FATIMA COLLEGE (AUTONOMOUS)

Re-Accredited with"A++"Grade by
NAAC(IVCycle)
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, Assistat Professor, PG and Research Department of Statistics, Thanthai Periyar Govt. Arts and Science College, Trichy.
4. Dr. V. Sangeetha, Assistat 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. Mr. A. Roshni, Data Analyst, Neuralnet data Science, Horamavu, Bengaluru. Karnataka
7. Dr. K. Mano, 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.	Common 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-methodspdf-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 L	R	N	G	Scope for 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 L	R	N	G	Scope for EM	EN	SD	Need for Introduction
1.	22ST4SB2	Sampling Distributions				✓	Employability			To introduce more Problems on t, F, χ^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.	22UGVAST1	Statistics using MS Excel				✓	Employability & Skill Development			To facilitate advanced learners.
6	22ST4SL2	Differential Equations			✓		Skill Development.			

The board reviewed the Syllabi for I UG (I & II Semester), II UG (III & IV Semester) and III UG (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

21ST1MME - 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 - III.
19ST5SB4 – Statistical Software : SPSS.

VI Semester

19ST6CC13 – Statistical Quality Control.

19ST6CC14	- Stochastic Processes.
19ST6CC15	- Actuarial Statistics.
19ST6ME5/	- Numerical methods /
19ST6ME6/	- Multivariate Analysis /
19ST6ME7	- Regression Analysis
19ST6ME8/	- Operations Research /
19ST6ME9/	- Industrial Statistics /
22ST6ME10	- Econometrics.

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

1.	Dr. E. HELENA	Helpoh
2.	Dr. A. SHOPHIA LAWRENCE	A.S.L
3.	Dr. A. KACHI MOHIDEEN	
4.	Dr. V. SANGEETHA	V. Sangeetha 15/03/2022
5.	Ms. S. SINDHUJA	ABSENT
6.	Ms. A. ROSHNI	ABSENT
7.	Dr. K. MANO	K. Mano
8.	Ms. P. DHANAPRIYA	D. anapriya
9.	Dr. M. MANOPRABHA.	M.P.
10.	Ms. A. MABLE JASMINE SHOBA	A. Mable Jasmine Shoba.

15/3/2022

VISIONOFTHEDEPARTMENT

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

MISSIONOFTHEDEPARTMENT

Todevelopstatisticalandprobabilistictheoriesandtechniquesandtopropagatestatisticalknowledgethroughteaching and outreach programmes, in order to serve the needsofthesociety.

PROGRAMMEEDUCATIONALOBJECTIVES(PEO)

AgraduateofB.Sc.STATISTICSprogrammeafterfiveyearswillbe

PEO1

Ourgraduateswillbeacademic,digitalandinformationliterates,creative,inquisitive,innovativeanddesirousforthe“more”inallaspects

PEO2

They will be efficient individual and team performers,exhibitingprogress,flexibility,transparencyandaccountabilityintheir professionalwork

PEO3

The graduates will be effective managers of all sorts ofreal–lifeandprofessionalcircumstances,makingethical decisions, pursuing excellencewithin thetimeframeworkanddemonstratingaptleadershipskills

PEO4

Theywillengagelocallyandgloballyevincing socialandenvironmentalstewardshipdemonstratingcivicresponsibilities and employing right skills at the rightmoment.

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 sustainandnurturethefollowingattributes:

I. SOCIALCOMPETENCE	
GA1	Deepdisciplinaryexpertisewithawiderangeofac ademicanddigitalliteracy
GA2	Honecreativity,passionforinnovationandaspireexcellenc e
GA3	Enthusiasmtowardsemancipationandempowermento fhumanity
GA4	Potentialsofbeingindependent
GA5	Intellectualcompetenceandinquisitivenesswithproblems olvingabilitiesbefittingthefieldofresearch
GA6	Effectivenessindifferentformsofcommunicationstobee mployedinpersonalandprofessionalenvironmentsthrou ghvariedplatforms
GA7	Communicativecompetencewithcivic,professionaland cyberdignityanddecorum
GA8	Integrityrespectingthediversityandpluralisminso cieties,culturesandreligions
GA9	All– inclusiveskillsetstointerpret,analyseandsolvesocialand environmentalissues in diverseenvironments
GA10	Selfawarenessthatwould enablethemtorecognisetheiruniquenessthroughconti nuousself- assessmentinordertofaceandmakechangesbuildingont heirstrengthsandimprovingtheirweaknesses
GA11	Finessetoco-operateexhibitingteam-spiritwhile

