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Course Syllabus

STAT 544: Stochastic Processes

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Description: *This course focuses on the modeling and analysis of stochastic processes arising from a wider range of applications. Topics include discrete-time Markov chains, Poisson processes, continuous-time Markov chains, queueing theory, and decision theory.*

Credit Hours: 3

Frequency: Offered every other fall semester (fall semester of odd-numbered years)

Audience: Elective for the M.S. in Analytics and Modeling

Prerequisites: An introductory statistics course and a linear algebra course

Format: 3 class periods (50 min each) per week

Textbook: No textbook is required. However, the textbook *Operations Research, 4th ed.*, by Wayne Winston is recommended and a PDF copy will be posted on Blackboard.

Technology: A TI-83/TI-84 or other calculator that can perform matrix operations is required. The calculator must not have internet access and should be brought to class daily for in-class activities. Course materials and grades are maintained in Blackboard, and students should check Blackboard regularly.

AARC: The Access and Accommodations Resource Center (AARC) is the campus office that works with students to provide access and accommodations in cases of diagnosed mental or emotional health issues, attentional or learning disabilities, vision or hearing limitations, chronic diseases, or allergies. You can contact the office at aarc@valpo.edu or 219.464.5206. Students who need, or think they may need, accommodations due to a diagnosis, or who think they have a diagnosis, are invited to contact AARC to arrange a confidential discussion with the AARC office. Further, students who are registered with AARC are required to contact their professor(s) if they wish to exercise the accommodations outlined in their letter from the AARC.

Notice of Cancellation: Notifications of class cancellations will be made through Blackboard with as much advance notice as possible. It will be both posted on Blackboard and sent to your Valpo e-mail address. If you don't check your Valpo email account regularly or have it set-up to be forwarded to your preferred email account, you may not get the message. Please check Blackboard and your Valpo email (or the e-mail address it forwards to) before coming to class.

Student Learning Objectives:

A. Students understand fundamental concepts of discrete-time Markov chains, Poisson processes, continuous-time Markov chains, queueing theory, and decision theory.

B. Students will apply their modeling and problem solving skills to multiple disciplines which rely on stochastic processes, such as actuarial science, business, biology, chemistry, etc.

C. Students can use technology to compute solutions to problems involving stochastic processes.

D. Students can communicate about stochastic processes in both written and oral form using both technical and nontechnical language.