COURSE SYLLABUS

Course Information

STOCHASTIC PROCESSES

SPRING 2024 **STAT 4382**

View Syllabus Online from https://coursebook.utdallas.edu/myclasses

SECTION	CALL NO	DAY / TIME	CLASSROOM
4382.001	20710/012122	MW 11:30 AM – 12:45 PM	FO 3.616

Professor Contact Information

DR. YULY KOSHEVNIK
Office: FA 2.408 **Phone: 972-883-4178** **Email: yuly.koshevnik@utdallas.edu**
Office Hours: M T W R => 1:00 – 2:00 PM and F => 12:00 – 2:00 PM

Course Pre-requisites, Co-requisites, and/or Other Restrictions

STAT 4351 or equivalent

Course Modality and Expectations

Instructional Mode	Traditional
Course Platform	The course will be taught in classroom. Homework assignments and Exams will be posted on E-Learning. Class notes will be provided weekly.
Expectations	Students are expected to attend the class, read regularly posted notes and submit homework on time. All exams will be conducted **IN CLASS**.

Course Description

Stochastic models including Markov chains, random walks, Poisson processes, renewal processes, and an introduction to time series and forecasting.

Student Learning Objectives/Outcomes

The overriding objective of this course is to make certain that each student knows the theoretical methods of probability models and stochastic processes – including Markov chains, counting and continuous stationary processes, and basics of the renewal and queuing theory with applications.
Class Notes will be regularly posted on E-Learning. They provide summary of material studied in class.

Required Textbooks and Materials

1. **[PK] An Introduction to Stochastic Modeling**, 4th Edition by M. Pinsky and S. Karlin Imprint: Academic Press – ISBN: 978-0-12-381416-6 [Main Source]
2. [**HK**] N. Humphreys and Y. Koshevnik: Probability and Statistics for Actuaries (First Edition. ISBN 978-1-7935-1427-1. Cognella Academic Publishing [Secondary Source]

IMPORTANT DATES & HOLIDAYS	
CLASSES START	WEDNESDAY, JANUARY 17
CENSUS DAY	WEDNESDAY, JANUARY 31
DROP (APPROVAL REQUIRED)	THURSDAY, FEBRUARY 1 – WEDNESDAY, APRIL 3
INTERMEDIATE EXAM 1	WEDNESDAY, FEBRUARY 14
SPRING BREAK	MONDAY, MARCH 11 – SUNDAY, MARCH 17
INTERMEDIATE EXAM 2	WEDNESDAY, APRIL 3
COURSE OVERVIEW	WEDNESDAY, APRIL 24 – MONDAY, APRIL 29
LAST DAY OF CLASSES	WEDNESDAY, MAY 1
LAST EXAM	WEDNESDAY, MAY 1

The general policies can be viewed from
http://coursebook.utdallas.edu/syllabus-policies

Grading Policy

Your OVERALL class grade will be determined based on the following weighting:

Two Intermediate Exams + LAST One (**25% + 25% + 30%**) = **80%**

Ten Homework Assignments (**ONLINE**) **20%**

Make-up exams will **not** be allowed, unless extraordinary circumstances emerge.

Grading Scale:

[97, 100]	**[93, 97)**	**[90, 93)**	**[87, 90)**	**[83, 87)**	**[80, 83)**	**[77, 80)**
A+	**A**	**A -**	**B+**	**B**	**B -**	**C+**
[73, 77)	**[70, 73)**	**[67, 70)**	**[63, 67)**	**[60, 63)**	**Below 60**	
C	**C -**	**D+**	**D**	**D -**	**F**	

Course & Instructor Policies

- You must catch up with the course – in particular, ALL EXAMS.
- Homework will be assigned according to the tentative schedule below. Papers will be collected via ONLINE submission and graded within one week.
- My office hours should be utilized when you need to clarify the course topics. Use this option, once you feel any uncertainty about the material.

TENTATIVE COURSE OUTLINE		
Dates	Topics	References to [PK]
01/17 – 01/24	Review of Probability – Random Variables HW 1 => Due 01/24	Ch. 1 + Notes [1]
01/24 – 01/31	Conditional Probabilities and Expectations HW 2 => Due 01/31	Ch. 2 Notes [1 – 2]
02/05 – 02/12	Markov Chains – Introduction Long Run Properties of Markov Chains HW 3 => Due 02/07	Ch. 3, Ch. 4, and Notes [3 – 4]
02/12	Exam I Review	Ch. 1 – 3 Notes [1 – 3]
02/14	**Exam I**	
02/19 – 02/28	Poisson Processes and Related Topics HW 4 => Due 02/21 | HW 5 => Due 02/28	Ch. 5 + Notes [5]
02/28 – 03/06	Birth and Death Processes Continuous Time Markov Chains HW 6 => Due 03/06	Ch. 6 Notes [6 – 7]
03/11 – 03/17	**Spring Break**	**No Classes**
03/18 – 03/20	Renewal Theory – Introduction and Sketch HW 7 => Due 03/20	Ch.7 (partially) + Notes [7]
11/06 – 04/01	Queuing Theory HW 8 => Due 03/27	Ch. 9 (partially) + Notes [8]
04/01	Exam II Review	Ch. 3 – 6 Notes [3 – 7]
04/03	**Exam II**	
04/08 – 04/24	Brownian Motion and Related Topics HW 9 => Due 04/15 | HW 10 => Due 04/24	Ch. 8 + Notes [9]
04/24 – 04/29	Course Overview	Ch. 7 – 9 and Notes [8 – 9]
05/01	**Exam III**	

These descriptions and timelines are subject to change at the discretion of the Professor.