Maestría en Inteligencia Artificial, 2025

# Primer semestre

11 de agosto - 5 de diciembre de 2025

# Curso de Probabilidad y Estadística (PE 2025)

**Probabilidad**

Salvador Ruiz Correa

12 de agosto-2 de octubre de 2025

Jueves, 11:00-13:00 horas (32 horas)

## Calendar

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| **Lecture** | **Day** | **Topic/Activity** | |
| 1  2  3  4  5  6 | August | 12 | 1. Probability theory and random phenomena  2. Probability measure key features.  3. Probability theory and random phenomena.  4. Kolmogorov axioms overview.  5. Probability space ().  5.1 Sample space ().  5.2 -algebras. |
|  | 14 | 5.3 -algebra generators.  5.4 Measureble space.  5.5 Product space.  5.6 Borel algebras.  5.7 Measures and probability measure ( . |
| 19 | 6. Independence.  7. Conditional probability.  8. Chain rule.  9. Bayes theorem. |
| 21 | 9. Random variables.  10. Probability distributions.  11. Cummulative distribution function.  12 Probability density functions. |
| 26 | 13. Examples of random variables.  14. Transformationof random variables. |
| 28 | 15. Random variable moments. |
| 7  8  9  10  11  12  13  14  15 | September | 2 | **Quiz 1** |
| 4 | 16. Random vectors.  17. Joint probability distribution.  18. Marginal distribution.  19. Mean vector and covariance matrix.  20. Examples.  21. Stochastic project definition. |
| 9 | 21. Independent random variables.  22. Conditional independence. |
| 11 | 23. Bayes networks.  23.1 Separation Theorem. |
| 16 | 24. Bayes networks inference. |
| 18 | 25. Practice session. |
| 23 | **Quiz 2** |
| 25 | 25. Markov random fields. |
| 30 | 26. Entropy and Information. |
| 16 | October | 2 | **Final Exam** |