

FATIMA COLLEGE (AUTONOMOUS)



**Re-Accredited with "A++" Grade by
NAAC(IV Cycle)**

Maryland, Madurai- 625 018, Tamil Nadu, India

NAME OF THE DEPARTMENT :STATISTICS

NAME OF THE PROGRAMME: B.Sc.STATISTICS

PROGRAMME CODE :USST

ACADEMIC YEAR :2022-2023

Minutes of the Annual Upgradation of Syllabus meeting in Statistics held on 15-03-2022 at 10.30 A.M.

Members :

1. Dr. E. Helena, Head, Department of Statistics, Fatima College, Madurai.
2. Dr. A. Shopia Lawrence, Assistant Professor, Department of Mathematics, Madurai Kamaraj University, Madurai
3. Dr. A. Kachi Mohideen, Assistant Professor, PG and Research Department of Statistics, Thanthai Periyar Govt. Arts and Science College, Trichy.
4. Dr. V. Sangeetha, Assistant Professor, Department of Statistics, PSG Arts and Science College, Coimbatore.
5. Ms. S. Sindhuja, Senior Statistical officer, NSSO (FOD) TN(N), Chennai R.O. Ministry of Statistics & P.I Government of India, Chennai.
6. Ms. A. Poshni, Data Analyst, Neuralnet data Science, Horamavu, Bengaluru. Karnataka
7. Dr. K. Manu, Assistant Professor, Department of Statistics, Fatima College, Madurai.
8. Mrs. P. Dhanapriya, Assistant Professor, Department of Statistics, Fatima College, Madurai.
9. Dr. M. Manoprabha, Assistant Professor, Department of Statistics, Fatima College, Madurai.
10. Ms. A. Mable Jasmine Shoba, Dean of Academic Affairs

1. Action taken report for 2021 - 2022

S. NO.	Comments Suggestions offered in the Previous Board	Action taken for the Academic Year 2021-22
1.	Change of title for the Course: 19ST4CC7 - Statistical Inference - I	The title is changed as Estimation Theory.
2.	Self Learning Course to be introduced	Self Learning Course introduced for I UG. 1. Quantitative Aptitude and Data Interpretation

2. Updation of Open Educational Resources in the list of references of each Course.

S. NO.	Course Code	Course Title	Details of updation
1.	19ST3CC5	Continuous Probability Distributions	https://stats.libretexts.org
2.	19ST3CC6	Sampling Theory	https://www.pdfdrive.com/Survey-Sampling-theory-and-methods.pdf e19713020.html
3.	19ST4CC7	Estimation theory	https://ocw.mit.edu/Courses/mathematics.443-Statistics-for-applications-fall-2003/lecture-notes
4.	19ST4CC8	Applied Statistics	https://Pradeepchandrasekar.weebly.com
5.	19ST5CC9	Testing of Hypotheses	http://www.ru.ac.bd/stat/wp-content/uploads/sites/25/2013/501-04-Lehmann-Testing-Statistical-hypotheses/2008-P

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3. Revision of Courses

S. No.	Course Code	Course Title	No. of units revised	%. of revision	Relevance to				Scope for		
					L	R	N	G	EM	EN	SD
1.	19ST1CC2	Probability Theory	1	5%				✓			✓
2.	22G1ACST1	Calculus	2	25%				✓			✓
3.	19ST2CC3	Descriptive Statistics	1	15%			✓				✓
4.	22ST3CC5	Continuous Probability Distributions	2	40%			✓				✓
5.	22ST4CC8	Applied Statistics	3	50%				✓	✓		✓
6.	19ST5CC12	Real Analysis	1	15%				✓			✓
7.	19ST6CC14	Stochastic Processes	1	15%				✓			✓
8.	19ST3SB1	Practical Statistics - I		15%				✓	✓		✓

4. New Courses introduced

S. No.	Course Code	Course Title	Relevance to				Scope for			Need for
			L	R	N	G	EM	EN	SD	
1.	22ST4SB2	Sampling Distributions				✓	Employability			To introduce more problems and, F, t^2
2.	22ST5ME3	Object Oriented Programming with C++				✓	Employability & Entrepreneurship			To facilitate advanced learners.
3.	22ST5ME4	C++ Practicals								
4.	22ST6ME10	Econometrics			✓		Employability			For increased job opportunities
5.	22UGIVAST1	Statistics using MS Excel				✓	Employability & Skill Development			To facilitate advanced learners
6.	22ST4SL2	Differential Equations			✓		Skill Development			

The board reviewed the syllabi for IUG (I & II Semester), IUG (III & IV Semester) and IUG (V & VI Semester).

The following revisions were carried out:

19ST1CC2 - Probability Theory : The Concept Correlation is included

22G1ACST1 - Calculus : Fourier Transform is removed and basics of differentiation and integration are included

19ST2CC3 - Descriptive Statistics : Curve fitting is included.

22ST3CC5 - Continuous Probability Distributions : More Problems on Normal, Beta, gamma distributions are included, Sampling distribution is removed

22ST4CC8 - Applied Statistics : More Content on time Series, National Income Estimate is included. Curve fitting, Interpolation & Extrapolation and vital statistics are removed and included in Descriptive Statistics, Numerical methods and Demography.

19ST5CC12 - Real Analysis : The Content Connectedness, Completeness and Compactness are removed.

19ST6CC14 - Stochastic Processes : Few Concept in Markov chain is included.

19ST3SB1 - Practical Statistics - I : More Problems on Binomial, Poisson and Sampling theory are included.

I Semester

19ST1CC1 - Basic Statistics

19ST1CC2 - Probability Theory.

22G1ACST1 - Calculus

21ST1NHE - Fundamentals of Statistics.

II Semester

- 19ST2CC3 - Descriptive Statistics
- 19ST2CC4 - Discrete Probability Distributions
- 19G2ACST2 - Algebra
- 21ST2NME - Fundamentals of Statistics

III Semester

- 22ST3CC5 - Continuous Probability Distributions
- 19ST3CC6 - Sampling Theory
- 19G3ACST3 - Linear Programming
- 19ST3SB1 - Practical Statistics - I

IV Semester

- 19ST4CC7 - Estimation Theory
- 22ST4CC8 - Applied Statistics
- 19G4ACST4 - Linear Algebra
- 22ST4SB2 - Sampling Distributions

V Semester

- 19ST5CC9 - Testing of Hypotheses
- 19ST5CC10 - Design of Experiments
- 19ST5CC11 - Demography
- 19ST5CC12 - Real Analysis
- 19ST5ME1 & - Computer Programming in C
- 19ST5ME2 - C - Practicals
- 22ST5ME3 & - Object Oriented Programming with C++
- 22ST5ME4 - C++ Practicals
- 19ST5SB3 - Practical Statistics - II
- 19ST5SB4 - Statistical Software: SPSS

VI Semester

- 19ST6CC13 - Statistical Quality Control

- 19ST6CC14 - Stochastic Processes.
 19ST6CC15 - Actuarial Statistics.
 19ST6ME51 - Numerical methods /
 19ST6ME61 - Multivariate Analysis /
 19ST6ME7 - Regression Analysis
 19ST6ME81 - Operations Research /
 19ST6ME91 - Industrial Statistics /
 22ST6ME10 - Econometrics.

The board also reviewed the Allied Core Syllabus for I B.Com: 19A1AC1 - Statistical Methods & for I B.Com with Computer Applications; 22K2AC2 - Business Statistics and Maths.

