COURSE SYLLABUS

Course Information

STOCHASTIC PROCESSES

FALL 2025 **STAT 4382**

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

SECTION	CALL NO	DAY / TIME	CLASSROOM
4382.001	80720/012122	MW 4:00 PM – 5:15 PM	**AD 3.218**

Professor Contact Information

DR. YULY KOSHEVNIK
Office: FA 2.408 **Phone: 972-883-4178** **Email: yuly.koshevnik@utdallas.edu**
Office Hours: M W => 1:30 – 2:30, T R => 4:30 – 5:30, F => 12:00 – 2:00

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 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

STAT 4382 - STAT 4382 - Stochastic Processes (3 semester credit hours) Stochastic models including discrete and continuous time Markov chains, random walks, Poisson processes, birth-and-death processes, finite-state Markov chains, renewal processes, queuing systems, Gaussian processes and related topics including Brownian motion and Brownian bridge processes. Prerequisite: STAT 4351 or equivalent. (3-0) S

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 a summary of material studied in class.

Required Textbooks and Materials

1. [**HK**] N. Humphreys and Y. Koshevnik: Stochastic Processes with Actuarial Applications ISBN: 979-8-8233-8872-6
2. **[PK] An Introduction to Stochastic Modeling**, 4th Edition by M. Pinsky and S. Karlin Imprint: Academic Press – ISBN: 978-0-12-381416-6 [Additional Source]

IMPORTANT DATES & HOLIDAYS	
CLASSES START	MONDAY, AUGUST 25
CENSUS DAY	WEDNESDAY, SEPTEMBER 10
DROP (APPROVAL REQUIRED)	THURSDAY, SEPTEMBER 11 – MONDAY, NOVEMBER 10
INTERMEDIATE EXAM 1	WEDNESDAY, SEPTEMBER 24
INTERMEDIATE EXAM 2	WEDNESDAY, OCTOBER 29
THANKSGIVING / FALL BREAK	MONDAY, NOVEMBER 24 – SUNDAY, NOVEMBER 30
COURSE OVERVIEW	MONDAY, DECEMBER 1 – WEDNESDAY, DECEMBER 3
LAST DAY OF CLASSES	MONDAY, DECEMBER 8
LAST EXAM	MONDAY, DECEMBER 8

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 + Exam 3 **(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 – particularly 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 [HK] / Notes
08/25 – 09/03	Review of Probability – Random Variables HW 1 => Due 09/03	Introduction + Notes [1]
09/03 – 09/10	Conditional Probabilities and Expectations HW 2 => Due 09/10	Notes [1 – 2]
09/10 – 09/17	Markov Chains – Introduction Long Run Properties of Markov Chains HW 3 => Due 09/17	Ch. 1 + Notes [3 – 4]
09/22	Exam I Review	Ch. 1 + Notes [1 – 3]
09/24	**Exam I**	
09/29 – 10/08	Poisson Processes and Related Topics HW 4 => Due 10/01 | HW 5 => Due 10/08	Ch. 2 + Notes [5]
10/15 – 10/22	Birth and Death Processes Continuous Time Markov Chains HW 6 => Due 10/15 | HW 7 => Due 10/22	Ch. 3 and 4+ Notes [6 – 7]
10/22 – 10/27	Renewal Theory – Introduction and Sketch	Ch.5 + Notes [7]
10/27	Exam II Review	Ch. 3 – 6 Notes [3 – 7]
10/29	**Exam II**	
11/03 – 11/12	Queuing Theory HW 8 => Due 11/12	Ch. 6 + Notes [8]
11/17 – 11/19	Brownian Motion and Related Topics HW 9 => Due 11/19	Ch. 7 + Notes [9]
11/24 – 11/30	**Thanksgiving + Fall Break**	**No Classes**
12/01 – 12/03	Course Overview HW 10 => Due 12/03	Ch. 7 + Notes [8 – 9]
12/08	**Exam III**	

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