CSE400 – Fundamentals of Probability in Computing

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Lecture 3: Introduction to Probability Theory
(Part-0: Course & Learning Context)
Instructor: Dr. Dhaval Patel
Date: January 13, 2026

1. Administrative Context of the Lecture

1.1 Course Identification

- Course Code: CSE400

- Course Title: Fundamentals of Probability in Computing

- Lecture Number: 3

- Lecture Theme: Introduction to Probability Theory

Note: This lecture primarily sets up course structure, motivation, and expectations, not formal probability axioms yet.

2. Instructor and Teaching Team

2.1 Instructor

- Name: Dr. Dhaval Patel

- Role: Course Instructor

- Office: Faculty Office, Room-210

- Email: dhaval.patel@ahduni.edu.in

Research Areas Mentioned

- xG Networks

- Applied ML/DL/RL

- AutoML

- Intelligent Transportation Systems

- Behaviour Modelling using AI

2.2 Teaching Assistants (TAs)

- Multiple B.Tech (CSE) students (3rd and 4th year)
- Areas include:
  - Reinforcement Learning
  - Spectrum Sensing
  - Antenna Systems
  - Transportation Systems
- **TA hours:** To be finalized (announcement to follow)

3. Learning Philosophy Emphasized in Class

3.1 Growth Mindset (Explicitly Shown)

Statements highlighted in slides:

- Failure is an opportunity to grow
- Challenges help learning
- Feedback is constructive
- Effort determines ability

3.2 Fixed Mindset (Contrasted)

- Failure defines limits
- Avoids challenges
- Belief in unchangeable ability

Purpose in lecture:
To set student attitude expectations for a mathematically rigorous course.

4. Why Learn CSE400? (Motivation)

4.1 Daily-Life Motivation

Probability appears in:

- Everyday conversations
- Decision-making under uncertainty

4.2 Engineering Applications (Explicit List)

- Speech Recognition
- Radar Systems
- Communication Networks

These examples justify why probability theory is foundational for computing systems.

5. Course Infrastructure

5.1 Active Learning Platform

- Platform: Campuswire
- Usage:
  - Anonymous participation
  - Back-channel questions during lectures
  - Real-time polling
  - Direct messaging (DM) with instructor/TAs

5.2 Course Website

Section-1 and Section-2 links are provided through Campuswire.

6. Lecture Schedule

6.1 Lecture Sessions

Section-1

- 9:30 AM – 11:00 AM
- Tuesday and Thursday
- GICT Room-13

Section-2

- 1:00 PM – 2:30 PM
- Tuesday and Thursday
- GICT Room-137

7. Communication and Support Policy

7.1 Instructor Interaction

- Contact hours: 24×7 through Campuswire
- Preferred method: Post queries on Campuswire
- Private issues: Direct Message (DM)
- One-to-one discussion possible (student–instructor only)

8. Assessment Structure

8.1 Project Component

- Weightage: 30%
- Includes:
  - Team formation
  - Mathematical modeling
  - Coding
  - Randomized algorithms
  - Final analysis and bounds

8.2 Project Milestones

- M1: Problem formulation
- M2: Mathematical modeling (Random Variables, PMF/PDF, CDF, multivariate RVs, joint distributions, etc.)
- M3: Simulation and computation
- M4: Inference and randomized algorithms
- M5: Comparison with deterministic approaches
- M6: Bounds, analysis, and final submission

9. Lecture Scribe Requirement (Meta-Instruction)

9.1 Definition (As per course)

A lecture scribe must:

- Reflect exact lecture content
- Follow the same structure and terminology
- Avoid:
  - Simplified tutorials
  - Extra intuition
  - New examples
  - Solution manuals

9.2 Types of Scribes

- Lecture Scribe
- Project Scribe

This current document follows the Lecture Scribe format.

10. Scope Boundary of This Lecture

- No probability axioms introduced
- No random variables defined
- No PMF, PDF, or CDF derivations
- Focus on course framing, motivation, and learning process

Formal probability theory begins in subsequent lectures.

11. End of Lecture Notes

- Open Q&A session
- No mathematical derivations in this lecture
- Sets foundation for upcoming probability theory lectures