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|--------------------------------|----------------------------|
| 1. Dr. E. HELENA | Helena |
| 2. Dr. A. SHOPHIA LAWRENCE | John |
| 3. Dr. A. KACHI MOHIDEEN | John |
| 4. Dr. V. SANGEETHA | V. Sangeetha
15/03/2022 |
| 5. MS. S. SINDHUJA | ABSENT |
| 6. MS. A. ROSHNI | ABSENT |
| 7. Dr. K. MANO | K. Manoj |
| 8. MS. P. DHANAPRIYA | Dhanapriya |
| 9. Dr. M. MANO PRABHU | M.P. |
| 10. MS. A. MABLE JASMINE SHOBA | Mable Jasmine Shoba |

15/3/2022

VISION OF THE DEPARTMENT

To empower women by developing human capabilities through quality education in the field of Statistics

MISSION OF THE DEPARTMENT

To develop statistical and probabilistic theories and techniques and to propagate statistical knowledge through teaching and outreach programmes, in order to serve the needs of the society.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

A graduate of B.Sc. STATISTICS programme after five years will be

PE 01	Our graduates will be academic, digital and information literates, creative, inquisitive, innovative and desirous for the “more” in all aspects
PE 02	They will be efficient individual and team performers, exhibiting progress, flexibility, transparency and accountability in their professional work
PE 03	The graduates will be effective managers of all sorts of real-life and professional circumstances, making ethical decisions, pursuing excellence within the time framework and demonstrating apt leadership skills
PE 04	They will engage locally and globally evincing social and environmental stewardship demonstrating civic responsibilities and employing right skills at the right moment.

GRADUATE ATTRIBUTES (GA)

Fatima College empowers her women graduates holistically. A Fatimite achieves all-round empowerment by acquiring Social, Professional and Ethical competencies. A graduate would sustain and nurture the following attributes:

I. SOCIAL COMPETENCE	
GA1	Deep disciplinary expertise with a wider range of academic and digital literacy
GA2	Hone creativity, passion for innovation and aspire excellence
GA3	Enthusiasm toward emancipation and empowerment of humanity
GA4	Potentials of being independent
GA5	Intellectual competence and inquisitiveness with problemsolving abilities befitting the field of research
GA6	Effectiveness in different forms of communication to be employed in personal and professional environments through varied platforms
GA7	Communicative competence with civic, professional and cyber dignity and decorum
GA8	Integrity respecting the diversity and pluralism in societies, cultures and religions
GA9	All-inclusive skill set to interpret, analyse and solve social and environmental issues in diverse environments
GA10	Self-awareness that would enable them to recognise their uniqueness through continuous self-assessment in order to face and make changes building on their strengths and improving their weaknesses
GA11	Finesse to co-operate exhibiting team-spirit while

	working groupsto achieve goals
GA12	Dexterity in self-management to control themselves in attaining the kind of life that they dream for
GA13	Resilience to rise up instantly from their intimidating setbacks
GA14	Virtuosity to use their personal and intellectual autonomy in being life-long learners
GA15	Digital learning and research attributes
GA16	Cybersecurity competence reflecting compassion, care and concern towards the marginalised
GA17	Rectitude to use digital technology reflecting civic and social responsibilities in local, national and global scenario
II. PROFESSIONAL COMPETENCE	
GA18	Optimism, flexibility and diligence that would make them professionally competent
GA19	Prowess to be successful entrepreneurs and become employees of trans-national societies
GA20	Excellence in Local and Global Job Markets
GA21	Effectiveness in Time Management
GA22	Efficiency in taking up Initiatives
GA23	Eagerness to deliver excellent service
GA24	Managerial Skills to Identify, Commend and tap Potentials
III. ETHICAL COMPETENCE	
GA25	Integrity and be disciplined in bringing stability leading as systematic life promoting good human behaviour to build a better society

GA26	Honestyinwordsanddeeds
GA27	Transparencyrevealingone"sowncharacteraswellassel f-esteemtoleadagenuineandauthenticlife
GA28	SocialandEnvironmentalStewardship
GA29	Readinesstomakeethicaldecisionsconsistentlyfromtheg aloreofconflictingchoicespayingheed to theirconscience
GA30	Rightlifeskillsattherightmoment

PROGRAMMEOUTCOMES(PO)

On completion (after three years) of B.Sc. Statistics programme,the graduateswouldbeableto

P01	Apply acquired scientific knowledge to solve complexissues
P02	AttainAnalyticalskillstosolvecomplexcultural,societalande nvironmentalissues
P03	Employ latest and updated tools and technologies toanalysecomplexissues
P04	DemonstrateProfessionalEthicsthatfosterCommunity,Nati onandEnvironmentBuildingInitiatives

PROGRAMME SPECIFIC OUTCOMES (PSO)

On completion (after three years) of B.Sc. Statistics programme, the graduates would be able to



PSO1	Apply the knowledge of Statistics, Mathematics and Computer science to become competent professionals at global level
PSO2	Apply statistical knowledge to analyze and solve complex problems using appropriate statistical methodology and interpret results in a variety of settings
PSO3	Demonstrate the ability of critical observation, logical, analytical and problem-solving skills
PSO4	Write code to extract and reformat real data and to utilize statistical programming environments
PSO5	Effectively present statistical findings to an audience lacking statistical expertise and work collaboratively
PSO6	Excel as socially committed statistics student having mutual respect, effective communications skills, high ethical values and empathy for the needs of society



PROGRAMME CODE:USST**FATIMACOLLEGE(AUTONOMOUS),MADURAI-18****DEPARTMENTOFSTATISTICS***ForthosewhojoinedinJune2019onwards***PART-I-TAMIL/FRENCH / HINDI-12CREDITS****PART-I-TAMIL****Offeredbythe ResearchCentreofTamil**

.N O	SEM.	COURSE CODE	COURSE TITLE	HRS	CRS	CIA Mks	ESE Mks	TOT. Mks
1.	I	19T1LC1	Language- ModernLiterature nghJj;jkpo-,f;fhy ,yf;fpak	5	3	40	60	100
2.	II	19T2LC2	Language- BakthiLiterature nghJj;jkpo-gf;jp ,yf;fpak	5	3	40	60	100
3.	III	19T3LC3	Language- Epic Literature nghJj;jkpo-fhg;gpa ,yf;fpak	5	3	40	60	100
4.	IV	19T4LC4	Language- SangamLiterature nghJj;jkpo-rq;f ,yf;fpak	5	3	40	60	100
			Total	20	12			

PART-I-FRENCH**OfferedbyTheDepartmentofFrench**

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CRE DITS	CIA Mks	ESE Mks	TOT. MKs
1.	I	19RL1C1	PART1LANGUAGEFR ENCH- LENIVEAUINTRODUC TIF	5	3	40	60	100

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDITS	CIA Mks	ESE Mks	TOT. MKs
2.	II	19RL2C2	PART 1 LANGUAGE FRENCH- LE NIVEAU DÉCOUVERTE	5	3	40	60	100
3.	III	19RL3C3	PART 1 LANGUAGE FRENCH- LE NIVEAU INTERMÉDIAIRE – LA CIVILISATION, LA LITTÉRATURE ET LA GRAMMAIRE	5	3	40	60	100
4.	IV	19RL4C4	PART 1 LANGUAGE FRENCH- LE NIVEAU DESUIVRE – LA CIVILISATION, LA LITTÉRATURE ET LA GRAMMAIRE	5	3	40	60	100
TOTAL				20	12			

PART-I-HINDI

Offered by The Department of Hindi

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDITS	CIA Mks	ESE Mks	TOT. MKs
1.	I	19DL1C1	PART 1 LANGUAGE HINDI-बोलचाल की हिंदी	5	3	40	60	100
2.	II	19DL2C2	PART 1 LANGUAGE HINDI-कार्यालयी हिंदी	5	3	40	60	100

S. NO	SE M.	COURSE CODE	COURSE TITLE	HRS	CREDITS	CIA Mks	ESE Mks	TOT. MKs
3.	III	19DL3C3	PART1 LANGUAGE HINDI-हिंगी साहस्रकआहदकालऔरभक्तिकाल	5	3	40	60	100
4.	IV	19DL4C4	PART1 LANGUAGE HINDI-हिंगी साहस्रकआधुनिककाल	5	3	40	60	100
TOTAL				20	12			

PART-II-ENGLISH-12 CREDITS

Offered by The Research Centre of English

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDITS	CIA Mks	ESE Mks	TOT. MKs
1.	I	19EL1WB	BASIC COMMUNICATIVE ENGLISH	5	3	40	60	100
2.		19EL1WI	INTERMEDIATE COMMUNICATIVE ENGLISH					
3.		19EL1WA	ADVANCED COMMUNICATIVE ENGLISH					
4.	II	19EL2WB	ENGLISH COMMUNICATION SKILLS	5	3	40	60	100
5.		19EL2WI	ENGLISH FOR EMPOWERMENT					
6.		19EL2WA	ENGLISH FOR					

