

# SWARNANDHRA

## COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA, Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.DT., Narsapur-534280, (Andhra Pradesh)

### DEPARTMENT OF MATHEMATICS

#### TEACHING PLAN

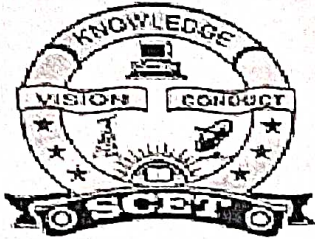
Course Code	Course Title	Semester	Branches	Contact Periods /Week	Academic Year	Date of commencement of Semester
20MA3T06	Statistical Methods	III	CE	60/6	2021-22	25-10-2021

**COURSE OUTCOMES:** At the end of this course, the student will be able to

CO1	make use of the concepts of probability and their applications (K <sub>3</sub> )
CO2	apply discrete and continuous probability distributions(K <sub>3</sub> )
CO3	use the components of a classical hypotheses test(K <sub>3</sub> )
CO4	examine Significance tests based on small and large sampling tests(K <sub>3</sub> )
CO5	use Correlation methods and Principle of Least squares (K <sub>3</sub> )

UNIT	Out Comes / Bloom's Level	Topic No.	Topics/Activity	Text Book/ Reference	Contact Hour	Delivery Method
I	CO1 Students are able to make use of the concepts of probability and their applications (K <sub>3</sub> )	<b>Basic Statistics and Probability</b>				
		1.1	Introduction-Collection and classification of data	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		1.2	Graphical representation- Comparison of frequency distributions	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		1.3	Measures of tendency	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		1.4	Measures of dispersion- Coefficient of variation	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		1.5	Relations between measures of dispersion- Standard deviation of the combination of two groups	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		1.6	Probability, definitions, axioms, related problems.	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		1.7	some elementary theorems on probability.	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk





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		1.8	Addition and multiplicative law of probability and related problems	$T_1$ & $T_2$	1	Chalk & Talk
		1.9	Conditional probability, related problems.	$T_1$ & $T_2$	1	Chalk & Talk
		1.10	Baye's Theorem and the problems	$T_1$ & $T_2$	1	Chalk & Talk
				$T_1$ & $T_2$	1	Chalk & Talk
					11	
II	CO2 Students are able to apply discrete and continuous probability distributions( $K_3$ )	<b>Random variables and Distributions</b>				
		2.1	Random variables -types, properties & related problems	$T_1$ & $T_2$	1	Chalk & Talk
				$T_1$ & $T_2$	1	Chalk & Talk
		2.2	Mathematical Expectation with problems	$T_1$ & $T_2$	1	Chalk & Talk
				$T_1$ & $T_2$	1	Chalk & Talk
		2.3	Introduction of Binomial Distribution and compute parameters .	$T_1$ & $T_2$	1	Chalk & Talk
				$T_1$ & $T_2$	1	Chalk & Talk
		2.4	Problems based on Binomial Distribution	$T_1$ & $T_2$	1	Chalk & Talk
		2.5	Introduction of Poisson Distribution and compute parameters .	$T_1$ & $T_2$	1	Chalk & Talk
		2.6	Problems based on Poisson Distribution	$T_1$ & $T_2$	1	Chalk & Talk
		2.7	Introduction to Normal Distribution and properties	$T_1$ & $T_2$	1	Chalk & Talk
		2.8	Applications of Normal Distribution	$T_1$ & $T_2$	1	Chalk & Talk
				$T_1$ & $T_2$	1	Chalk & Talk
		2.9	Problems on normal distribution	$T_1$ & $T_2$	1	Chalk & Talk
$T_1$ & $T_2$	1			Chalk & Talk		
					14	
		<b>Sampling Distribution and Testing of Hypothesis, large Sample Tests</b>				
		3.1	Introduction , Basic terminology in sampling	$T_1$ & $T_2$	1	Chalk & Talk



