

ENGINEERING 9826: Advanced Control Systems

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Office Hours 1-1:50pm Monday and Friday

PREFERRED METHOD OF CONTACT: email

SCHEDULE: Every Wednesday: 3:30 – 6:30pm, EN1004

RATIONALE:

This is an introductory graduate level course aimed at exposing a novice to different theoretical areas in systems and controls. It will review both classical controls and modern controls and introduce optimal control for continuous-time dynamical systems, and discrete-event systems built upon automata theory. The course will also give a unified view of continuous-time dynamical systems and discrete-event systems as hybrid systems.

REFERENCES:

- Luenberger, D.C., *Introduction to Dynamical Systems*, Wiley, 1979
- Nise, N. S., *Control Systems Engineering*, 7th Ed., Wiley, 2015
- Ogata, K., *Modern Control Engineering*, 5th Ed., Prentice Hall, 2009
- Williams, R. L. and D. A. Lawrence, *Linear State-Space Control Systems*, Wiley, 2007
- Belegundu, A.D. and T.R. Chandrupatla, *Optimization Concepts and Applications in Engineering*, Prentice-Hall, 1999
- Hopcroft, J.E. and J.D. Ullman, *Introduction to Automata Theory, Languages, and Computation*, 3rd Ed., Pearson, 2006
- Cassandras, C.G. and S. Lafortune, *Introduction to Discrete-Event Systems*, 2nd Ed., Springer, 2009
- Polderman, J.C. and J.C. Willems, *Introduction to Mathematical Systems Theory: A Behavioral Approach*, Springer, 1998

MAJOR TOPICS:

- Dynamical Systems and Representations
- Classical Control Systems in Frequency Domain
- Modern Control Systems in Time Domain
- Optimal Control
- Behavioral Systems
- Discrete-Event Systems

- Hybrid Systems

ASSESSMENTS:

- Four assignments (20%)
- Midterm (20%) Feb 15, 2017
- Project Presentation (15%) Mar 29 to Apr 5
- Final Project (45%) April 12

ACADEMIC INTEGRITY AND PROFESSIONAL CONDUCT:

Students are expected to conduct themselves in all aspects of the course at the highest level of academic integrity. Any student found to commit academic misconduct will be dealt with according to the Faculty and University practices. More information is available at <http://www.mun.ca/engineering/undergrad/academicintegrity.php>

Students are encouraged to consult the Faculty of Engineering and Applied Science Student Code of Conduct at <http://www.engr.mun.ca/policies/codeofconduct.php> and Memorial University's Code of Student Conduct At <http://www.mun.ca/student/home/conduct.php>.

INCLUSION AND EQUITY:

Students who require accommodations are encouraged to contact the Glenn Roy Blundon Centre, <http://www.mun.ca/blundon/about/index.php>. The mission of the Blundon Centre is to provide and co-ordinate programs and services that enable students with disabilities to maximize their educational potential and to increase awareness of inclusive values among all members of the university community.

The university experience is enriched by the diversity of viewpoints, values, and backgrounds that each class participant possesses. In order for this course to encourage as much insightful and comprehensive discussion among class participants as possible, there is an expectation that dialogue will be collegial and respectful across disciplinary, cultural, and personal boundaries.

STUDENT ASSISTANCE:

Student Affairs and Services offers help and support in a variety of areas, both academic and personal. More information can be found at www.mun.ca/student.