	workingingroupstoachievegoals
GA12	Dexterityinself-managementtocontroltheirselvesinattainingthekindoflifethattheydreamfor
GA13	Resiliencetoriseupinstantlyfromtheirintimidatingsetbacks
GA14	Virtuosity to use their personal and intellectualautonomyinbeinglife-longlearners
GA15	Digitallearningandresearchattributes
GA16	Cybersecuritycompetencereflectingcompassion,careandconcerntowardsthemarginalised
GA17	Rectitudetousedigitaltechnologyreflectingcivicandsocialresponsibilitiesinlocal,nationalandglobalscenario
II. PROFESSIONALCOMPETENCE	
GA18	Optimism,flexibilityanddiligencethatwouldmakethemprofessionallycompetent
GA19	Prowesstobesuccessfulentrepreunersandbecomeemployeesoftrans-nationalsocieties
GA20	ExcellenceinLocalandGlobalJobMarkets
GA21	EffectivenessinTimeManagement
GA22	EfficiencyintakingupInitiatives
GA23	Eagernesstodeliverexcellentservice
GA24	ManagerialSkillstoIdentify,CommendandtapPotentials
III. ETHICALCOMPETENCE	
GA25	Integrity and be disciplined in bringing stabilityleadingasystematiclifepromotinggoodhumanbehaviourtobuildbettersociety

GA26	Honestyinwordsanddeeds
GA27	Transparencyrevealingone‟sowncharacteraswellasself-esteemtoleadagenuineandauthenticlife
GA28	SocialandEnvironmentalStewardship
GA29	Readinesstomakeethicaldecisionsconsistentlyfromthegaloreofconflictingchoicespayingheed to theirconscience
GA30	Rightlifeskillsattherightmoment

PROGRAMMEOUTCOMES(PO)

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

PO1	Apply acquired scientific knowledge to solve complexissues
PO2	AttainAnalyticalskillstosolvecomplexcultural,societalandenvironmentalissues
PO3	Employ latest and updated tools and technologies toanalysecomplexissues
PO4	DemonstrateProfessionalEthicsthatfosterCommunity,NationandEnvironmentBuildingInitiatives

PROGRAMMESPECIFICOUTCOMES(PSO)

Oncompletion(afterthreeyears)ofB.Sc.Statisticsprogramme,thegraduateswouldbeableto

PSO1	ApplytheknowledgeofStatistics,MathematicsandComputersciencetobecome competentprofessionals atgloballevel
PSO2	Applystatisticalknowledgetoanalyzeandsolvecomplexproblemsusingappropriatestatisticalmethodologyandinterpretresultsina varietyof settings
PSO3	Demonstratetheabilityofcriticalobservation,logical,analyticalandproblem-solvingskills
PSO4	Writecodetoextractandreformatrealdataandtoutilizestatisticalprogrammingenvironments
PSO5	Effectivelypresent statistical findings to an audience lackingstatisticalexpertiseandworkcollaboratively
PSO6	Excelassociallycommittedstatisticsstudentshaving mutualrespect,effectivecommunicationskills,highethicalvaluesandempathyfortheneedsofsociety

PROGRAMME CODE:USST

FATIMACOLLEGE(AUTONOMOUS),MADURAI-18

DEPARTMENTOFSTATISTICS

ForthosewhojoinedinJune2019onwards

PART–I–TAMIL/FRENCH / HINDI–12CREDITS

PART–I–TAMIL

Offeredbythe ResearchCentreofTamil

.NO	SEM.	COURSE CODE	COURSETITLE	HRS	CRS	CIA Mks	ESE Mks	TOT. Mks
1.	I	19T1LC1	Language-ModernLiterature பொதுத்தமிழ்-இக்கால இலக்கியம்	5	3	40	60	100
2.	II	19T2LC2	Language-BakthiLiterature பொதுத்தமிழ்-பக்தி இலக்கியம்	5	3	40	60	100
3.	III	19T3LC3	Language- Epic Literature பொதுத்தமிழ்-காப்பிய இலக்கியம்	5	3	40	60	100
4.	IV	19T4LC4	Language-SangamLiterature பொதுத்தமிழ்-சங்க இலக்கியம்	5	3	40	60	100
			Total	20	12			

