UNIVERSITY ⚜ OF MYSORE

Estd. 1916

Vishwavidyanilaya Karyasoudha
Crawford Hall, Mysuru- 570 005
Dated: 12.07.2019

No.AC.2(S)/785/19-20

NOTIFICATION

Sub: Revision of the syllabus & titles of M.Sc Statistics from the Academic
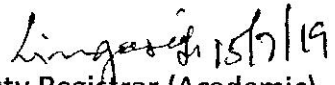Year 2019-20.

Ref: 1. Decision of Board of Studies in Statistics (CB) meeting held on
11.12.2018 & 19.03.2019.
2. Decision of the Faculty of Science & Technology Meeting held
on 01.04.2019.
3. Decision of the Academic Council meeting held on 07.06.2019.

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The Board of Studies in Statistics (CB) which met on 11.12.2018 & 19.03.2019 has
recommends to revise the syllabus and titles of two softcore papers to be offered for M.Sc.
Statistics from the Academic Year 2019-20.

The Faculty of Science and Technology and Academic Council meetings held on
01.04.2019 and 07.06.2019 respectively have approved the above said proposal and the
same is hereby notified.

The modified syllabus M.Sc Statistics course is annexed. The contents may be
downloaded **from the University Website i.e., www.uni-mysore.ac.in.**

Draft approved by the Registrar

Lingaraj 15/7/19
Deputy Registrar (Academic),
Deputy Registrar (Academic)
University of Mysore
& Mysore-570 005

To:

1. The Registrar (Evaluation), University of Mysore, Mysore.
2. The Dean, Faculty of Science & Technology, DOS in Zoology, Manasagangotri, Mysore.
3. The Chairperson, BOS in Statistics, DOS in Statistics, Manasagangotri, Mysore.
4. The Chairperson, Department of Studies in Statistics, Manasagangotri, Mysore.
5. The Director, College Development Council, Moulya Bhavan, Manasagangotri, Mysore.
6. The Principals of the Affiliated Colleges where UG Program is running in Science stream.
7. The Deputy/Assistant Registrar/Superintendent, AB and EB, UOM, Mysore.
8. The P.A. to the Vice-Chancellor/Registrar/Registrar (Evaluation), UOM, Mysore.
9. Office file.

Soft Core Discipline Centric Paper:

Paper XXXII: Data Science

(4 Credits – LTP 202 - 2 hours of Theory + 4 hours of Practical teaching per week)

Unit 1: Introduction to data science, data visualization, data wrangling, data ethics. Introduction to big data, its sources. Structured and unstructured data. Analysis of scalability of algorithms to big data, Data warehouses and online analytical processing, Efficient storage of big data including data streams.

Unit 2: Introduction to data science in R. Machine learning algorithms - linear regression, k-nearest neighbors (k-NN), k-means. Filtering Spam. Naive Bayes, Data Wrangling.
Logistic regression, Newton's method, stochastic gradient descent, case study.

Unit 3: Dimensionality reduction. Principal Component Analysis (PCA), Cluster Analysis. Basic principles, ideas and tools for data visualization. Supervised learning, unsupervised learning.

Unit 4: Data modelling, predictive analysis, simulation. Spatial data, text mining. Distributed algorithms over very large graphs and matrices, Social media analysis,

References:

1. Alan Anderson and David Semmelroth (2015). Statistics for Big Data for Dummies, Wiley.

2. Deborah Nolan and Duncan Temple Lang (2015). Data Science in R- A case studies approach to computational reasoning and problem solving, CRC Press.

3. Deborah Nolan and Terry Speed (2015): StatLabs: Mathematical Statistics throgh Applications, Springer.

4. Joseph Hair, William C. Black, Barry Babin and Rolph Anderson (2013). Multivariate Data Analysis, Cengage.

Soft Core Discipline Centric Paper:

Paper XXXIII: Data Science - Practical Multivariate Data Analysis using R

(4 Credits – LTP 004 - 8 hours of Practical teaching per week)

Unit 1: Introduction to multivariate data, multivariate statistics, multivariate distributions, statistical inference. Graphical visualization of multivariate data.

Unit 2: Principal component analysis - scores, correlations, biplots. Correspondence analysis, multiple correspondence analysis. Cluster analysis – Hierarchical, K-means clustering. Factor analysis. Partial least squares regression.

Unit 3: Multidimensional scaling – classical, nonmetric, individual differences scaling. Regression analysis – linear, multiple linear, multivariate multiple linear. MANOVA - univariate one-factor, multivariate one-factor, profile analysis. Canonical correlation analysis, Discriminant analysis. Support vector machines, CART. Loglinear modelling.

Unit 4: Latent variable models. Graphical modelling. Basics of data mining.

References:

 1.   Avril Coghlan. Welcome to a little book of R for Multivariate analysis (https://little-book-of-r-for-multivariate-_analysis.readthedocs.io/_en/__latest/)

2. Daniel Zelterman (2015). Applied Multivariate Statistics with R, Springer.

3. Shailaja R. Deshmukh and Sudha G. Purohit (2011). Microarray Data, Narosa.

4. Trevor F. Cox (2014). An Introduction to Multivariate Data Analysis, John Wiley.