

COURSE TEMPLATE

1.	Department/Centre proposing the course	Mathematics
2.	Course Title (<i>< 45 characters</i>)	INTRODUCTION TO STATISTICS
3.	L-T-P structure	3-1-0
4.	Credits	4
5.	Course number	MAL 215
6.	Status (<i>category for program</i>)	Core for students of B.Tech in Maths and Computing - Program-Linked BS course for other depts.

7.	Pre-requisites (<i>course no./title</i>)	MAL110 and MAL120
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8.	Status vis-à-vis other courses (<i>give course number/title</i>)	
8.1	Overlap with any UG/PG course of the Dept./Centre	MAL250 - 10% overlap
8.2	Overlap with any UG/PG course of other Dept./Centre	NO
8.3	Supercedes any existing course	MAL140

9.	Not allowed for (<i>indicate program names</i>)	
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10.	Frequency of offering	☐ Every sem ☐ 1 st sem ☐ 2 nd sem ☒ Either sem
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11.	Faculty who will teach the course Niladri Chatterjee. S. Dharmaraja, B. Chandra	
12.	Will the course require any visiting faculty?	NO

13.	Course objective (<i>about 50 words</i>): The aim of the course is to provide the students with - explanations and expositions of statistical concepts which they need for their experiments and research - theoretical concepts pertaining to handling of large data sets and inference from them.	
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14.	Course contents (<i>about 100 words</i>) (<i>Include laboratory/design activities</i>): This course provides fundamentals of probability distributions, Descriptive Statistics and Data Visualization, Theory of Estimation, Testing of Hypothesis, Nonparametric Analysis, Concept of Correlation and regression	
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15. Lecture Outline *(with topics and number of lectures)*

Module no.	Topic	No. of hours
1	Measures of central tendency, Dispersion, Skewness, Kurtosis, Data Representation using Histogram, Pie Chart, Boxplot, Biplot, Multi Dimensional Scaling etc.	4
2	Fundamentals of Probability, Concept of Random Variable, Some common discrete and continuous distributions,	4
3	Distribution of Functions of Random Variables, Bivariate and Multivariate random variables.	5
4	Gamma, Beta, ChiSquare, Fisher's t, F distributions	5
5	Sampling Distribution of Mean, Variance, proportion, SRSOR, SRSWOR,	4
6	Theory of Estimation, Properties of an estimator, Efficiency, Sufficiency, MVUE, Cramer Rao inequality, Rao Blackwell Theorem	5
7	Testing of Hypotheses, One-sample and Two sample tests of Proportion, mean, variance, Critical regions, Neyman Pearson Lemma	5
8	Tests for Goodness of fit, Chi-square Test, kolmogorov Smirnov Test, One sample and paired sample tests: Sign Test, Signed-rank Test, Run tests etc	5
9	Linear regression, Non-linear regression, Logit and Probit Methods, Ordinal Regression, Poisson Regression	5
10		
11		
12		
COURSE TOTAL (14 times 'L')		42

16. Brief description of tutorial activities

Solving of problems related to theories done in class. In addition solving problems using some Statistical package (e.g. SPSS, R) will be covered .

17. Brief description of laboratory activities

Module no.	Experiment description	No. of hours
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
COURSE TOTAL (14 times 'P')		

18. Suggested texts and reference materials

STYLE: Author name and initials, Title, Edition, Publisher, Year.

1. Anthony J Hayter; Probability and Statistics for Engineers, Cengage learning, 2009.

2. R.J Freund, W. J. Wilson and D. L.Mohr: Statistical Methods, 3rd Edition, Academic Press, 2011.
3. R.V.Hogg and E.A.Tanis: Probability and Statistical Inference, 6th Edition, Pearson Education. 2002.

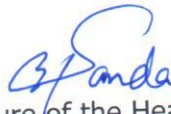
19. Resources required for the course (*itemized & student access requirements, if any*)

19.1	Software	R, SPSS, MATLAB (Anyone)
19.2	Hardware	NIL
19.3	Teaching aides (videos, etc.)	NIL
19.4	Laboratory	NIL
19.5	Equipment	NIL
19.6	Classroom infrastructure	Projector
19.7	Site visits	NIL

20. Design content of the course (*Percent of student time with examples, if possible*)

20.1	Design-type problems	N/A
20.2	Open-ended problems	N/A
20.3	Project-type activity	N/A
20.4	Open-ended laboratory work	N/A
20.5	Others (please specify)	N/A

Date: 28th February, 2013


(Signature of the Head of the Department)