PART–I–FRENCH

OfferedbyTheDepartmentofFrench

S. NO	SEM.	COURSE CODE	COURSETITLE	HRS	CREDITS	CIA Mks	ESE Mks	TOT. MKs
1.	**I**	19RL1C1	PART1LANGUAGEFRENCH-LENIVEAUINTRODUCTIF	**5**	**3**	**40**	**60**	**100**
2.	**II**	19RL2C2	PART 1 LANGUAGEFRENCH-LENIVEAUDÉCOUVERTE	**5**	**3**	**40**	**60**	**100**
3.	**III**	19RL3C3	PART1LANGUAGEFRENCH-LENIVEAUINTERMEDIAIRE – LACIVILISATION,LALITTERATUREETLAGRAMMAIRE	**5**	**3**	**40**	**60**	**100**
4.	**IV**	19RL4C4	PART1LANGUAGEFRENCH-LENIVEAUDESUIVRE – LACIVILISATION,LALITTERATUREETLAGRAMMAIRE	**5**	**3**	**40**	**60**	**100**
			TOTAL	**20**	**12**			

PART–I–HINDI

OfferedbyTheDepartmentofHindi

S. NO	SEM.	COURSECODE	COURSETITLE	HRS	CREDITS	CIA Mks	ESE Mks	TOT. MKs
1.	I	19DL1C1	PART1LANGUAGE HINDI-बोलचालकीहहदिं ी	5	3	40	60	100
2.	II	19DL2C2	PART1LANGUAGE HINDI-कार्ालर्ीनहहदिं ी	5	3	40	60	100
3.	III	19DL3C3	PART1LANGUAGE HINDI-हहदिं ी साहहत्र्काआहदकालऔरभक्तिकाल	5	3	40	60	100
4.	IV	19DL4C4	PART1LANGUAGE HINDI-हहदिं ी साहहत्र्काआधुननककाल	5	3	40	60	100
			TOTAL	20	12			

PART–II-ENGLISH–12CREDITS

OfferedbyTheResearchCentreofEnglish

S. NO	SEM.	COURSECODE	COURSETITLE	HRS	CREDITS	CIA Mks	ESE Mks	TOT. MKs
1.	I	19EL1WB	BASICCOMMUNICATIVEENGLISH	5	3	40	60	100
2.		19EL1WI	INTERMEDIATECOMMUNICATIVEENGLISH					
3.		19EL1WA	ADVANCEDCOMMUNICATIVEENGLISH					
4.	II	19EL2WB	ENGLISHCOMMUNICATIONSKILLS	5	3	40	60	100
5.		19EL2WI	ENGLISHFOREMPOWERMENT					
6.		19EL2WA	ENGLISHFOR CREATIVEWRITING					
7.	III	19EL3WN	ENGLISHFORDIGITALERA	5	3	40	60	100
8.	IV	19EL4WN	ENGLISHFORINTEGRATEDDEVELOPMENT	5	3	40	60	100
			TOTAL	**20**	**12**			

PART–III-MAJOR,ALLIED&ELECTIVES–95CREDITS

CORECOURSES:60CREDITS

S. NO	SEM.	COURSE CODE	COURSETITLE	HRS	CRS	CIA Mks	ESE Mks	TOT. Mks
1.	I	19ST1CC1	BASICSTATISTICS	6	4	40	60	100
2.		19ST1CC2	PROBABILITYTHEORY	6	4	40	60	100
3.	II	19ST2CC3	DESCRIPTIVESTATISTICS	6	4	40	60	100
4.		19ST2CC4	DISCRETEPROBABILITYDISTRIBUTIONS	6	4	40	60	100
5.	III	22ST3CC5	CONTINUOUSPROBABILITYDISTRIBUTIONS	6	4	40	60	100
6.		19ST3CC6	SAMPLINGTHEORY	6	4	40	60	100
7.	IV	19ST4CC7	ESTIMATIONTHEORY	6	4	40	60	100
8.		22ST4CC8	APPLIEDSTATISTICS	6	4	40	60	100
9.	V	19ST5CC9	TESTING OF HYPOTHESIS	5	4	40	60	100
10.		19ST5CC10	DESIGNOF	5	4	40	60	100