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDITS	CIA Mks	ESE Mks	TOT. MKs
			CREATIVE WRITING					
7.	III	19EL3WN	ENGLISH FOR DIGITAL ERA	5	3	40	60	100
8.	IV	19EL4WN	ENGLISH FOR INTEGRATED DEVELOPMENT	5	3	40	60	100
TOTAL				20	12			

PART-III-MAJOR, ALLIED & ELECTIVES-95 CREDITS
CORE COURSES: 60 CREDITS

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CRS	CIA Mks	ESE Mks	TOT. Mks
1.	I	19ST1CC1	BASIC STATISTICS	6	4	40	60	100
2.		19ST1CC2	PROBABILITY THEORY	6	4	40	60	100
3.	II	19ST2CC3	DESCRIPTIVE STATISTICS	6	4	40	60	100
4.		19ST2CC4	DISCRETE PROBABILITY DISTRIBUTIONS	6	4	40	60	100
5.	III	22ST3CC5	CONTINUOUS PROBABILITY DISTRIBUTIONS	6	4	40	60	100
6.		19ST3CC6	SAMPLING THEORY	6	4	40	60	100
7.	IV	19ST4CC7	ESTIMATION THEORY	6	4	40	60	100
8.		22ST4CC8	APPLIED STATISTICS	6	4	40	60	100
9.	V	19ST5CC9	TESTING OF HYPOTHESIS	5	4	40	60	100
10.		19ST5CC10	DESIGN OF	5	4	40	60	100

S. NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CRS	CIA Mks	ESE Mks	TOT. Mks
			EXPERIMENTS					
11.		19ST5CC11	DEMOGRAPHY	5	4	40	60	100
12.		19ST5CC12	REAL ANALYSIS	5	4	40	60	100
13.	VI	19ST6CC13	STATISTICAL QUALITY CONTROL	5	4	40	60	100
14.		19ST6CC14	STOCHASTIC PROCESSES	5	4	40	60	100
15.		19ST6CC15	ACTUARIAL STATISTICS	5	4	40	60	100

ELECTIVES-15 CREDITS

S.No	SEM.	COURSE CODE	COURSE TITLE	HRS	CRS	CIA Mks	ESE Mks	TOT. Mks
1	V	19ST5ME1&19ST5ME2/ 22ST5ME3&22ST5ME4	COMPUTER PROGRAMMING IN C&C- PRACTICALS/ OBJECT ORIENTED PROGRAMMING WITH C++ & C++ PRACTICALS	5	5	40	60	100
2	VI	19ST6ME5/ 19ST6ME6/ 19ST6ME7/ 19ST6ME8/ 19ST6ME9/ 19ST6ME10	NUMERIC ALGORITHMS/MULTIVARIATE ANALYSIS/ REGRESSION ANALYSIS/ OPERATIONS RESEARCH/ INDUSTRIAL STATISTICS/ECONOMETRICS	5	5	40	60	100

			TOTAL	15	15			
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ALLIED-20CREDITS

S.NO	SEM.	COURSE CODE	COURSE TITLE	HRS	CRS	CIA Mks	ESE Mks	TOT. Mks
1.	I	22G1ACST1	CALCULUS	5	5	40	60	100
2.	II	19G2ACST2	ALGEBRA	5	5	40	60	100
3.	III	19G3ACST3	LINEAR PROGRAMMING	5	5	40	60	100
4.	IV	19G4ACST4	LINEAR ALGEBRA	5	5	40	60	100

PART-IV-20CREDITS

- VALUE EDUCATION
- ENVIRONMENTAL AWARENESS
- NON MAJOR ELECTIVE
- SKILL BASED COURSES

S.No	SEM.	COURSE CODE	COURSE TITLE	HRS	CRS	CIA Mks	ESE Mks	TOT. Mks
1.	I	21G1VE1	PERSONAL VALUES-VALUE EDUCATION (INCLUDING MEDITATION IN ACTION MOVEMENT)	1	1	40	60	100
2.		21ST1NME	FUNDAMENTALS OF STATISTICS	2	2	40	60	100
3.	II	21G2VE2	VALUES FOR LIFE	1	1	40	60	100
4.		21ST2NME	FUNDAMENTALS OF STATISTICS	2	2	40	60	100
5.		21G3EE1	ENVIRONMENTAL EDUCATION	1	1	40	60	100

6.	III	19ST3SB1	PRACTICALSTATISTIC S-I	2	2	40	60	100
7.	IV	19G4EE2	GENDERSTUDIES	1	1	40	60	100
8.		22ST4SB2	SAMPLING DISTRIBUTIONS	2	2	40	60	100
9.	V	19ST5SB3	PRACTICALSTATISTIC S-III	2	2	40	60	100
10.		19ST5SB4	STATISTICALSOFTWA RE:SPSS	2	2	40	60	100
11.	VI	159ST6SB5	PRACTICALSTATISTIC S-IV	2	2	40	60	100
12.		19ST6SB6	STATISTICALS SOFTWARE:R	2	2	40	60	100

PART-V-1CREDIT

OFF-CLASSPROGRAMMES

SHIFT-II

S. No	SEM	COURSE CODE	COURSE TITLE	HRS	CREDIT	TOT. Mks
1.	I-IV	21S4PED	PhysicalEducation	30/ SEM	1	100
2.		21S4YRC	YouthRedCross			
3.		21S4NSS	NSS			
4.		21S4RTC	Rotaract			
5.		21S4WEC	WomenEmpowermentCell			
6.		21S4ACUF	AICUF			

OFF-CLASSPROGRAMME

ADD-ONCOURSES

COURSE CODE	Courses	HRS	CRS	Semester in which the course is offered	CIA Mks	ESE Mks	TOT. Mks
19UAD2CA	COMPUTER APPLICATIONS	40	2	I&II	40	60	100
19UADFCA	ONLINE SELF LEARNING COURSE- Foundation Course for Arts	40	3	I	50	-	50
19UADFCS	ONLINE SELF LEARNING COURSE- Foundation Course for Science	40	3	II	50	-	50
21UAD3ES	Professional Ethics	15	1	III	40	60	100
21UAD4ES	Personality Development	15	1	IV	40	60	100
21UAD5ES	Family Life Education	15	1	V	40	60	100
21UAD6ES	Life Skills	15	1	VI	40	60	100
19UAD5HR	Human Rights	15	2	V	40	60	100
	OUTREACH PROGRAMME- Reach Out to Society through Action ROSA	100	3	V&VI	-	-	100
	PROJECT	30	4	VI	40	60	100
	READING CULTURE	10/Semester	1	II-VI	-	-	-
	MOOC COURSES (Department Specific Courses/any other courses)*	-	Minimum 2 Credit	-	-	-	-

COURSE CODE	Courses	HRS	CRS	Semester in which the course is offered	CIA Mks	ESE Mks	TOT. Mks
	Students can opt other than the listed course from UGC-SWAYAMUGC/CEC		S				
	TOTAL		22+				

EXTRA CREDIT COURSE

Course Code	Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
22ST4SL2	SELF LEARNING COURSE for ADVANCED LEARNERS (offered for IUG) DIFFERENTIAL EQUATIONS			IV	40	60	100

Value Added Crash Course:

Statistics using Ms-Excel - 22UGVAST1



II B.Sc STATISTICS

SEMESTER –IV

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USST	22ST4SB2	Sampling Distribution	Lecture	2	2

COURSE DESCRIPTION

The course provides an application related to the concepts of sampling distribution for large & small samples.

COURSE OBJECTIVES

To expose the students analyze the statistical techniques in real life situations

UNIT – I CHI-SQUARE DISTRIBUTION (6 HRS.)

Introduction – derivation of the χ^2 distribution – moment generating function of the χ^2 distribution –

UNIT – II CHI-SQUARE DISTRIBUTION CONT.(6 HRS.)

Some theorems on χ^2 distribution – linear transformation – applications of χ^2 distribution.

