Regression and Time-series Model

MA31020 / MA41025

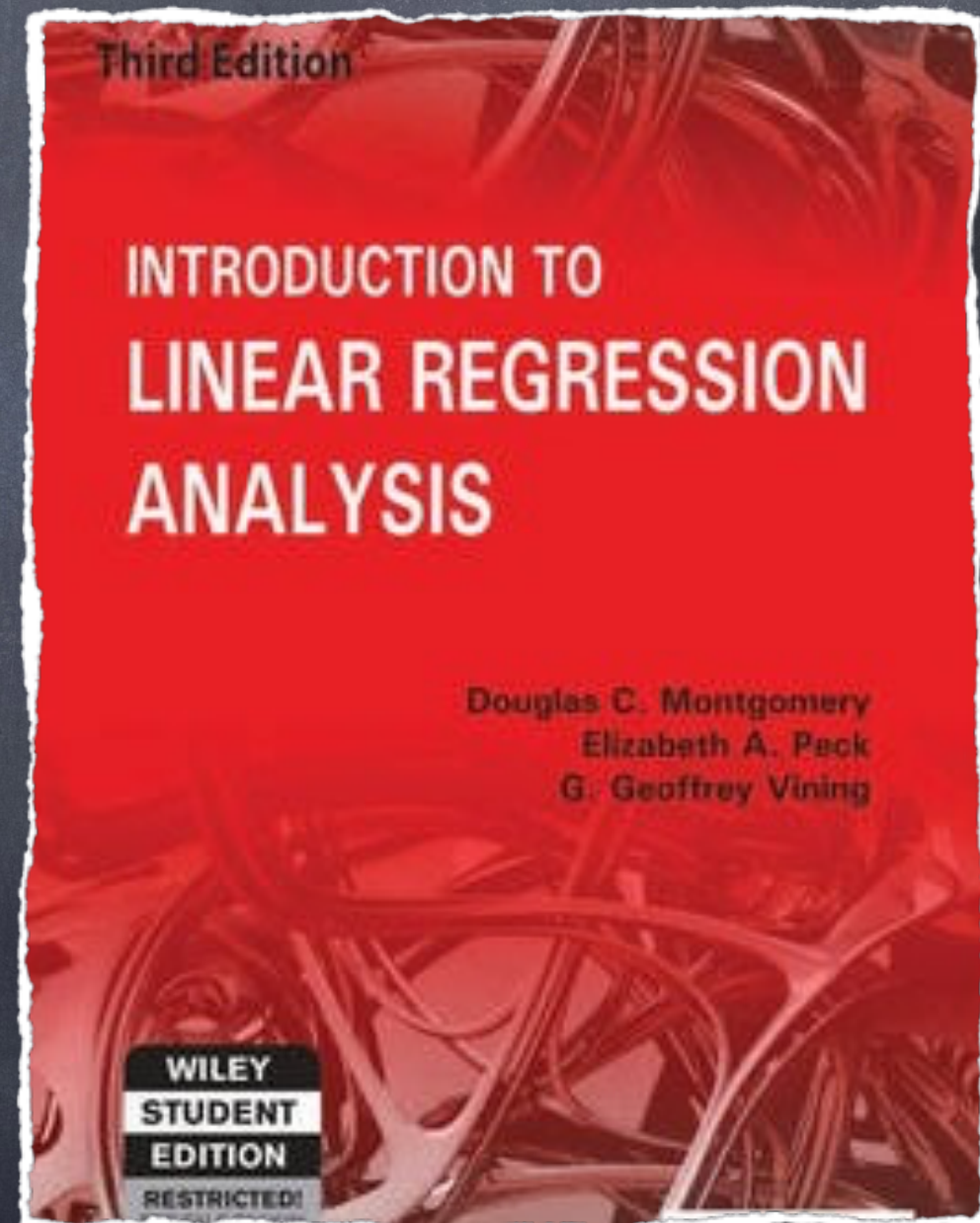# Prerequisite

Probability & Statistics
Or
Probability and Stochastic process

Regression

1. Concept of regression,
2. Simple linear regression,
3. Multiple linear regression,
4. Model adequacy checking,
