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Spring 2021

## IE 440-HM2: Stochastic Models in Operations Research

Layek Abdel-Malek

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## IE 440 Stochastic Models in Operations Research

Instructor: Layek Malek

Spring 2021

**Recommended TEXT:** Hillier & Lieberman: Introduction to *Operations Research*, 10<sup>th</sup> Edition 2015

**Office Hours:** Tuesday 2:00 -3:00 pm and by appointment

### \*Week

### Topic

1. Introduction to Stochastic Processes, Review of Probability
2. Introduction to Inventory Theory, Components of Inventory Models
3. Deterministic Models in Inventory Models
4. Stochastic Models in Inventory Theory
5. Markov Chains and classification of their states
6. Long-Run Properties of Markov Chains, and application of Markov Chains
7. Introduction to Queuing Theory, Birth and Death Process
8. **Midterm Exam\*\***
9. M/M/1/ $\infty$  System, M/M/C Systems and M/G/I System
10. Application to Queuing Theory
11. Tandem, Queues and Markovian queuing network
12. Introduction to Reliability
13. Reliability Structural Function, Parallel Series Systems, Redundancy
14. Term project presentation
15. **Final Exam\*\***

**Grading :** Midterm      33%  
                  Final            33%  
                  Class work        34%

\*Approximate

\*\* May be replaced by quizzes as the situation evolves

