

IT- 412 Topics and Statistics and Linear Algebra

Credits: 3

Prerequisite: Maths1 and Introduction to Probability and Statistics.

Lectures: 3 hrs a week (minimum)

Objective: This course is meant to provide a solid and rigorous foundation in

a) advanced linear algebra (LA)

b) advanced regression analysis

Course overview: Topics to be covered:

Linear Algebra: The Four Fundamental Vector spaces (row space, column space, null space and left-null space), Eigenvalues and Eigenvectors, Diagonalization, Various forms for decomposition/factorization of matrices (eg. LU-decomposition, QR-decomposition, Singular Value Decomposition)

Statistics: Hypothesis Testing, Analysis of Variance, (Multiple) Linear Regression (LR/MLR), Principal Components Regression (PCR).

The course may be modified based on needs of the class. Make sure you check with the course instructor for sections covered on the exams, HW problems and other course related announcements.

References:

1) Introduction to Linear Algebra (4th edition) by Gilbert Strang

2) Selected video lectures on Linear Algebra by Gilbert Strang downloadable from <http://ocw.mit.edu/courses/mathematics/18-06-linear-algebra-spring-2010/video-lectures/>

3) An Introduction to Generalized Linear Models (2nd Edition) by Annette J. Dobson

Handouts of relevant articles/book chapters will be given as required.

Grading Policy: The policy for grading subjects is as follows: Quiz/Assignment: 20%; Mid-semester exam: 30%; Final: 50%

Assignments: The assignments will be a mixture of theoretical and programming jobs. You are encouraged to discuss the solutions amongst your fellow students, but the submissions have to be your own and will be graded likewise. Homework submitted late will not be graded. Retake of missed quizzes is not allowed.

Programming assignments are often graded based on your presentation in the class, as such any queries wrt. the grades given should be taken up immediately.

Programming: All assignments must be submitted in R

Remedial Classes: Students in need of remedial classes are requested to contact to contact the instructor at the earliest possible. Students are also encouraged to contact the instructor (preferable via email) for any questions pertaining to this course. These will then be discussed and clarified in the class.

Policy on cheating and plagiarism: Although, cooperation between the students is highly recommended, any act of cheating and plagiarism will not be tolerated and the matter will be handled strictly as per the JNU regulations.