THE UNIVERSITY OF WESTERN ONTARIO
FACULTY OF ENGINEERING

DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

ECE 9056 – Linear Systems and Modern Control Theory

COURSE OUTLINE – 2017(M.Eng. only)

OBJECTIVE:

After completing this course, the students will understand the behaviour of linear systems and be able to analyze and design linear control systems using state-space approach. Students will also understand proper approach to mathematical proofs.

CONTACT HOURS:

3 lecture hours/week

PREREQUISITES:

Undergraduate course(s) in control theory; advanced undergraduate course in linear algebra

TOPICS:

1. State-space analysis of dynamic systems.
2. Lyapunov Stability
3. Controllability and observability
4. Canonical forms and minimal realizations
5. Design of SISO and MIMO state-feedback controllers
6. State estimation and observers.
7. Quadratic optimal control.
8. Linear Time Varying Systems
9. Current interests and research topics in control engineering.

TEXTBOOK
Chi-Tsong Chen, "Linear system theory and Design, 4ed", Oxford University Press, 2013

REFERENCE BOOKS:
W. J. Rugh, "Linear System Theory", Second Edition, Prentice Hall, 1996

EVALUATION:

The final course grade will be based on the results of four assignments, a 24 hour take home midterm and a 3 hour final exam. Those who would like to have the course appear on their

transcripts as AUDIT will have to complete all assignments, though they will not be marked. The weights for each component are as follows:

Component	Weight
Assignments	30%
Mid-Term	30%
Final	40%

In accordance with the policy of the University, the grade assigned to all written and oral work presented in English shall take into account syntax, diction, grammar and spelling. In addition, in the professional life of an engineer, the manner in which oral and written communications are presented is extremely important. To encourage the student to do so, the grades assigned to all written and oral work will take into account all aspects of presentation including conciseness, organization, neatness, use of headings, and the preparation and use of tables and figures.

CHEATING

University policy states that cheating, including plagirism is a scholastic offence. The commission of a scholastic offence is attended by academic penalties, which may include expulsion from the program. If you are caught cheating, there will be no second warning.

Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar). Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage of text from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations.

The University of Western Ontario uses software for plagiarism checking. Students may be required to submit their written work in electronic form for plagiarism checking.

Please contact the course instructor if you require material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 X 82147 for any specific question regarding an accommodation.

INSTRUCTOR:

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TEB 335