

<<Foundations of Data Science >> Syllabus

Week/Module	Topics	Release Date
Week 0	<ul style="list-style-type: none"> • Demo Video • Welcome to the course • Course Schedule • Grading Policy • Exam Details • FAQ 	31 st July 2023
Week 1: Descriptive Statistics and Data Visualization	<ul style="list-style-type: none"> • Introduction • Data Types and Scales • Population and Sample • Measures of Central Tendency • Measures of Variation • Measures of Shape • Data Visualization • Demo Using Excel and Tableau 	31 st July 2023
Week 2: Probability Theory	<ul style="list-style-type: none"> • Introduction • Probability Theory- Terminology • Axioms of Probability • Bayes' Theorem • Random Variables • PDF& CDF of Continuous • Random Variable • Binomial Distribution • Poisson Distribution • Geometric Distribution • Uniform Distribution • Exponential Distribution • Normal Distribution • Chi-Square Distribution • Student's t-Distribution • F-Distribution • Tutorials 	11 th August 2023
Week 3: Sampling and Estimation	<ul style="list-style-type: none"> • Introduction • Population Parameter & Sample Statistic • Sampling 	18 th August 2023

	<ul style="list-style-type: none"> • Probabilistic Sampling • Non-Probability Sampling • Sampling Distribution • Central Limit Theorem • Sample Size Estimation for Mean of the Population • Estimation of Population Parameters • Method of Moments • Estimation of Parameters Using Maximum Likelihood Estimation 	
	Mid – Term Assessment	18 th August 2023 Due Date: 18th September 2023
Week 4: Confidence Intervals	<ul style="list-style-type: none"> • Introduction • CI for Population Mean • CI for Population Proportion • CI for Population Mean when Standard Deviation is unknown • CI for Population Variance 	25 th August 2023
Week 5: Hypothesis Testing	<ul style="list-style-type: none"> • Introduction • Setting up a Hypothesis Test • One-Tailed and Two-Tailed Test • Type I Error, Type II Error, and Power of the Hypothesis Test • Hypothesis testing for Population Mean with Known Variance: Z-Test • Hypothesis testing for Population Proportion: Z-Test • Hypothesis test for Population Mean under Unknown Population Variance: t-test • Paired Sample t-test • Two-Sample Z and t-test • Two-Sample Z-Test for Proportions • Effect Size: Cohen’s D • Hypothesis Test for Equality of Population Variances • Non-Parametric Tests: Chi-Square Tests 	1 st September 2023

	<ul style="list-style-type: none"> • Tutorials 	
Week 6: Analysis of Variance	<ul style="list-style-type: none"> • Introduction • Multiple t-Tests for Comparing Several Means • One-way ANOVA • Two-way ANOVA • Tutorials 	8 th September 2023
Week 7: Correlation Analysis	<ul style="list-style-type: none"> • Introduction • Pearson Correlation Coefficient • Spearman Rank Correlation • Point Bi-Serial Correlation • The Phi-Coefficient 	15 th September 2023
Week 8: Applied Linear Algebra	<ul style="list-style-type: none"> • Why do we need Linear Algebra? • Matrix Algebra and Operations • Eigen Values and Eigen Vectors • Linear Algebra in Dimensionality Reduction • Linear Algebra in Natural Language Processing • Linear Algebra in Machine Learning 	22 nd September 2023
	End – Term Assessment	29 th September 2023 Due Date: 29th October 2023

Final Exam Details:

If you wish to obtain a certificate, you must register and take the proctored exam in person at one of the designated exam centres. The registration URL will be announced when the registration form is open. To obtain the certification, you need to fill out the online registration form and pay the exam fee. More details will be provided when the exam registration form is published, including any potential changes. For further information on the exam locations and the conditions associated with filling out the form, please refer to the form.

Grading Policy:

Assessment Type	Weightage
Mid-Term & End-Term	25%



Final Exam	75%
-------------------	-----

Certificate Eligibility:

- 40% marks and above in Mid Term & End Term
- 40% marks and above in the final proctored exam

Disclaimer: In order to be eligible for the certificate, you must register for enrolment and exams using the same email ID. If different email IDs are used, you will not be considered eligible for the certificate.