UNIT – III t - DISTRIBUTION (6 HRS.)

Introduction – student's 't' distribution – applications of 't' distribution – distribution of sample correlation coefficient when population correlation coefficient $\rho = 0$ -

UNIT –IV F - DISTRIBUTION (6 HRS.)

f distribution – applications of f distribution – relation between t and f distributions – relation between f and χ^2 distribution.

UNIT –V F - DISTRIBUTION CONT. (6 HRS.)

Relation between t and f distributions – relation between f and χ^2 distribution.

TEXT:

S.C.Gupta and V.K.Kapoor, *Fundamentals of Mathematical Statistics*, Sultan Chand & Sons, Revised edition (2014).

REFERENCES:

1. Arumugam and Thangapandi Isaac, *Statistics*, New Gamma publishing house, (2012).
2. S.P.Gupta, *Statistical Methods*, Sultan Chand & Sons, Revised edition (2014).

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 CHI SQUARE DISTRIBUTION				
1.1	Derivation of the χ^2 distribution	3	Chalk & Talk	Black Board
1.2	Moment generating function of the χ^2 distribution	3	Chalk & Talk	Black Board
UNIT -2CHI SQUARE DISTRIBUTION CONT.				
2.1	Linear transformation	3	Chalk & Talk	Black Board
2.2	Applications of χ^2 distribution.	3	Chalk & Talk	Black Board
UNIT -3 t - DISTRIBUTION				
3.1	student's 't' distribution	3	Chalk & Talk	Black Board
3.2	applications of 't' distribution	3	Chalk & Talk	Black Board
UNIT - 4 F - DISTRIBUTION				
4.1	applications of f distribution	6	Chalk & Talk	Black Board
UNIT - 5 F – DISTRIBUTION CONT.				
5.1	Relation between t and f distributions	3	Chalk & Talk	Black Board
5.2	Relation between f and χ^2 distribution.	3	Chalk & Talk	Black Board

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1	T2	Quiz	Assignment	OBT/PPT				
	10 Mks.	10 Mks.	5 Mks.	5 Mks	5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

CIA	
Scholastic	
Non Scholastic	

✓ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are :**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse

EVALUATION PATTERN

	SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

COURSE OUTCOMES

On the successful completion of the course, students will be able to:

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Recall the definition of a t statistic in terms of statistics of a sample from a normal distribution	K1, K2 & K3	PSO5
CO 2	State and apply the definitions of the t, F and Chisquare distributions in terms of the standard normal.	K2 & K3	PSO5 & PSO6
CO 3	Explain the relation between t, f and χ^2	K3	PSO5 & PSO6

Mapping of COs with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	2	3	2
CO2	2	2	2	2	3	3
CO3	2	2	2	3	3	2

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	3	3	3
CO2	3	3	3	3
CO3	3	3	3	3

Note: ♦ Strongly Correlated – 3 ♦ Moderately Correlated – 2 ♦ Weakly Correlated -1

COURSE DESIGNER:

1. Dr. M.Mano Prabha

2. Mrs. K. Bhuvaneswari

Forwarded By



Dr. E. Helena

III B.Sc STATISTICS

SEMESTER -V

For those who joined in 2021 onwards

Skill Development-100%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDIT
USST	22ST5ME3	Object Oriented Programming with C++	Lecture	3	3

COURSE DESCRIPTION

This course introduces the student to object-oriented programming through a study of the concepts of program specification and design, algorithm development.

COURSE OBJECTIVES

In the expanding field of computer education, one of the fastest growing, versatile and much sought after languages is C++. This course enables the students to understand the fundamentals of the language, the concepts related to the syntax of the language.

UNIT -I BEGINNING WITH C++, TOKENS, EXPRESSIONS AND CONTROL STRUCTURES, FUNCTIONS IN C++ (9 HRS.)

What is C++ - Applications of C++ - A simple C++ program – More C++ statements – Structure of C++ program – **Tokens – Keywords – Identifiers – Variables – Operators – Manipulators – Expressions – Control structures.** Introduction – The main function – **Function prototyping** – Call by reference – Return by reference – Return by reference – Inline function – Default arguments – Const arguments – Function overloading – Friend and virtual functions – Math library functions.

UNIT -II CLASSES AND OBJECTS (9 HRS.)

Introduction – C structures revisited – Specifying a class – Defining member functions – A C++ program with class – Making an outside function inline – Nesting of member functions – Private member functions – Arrays within a class – Memory allocation for objects – Static data members – Static member functions –

Arrays of objects – Objects as function arguments – Friendly functions – Returning objects – Const member functions – Pointers to members – Local classes.

UNIT – III CONSTRUCTORS, DESTRUCTORS AND OPERATOR OVERLOADING (9 HRS.)

Introduction – Constructors and destructors - Defining operator overloading – Overloading unary operators - Overloading binary operators - Overloading binary operators using friends – Manipulation of strings using operators – Rules for overloading operators – Type conversions.

UNIT – IV INHERITANCE (9 HRS.)

Introduction – Defining derived classes – Single inheritance – Making a private member inheritable – Multilevel inheritance – Multiple inheritance – Hierarchical inheritance – Hybrid inheritance – Virtual base classes – Abstract classes – Constructors in derived classes – Member classes: Nesting of classes.

UNIT –V POINTERS, VIRTUAL FUNCTIONS AND POLYMORPHISM

(9 HRS.)

Introduction – Pointers – Pointers to objects –this pointer – Pointers to derived classes – Virtual functions – Pure virtual functions – Polymorphism.

TEXT BOOK:

1. E. Balagurusamy - *Object Oriented Programming with C++*, Tata McGraw-Hill Publishing Company Limited – Fourth Edition - 2007.

UNIT I : Chapter 2- 2.1 to 2.4, 2.6, Chapter 3- 3.2 to 3.24

Chapters 4- 4.1 to 4.11

UNIT II : Chapter 5- 5.1 to 5.19,

UNIT III: Chapter 6-6.1 to 6.11 Chapter 7- 7.1 to 7.8,

UNIT IV: Chapter 8-8.1 to 8.12

UNIT V : Chapter 9- 9.1 to 9.7

REFERENCES:

1. Robert Lafore – *Object-Oriented Programming in Microsoft C++* - Galgotia publication – Third Edition – 2004.
2. Stephen Prata - *C++ primer plus* - Galgotia publication pvt. Ltd. – 1997.

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 BEGINNING WITH C++, TOKENS, EXPRESSIONS AND CONTROL STRUCTURES, FUNCTIONS IN C++				
1.1	What is C++, Applications of C++, A simple C++ program, More C++ statements, Structure of C++ program and example programs.	2	Chalk & Talk	Black Board
1.2	Tokens, Keywords, Identifiers, Variables, Operators, Manipulators Expressions, Control structures. (self study)	1	Discussion	Black Board
1.3	Introduction, The main function, Function prototyping (self study) Call by reference, Return by reference	4	Chalk & Talk	Black Board
1.4	Inline function, Default arguments, Const arguments and example programs.	1	Chalk & Talk	Black Board
1.5	Function overloading, Friend and virtual functions, library functions and example programs.	1	Chalk & Talk	Black Board
UNIT -2 CLASSES AND OBJECTS				
2.1	Introduction, C structures revisited , Specifying a class, Defining member functions	1	Chalk & Talk	Black Board
2.2	A C++ program with class , Making an outside function inline ,Nesting of member functions , Private member functions, programs	1	Chalk & Talk	Black Board

