

CE695: Stochastic Processes
Department of Computer
Engineering Sharif University of
Technology
Fall 2025: Sunday & Tuesday: 10:30-12:00

Instructor:

Hamid R. Rabiee

Office: CE-804 & DML (CE 803)

Office Hours: By Appointment (Through

Email) Office Phone: 6616-6683

Email: rabiee@sharif.edu

URL: <http://sharif.edu/~rabiee/>

TAs:

Elham Abolhasani

Email: elhamabolhasani1999@gmail.com

Fatemeh Saligheh

Email: fa.saligheh@gmail.com

Rassa Ghavami

Email: rassa.gh@gmail.com

Mohammad Ostadmohammadi

Email: mohammad.ostad73@gmail.com

Gita Sarafraz

Email: sarafranz@ce.sharif.edu,

Mina Rafiei

Email: mrafiei@ce.sharif.edu

S. Muhammed Javad Feyzabadi Sani

Email: smjfas@gmail.com

Armin Behnamnia

Email: arminbehnania@gmail.com

Zahra Dehghanian

Email: zahra.dehghanian97@gmail.com

Hossein Azizi Naghsh

Email: hossein.azizi@gmail.com

Mahta Fetrat

Email: 77fetrat@gmail.com

Abolfazl Asad

Email: a.asad@sharif.edu

Amirhossein Moradpor

Email: a.moradpour1378@gmail.com

Mohammad Cheraghi

Email: mohammad.cheraghi80@gmail.com

Morteza Abolqasemi

Email: a.re.morteza@gmail.com

Amir Vahedi

Email: amirvahedi81328@gmail.com

Pouya Ardekhani

Email: pouya.ardekhani02@sharif.edu

Amirreza Vishteh

Email: amirreza.vishteh@ce.sharif.edu

Alireza Fraj Tabizi

Email: alireza15farajtabrizi@gmail.com

Mohammad Zeinal Pour

Email: zeinalpour.mo@gmail.com

Course Website:

<https://stoch-sut.ir/>

Online Lectures:

<https://vc.sharif.edu/rabiee>

Prerequisites:

Engineering Probability and Statistics (40-181)

Course Objectives:

To make the graduate students acquainted with the fundamental concepts of stochastic processes and their applications in Electrical & Computer Engineering.

Course Textbooks & References:

1. A. Papoulis and S. Pillai, Probability, Random Variables and Stochastic Processes, 4th Edition, McGraw Hill, 2002.
2. S. Ross, Introduction to Probability Models, Academic Press, 2009.
3. G. Casella and R. L. Berger, Statistical Inference, Wadsworth Press, 1990 (reference for Estimation Theory part of the course).
4. Bishop, Christopher M. Pattern recognition and machine learning. springer, 2006.
5. Instructor Handouts.

Grading:

Based on your performance on Homework, Quiz, Project, Mid-Term and Final Exam. The grade will be determined by:

- Homework: 20%
- Quiz: 20%
- Project: 20%
- Mid-Term Exam: 20%
- Final Exam: 25% (Comprehensive)
- Total: 105% (5% Extra Point)

Course Description:

The course includes fundamental concepts of Probability Theory, Stochastic Processes, Stochastic Linear Systems, Stationary and Ergodic Processes, Power Spectral Density, Estimation Theory, Spectral Estimation, Markov processes, Markov Chains, Sampling, and Selected Advanced Topics. For each topic instructor handout is the main reference.

Homework Problems:

Homework problems will be handed out on their designated dates and will be due about 10 days later. The problems will also cover the following week's materials so do not expect to cover the whole problem set right after its release. There might be some simple programming Homework and a Project using MATLAB or Python. If needed there will be learning materials and classes on how to use MATLAB or Python for problem solving. Course policy for late submission is 10% penalty for each day and no submission is accepted after 3 days.

Homework Submission:

Hand in your answers at the start of your class session and also submit your answers in .pdf file in course page on quera website, with the following format:
HW[HW#]-[std#] (For example HW3-400100111)

Quizzes & Exams:

There will be a quiz, at the end of the lectures. Each quiz will cover the facts discussed in the previous lecture.

