MTH362 Stochastic Processes II

Level: 3

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JULY

Synopsis:

MTH362 Stochastic Processes II will complement MTH361 Stochastic Processes I by extending the study of Markov chains and getting into Poisson Processes. The two courses will be useful for applications to finance, data science and engineering. Additionally, computer simulation with Python will also be taught.

Topics:

- Mean Time Spent
- Branching Processes
- Time Reversible Markov Chains
- Markov Chain Monte Carlo Methods
- Markov Decision Processes
- Hidden Markov Chains
- Predicting the States
- Exit Distributions
- Exit Times
- Exponential Distribution
- Compound Poisson Processes
- Transformations

Textbooks:

Peter Watts Jones, Peter Smith: Stochastic Processes: An Introduction Third Edition Chapman and Hall/CRC
ISBN-10: 9781498778

Learning Outcome:

- Compute probabilities of events of a Markov chain expectation or distribution of random variables.
- Show the validity of given mathematical statements in stochastic processes.
- Calculate the mean and variance of random variables.
- Determine the time it takes for a Markov chain to reach absorbing state.
- Solve for the asymptotic behaviour of Markov chains.
- Formulate Markov chain models from word problems.

Assessment Strategies (Evening Class):

Components	**Description**	**Weightage Allocation (%)**
Overall Continuous Assessment	COMPUTER MARKED ASSIGNMENT 1	10
	TUTOR-MARKED ASSIGNMENT 1	20
Overall Examinable Components	Written Exam	70
Total		**100**