5. Transformations and weighting to correct model inadequacies,
6. Diagnostics for leverage and influence,
7. Polynomial regression models, Orthogonal polynomials,
8. Variable selection and model building,
9. Model validation,
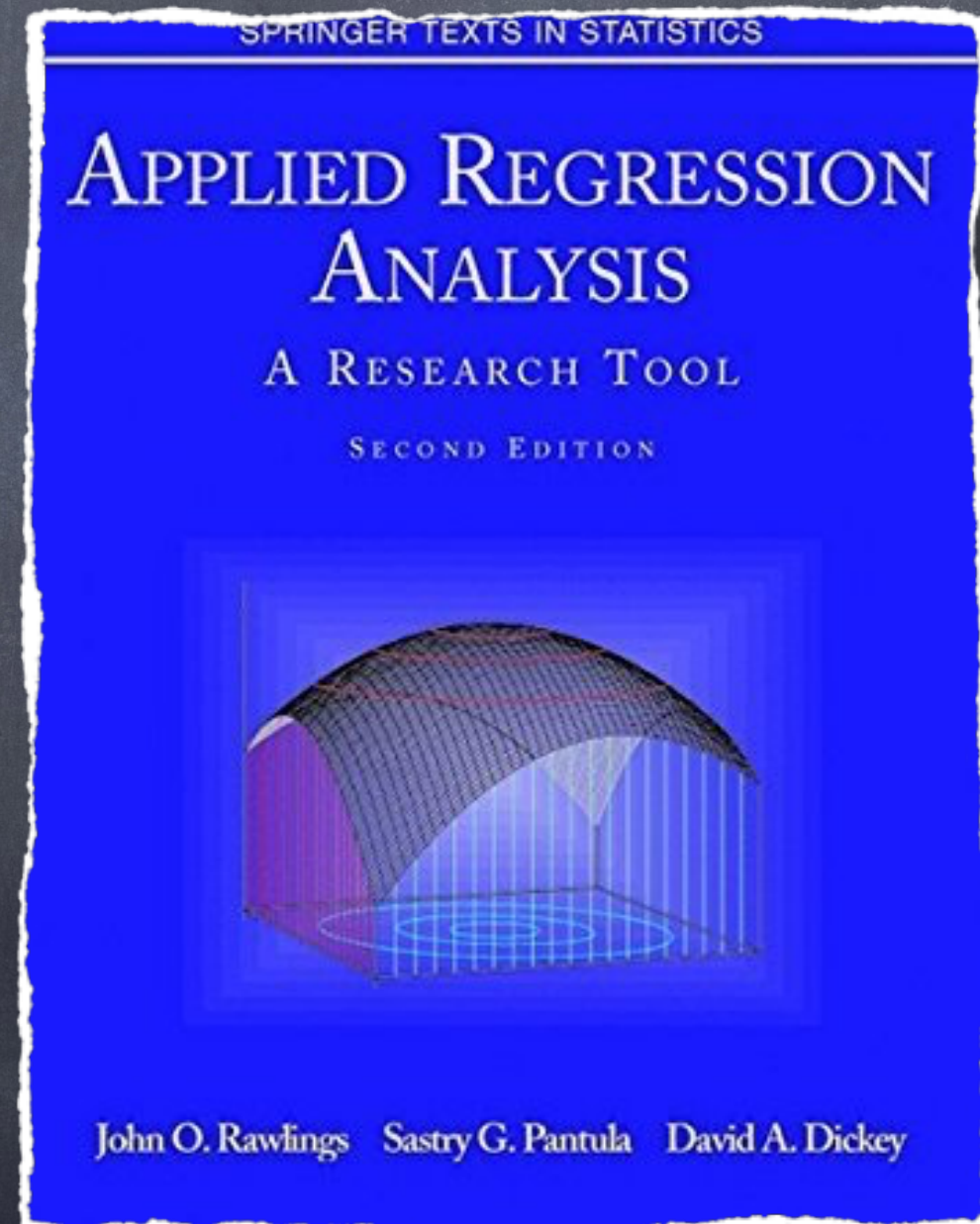10. Multicollinearity and autocorrelation
11. LASSO, Ridge, PCA regression