Problem Solving Classes:

As a fundamental course, "Stochastic Processes" needs practice through problem solving; Therefore, Problem solving classes are mandatory. Do not be disappointed, as it is an obligatory help!

Statement on Collaboration, Academic Honesty, and Plagiarism:

We encourage working together whenever possible on homework, working problems in tutorials, and discussing and interpreting reading assignments. Talking about the course material is a great way to learn. Regarding homework, the following is a fruitful (and acceptable) form of collaboration; discuss with your classmates possible approaches to solving the problems, and then have each one fill in the details and write her/his own solution *independently*. An unacceptable form of dealing with homework is to copy a solution that someone else has written. We discourage, but do not forbid, use of materials from prior terms that students may have access to. Furthermore, at the time that you are actually writing up your solutions, these materials must be set aside; copy-editing from other's work is not acceptable. At the top of each homework you turn in, we expect you to briefly list all sources of information you used, except known course materials like Text Book, Lectures, etc. A brief note such as "Did homework with ABC and ABD in study group" or "Looked at old solution for Problem 4" would be sufficient. Besides the morality issues, it will help TAs on grading your hand outs. There will be a zero tolerance policy for Cheating/Copying HW's. The first time you are caught, you will receive a zero for the task at hand. If you are caught for a second time, you will fail the course. In general, we expect students to adhere to basic, common sense concepts of academic honesty. Presenting other's work as if it was your own, or cheating in exams will not be tolerated.

			Stochastic Processes - Fall 2025						
			Sharif University of Technology						
			https://stoch-sut.github.io/						
Week	Date	#Slide	Topic	Readings	Quiz	HW			
	1404/07/20		Theory	Ch. 1-7Ch. 9					
week 1	1404/07/22	1	Introduction to Stochastic Processes		Quiz0				
	1404/07/27								
week 2	1404/0729	2	Stochastic Processes	Ch. 9Ch. 9	Quiz1				Course overview, and Review of Probability Theory
	1404/08/04		Stationary Stochastic Processes						Introduction to Stochastic Processes
week 3	1404/08/06		Ergodic Stochastic Processes		Quiz2	HW1			Stochastic Processes
	1404/08/11	3	Stochastic Analysis of Linear Systems	Ch. 12, Ch. 9					
week 4	1404/08/13		Power Spectrum						Stationary Stochastic Processes
	1404/08/18		Point Process		Quiz3				Ergodic Stochastic Processes
week 5	1404/08/20	4	Poisson Process	landoutHandoutCh. 9		HW2			Stochastic Analysis of Linear Systems
	1404/08/25								Power Spectrum
week 6	1404/08/27	5	Gaussian Process	HandoutHandout	Quiz4				
	1404/09/02								Point Process
week 7	1404/09/04	6	Estimation Theory 01	Ch. 8, CB: Ch 6,7	Quiz5				Poisson Process
	1404/09/09		Midterm Exam	Comprehensive		HW3			Gaussian Process
week 8	1404/09/11	6	Estimation Theory 01						
	1404/09/16								
week 9	1404/09/18		Estimation Theory 02		Quiz6				Estimation Theory
	1404/09/23	7		Ch. 8, CB: Ch 6,7					
week 10	1404/09/25					HW4			
week 11	1404/09/30	8	Hypothesis Testing	Handout	Quiz7				
	1404/10/2								
week 12	1404/10/7		Markov Chains		Quiz8				
	1404/10/9	9	HMM	HandoutRoss Ch. 4					Hypothesis Testing
	1404/10/14		Course Evaluation		Quiz9				Markov Chains
week 13	1404/10/16		Sampling of Stochastic Processes			HW5			HMM
	1404/10/21	10		Bishop Ch. 11Handout					
week 14	1404/10/23						Project		
	1404/10/25		Final Exam						
	1404/11/10		Project Deadline						
	1401/11/11		Project Presentation						
	Home Work	20%							
	Quiz	20%	From in-class notes and HW						
	Project	20%	We drop the lowest score.						
	Midterm	20%	We drop the lowest score.						
	Final	25%	Comprehensive						
	Total	105%	5% Extra Points						
			Enjoy the course & Good Luck						