Math 466 Spring Semester 2024

Instructor: Professor I. G. Rosen
Office: KAP 244C
Telephone: X02446
Email: grosen@math.usc.edu
Office Hours: M, W 11:00 – 12:00 or by appointment
Zoom Coordinates:
https://usc.zoom.us/j/95151923344?pwd=RTFVd0xZZy9PMjRrb0VDZGcyV1hVUT09
Meeting ID: 951 5192 3344
Passcode: 957745

Lecture and Labs:	Class No.	Time	Location
Lecture:	39675R	MWF 10-10:50	KAP 245 (147)

Zoom Coordinates:
https://usc.zoom.us/j/99255012147?pwd=SUUrcG42UllTRlRpbDc3Rmxjb1A3QT09
Meeting ID: 992 5501 2147
Passcode: D6lJ3cXr8c

Discussion:	39676R	TTH 9-9 :50	KAP 148

Text: There is no single text for this class.

Some Recommended References:

Matlab and Simulink
A. https://www.tutorialspoint.com/matlab/matlab_overview.htm
B. Introduction to MATLAB for Engineering Students - McCormick School (on Blackboard),
C. https://www.youtube.com/watch?v=T_ekAD7U-wU,
D. What ever you can find on-line on your own (let us know if you come across anything good!)

Difference Equations:
A. Introduction to Difference Equations (Dover Books on Mathematics) Reprint Edition, by Samuel Goldberg (Author), https://www.amazon.com/Introduction-Difference-Equations-Dover-Mathematics/dp/0486650847
B. Discrete-Time Systems: An Introduction With Interdisciplinary Applications (Prentice-Hall computer applications in electrical engineering series) by James A. Cadzow https://www.amazon.com/Discrete-Time-Systems-Introduction-Interdisciplinary-Prentice-Hall/dp/0132159961/ref=olp_product_details?_encoding=UTF8&me=

Ordinary Differential Equations
Elementary Differential Equations 9th Edition by William Boyce and Richard C. DiPrima, https://www.amazon.com/Elementary-Differential-Equations-Boyce/dp/047003940X

Delay Differential Equations
Ordinary and Delay Differential Equations (Applied Mathematical Sciences) Softcover reprint of the original 1st ed. 1977 Edition by R. D. Driver, https://www.amazon.com/Ordinary-Differential-Equations-Mathematical-Sciences/dp/0387902317

Partial Differential Equations

Applied Partial Differential Equations with Fourier Series and Boundary Value Problems, Books a la Carte (5th Edition) 5th Edition, by Richard Haberman, https://www.amazon.com/Applied-Differential-Equations-Boundary-Problems/dp/032179706X

Control and Estimation

A. Optimal Control Theory: An Introduction (Dover Books on Electrical Engineering) 1st Edition by Donald E. Kirk, https://www.amazon.com/Optimal-Control-Theory-Introduction-Engineering/dp/0486434842
B. Optimal Control and Estimation (Dover Books on Mathematics) Paperback – September 20, 1994 by Robert F. Stengel, https://www.amazon.com/Optimal-Control-Estimation-Dover-Mathematics/dp/0486682005/ref=pd_lpo_sbs_14_img_0?_encoding=UTF8&psc=1&refRID=RZ291PHBW3EKPPEJM9KJ

Review of Probability

Probability With Statistical Applications 2nd Edition, Frederick Mosteller (Author), Robert E. K. Rourke (Author), George B. Thomas Jr. (Author), https://www.amazon.com/Probability-Statistical-Applications-Frederick-Mosteller/dp/0201048574

T.A: Haoxing Liu
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Phone: 821-XXXX
Office Hours: To be announced

Assignments: Assignments made when appropriate. They will generally be due one or two weeks after they have been assigned. There will be numerous computing assignments using Matlab and Simulink.

Exams: There are no exams for this course.

Grading: The course will be graded based on the handed-in assignments

Topics covered:
Matlab and Simulink
Discrete Event Simulation
Deterministic Models

- Difference Equation (DE) Models
- Ordinary Differential Equation (ODE) Models
- Delay Differential Equation (DDE) Models
- Partial Differential Equation (PDE) Models
- Parameter Identification
- Stability
- Frequency Domain Analysis and Filtering
- Control and Estimation
- Principal Component Analysis

Stochastic Models

Review of basic concepts from probability
Pseudo Random Number Generators (PRNGs)
Simulation of Random Phenomena
Monte Carlo Integration
Hidden Markov Models
Stochastic Processes (Time Series)
Markov Chain Monte Carlo (MCMC)
Stochastic Differential Equations (SDEs)

Collaboration Policy: Collaboration on all assigned homework problems and computer assignments that are to be turned in is strictly prohibited. All turned in assignments must be your work and your work alone.

Policy regarding students with disabilities: Any student requesting academic accommodations based on a disability is required to register with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure the letter is delivered to me (or to TA) as early in the semester as possible. DSP is located in GFS 120 and is open 8:30 am – 4:30 pm, Monday through Friday. Website for DSP: http://dsp.usc.edu and contact information: (213) 740-0776 (Phone), (213) 740-8216 (FAX), ability@usc.edu (Email).