Text Books

- Introduction to Linear Regression Analysis, 5th Edition

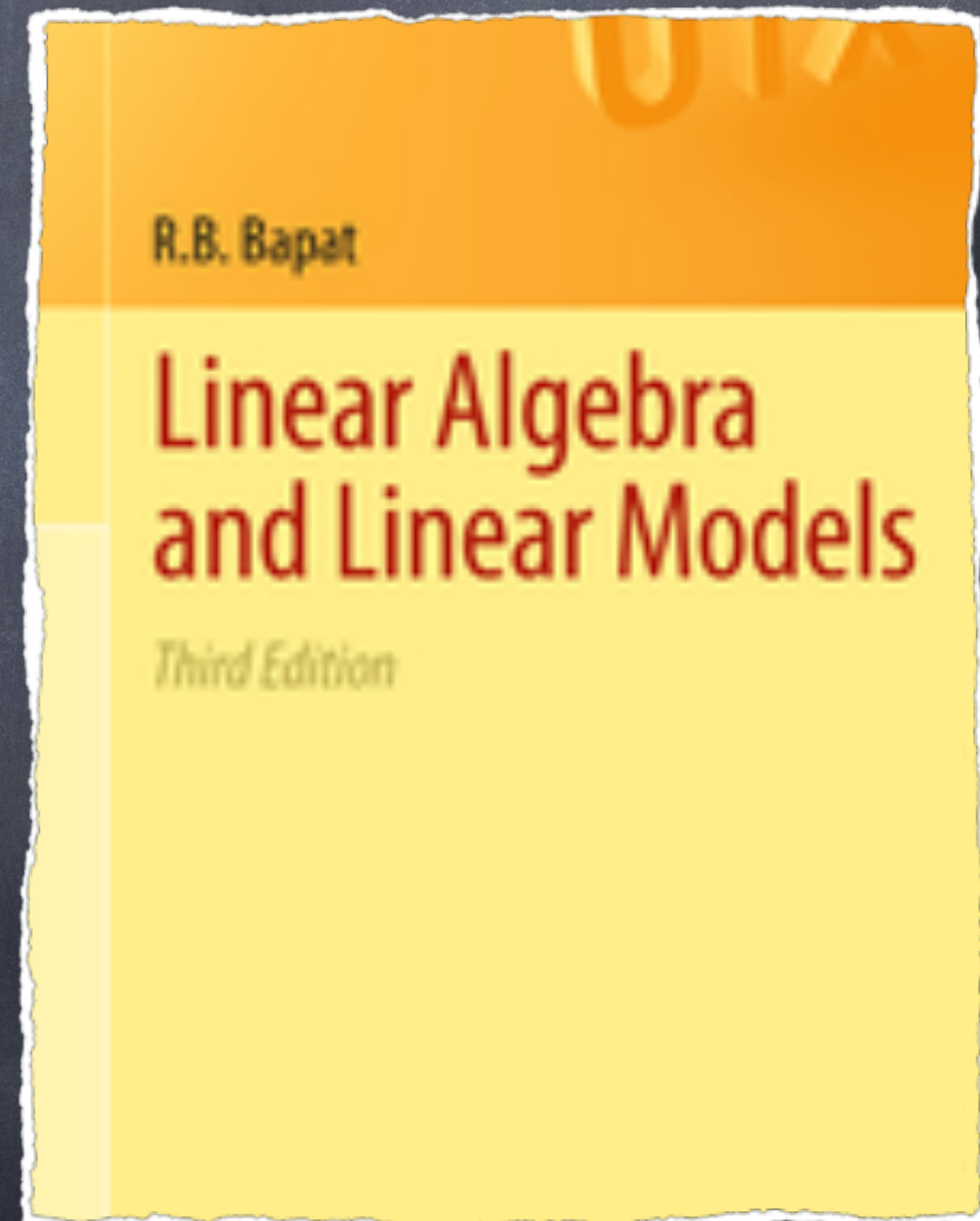- By Douglas C. Montgomery, Elizabeth A. Peck, G. Geoffrey Vining

Text Books

- Applied regression analysis: a research tool.

