EE 502: Stochastic Processes

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| **Lecture Schedule** | | See Time Table | **Course Type,**  **Semester** | Core | | |
| **Credit Hours** | | Three | **Pre-requisite** | None | | |
| **Instructor** | | Ubaid Ullah Fayyaz | **Contact** | [ubaid@uet.edu.pk](mailto:ubaid@uet.edu.pk) | | |
| **Office** | | Top Floor, EE Dept. | **Office Hours** | Wednesday  02.00pm to 04.00 pm  Monday  10.00am to 12.00 am | | |
| **Teaching Assistant** | | None | **Lab Schedule** | See Time Table | | |
| **Course Description** | | This is a graduate level course in probability and random variables which is a pre-requisite for a majority of graduate-level courses in communications, signal processing, controls and networks. | | | | |
| **Measurable Learning Outcomes** | **CLOs** | **Description** | | | **PLOs** | **Level** |
| CLO1 | Understand probability and random variables theory | | | PLO1 | High |
| CLO2 | Understand the fundamentals of stochastic processes | | | PLO1 | Medium |
| CLO3 | Understand the fundamentals of detection and theory. | | | PLO1 | High |
| **Textbooks** | | **Required**  Probability, Random Variables and Stochastic Processes by Athanasios Papoulis and S. U. Pillai, 4th Edition, McGraw Hill.  **Optional**  Probability, Random Processes and Estimation Theory for Engineers by Henry Starks and John Woods, Prentice Hall  Probability and Random Processes for Electrical Engineering by Alberto Leon Garcia, 2nd Edition, Prentice Hall.  Probability, Random Variables and Random Signal Principles by Peyton Z Peebles Jr., 4th Edition, McGraw Hill | | | | |
| **Grading Policy vis-à-vis CLO Mapping** | | * Quizzes (~2 to 3; mostly unannounced) 30% CLO1 to CLO3 * Midterm 30% CLO1 to CLO2 * Final 40% CLO1 to CLO3 | | | | |

**Lecture Plan**

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| **Weeks** | Topics | | **Readings & CLOs** |
| **1,2** | **Review of Probability Concepts** | | **CLO1** |
| **3,4** | **Random Variable, Functions of One Random Variable** | | **CLO1** |
| **5,6** | **Functions of Two Random Variables** | | **CLO1** |
| **7,8** | **Moments and Conditional Statistics** | | **CLO1** |
| **9,10** | **Introduction to Stochastic Processes** | | **CLO2** |
| **11** | **Applications of Stochastic Processes** | | **CLO2** |
| **12, 13** | **Introduction to Estimation Theory** | | **CLO3** |
| **14, 15** | **Introduction to Detection Theory** | | **CLO3** |
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