2.3	Arrays within a class, Memory allocation for objects, Static data members, Static member functions, programs.	3	Chalk & Talk	Black Board
2.4	Arrays of objects, Objects as function arguments, Friendly functions , Returning objects, programs.	2	Chalk & Talk	Black Board
2.4	Const member functions , Pointers to members , Local classes, programs.	2	Chalk & Talk	Black Board
UNIT -3 CONSTRUCTORS, DESTRUCTORS AND OPERATOR OVERLOADING				
3.1	Introduction, Constructors and destructors, programs.	1	Chalk & Talk	Black Board
3.2	Defining operator overloading , Overloading unary operators , Overloading binary operators , Overloading binary operators using friends, programs	2	Chalk & Talk	Black Board
3.3	Manipulation of strings using operators , Rules for overloading operators, programs	4	Chalk & Talk	Black Board
3.4	Type conversions, programs	2	Chalk & Talk	Black Board
UNIT -4 INHERITANCE				
4.1	Introduction , Defining derived classes and programs.	1	Chalk & Talk	Black Board
4.2	Single inheritance , Making a private member inheritable , Multilevel inheritance and programs	4	Chalk & Talk	Black Board
4.3	Multiple inheritance , Hierarchical inheritance , Hybrid inheritance and programs	2	Chalk & Talk	Black Board
4.4	Virtual base classes , Abstract classes, Constructors in derived classes, Member classes: Nesting of classes and programs.	2	Chalk & Talk	Black Board

UNIT -5 POINTERS, VIRTUAL FUNCTIONS AND POLYMORPHISM

5.1	Introduction , Pointers , Pointers to objects and programs.	2	Chalk & Talk	Black Board
5.2	this pointer , Pointers to derived classes and programs.	3	Chalk & Talk	Black Board
5.3	Virtual functions , Pure virtual functions and programs.	2	Chalk & Talk	Black Board
5.4	Polymorphism and programs.	2	Chalk & Talk	Black Board

	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total
Levels	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.
K1	2	2	-	-	-	4	-	4
K2	2	2	5	-	-	9	-	9
K3	3	3	-	-	5	11	-	11
K4	3	3	-	5	-	11	-	11
Non Scholastic	-	-	-	-	-		5	5
Total	10	10	5	5	5	35	5	40

CIA	
Scholastic	35
Non Scholastic	5
	40

✓ The levels of CIA Assessment based on Revised Bloom's Taxonomy are

:

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse

EVALUATION PATTERN

	SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

COURSE OUTCOMES

On the successful completion of the course, students will be able to:

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Define the features of C++ supporting object oriented programming	K1	PSO1
CO 2	Describe classes and objects	K1, K2	PSO2
CO 3	Distinguish Constructors and Destructors and Explain overloading concepts	K1 & K3	PSO4
CO 4	Classify Inheritance in C++	K1, K2, K3	PSO4
CO 5	Design C++ programs for real life situations	K2 & K4	PSO5

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2
CO2	2	3	2	2	2
CO3	2	2	2	3	2
CO4	2	2	2	3	2
CO5	2	2	2	2	3

Mapping COs Consistency with POs

CO/ PO	PO1	PO2	PO3	PO4
CO1	3	2	2	2
CO2	2	2	2	3
CO3	2	2	2	3
CO4	2	3	2	2
CO5	2	2	2	3

Note: ♦ Strongly Correlated – 3 ♦ Moderately Correlated – 2 ♦
Weakly Correlated -1

COURSE DESIGNER:

1. Dr. E. Helena
2. Mrs. J. Annaal Mercy

Forwarded By



IIIB.Sc.STATISTICS

SEMESTER V

Forthosewhojoinedin2021onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USST	22ST5ME4	C++ Practicals	Practical	2	2

1. Tofindtheareaofasquare
2. Tofindtheareaofacircle
3. Tofindtheareaofatriangle
4. TofindSimpleinterest
5. SolvingQuadraticicequations
6. Checkingprimes
7. Arrangingnumbersinascendingorder
8. Reversingdigitsofanumber
9. Findingthevaluesofnpr,npr.
10. Palindrome
11. Matrixaddition
12. Matrixmultiplication
13. Transposeofamatrix
14. Traceofamatrix
15. Alphabetizingnames
16. MeanandStandarddeviation
17. TofindCorrelationCoefficient
18. Straightlinefittingbythemethodofleastssquares
19. ToprintnthFibonaccinumber
20. Toreadaseriesofwordsformaterminal

III B.Sc. STATISTICS

For those who joined in 2020 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USST	22ST6ME10	Econometrics	Lecture	5	5

COURSE DESCRIPTION

This course provides the basic principles of econometric models

COURSE OBJECTIVES

This course enables the students to use economic methods in several areas like engineering sciences, biological sciences, medical sciences, geo-sciences, agriculture sciences etc

UNIT – I THE SIMPLE REGRESSION MODEL

Model with one explanatory variable: Definition, scope and objectives of Econometrics. Linear model with one independent variable - Least squares estimators of regression coefficients, properties of least squares estimators - analysis of variance to regression model

UNIT – II MULTIPLE REGRESSION ANALYSIS: INFERENCE

Model with more variables: Linear model with more than one explanatory variables – assumptions – estimation of model parameter - Least squares estimators and their properties. Hypothesis testing – test the overall significance of the regression – Testing the individual regression coefficients

UNIT – III RESIDUAL ANALYSIS

Adequacy of Model: Model adequacy checking – residual analysis – residuals – standardized residuals – residual plot – normal probability plot – plot of residuals against estimated response. A formal test for lack of fit of the model

UNIT – IV MULTICOLLINEARITY

Multicollinearity: Meaning and sources – consequences of multicollinearity. Test for detecting multicollinearity – Examining the correlation matrix – Variance Inflation factor – Eigen values of $X'X$.

UNIT – V AUTOCORRELATION

Autocorrelation: Meaning of serial independence – sources of autocorrelation – first order autoregressive scheme – consequences of autocorrelation – Durbin – Watson test –

analysing the model in the presence of autocorrelation

TEXT BOOK:

- 1.Montgomery, D.C. Peck, E.C. and Vining, G.G. (2003) Introduction to Linear Regression Analysis(3/e), Wiley Eastern, New Delhi
- 2.Gujarati, D. N., Dawn C Porter and SangeethaKunasekar, (2016), Basic Econometrics, Fifth Edition, McGraw Hill Publisher, New York
- 3.Goldberger, A.S. (1964): Econometrics theory. John Wiley & Sons, New Delhi

REFERENCES:

- 1.Castle, J. and Shephard, N. (2009).The Methodology and Practice of Econometrics.OUP Oxford Publications
- 2.Kelejion, H.H. and Oates, W.E. (1988). Introduction to Econometrics, Principles and Applications. Harper and Row Publishers Inc., New York
3. Maddala, G.S. and KajalLagari (2009). Introduction to Econometrics. John Wiley & Sons
- 4.Madnani, G.M.K. (2008): Introduction to Econometrics: Principles and Applications. Oxford and IBH Publishing

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 THE SIMPLE REGRESSION MODEL				
1.1	Model with one explanatory variable: Definition, scope and objectives of Econometrics.	4	Chalk & Talk	Black Board
1.2	Linear model with one independent variable	3	Chalk & Talk	Black Board
1.3	Least squares estimators of regression coefficients,	4	Chalk & Talk	Black Board
1.4	properties of least squares estimators	3	Chalk & Talk	Black Board
1.5	Analysis of variance to regression model	4	Chalk & Talk	Black Board
UNIT -2 MULTIPLE REGRESSION ANALYSIS: INFERENCE				
2.1	Model with more variables: Linear model	5	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	with more than one explanatory variables.			
2.2	Assumptions and estimation of model parameter - Least squares estimators and their properties.	3	Chalk & Talk	Black Board
2.3	Hypothesis testing ,overall significance of the regression	5	Chalk & Talk	Black Board
2.4	Testing the individual regression coefficients	5	Chalk & Talk	Black Board
UNIT 3 RESIDUAL ANALYSIS				
3.1	Adequacy of Model: Model adequacy checking ,residual analysis , residuals	5	Chalk & Talk	Black Board
3.2	standardized residuals , residual plot	3	Chalk & Talk	Black Board
3.3	Normal probability plot – plot of residuals against estimated response.	5	Chalk & Talk	Black Board
3.4	A formal test for lack of fit of the model	5	Discussion	Black Board
UNIT 4 MULTICOLLINEARITY				
4.1	Multi collinearity: Meaning and sources – consequences of multi collinearity.	4	Chalk & Talk	Black Board
4.2	Test for detecting multi collinearity	3	Chalk & Talk	Black Board
4.3	Examining the correlation matrix	4	Chalk & Talk	Black Board
4.4	Variance Inflation factor	4	Chalk & Talk	Black Board
4.5	Eigen values of $X'X$.	3	Chalk & Talk	Black Board
UNIT 5 AUTOCORRELATION				
5.1	Autocorrelation: Meaning of serial independence	5	Lecture	PPT & White board
5.2	Sources of autocorrelation	3	Lecture	PPT & White board
5.3	First order autoregressive scheme – consequences of autocorrelation	5	Lecture	PPT & White board
5.4	Durbin & Watson test – analysing the model in the presence of autocorrelation	5	Chalk & Talk	Black Board

