DEPARTMENT OF MATHEMATICS AND STATISTICS

MEETING OF BOARD OF STUDIES

MINUTES

The Board of Studies in Mathematics and Statistics of SIES College of Commerce & Economics (Autonomous) , Sion East , Mumbai 400 022 held on Friday, 24th April 2021 at 5.00 pm by Online Mode on MS Teams.

Following members were present:

Sr.No.	Name	Designation
1	Chairperson (HOD)	Ms. Sangeeta Kore
2	Faculty Members	Mr. Amit Khatri (B.Com.) CA Darshak Doshi (B.Com A&F) Mr. Ajay Gupta (B.Sc IT) Mr. Vinayak Krishnan (B.M.S.)
3	Subject Expert from Other University	Dr. Sanjeev Sabnis Professor , Department of Mathematics IIT , Mumbai. Dr. Rajendra Gurao Principal, SNDT college of Arts & SCB College of Commerce & Science for women , Mumbai.

4	One Expert selected by Vice-Chancellor from the six recommended by the College Principal	Dr. Annapurna Shankarnarayanan, Vice Prin.(Arts), St. Xavier's College (Autonomous)
5	One Representative Industry / Corporate Sector / Related Field	Mr. Moorthy Konar Associate Vice President , S.B.I. Life Insurance Co. Ltd.
6	P G Alumni	CA CS Divya Krishnan Naik Visiting Faculty
7	Outside Subject Expert	Dr. Dnyaneshwar Doke Principal , M.L.Dahanukar College of Commerce
8	Other Members of Faculty, if any.	Mrs Neha Palshetkar (B.M.S.) Mr. Manish Mirgh (B.Com B&I)

The Chairman, Ms. Sangeeta Kore welcomed the members of BOS.
the minutes of the Meeting of Board of Studies in Mathematics and Statistics held on 10th &
11th Nov 2020 (as circulated) was taken as read and confirmed as it was mailed to the members
prior to the meeting.

Mr. Ajay R. Gupta, Faculty from BSc IT Department, presented the proposed syllabus of
Computer Oriented Statistical Techniques and Applied Mathematics (Theory and Practical)
along with proposed pattern of examination. Thereafter the same was discussed by the members.

Following suggestions/observations were made:

Applied Mathematics:

Name of the member	Suggestions/observations
Dr. Sanjeev Sabnis	To include Basics of Optimisation, as the topic has numerous applications. Also the topic should be restricted to Functions with one variable. Dr. Dnyaneshwar Doke and Dr. Dr. Rajendra

	Gurao supported the same.
	Prof. Ajay Gupta suggested that the sub topics Inverse Hyperbolic Functions, Differentiation and Integration, Graphs of the Hyperbolic Functions, Logarithms of Complex Numbers. can be removed from Complex Numbers , Complex Numbers to be shifted to Unit 1 with Matrices
Dr. Dnyaneshwar Doke	The newly introduced topic – Mean Value Theorem should include the statement of the theorem as well as the application
Dr. Sanjeev Sabnis	Mean Value Theorem should be included prior to Basics of Optimization He also enquired about topics – Linear Programming and Numerical methods , to which Mr. Ajay Gupta informed that the topics are included in the Semester 2 , which was supported by Dr. Doke

Computer Oriented Statistical Techniques:

Name of the member	Suggestions/observations
Dr. Annapurna S	To rename Frequency Distribution as Presentation of Data in Unit 1. Renaming of some subtopic titles of Unit 1 and rearranging the subtopics of Unit 1 and Unit 2.
Dr. Sanjeev Sabnis Dr. Annapurna S	To rename Unit 4 as Testing of Hypotheses as the subtopics deal with Statistical Inference. Also the subtopic Statistical Decisions should be removed as it misfits there. Dr. Dnyaneshwar Doke and Dr. Dr. Rajendra Gurao supported the same.
Dr. Dnyaneshwar Doke Dr. Rajendra Gurao.	Expressed the need of reframing and restructuring the subtopics in Unit 4. Dr. Doke guided that the subtopics can be restructured into 1. **Introduction to Statistical Hypothesis Testing** 2. **Tests Involving Normal Distributions** 3. **Small Sampling Theory** 4. **The Chi-Square Test**
Dr. Sanjeev Sabnis Dr. Annapurna S	Pointed out the errors in names of some of the topics and suggested the changes.

Dr. Dnyaneshwar Doke Dr. Rajendra Gurao.	Dr. Sabnis insisted that the topic should be named as Linear Regression Analysis Dr. Annapurna S suggested that the topic can be bifurcated as Linear Correlation and Linear Regression Analysis and the subtopics should be arranged accordingly.