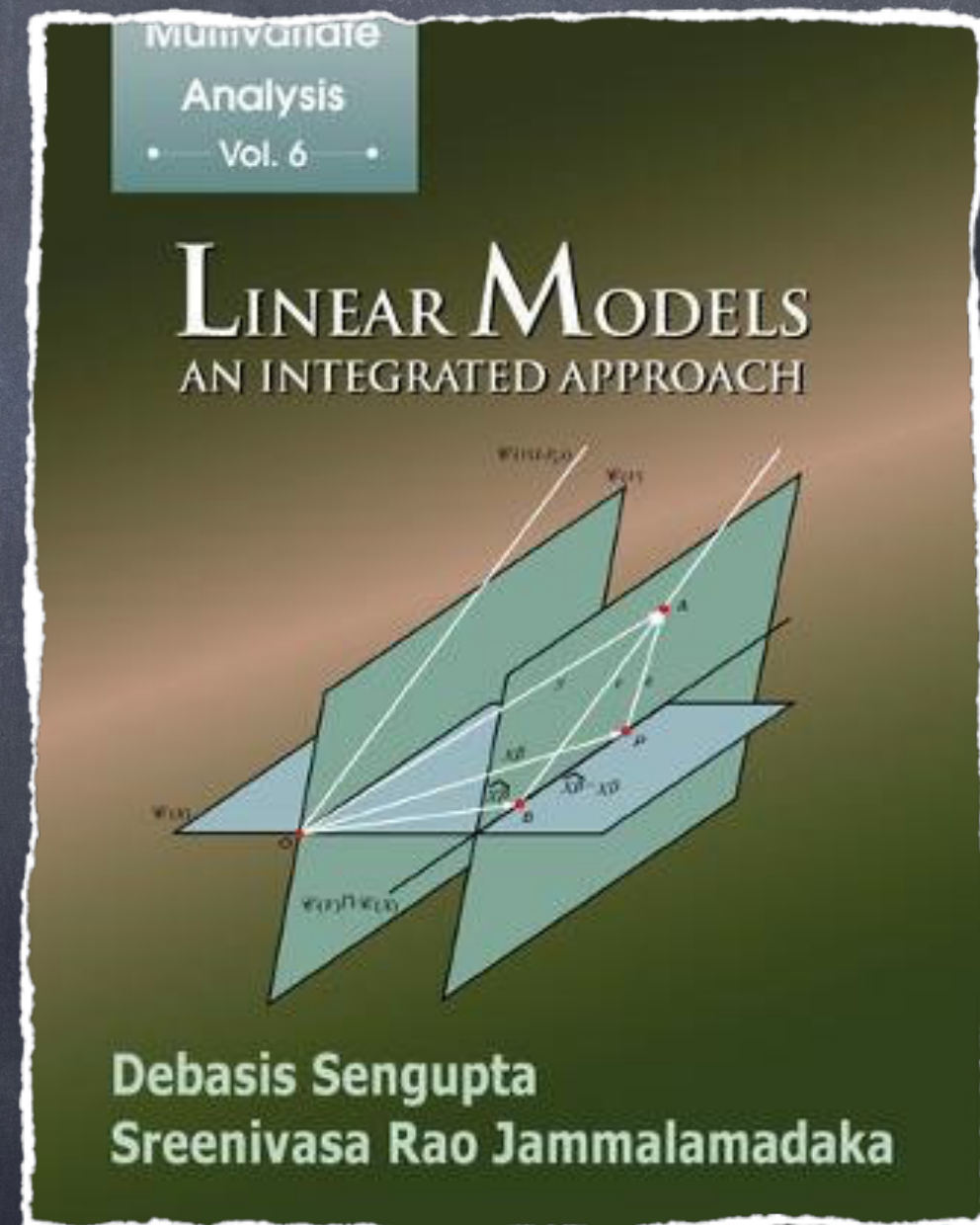- By John O. Rawlings Sastry G. Pantula David A. Dickey