CIA	
Scholastic	5
Non Scholastic	5

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1	T2	Quiz	Assignment	OBT/PPT				
	10 Mks.	10 Mks.	5 Mks.	5 Mks	5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

	5
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✓ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are :**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse

EVALUATION PATTERN

	SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

COURSE OUTCOMES

On the successful completion of the course, students will be able to:

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Ability to perform analyses of economic data based on broad knowledge of the linear regression model	K3 & K4	PSO1
CO 2	Estimate and test regression model	K1 & K2	PSO5
CO 3	Assess the appropriateness of a linear regression model by defining residuals and examining the residual plot graphs	K3 & K4	PSO3
CO 4	Check the existence of multicollinearity in a data set can lead to less reliable results due to larger standard errors	K1 & K4	PSO5 & PSO6
CO 5	Articulate the null and alternative hypotheses for the Durbin-Watson (DW) test	K4	PSO5

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	2	2	2
CO2	2	2	2	2	3	2
CO3	2	2	3	2	2	2
CO4	2	2	2	2	3	3
CO5	2	2	2	2	3	2

Mapping COs Consistency with POs

CO/ PO	PO1	PO2	PO3	PO4
CO1	3	2	2	2
CO2	2	2	2	3
CO3	2	2	2	3
CO4	2	3	2	2
CO5	2	2	2	3

Note: ♦ Strongly Correlated – 3 ♦ Moderately Correlated – 2 ♦ Weakly Correlated -1

COURSE DESIGNER:

1. Dr. M. Mano Prabha

Forwarded By



DEPARTMENT OF STATISTICS

For those who joined in 2021 onwards

COURSE DESCRIPTION

This course is designed to make the students learn the concept of Differentiation

COURSE OBJECTIVES

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USST	22ST4SL2	Differential Equations			2

To enable the students understand the mathematical concepts required to learn statistics

UNIT-I: DIFFERENTIAL EQUATIONS OF FIRST ORDER FIRST DEGREE

(6 Hrs.)

Variable Separable - Homogeneous equations – Non homogeneous equations of the first degree in x and y

UNIT-II: DIFFERENTIAL EQUATIONS OF FIRST ORDER - I (6 Hrs.)

Linear equations – Bernoulli's equation – Exact differential equation

UNIT III: DIFFERENTIAL EQUATIONS OF FIRST ORDER - II (6 Hrs.)

Linear equations with constant coefficient with terms of the form e^{ax} V on RHS – Linear equations with variable coefficients

UNIT-IV: PARTIAL DIFFERENTIAL EQUATIONS (6 Hrs.)

Formation of Partial Differential equations – First order Partial Differential Equations – Some standard forms

UNIT-V: APPLICATIONS (6 Hrs.)

Applications of first order equations: Growth, decay and chemical reactions.

TEXT BOOKS:

1. S.Narayanan, T.KManickavachagamPillay, Differential Equation and its Applications – S. Viswanathan (Printers and Publishers) Pvt. Ltd.2006

REFERENCES:

1. S. Narayanan and T. K. Manickavachagam Pillai, Ancillary Mathematics Vol II, S. Viswanathan Printers& Publishers, 1996.

DIGITAL EDUCATIONAL OPEN RESOURCES:

<https://www.khanacademy.org/math/differential-equations>

<https://www.youtube.com/watch?v=M9rcYTufG4w>

B.Sc. STATISTICS
Skill Development-50%
Employability-50%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USST	22UGVAST1	Statistics Using MS Excel	-	-	

COURSE DESCRIPTION

This paper gives an idea about various methods in which Statistics are being collected in different sectors Goal

COURSE OBJECTIVES

To enable the students to understand how the statistics are collected, recorded and published using MS Excel.

UNIT-I: Basics of Statistics

Collection of data – Classification of data – Tabulation – Presentation – Simple Bar & Multiple Bar charts, Pie chart, Histogram, Polygon

UNIT-II: Measures of Central Tendency & Dispersion

Mean, Median and Mode-Range, Standard deviation and Variance – ungrouped and grouped data with simple problems.

Moments – First four Central & Non-Central – simple problems Skewness & Kurtosis using moments

UNIT-III: Correlation & Regression Analysis

Simple, rank, multiple and partial correlations – Regression equations

UNIT-IV

MS Excel – Charts (Simple Bar & Multiple Bar charts, Pie chart), Pivot tables, formulae and Unit – II & III topics

Text Books

1. **Fundamentals of Statistics** – S.C. Srivastava & Sangya Srivastava
2. **Statistical Analysis: Microsoft Excel 2013** – Conrad Carlberg

Reference Books

1. S.P. Gupta **Statistical Methods**, Sultan Chand & Sons (2007).

I B.Sc STATISTICS

SEMESTER –I

For those who joined in 2022 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USST	22G1ACST1	Calculus	Lecture	5	5

COURSE DESCRIPTION

This course covers differentiation and integration of functions of one variable.

COURSE OBJECTIVES

To enable the students to understand higher derivatives, curvature, singular points, envelopes, asymptotes, reduction formula, multiple integrals in calculus.

UNIT –I DIFFERENTIATION

(15 HRS.)

Differentiability –Algebra of Derivatives – Derivatives of Standard Functions –The Chain Rule – Differentiation of Inverse Functions – Differentiation by Transformation – Logarithmic Parametric Differentiation – Differentiation of Functions with respect to Functions- Differentiation of Implicit Function

UNIT – II HIGHER DERIVATIVES AND CURVATURE

(15 HRS.)

Higher Derivatives - n^{th} Derivative of some standard functions- Leibnitz theorem- p-r equations – Curvature , centre and radius of curvature

UNIT –III EVALUATION OF INTEGRALS (15 HRS.)

Some simple integrals – Method of Substitution – Integration of : Rational , Irrational and Trigonometric Functions – Evaluation of Definite Integrals – Integration by Parts

UNIT –IV REDUCTION FORMULA

(15 HRS.)

Reduction formula for $\sin^n x$, $\cos^n x$, $\tan^n x$, $\cot^n x$, $\operatorname{cosec}^n x$, $\sec^n x$, and $\sin^m x \cos^n x$.

UNIT –V MULTIPLE INTEGRALS

(15 HRS.)

Jacobian - (Self Study) – Double and Triple integrals

TEXT:

S. Arumugam and A. Thangapandi Issac - *Calculus* (Differential and Integral Calculus) - New Gamma Publishing House (2012).

REFERENCES:

1. Narayanan and Manickavasagam Pillai, *Calculus*, S.Viswanathan (Printers & Publishers) Pvt Ltd (2008).
2. Anit. M.Agarwal, *Differential Calculus*, MeerutArihantPrakashan (2008).
3. Shanthi Narayanan- *Differential Calculus*, Shyam Lal Chairtable Trust (1994).
4. Shanthi Narayanan, *Integral Calculus*, S.Chand and Company Ltd (1994).