Mr. Ajay R. Gupta also brought to the notice of BOS that the contents of Semester 3 and 4 have been interchanged. As students learn Probability in Semester 1 and Standard Distributions in Semester 2. Computer Oriented Statistical Techniques will be continuation of Statistics learnt in Semester 1 and 2. Hence he proposed to have **Computer Oriented Statistical Techniques** in Semester 3 and **Applied Mathematics in Semester 4.**

It was decided to incorporate the following changes in Proposed syllabus presented before the meeting.
Computer Oriented Statistical Techniques:

Particulars as per proposed syllabus	Changes as approved in the meeting
Unit 4 **Statistical Decision Theory** **Small Sampling Theory** **The Chi-Square Test**	**Introduction to Statistical Hypothesis Testing:** Statistical Hypotheses, Tests of Hypotheses and Significance, or Decision Rules, Type I and Type II Errors, Level of Significance, Critical Region, Two-Tailed and One-Tailed Tests, The Power of a Test, p-Values for Hypotheses Tests. **Tests Involving Normal Distributions:** Test for Single Mean, Single Proportion, Test of Significance for Differences of Means, Test of Significance for Differences of Proportion. **Small Sampling Theory**: Small Samples, Student's t Distribution, Confidence Intervals, Tests of Hypotheses and Significance, The Chi-Square Distribution, Confidence Intervals for Sigma, Degrees of Freedom, The F Distribution. **The Chi-Square Test**: Observed and Theoretical Frequencies, Definition of Chi-Square, The Chi-Square Test for Goodness of Fit and Independence of Attributes, Contingency Tables, Yates' Correction, Coefficient of Contingency, Correlation of Attributes, Additive Property of Chi-Square. (**Reframing and Restructuring Done**)
Unit 5 **Curve Fitting and the Method of Least Squares** **Correlation Theory**	**Linear Correlation:** Introduction, Types of Correlation, Determination of Correlation – Scatter Diagram, Karl Pearson's Coefficient of Correlation and Spearman's Rank Correlation

	Coefficient.
	Linear Regression: Introduction, Regression Lines and Regression Coefficients, Relation between Coefficient of Correlation and Regression Coefficients.
	Curve Fitting and the Method of Least Squares: Introduction, Freehand Method of Curve Fitting, The Straight Line Fitting by The Method of Least Squares, Nonlinear Relationships, Fitting of Parabolic Curve by The Method of Least-Squares. Applications to Time Series.
	Sampling Theory of Correlation and Regression:
	(**Renaming** , **Reframing and Restructuring Done**)

Applied Mathematics:

Unit 1: **Matrices**	**Unit 1:** **Matrices** **Complex Numbers:** Introduction, Equality of Complex Numbers, Graphical Representation of Complex Number (Argand's Diagram), Polar Form of Complex Numbers, Polar Form of x + iy for Different Signs of x, y, Exponential Form of Complex Numbers, Mathematical Operation with Complex Numbers and their Representation on Argand's Diagram, Circular Functions of Complex Angles, Definition of Hyperbolic Function, Relations between Circular and Hyperbolic Functions. (**Complex Numbers topic added in Unit 1 with removal of some subtopics**)
Unit 2: **Complex Numbers** **Mean Value Theorems**	**Unit 2:** **Functions of Single Variable:** Limit, Continuity and Differentiability, Mean Value Theorems **-** Introduction, Rolle's Theorem, Lagrange's Mean Value Theorem, Cauchy's Mean Value Theorem (Statements and Applications), Increasing and Decreasing Functions, Maxima and Minima. (**Optimization topic added along with the some basic topics**)

General Suggestions:
1. Dr. Annapurna S and Dr. Doke suggested to refer to some of the standard books in statistics such as Gupta Kapoor , V K Kapoor ,

Thereafter following Resolution was passed.

1. Resolved to continue with same syllabus and examination pattern of FY courses as confirmed in BOS meeting on 10th & 11th November, 2020.
2. Resolved that the Proposed syllabus for Computer Oriented Statistical Techniques at Semester III & Applied Mathematics at Semester IV at B.Sc (IT) is passed by the BOS in this meeting.
3. Resolved that the method of examination will be on-line and /or off-line as per the direction of UGC/ State Govt. / University of Mumbai.

The meeting was concluded with a vote of thanks extended by Mr Amit Khatri.

Name & signature
Chairman – BOS – Mathematics and Statistics
Place Mumbai
Date 23/04/2021