

Course : Linear Statistical Models

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Video 1 : INTRODUCTION TO THE COURSE

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Introduction

Linear Statistical models or linear models is one of the pillars of traditional statistics and has various applications in the following fields :

1. Clinical Trials
2. Agricultural Studies
3. Engineering Processes
4. Social Science Studies

Whenever there is a system involved and we want to access the effects of various inputs on the output, we use Linear Models. Further, we study how much significant is each input to influence the output.

Position of Linear Models in Statistics

Mathematically, the theory behind Linear Model comes from Linear Algebra. Linear models are widely used in statistics but it is no longer an active research area.

Textbooks

The books may be broadly divided into three categories :

1. Math-centric

- (a) *Plane Answers to Complex Questions by R Christensen*
- (b) *Linear Models : An Integrated Approach by J S Rao and D Sengupta*
- (c) *Applied Linear Statistical Models by Kutner, Nachtsheim, Neter and Li.*

2. Data-centric

- (a) *Linear Models with R by J J Faraway*
This book will be used as "the textbook" and would be referred throughout the course.
- (b) *Extending the Linear Models with R by J J Faraway*

3. Software-centric

- (a) *Mixed-Effects Models in S and S-Plus by D M Bates and J Pinheiro*