CAS 745 - Supervisory Control of Discrete-Event Systems
Jan 2019

INSTRUCTOR:

Dr. Ryan Leduc

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Office Hours: TBA.

LECTURES:

- Location: ITB/222

- Time: Monday 15:30-17:00, Friday 15:30-17:00.

- Start: Check website for date of first lecture.

Note: Information will sometimes be sent to your mcmaster.ca e-mail accounts. It's your responsibility to check this account regularly.

OVERVIEW:

This course is an introduction to the control of discrete-event systems (DES), asynchronous systems discrete in space and time (eg. manufacturing systems, communication systems etc.). The course will provide a solid foundation for research in this area, focusing on architectural issues such as modular, and hierarchical control. The course will also discuss timed DES, as well as current topics of interest, time permitting.

MAJOR TOPICS:

- Algebraic preliminaries review (posets, lattices, equivalence relations etc).

- Linguistic preliminaries (languages, Nerode equivalence, automata, generators, etc).

- Supervisory control basics (representation, synchronous product, controllability, nonblocking, maximally permissive supervision).

- Modular control.

- Hierarchical interface-based supervisory control.

- Timed discrete-event systems.

- Current topics of interest.

NOTE: We may not have time to cover all topics.

GRADING SCHEME:

- Assignments 30%

- Final Exam 70%

(The instructor reserves the right to conduct deferred examinations orally. All work on assignments is to be done individually.)

TEXT:

W. M. Wonham, *Supervisory Control of Discrete-Event Systems*, Department of Electrical and Computer Engineering, University of Toronto, Jan 2018. Ask instructor for information.

REFERENCE:

Daniel Solow, *How to Read and Do Proofs, 6th ed.*, John Wiley and Sons, 2013. ISBN 1118164024.

NOTES:

Discrimination

"The Faculty of Engineering is concerned with ensuring an environment that is free of all adverse discrimination. If there is a problem that cannot be resolved by discussion among the persons concerned, individuals are reminded that they should contact their Chair, the Sexual Harassment Office or the Human Rights Consultant, as soon as possible."

Academic Dishonesty

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: Grade of F assigned for academic dishonesty), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at http://www.mcmaster.ca/academicintegrity The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g. the submission of work that is not ones own or for which other credit has been obtained.

2. Improper collaboration in group work.

3. Copying or using unauthorized aids in tests and examinations.

Academic dishonesty committed by graduate students will have more serious consequences than that committed by undergraduate students.

NOTE: Graduate student cases are supposed to be referred automatically to the Office of Academic Integrity, even if it's only the first offence.