Reference Books

- Linear Algebra and Linear Models

- By Ravindra B. Bapat

R.B. Bapat

Linear Algebra and Linear Models

Third Edition

Reference Books

- Linear Models : An Integrated Approach

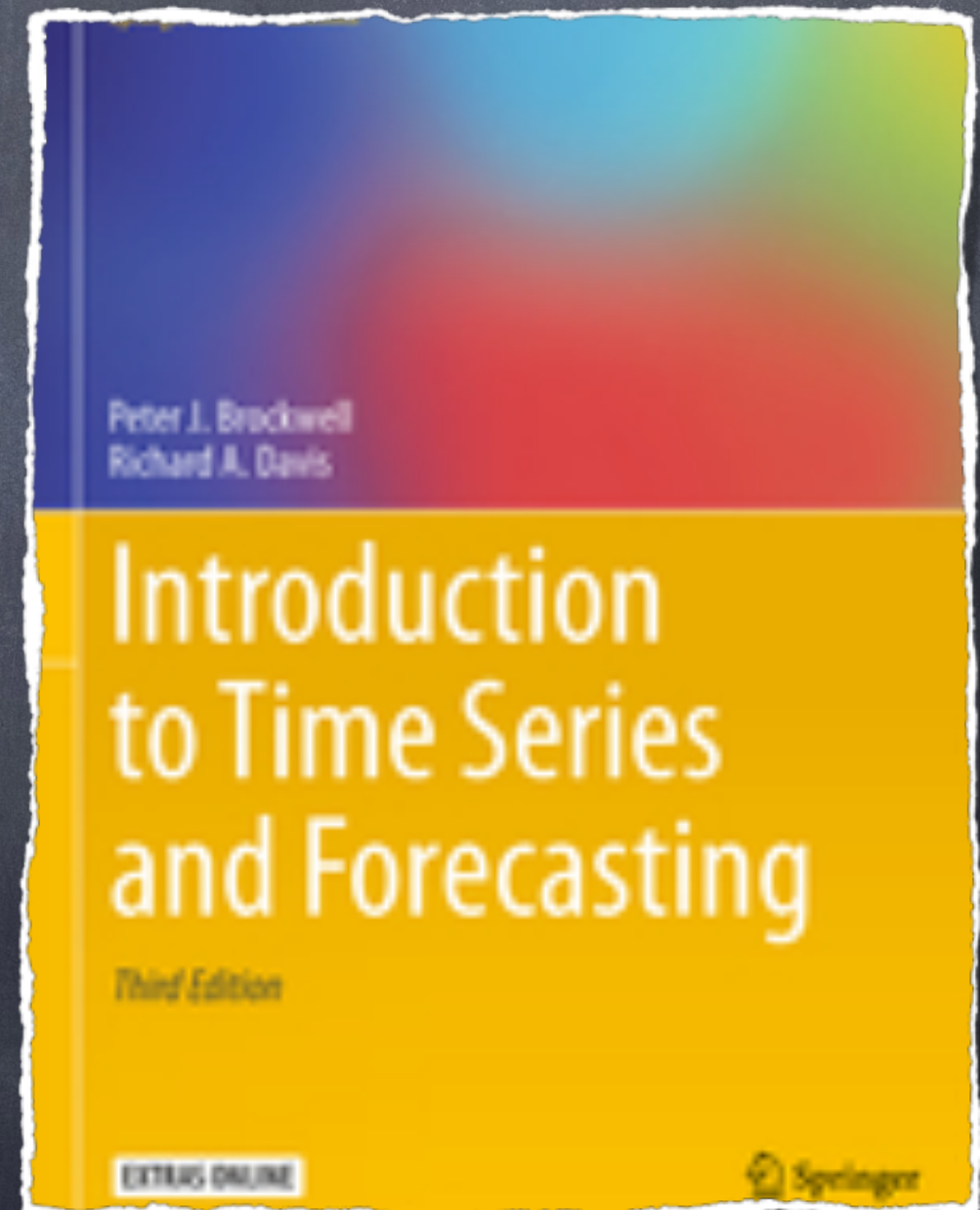- Debasis Sengupta, Sreenivasa Rao Jammalamadaka

