

IISER Pune - Course Content

Semester	JAN 2024
Open to Semester	4
Course Code	TD2223
Course title	Data Analysis
Nature of Course	LT - lecture and Tutorial
Credit	3
Coordinator and participating faculty (if any)	Dr. Amit Apte
Pre-requisites	courses from the first three semesters
Objectives	The course will introduce students to basic techniques of data analysis in order to equip them with tools to understand and interpret data in the context of experiments, population statistics and real world numbers in general. The students will gain the following skills: design of experimental or observational studies, basic explorations, inference, modelling.
Course content	<ul style="list-style-type: none"> - experimental and observational studies* data summaries* visualization* (4 lectures, 1 tutorial) - sampling distribution* foundations of inference* (3 lectures, 1 tutorial) - confidence intervals (3 lectures, 1 tutorial) - hypothesis testing* bayesian hypothesis testing (4 lectures, 1 tutorial) - mid-sem exam (approximately around here) - linear, logistic, and nonlinear regression (5 lectures, 1 tutorial) - analysis of variance (3 lectures, 1 tutorial) - measurement errors, error propagation, experimental design (2 lectures, 1 tutorial) - optional topics: statistical graphics, causal inference, scientific ethics - end-sem exam
Evaluation / Assessment	End-Sem Examination 50% Mid-Sem Examination 30% Others-continuous assessment 20%
Suggested readings	1. Introduction to Modern Statistics by Mine Cetinkaya-Rundel and Johanna Hardin, https://openintro-ims.netlify.app/ or https://leanpub.com/imstat 2. Introduction to Probability and Statistics for Engineers and Scientists by Sheldon M. Ross, Academic Press Inc, 6th edition (2021)

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When Next	Jan2025
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