Semester	JAN 2022
Open to semester	4
Course code	**TD2223**
Course title	**Data Analysis**
Credits	3 /
Course Coordinator & participating faculty (if any)	Amit Apte, Leelavati Narlikar
Nature of Course	Lectures and Tutorials
Pre-requisites	Introduction to Computing, Calculus I and II, Linear Algebra, Probability (courses from the first three semesters)
Objectives (goals, type of students for whom useful, outcome etc)	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 contents (details of topics /sections with no. of lectures for each)	- 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 (with full list of authors, publisher, year,	Main text: Introduction to Modern Statistics by Mine Cetinkaya-Rundel and Johanna Hardin, https://openintro-

edn etc.)	ims.netlify.app/ or https://leanpub.com/imstat Additional (optional) reference: - Introduction to Probability and Statistics for Engineers and Scientists by Sheldon M. Ross, Academic Press Inc, 6th edition (2021) - OpenIntro Statistics by David Diez, Mine Çetinkaya-Rundel, Christopher D Barr, Fourth Edition, free PDF at openintro.org/os