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 DIFFERENTIATION				
1.1	Differentiability –Algebra of Derivatives	2	Chalk & Talk	Black Board
1.2	Derivatives of Standard Functions – The Chain Rule	3	Chalk & Talk	Black Board
1.3	Differentiation of Inverse Functions	3	Chalk & Talk	Black Board
1.4	Differentiation by Transformation	3	Chalk & Talk	Black Board
1.5	Logarithmic Parametric Differentiation	2	Chalk & Talk	Black Board
1.6	Differentiation of Functions with respect to Functions	2	Chalk & Talk	Black Board
1.7	Differentiation of Implicit Function	3	Chalk & Talk	Black Board
UNIT -2 HIGHER DERIVATIVES AND CURVATURE				
2.1	Higher Derivatives	5	Chalk & Talk	Black Board
2.2	n^{th} Derivative of some standard functions	3	Chalk & Talk	Black Board
2.3	Leibnitz theorem- p-r equations	5	Chalk & Talk	Black Board
2.4	Curvature , centre and radius of curvature	5	Chalk & Talk	Black Board
UNIT 3 EVALUATION OF INTEGRALS				
3.1	Some simple integrals	4	Chalk & Talk	Black Board

3.2	Method of Substitution Integration of Rational functions	3	Chalk & Talk	Black Board
3.3	Irrational and Trigonometric Functions	3	Chalk & Talk	Black Board
3.4	Evaluation of Definite Integrals	4	Chalk & Talk	Black Board
3.5	Integration by Parts	4	Chalk & Talk	Black Board

UNIT 4 REDUCTION FORMULA

4.1	Reduction formula for $\sin^n x$,	4	Chalk & Talk	Black Board
4.2	Reduction formula for $\cos^n x$,	3	Chalk & Talk	Black Board
4.3	Reduction formula for $\tan^n x$,	4	Chalk & Talk	Black Board
4.4	Reduction formula for $\cot^n x$, $\operatorname{cosec}^n x$,	4	Chalk & Talk	Black Board
4.5	Reduction formula for $\sec^n x$ and $\sin^m x \cos^n x$	3	Chalk & Talk	Black Board

UNIT 5 MULTIPLE INTEGRALS

5.1	Double integrals	9	Lecture	PPT & White board
5.2	Triple integrals	9	Lecture	PPT & White board

	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total
Levels	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assign ment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.
K1	2	2	-	-	-	4	-	4
K2	2	2	5	-	-	9	-	9
K3	3	3	-	-	5	11	-	11

K4	3	3	-	5	-	11	-	11
Non Scholastic	-	-	-	-	-		5	5
Total	10	10	5	5	5	35	5	40

CIA	
Scholastic	35
Non Scholastic	5
	40

✓ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are :**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse

EVALUATION PATTERN

	SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

COURSE OUTCOMES

On the successful completion of the course, students will be able to:

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Able to differentiate the given functions	K1, K2 & K3	PSO1& PSO2
CO 2	Explain higher derivatives and apply Leibnitz theorem to find the nth derivative of functions.	K2	PSO3
CO 3	Able to evaluate the definite integrals	K1 & K3	PSO3

CO 4	Construct reduction formula for trigonometric functions	K1, K2 & K3	PSO1 & PSO3
CO 5	Define Jacobian, double & triple integrals and apply the knowledge of change of variables to solve the problems in double and triple integrals.	K3 & K4	PSO3

Mapping of COs with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	2	2	2
CO2	2	2	3	2	2	2
CO3	2	2	3	2	2	2
CO4	3	2	2	3	2	2
CO5	2	2	3	2	2	2

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	2
CO2	2	3	1	2
CO3	3	2	2	2
CO4	2	3	2	2
CO5	3	2	2	2

Note: ♦ Strongly Correlated – 3 ♦ Moderately Correlated – 2

♦ Weakly Correlated -1

COURSE DESIGNER:

1. Mrs. J. Annaal Mercy

2. Mrs. P. Dhanapriya

Forwarded By



Dr. E. Helena

IIB.Sc.STATISTICS

SEMESTER III

For those who joined in 2019 onwards
Skill Development-100%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USST	19ST3CC5	Continuous Probability Distribution	Lecture	6	4

COURSE DESCRIPTION

This course is designed to expose the students various important continuous probability models

COURSE OBJECTIVES

To enable the students understand the continuous probability distribution and real life situations where these distributions provide appropriate models.

UNIT-I NORMAL DISTRIBUTION

(18 HRS.)

Normal distribution as a limiting form of binomial distribution- chief characteristics of the normal distribution- mode, median, moment generating function of normal distribution- cumulant generating function of normal distribution - moments of normal distribution - a linear combination of independent normal variates - points of inflexion of normal curves - mean deviation about mean for normal distribution- area property- error function - importance of normal distributions- fitting of normal distribution

UNIT-II RECTANGULAR, BETA AND GAMMA DISTRIBUTIONS (18 HRS.)

Moments of rectangular distribution- m.g.f. of rectangular distribution - characteristics function of rectangular distribution - mean deviation about mean of rectangular distribution - m.g.f. of gamma distribution - cumulant generating function of gamma distribution- additive function of gamma distribution- beta distribution of first kind- beta distribution of second kind.

UNIT-III EXPONENTIAL AND CAUCHY DISTRIBUTIONS (18 HRS.)

Moment generating function of exponential distribution -
characteristic function of Cauchy distribution -
moments of Cauchy distribution - (Self Study).

UNIT-IV SAMPLING DISTRIBUTION (CHI-SQUARE) (18 HRS.)

Introduction - derivation of the χ^2 distribution - moment generating
 function of the χ^2 distribution - some theorems on χ^2 distribution - linear
 transformation - applications of χ^2 distribution.

UNIT-V SAMPLING DISTRIBUTION (t, F) (18 HRS.)

Introduction - student's t distribution - applications of t distribution
 - distribution of sample correlation coefficient when population correlation
 coefficient $\rho=0$ - f distribution - applications of f distribution - relation
 between t and f distributions - relation between f and χ^2 distribution.

TEXT:

S.C. Gupta and V.K. Kapoor, *Fundamentals of Mathematical Statistics*,
 Sultan Chand & Sons, Revised edition (2014). Chapters: 9,

15, 16

REFERENCES:

1. Arumugam and Thangapandi Isaac, *Statistics*, New
 Gamma publishing house, (2012).
2. S.P. Gupta, *Statistical Methods*, Sultan Chand & Sons, Revised edition (20
 14).

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT-1 NORMAL DISTRIBUTION				
1.1	Normal distribution as a limiting form of binomial distribution - chief characteristics of the normal distribution	4	Chalk & Talk	Black Board
1.2	Mode, median, moment generating function of normal distribution - cumulant generating function of normal distribution	5	Chalk & Talk	Black Board
1.3	Linear combination of independent normal variates	1	Chalk & Talk	Black Board
1.4	Mean deviation about mean for normal distribution - area property	3	Chalk & Talk	Black Board
1.5	Importance of normal distributions	2	Chalk & Talk	Black Board
1.6	Fitting of normal distribution	3	Chalk & Talk	Black Board
UNIT 2 RECTANGULAR, BETA AND GAMMA DISTRIBUTIONS				
2.1	Moments of rectangular distribution	4	Chalk & Talk	Black Board
2.2	m.g.f. of rectangular distribution - characteristics function of rectangular distribution	4	Chalk & Talk	Black Board
2.3	m.g.f. of gamma distribution - cumulant generating function of gamma distribution	4	Chalk & Talk	Black Board
2.4	beta distribution of first kind	3	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
2.5	Beta distribution of second kind.	3	Chalk & Talk	Black Board
UNIT-3 EXPONENTIAL AND CAUCHY DISTRIBUTIONS				
3.1	Moment generating function of exponential distribution	6	Chalk & Talk	Black Board
3.2	characteristic function of Cauchy distribution	6	Discussion	Black Board
3.3	Moments of Cauchy distribution.	6	Discussion	Black Board
UNIT-4 SAMPLING DISTRIBUTION (CHI-SQUARE)				
4.1	Derivation of the χ^2 distribution	4	Chalk & Talk	Black Board
4.2	Moment generating function of the χ^2 distribution	4	Chalk & Talk	Black Board
4.3	Linear transformation	4	Chalk & Talk	Black Board
4.4	Applications of χ^2 distribution.	6	Chalk & Talk	Black Board
UNIT-5 SAMPLING DISTRIBUTION (t, F)				
5.1	student's, t distribution	3	Chalk & Talk	Black Board
5.2	applications of, t distribution	4	Chalk & Talk	Black Board
5.3	applications of f distribution	4	Chalk & Talk	Black Board
5.4	relation between t and f distributions	3	Chalk & Talk	Black Board
5.5	Relation between f and χ^2 distribution.	4	Chalk & Talk	Black Board

