

EECE 361 Control Systems

Spring 2022

Location /Time	Lecture: T and R, 10:05 – 11: 30 AM, UU 103
Instructor TA	<ul style="list-style-type: none"> • Ziang Zhang, Associate Professor, Email: ziang.zhang@binghamton.edu Office Hours: M and W 4 – 5 PM, ES 2317 • TA: <ul style="list-style-type: none"> ○ Austin J Crofoot acrofool@binghamton.edu ○ TA office hours: Fri 2:30-3:30pm, ES 2332
Textbooks and Course Website:	<ul style="list-style-type: none"> • Modern Control Systems, 13th Edition (Recommend) <ul style="list-style-type: none"> ○ Authors: Richard Dorf, Robert Bishop ○ ISBN: 0134407628 • Additional reference: Feedback Systems, 2nd Edition <ul style="list-style-type: none"> ○ https://fbswiki.org/wiki/index.php/Main_Page • Class website will be on Brightspace, where announcements, course materials, etc., will be posted.
Prerequisites	EECE 301
Objective:	This course will walk through the history of control theory and explain a few control techniques that have changed the course of human history. Students will learn differential equations of physical systems, feedback control systems, controller design techniques, stability of systems in both time domain and frequency domain, and a few recent developments in the field.
Grading:	<ul style="list-style-type: none"> • In-class quizzes: 5% • Homework: 40% <ul style="list-style-type: none"> ○ Late submission received within 2 days after the original due: 20% off ○ Late submission received after 2 days after the original due: 0 point • Exams 55% <ul style="list-style-type: none"> ○ Exam 1: 20% ○ Exam 2: 20% ○ Exam 3: 15%

Tentative Schedule

Week #	Lecture Content	HW Exam	History of control systems
1	Christiaan Huygens and pendulum		Pre-industrial revolution period
2(Feb)	Newton/Leibniz and Differential Equations	HW 1	
3	Transfer function and block diagram	HW 2	
4	Error signal analysis, steady-state error, and transient response		
5	The concept of stability	HW 3	Industrial Revolution
6(Mar)	James Watt and steam governor	Exam 1	
7	The Root Locus method	HW 4	
8	Spring Break		
9	PID	HW 5	Classical control period
10(Apr)	Frequency domain methods	HW 6	
11	Design of feedback control design	HW 7	
12	Discrete-time control systems	Exam 2	
13	Introduction of State Space	HW 8	"Modern" control period
14	Design of state variable feedback system	HW 9	
15(May)	More recent developments in control	HW 10	Recent developments
16	Introduction of Reinforcement Learning		
	Exam Week	Exam 3	

Health Concerns

If you become ill or are asked to go into quarantine/isolation, you should immediately notify the instructor and follow instructions from health providers and health authorities. Further information on COVID-19 symptoms and next steps are available here: [Health](#). First, students who exhibit symptoms should call the Decker Student Health Services Center at 607-777-2221.

Academic Integrity

All students must adhere to the Student Academic Honesty Code of the University and the Watson School (below). The Department of Electrical and Computer Engineering has adopted a standard policy to enforce these codes for coursework violations. Category I violations result in a grade of 0 for the graded work plus a one-letter course grade reduction. A *Report of Category I Academic Dishonesty* form is filed with the Provost's Office; if a prior report is already on file, the offense is automatically elevated to Category II. Category II violations result in at least a failing grade for the course plus any additional penalties determined by the Watson Academic Integrity Committee.

The University Academic Honesty Code details are available in the [University Bulletin](#) under "Academic Policies and Procedures for All Students." The Watson School Academic honesty policy can be found at <http://www.binghamton.edu/watson/about/fast-facts/academic-honesty.html>.

Course Workload

This course is a 4-credit course, which means that students are expected to do at least 12.5 hours of course-related work each week during the semester. This includes scheduled lectures/discussions, completing assigned readings, participating in lab sessions, studying for tests and examinations, preparing written assignments, completing an internship or clinical placement requirements, and other tasks that must be completed to earn credit in the course.

ITS Helpdesk/myCourses Support

Walk-in: Located in the Computer Center first floor lobby.

Call: 607-777-6420; E-mail: helpdesk@binghamton.edu.

<https://www.binghamton.edu/its/>

Students in Distress

Suppose you are experiencing undue personal or academic stress at any time during the semester or need to talk with someone about a unique problem or situation. In that case, you are encouraged to seek support as soon as possible. Course instructors can speak with you about stresses related to your work in your courses. Additionally, the campus has a wide range of resources, including:

- Dean of Students Office: 607-777-2804

- Decker Student Health Services Center: 607-777-2221
- University Police: On-campus emergency, 911
- University Counseling Center: 607-777-2772

Contact the Electrical and Computer Engineering Department

- Chair - Douglas Summerville: dsummer@binghamton.edu
- Graduate Program Director - Vladimir Nikulin: vnikulin@binghamton.edu
- General Information - ecestaff@binghamton.edu
- Graduate Secretary - Lynn Callahan: lcallaha@binghamton.edu
- More Department Contacts: <https://www.binghamton.edu/electrical-computer-engineering/about/contact.html>