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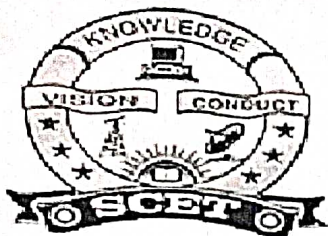
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<b>III</b>	CO3 Students are able to use the components of a classical hypotheses test(K <sub>3</sub> )	3.2	Sampling distributions of means for large samples with known and unknown variance.	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
				T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		3.3	Sampling distributions of means for small samples with known and unknown variance.	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
				T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		3.4	Sampling distributions of proportions.	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		3.5	Introduction, Type-I and Type-II errors, maximum error, One tail, two tail tests	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		3.6	Test of significance for single means using Z-test	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		3.7	Test of significance for difference of means using	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		3.8	Test concerning single proportions using Z-test	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
				T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
3.9	Test concerning difference of proportions using Z-test	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk		
		T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk		
<b>Total</b>				<b>13</b>		
<b>IV</b>	CO4 Students are able to use the components of a classical hypotheses test(K <sub>3</sub> )	<b>Small Sample Tests</b>				
		4.1	t-test for single mean	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
				T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		4.2	t-test for difference of means	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
				T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		4.3	F-test for equality of population variance	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
				T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		4.4	Chi-Square test(Goodness of fit )	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
				T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		4.5	Chi-square test (Independence of attributes)	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
T <sub>1</sub> &T <sub>2</sub>	1			Chalk & Talk		
<b>Total</b>				<b>10</b>		
<b>V</b>	CO5 Students are able to use Correlation methods and Principle	<b>Curve fitting &amp; Correlation</b>				
		5.1	Method of least squares-fitting a straight line.	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
				T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
		5.2	Fitting a parabola.	T <sub>1</sub> &T <sub>2</sub>	1	Chalk & Talk
T <sub>1</sub> &T <sub>2</sub>	1			Chalk & Talk		





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of Least squares ( $K_3$ )	5.3	Fitting a Exponential curve	$T_1$ & $T_2$	1	Chalk & Talk
			$T_1$ & $T_2$	1	Chalk & Talk
	5.4	Fitting a Power curve.	$T_1$ & $T_2$	1	Chalk & Talk
	5.6	Introduction and types of correlation	$T_1$ & $T_2$	1	Chalk & Talk
	5.7	Compute correlation coefficient	$T_1$ & $T_2$	1	Chalk & Talk
			$T_1$ & $T_2$	1	Chalk & Talk
	5.8	Compute Rank correlation	$T_1$ & $T_2$	1	Chalk & Talk
			$T_1$ & $T_2$	1	Chalk & Talk
			Total	12	
<b>Cumulative Proposed Periods</b>				<b>60</b>	

### Text Books:





S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
T1	Mr. K. Murugesan and Mr. P. Gurusamy, Probability and Statistics, Revised Edition 2010. Anuradha Publication, 2011
T2	Dr. B.S.Grewal Higher Engineering Mathematics, 43 <sup>rd</sup> Edition, Khanna Publications, 2015

### Reference Books:

S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION
R1	Ramana B.V., Higher Engineering Mathematics, 11/e, Tata Mc Graw Hill New Delhi, 2010
R2	Richard A., Johnson, Miller & Freund's Probability and statistics for engineers 8/e, PHI Publications-2011

### Web Details

1	<a href="https://swayam.gov.in/courses/1349-probability-and-stochastics-for-finance">https://swayam.gov.in/courses/1349-probability-and-stochastics-for-finance</a>
2	<a href="https://onlinecourses.nptel.ac.in/noc18_cs17/">https://onlinecourses.nptel.ac.in/noc18_cs17/</a>
3	<a href="http://www.nptelvideos.in/2012/11/probability-methods-in-civil-engineering.html">http://www.nptelvideos.in/2012/11/probability-methods-in-civil-engineering.html</a>
4	<a href="http://www.nptelvideos.in/2012/12/probability-random-variables.html">http://www.nptelvideos.in/2012/12/probability-random-variables.html</a>

	Name	Signature with Date
i. Faculty	P .SUJATHA for CE	
ii. Course Coordinator	P .SUJATHA	
iii. Module Coordinator	Mr. M. RAVINDRA BABU	
iv. HoD	Dr. S. DHARAJA DEVI	

  
Principal