Timeseries

1. Time Series: Classical techniques of time series analysis,
2. Different smoothing techniques,
3. General linear process,
4. Autoregressive Processes AR(P),
5. Moving average Process Ma(q):
6. Autocorrelation, Partial autocorrelation
7. ARMA(p,q)
8. Spectral analysis, Identification in time domain
9. Forecasting, Estimation of Parameters,
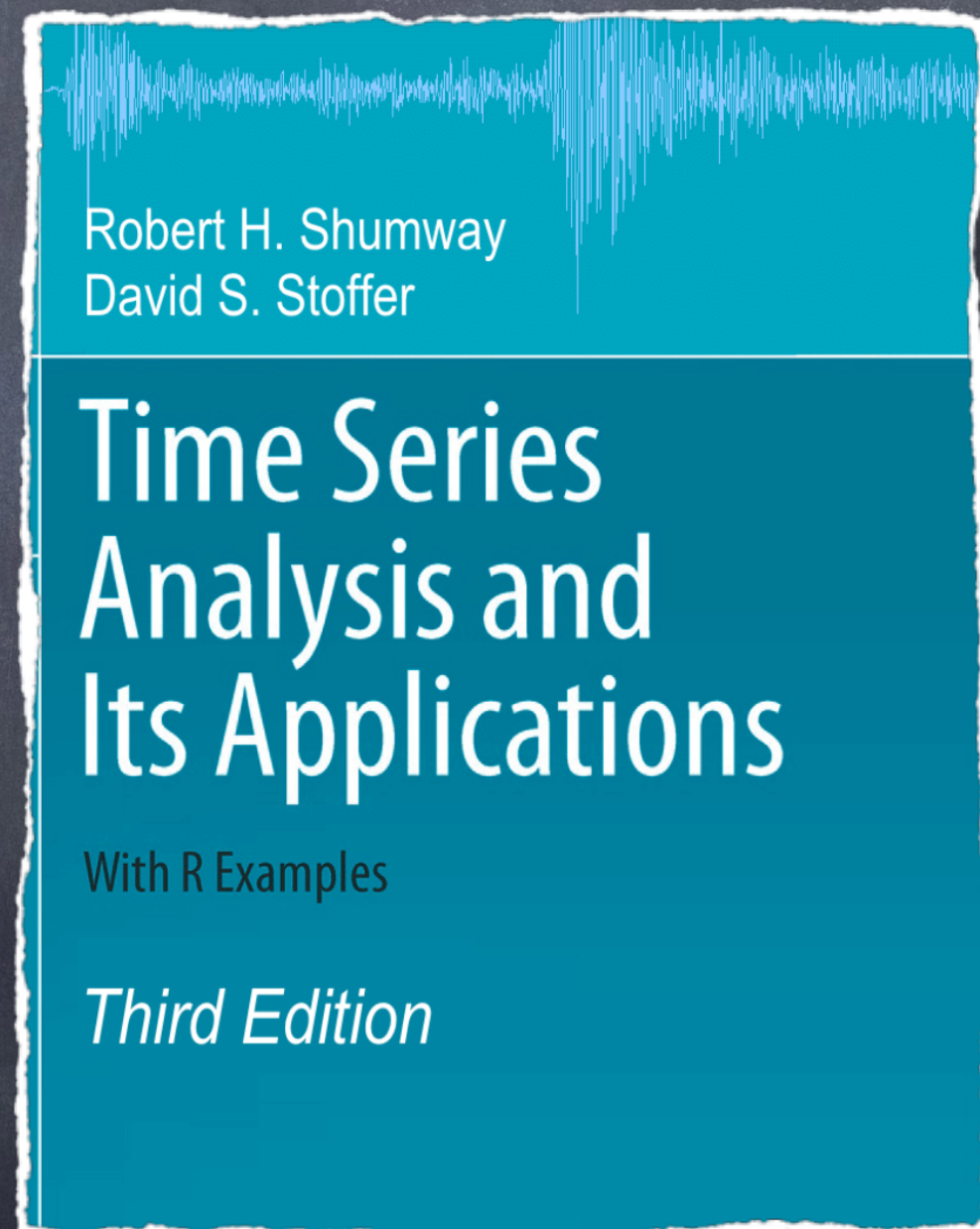10. Missing value , EM algorithm , Spline

Text Books

- Introduction to Time Series and Forecasting

- By: Brockwell, Peter J., Davis, Richard A.

