

Course Design and Promotion : MA324 Statistical Inference and multivariate Analysis

Arabin Kumar Dey

Founder & Director, MedSolu Pvt Ltd
Associate Professor, IIT Guwahati

January 3, 2024

1 Important Information related to Course

2 Grading Scheme

3 Promotion of Statistics

- ASA Promotion regarding Statistics

4 Reference

- Monday. (3:00 - 4:00 pm), Thursday (5:00 - 6:00 pm) and Friday. (4:00 - 5:00 pm)
- Extra-ordinary Day : Alternative option : Tuesday (2:00 - 3:00 pm).
- Class Room : 5102.

Text Book

Major Two :

- 1. R. V. Hogg, J. W. McKean and A. T. Craig, Introduction to Mathematical Statistics, 7th Ed., Pearson, 2013.
- 3. R. A. Johnson and D. W. Wichern, Applied Multivariate Statistical Analysis, 6th Ed., Prentice Hall of India, 2012.

- Comments on "V. K. Rohatgi and A. K. Saleh, An Introduction to Probability and Statistics, 3rd Ed., Wiley, 2015."
- Comments on "D. C. Montgomery, E. A. Peck and G. G. Vining, Introduction to Linear Regression Analysis, 5th Ed., Wiley, 2012."
- Comments on "G. Casella and R. L. Berger, Statistical Inference, 2nd Ed., Cengage Learning, 2006."
- On "T. W. Anderson, An Introduction to Multivariate Statistical Analysis, 3rd Ed., Wiley, 2012."

TEXT BOOKS

- 1 “Statistics and Finance : An Introduction” by David Ruppert
- 2 “Statistical Analysis of Financial Data in S-plus” : Rene Carmona
- 3 Tsay, Financial Time Series.

Avail Extra or relevant Lecture Notes : **Moodle passwd : ma3242024** (check)

The grade for this course will be determined based on your performance on

- Assignments/Tutorials (5%),
- Quiz (10%) [at least 2 (Coding + Non-coding)]
- Midsem exam (30%),
- Instructor Quota [Project Report, Attendance, Attitude, Class performance etc (labs) (5%)]
- Extra Assignment [10%] (We will explore the possibility or discard)
- Final Examination (40%).

- . Collection of Data
- Analysis of Data
- Interpretation of Data

Process we follow

- Turning the data into information
- data-based decision making
- The technology of the "Scientific Method"

Take a look :

Focus Area :

Key Points and Past Experiences
Dealing with SIMA.pdf

Statistical Computing we would pursue in solving assignments and extra problems

- R -package
- Python

Live Tutorial :

Live Tutorial :

- Real Time Data
- Stored Data.
- Structured Data
- Un-Structured Data

- Missing Data
- Censored Data
- Small sample data
- Data with abnormal observations
- Dependent Data
- Multi-dimensional Data
- The list goes on..

- Take a small sample
- Build your algorithms on Small sample
- Simulation to verify your algorithm.
- Establish Theoretical Evidence on large sample.
- etc

- Primary Objective : Error analysis in decision making system.
- Most of the theory can be visualised through computer simulation.
- Approximate calculation/guess requires further methodology or theoretical development.
- Validation and testing on New observations is utmost important.
- Reporting the Error level in the end.

Goal Same.. God one : ML handles large/very big data; Statistical Approach Never

- Limitations.
- Approaches
- Beyond :
- Adaptive
- Heuristic
- Intuition based
- Our choices on specific Problems beyond domain.

Thank you for your attention !!