**Probability & Statistics**

**IPE 205**

by

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<https://github.com/tanmoyie/applied-statistics>

<https://www.youtube.com/playlist?list=PLHyZ7Tamw-fdGRPgIXiYDZuLdtYoeP4CM>

\*\* This document is incomplete & will be updated frequently

Applied Statistics

Estimated Contents:

1. Introduction to Statistics, Data, Data Visualization (Box plot, Normal Probability Plot etc), EDA **project**
2. Basic laws of probability, conditional probability, rando. .m variables, measures of central tendency and dispersion, mathematical exception, probability distributions, transformation of variables, moments and moment generating functions, sampling,
3. Correlation and regression analysis, **project**
4. Analysis of variance, **project, Data Mining**
5. Central limit theorem, chi-square distribution, t-distribution, f-distribution: estimation and confidence interval,
6. Statistical hypothesis and testing, goodness-of-fit tests.
7. Experimental designs, randomized block design, factorial design, introduction to stochastic problems in engineering. **Project**

# Introduction to Data

Introduction to Statistics, Data, Data Visualization (Box plot, Normal Probability Plot etc), EDA **project**

Show 1 table of data & graph side by side

Nominal data vs numeric data

Roll number vs cgpa

Positive correlation & no correlation

Attendance vs Cgpa ; age of student vs cgpa (find real data of IPE 02, mist)

# Probability & Distribution

Basic laws of probability, conditional probability, rando. .m variables, measures of central tendency and dispersion, mathematical exception, probability distributions, transformation of variables, moments and moment generating functions, sampling,

# Correlation and Regression analysis

Correlation and regression analysis, **project**

# ANOVA

analysis of variance, **project, Data Mining**

# Central Limit Theorem & distributions in its propencity

central limit theorem, chi-square distribution, t-distribution, f-distribution: estimation and confidence interval,

# Hypothesis Testing

Statistical hypothesis and testing, goodness-of-fit tests.

# Engineering Design Experiments

Experimental designs, randomized block design, factorial design, introduction to stochastic problems in engineering. **Project**

Experimental designs

P442, Six sigma handbook

# Data Mining