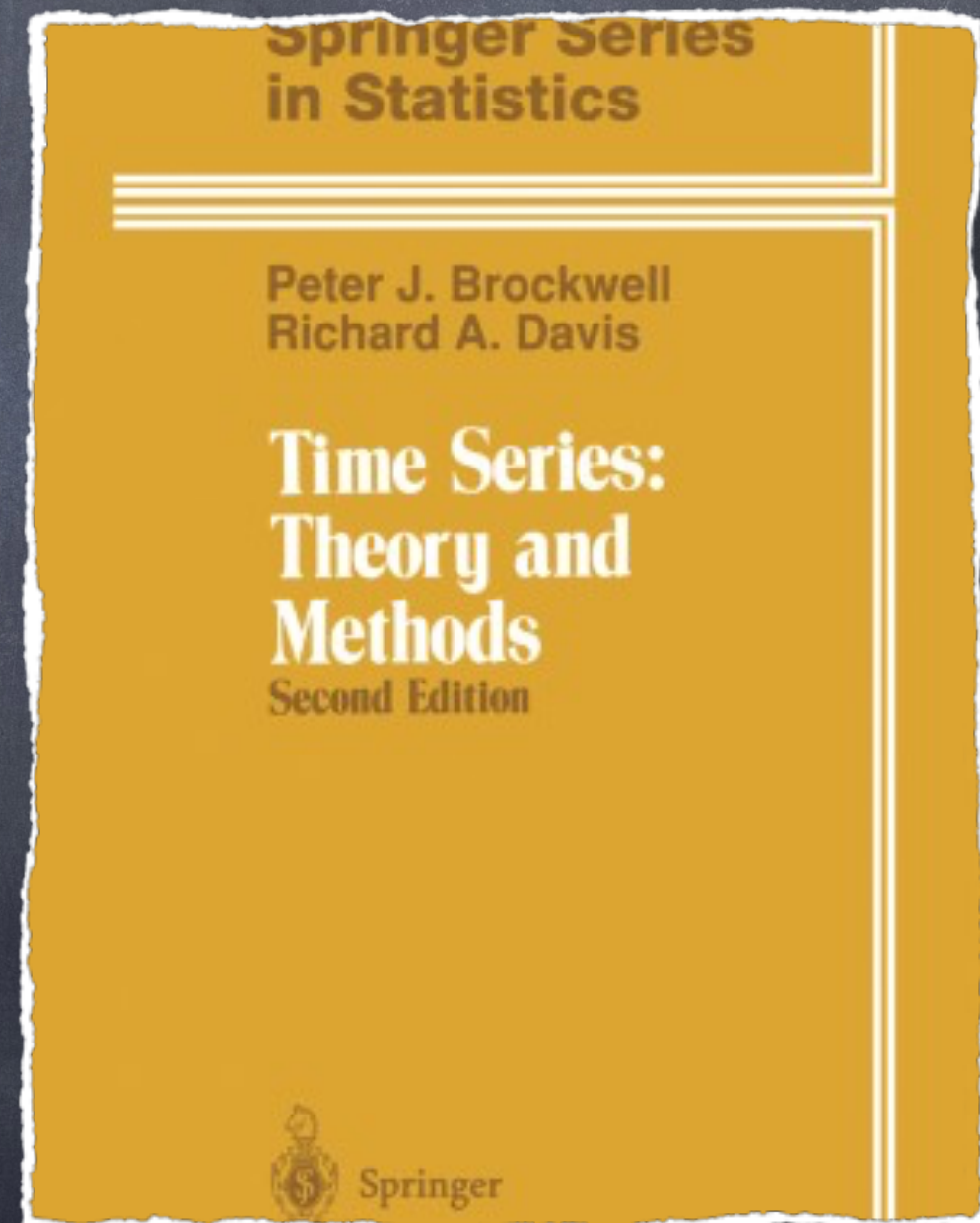# Text Books

- Time Series Analysis and Its Applications: With R Examples

- By Robert H. Shumway , David S. Stoffer

Robert H. Shumway
David S. Stoffer

Time Series Analysis and Its Applications
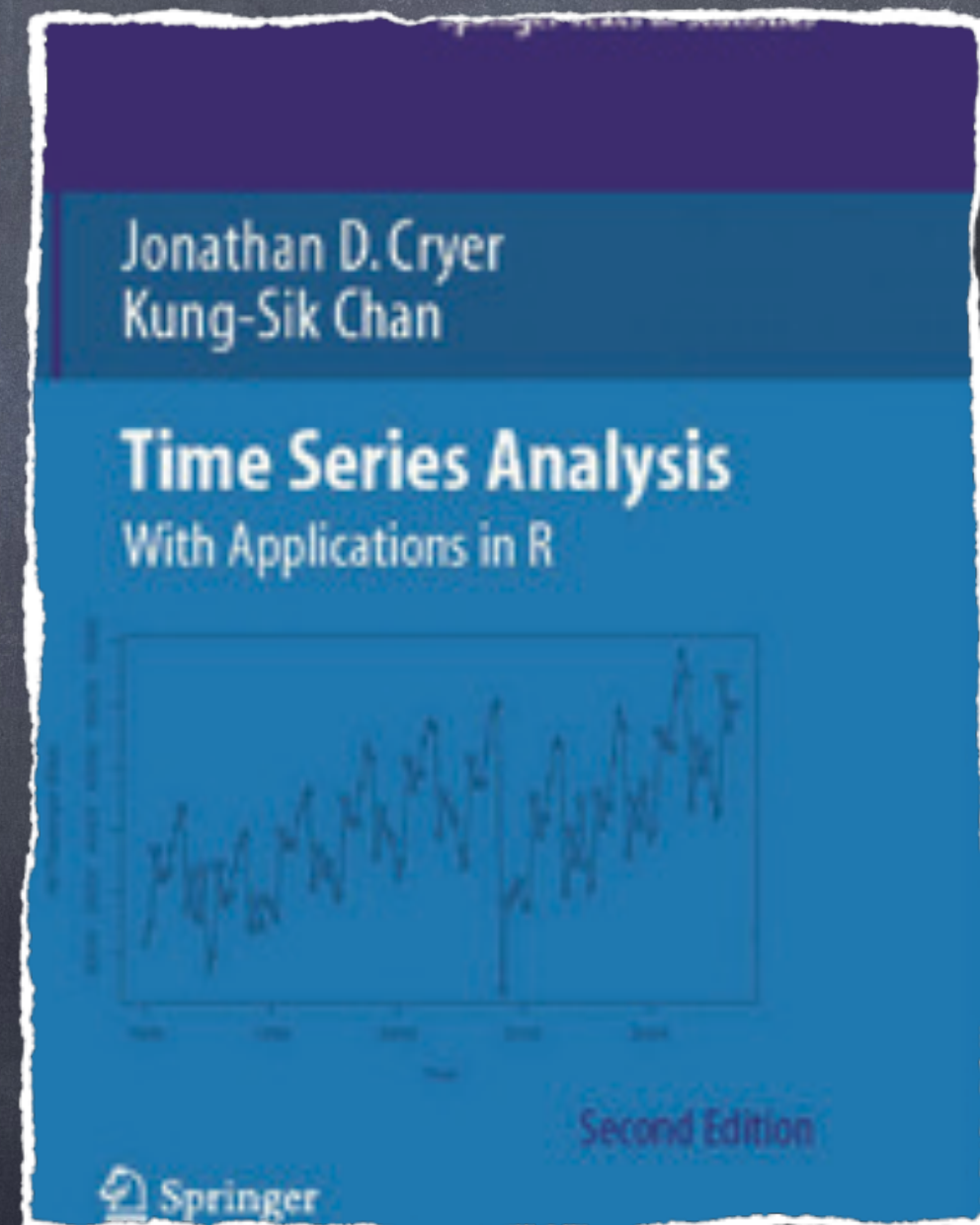
With R Examples

Third Edition

Reference Books

- Time Series: Theory and Methods

- By: Peter J. Brockwell, and Richard A. Davis

Reference Books

- Time series Analysis with application in R

- By Jonathan D. Cryer and Kung-Sik Chan

Evaluation

	NO	MARKS	TOTAL	TOPICS	DUE DATE
QUIZ	5	10	50	RECENT CONETENT	BIWEEKLY
ASSIGNMENT 1	1	15	15	THEORY	BY 1 MONTH
ASSIGNMENT 2	1	15	15	DATA ANALYSIS	BY 2 MONTHS
GROUP PROJECT	1	20	20	STUDENT'S CHOICE	BY 3 MONTHS

Schedule

	FROM	TO	PLAN
Monday	5:00 PM	6:00 PM	Video/ live lecture + Doubt clearing + Practice Problems
Tuesday	8:00 PM	9:30 PM	Video/ live lecture + Doubt clearing + Practice Problems / QUIZ
Wednesday	11:00 AM	12:00 AM	Video/ live lecture + Doubt clearing + Practice Problems
Thursday	12:00 AM	1:00 PM	Video/ live lecture + Doubt clearing + Practice Problems
Friday	8:00 AM	9:00 AM	Video/ live lecture + Practice Problems

Important

My home page
https://sites.google.com/site/buddhanandastat/running-courses

Official Notice, course material, Evaluation
KGP-MOODLE

Online interaction and discussion
MICROSOFT TEAM

Important

Instructor
Dr. Buddhananda Banerjee
 Email: bbanerjee@maths.iitkgp.ac.in

Teaching Assistants
Mr. Arjun Lakra
Email: arjunarjunlakra@gmail.com

Mr. Suvojit Dhara
Email: sdhara1994@gmail.com