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1	T2	Quiz	Assignment	OBT/PPT				
	10 Mks.	10 Mks.	5 Mks.	5 Mks	5 Mks	35 Mks.	5 Mks.	40 Mks.	
K1	2	2	-	-	-	4	-	4	10%
K2	2	2	5	-	-	9	-	9	22.5%
K3	3	3	-	-	5	11	-	11	27.5%
K4	3	3	-	5	-	11	-	11	27.5%
Non Scholastic	-	-	-	-	-		5	5	12.5%
Total	10	10	5	5	5	35	5	40	100%

CIA	
Scholastic	35
Non Scholastic	5
	40

✓ The level of CIA Assessment based on Revised Bloom's Taxonomy are:

K1-Remember, **K2**-Understand, **K3**-Apply, **K4**-Analyse

EVALUATION PATTERN

	SCHOLASTIC				NON-SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

COURSE OUTCOMES

On the successful completion of the course, students will be able to:

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs Addressed
CO1	Recognize cases where the normal distribution could be an appropriate.	K1	PSO1 & PSO2
CO2	Understand and derive the moments, moment generating functions, characteristic function of rectangular, beta and gamma distribution.	K1 & K2	PSO3
CO3	Explore the key properties such as the moment generating function and cumulants of exponential and Cauchy distribution	K3 & K4	PSO3
CO4	Derive chi-squared distribution and apply in real life problem	K1, K2 & K3	PSO5
CO5	State and apply the definition of t and F distributions	K2 & K3	PSO6

Mapping of COs with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	2	2	2	2
CO2	2	2	3	2	2	2
CO3	2	2	3	2	2	2
CO4	2	2	2	2	3	2
CO5	2	2	2	2	2	3

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	2	2	1	3
CO2	3	1	3	2
CO3	1	3	2	3
CO4	1	3	2	3
CO5	2	2	1	2

Note: ♦ Strongly Correlated-3 ♦ Moderately Correlated-2
 ♦ Weakly Correlated-1

COURSE DESIGNER:

1. Dr.P.Vetriselvi
2. Ms.D.K.PonOvya

Forwarded By



Dr.E.Helena

II B.Sc STATISTICS

SEMESTER –IV

For those who joined in 2021 onwards

Employability-60%

Skill Development-40%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USST	22ST4CC8	Applied statistics	Lecture	6	4

COURSE DESCRIPTION

This course provides some of the applications of statistics which includes topics such as time series, index numbers and national income.

COURSE OBJECTIVES

To enable the students understand and appreciate the applications of Statistics

UNIT –I TIME SERIES (18 HRS.)

Concepts of Time series-Components of Time series-Uses-Additive and Multiplicative Models-Measurement of Trend-Least Square Method-Fitting of Linear Trend- Method of Moving Averages

UNIT –II ANALYSIS OF TIME SERIES (18 HRS.)

Seasonal Variations-Simple Average, Ratio to Moving Average, Ratio to Trend, Link relative Method- Cyclical fluctuations-Residual method only-Random Components-Variate difference Method.

UNIT –III INDEX NUMBERS (18 HRS.)

Classification and methods-Tests of adequacy- Chain index numbers - **consumer price index numbers**– (Self Study).

UNIT –IV INDEX NUMBERS CONT. (18 HRS.)

Laspeyer's , Paasche's, Fisher's Kelly's and Marshall Edgeworth Index numbers-Tests for ideal index numbers. Cost of Living index number-Construction and uses.

UNIT –V NATIONAL INCOME (18 HRS.)

National Income-Estimation methods-Uses of National Income Estimate-Computational

difficulties in India.

TEXT:

1. S.C.Gupta and V.K.Kapoor, *Fundamentals of Applied Statistics*, Sultan Chand & Sons, Revised edition (2002).
2. Goon. A.M., Gupta.B & Das Gupta.M.K., *Fundamentals of Statistics*, World Press, 1987.
3. Agarwal.B.L., *Basic Statistics*, Anshan Publisher, 1st edn 2012.

REFERENCES:

1. Elhance. D.N., *Fundamentals of Statistics*, Kitab Mahal, 2010.
2. Croxton & Frederick ., *Applied General Statistics*, Prentice Hall of India, 1979.

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 TIME SERIES				
1.1	Concepts of Time series	3	Chalk & Talk	Black Board
1.2	Components of Time series-Uses	3	Chalk & Talk	Black Board
1.3	Additive and Multiplicative Models	3	Chalk & Talk	Black Board
1.4	Measurement of Trend-Least Square Method	3	Chalk & Talk	Black Board
1.5	Fitting of Linear Trend	3	Chalk & Talk	Black Board
1.6	Method of Moving Averages.	3	Chalk & Talk	Black Board
UNIT -2 ANALYSIS OF TIME SERIES				
2.1	Seasonal Variations-Simple Average method	3	Chalk & Talk	Black Board
2.2	Ratio to Moving Average, Ratio to Trend	3	Chalk & Talk	Black Board
2.3	Link relative Method, Cyclical fluctuations	3	Chalk & Talk	Black Board

2.4	Residual method only	3	Chalk & Talk	Black Board
2.5	Random Components	3	Chalk & Talk	Black Board
2.6	Variate difference Method	3	Chalk & Talk	Black Board
UNIT 3 INDEX NUMBERS				
3.1	Basic Index numbers and their definitions-	5	Chalk & Talk	Black Board
3.2	Constructions of Whole sale Price Index Numbers and uses	3	Chalk & Talk	Black Board
3.3	Fixed and Chain base index numbers	5	Chalk & Talk	Black Board
3.4	Un weighted and Weighted index numbers.	5	Discussion	Black Board
UNIT 4 INDEX NUMBERS CONT.				
4.1	Lespeyer's , Paasche's Index numbers	4	Chalk & Talk	Black Board
4.2	Fisher's Kelly's and Marshall Edgeworth Index numbers	3	Chalk & Talk	Black Board
4.3	Tests for ideal index numbers.	4	Chalk & Talk	Black Board
4.4	Cost of Living index number	4	Chalk & Talk	Black Board
4.5	Construction and uses	3	Chalk & Talk	Black Board
UNIT 5 NATIONAL INCOME				
5.1	National Income	5	Lecture	PPT & White board
5.2	Estimation methods	3	Lecture	PPT & White board

5.3	Uses of National Income Estimate	5	Lecture	PPT & White board
5.4	Computational difficulties in India	5	Chalk & Talk	Black Board

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% Assessment
	T1	T2	Quiz	Assignment	OBT/PPT				
	10 Mks.	10 Mks.	5 Mks.	5 Mks	5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	1
K2	2	2	5	-	-	9	-	9	22
K3	3	3	-	-	5	11	-	11	27
K4	3	3	-	5	-	11	-	11	27
Non Scholastic	-	-	-	-	-		5	5	12
Total	10	10	5	5	5	35	5	40	100

CIA	
Scholastic	
Non Scholastic	

✓ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are :**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse

EVALUATION PATTERN

	SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

COURSE OUTCOMES

On the successful completion of the course, students will be able to:

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Fitting of Linear trend and Calculation of Moving Average.	K2	PSO2
CO 2	Understand the calculation of seasonal variations using different methods and able to find cyclic fluctuations	K1 & K2	PSO5
CO 3	Apply the concept of Index numbers uses and its applications.	K3 & K4	PSO3
CO 4	Prepare cost of living index and other index numbers for real life situations	K1, K3 & K4	PSO5 & PSO6
CO 5	To estimate the national income and to analysis its difficulties.	K3 & K4	PSO5 & PSO6

Mapping of COs with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	3	2	2	2	2
CO2	2	2	2	2	3	2
CO3	2	2	3	2	2	2
CO4	2	2	2	2	3	3
CO5	2	2	2	2	3	3



Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	2	3	2	2
CO2	2	3	2	2
CO3	3	2	2	2
CO4	2	2	3	2
CO5	2	2	2	3

Note: ♦ Strongly Correlated – **3**

♦ Moderately Correlated – **2**



Weakly Correlated -**1**

COURSE DESIGNER:

1. Mrs. K. Bhuvaneswari

2. Ms. K. Mano

Forwarded By

Dr. E. Helena

