@cs.usask.ca
Office Phone: 4899
Office Hours: Location: Thorv 281.2
Hours: feel free to drop by my office anytime, or make appointment via email

Course Objectives and Overview

This offering of CMPT 815 will provide an introduction to computer systems modeling and evaluation. The course will cover basic concepts and techniques in this area, with emphasis on their application rather than on the details of the underlying theory. Illustrative applications will be drawn from topics in networks and distributed systems, including green computing, Internet content delivery, structural characterization of online social networks, Internet traffic and application workload characterization, and network protocol design.

Student Evaluation

Grading Scheme

There will be 3 equally-weighted *regular assignments* (likely approximate due dates – early October, mid November, and early December), as well as a *capstone assignment* that will be done in mid December. Assignments will include modelling and data analysis exercises; the capstone assignment will also include short (at most one page answer) questions concerning the required readings. Students will be expected to complete a *project* on a mutually-agreeable topic in the computer systems modeling and evaluation area, with due date in mid December. Evaluation will also be based on the extent of *participation* in class discussions, and short *summaries* of selected papers from the reading list. The weightings for these components are as follows:

Class Participation and Paper Summaries:	10 %
Assignments:	20 %
Project:	30 %
Capstone Assignment:	40 %



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

Reference Materials

A reading list will be provided

Schedule of Topics

- Modeling Workload and Structure
 - important types of probability distributions including Pareto, Zipf, exponential and others; Poisson processes; network structural metrics; correlation, stationarity, self-similarity
- Simulation Models
 - mainly we will focus here on the problem of assessing validity – to what extent can the results from a simulation study be believed?
- Queueing Models
 - metrics and fundamental laws; PASTA and its application; single-resource queueing systems; multiple-resource systems
- State-Transition Models
 - discrete time, continuous time; flow balance equations; problem of determining a suitable state description for a system
- Fluid Models
 - motivation and comparison with other types of models; assessing validity

Policies

Late Assignments

Requests for extensions will only be considered by the instructor when such requests are received **in advance** of the assignment due date.

Missed Assignments

Students who do not submit anything for an assignment by the due date (possibly as extended by the instructor) will receive a grade of zero for the assignment.

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.

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.