S. NO	SEM.	COURSE CODE	COURSETITLE	HRS	CRS	CIA Mks	ESE Mks	TOT. Mks
			EXPERIMENTS					
11.		19ST5CC11	DEMOGRAPHY	5	4	40	60	100
12.		19ST5CC12	REALANALYSIS	5	4	40	60	100
13.	VI	19ST6CC13	STATISTICALQUALITYCONTROL	5	4	40	60	100
14.		19ST6CC14	STOCHASTICPROCESSES	5	4	40	60	100
15.		19ST6CC15	ACTUARIAL STATISTICS	5	4	40	60	100

ELECTIVES-15 CREDITS

S.No	SEM.	COURSECODE	COURSETITLE	HRS	CRS	CIA Mks	ESE Mks	TOT. Mks
1	V	19ST5ME1&19ST5ME2/ 22ST5ME3&22ST5ME4	COMPUTERPROGRAMMINGIN C&C-PRACTICALS/ OBJECT ORIENTED PROGRAMMING WITH C++ &C++ PRACTICALS	5	5	40	60	100
2	VI	19ST6ME5/ 19ST6ME6/ 19ST6ME7/ 19ST6ME8/ 19ST6ME9/ 19ST6ME10	NUMERICALMETHODS/MULTIVARIATE ANALYSIS/ REGRESSIONANALYSIS/ OPERATIONSRESEARCH/ INDUSTRIALSTATISTICS/ECONOMETRICS	5	5	40	60	100
			TOTAL	15	15			

ALLIED-20CREDITS

S.NO	SEM.	COURSECODE	COURSETITLE	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	LINEARPROGRAMMING	5	5	40	60	100
4.	IV	19G4ACST4	LINEARALGEBRA	5	5	40	60	100

PART–IV–20CREDITS

- **VALUEEDUCATION**
- **ENVIRONMENTAL AWARENESS**
- **NONMAJORELECTIVE**
- **SKILLBASEDCOURSES**

S.No	SEM.	COURSE CODE	COURSETITLE	HRS	CRS	CIA Mks	ESE Mks	TOT. Mks
1.	I	21G1VE1	PERSONALVALUES-VALUEEDUCATION(INCLUDINGMEDITATIONINACTIONMOVEMENT)	1	1	40	60	100
2.		21ST1NME	FUNDAMENTALSOFSTATISTICS	2	2	40	60	100
3.	II	21G2VE2	VALUES FORLIFE	1	1	40	60	100
4.		21ST2NME	FUNDAMENTALSOFSTATISTICS	2	2	40	60	100
5.	III	21G3EE1	ENVIRONMENTALEDUCATION	1	1	40	60	100
6.		19ST3SB1	PRACTICALSTATISTICS-I	2	2	40	60	100
7.		19G4EE2	GENDERSTUDIES	1	1	40	60	100

8.	IV	22ST4SB2	SAMPLING DISTRIBUTIONS	2	2	40	60	100
9.	V	19ST5SB3	PRACTICALSTATISTICS–III	2	2	40	60	100
10.		19ST5SB4	STATISTICALSOFTWARE:SPSS	2	2	40	60	100
11.	VI	159ST6SB5	PRACTICALSTATISTICS–IV	2	2	40	60	100
12.		19ST6SB6	STATISTICALSOFTWARE:R	2	2	40	60	100

PART–V–1CREDIT

OFF-CLASSPROGRAMMES

SHIFT-II

S. No	SEM	COURSE CODE	COURSETITLE	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 inwhichthecourse isoffered	CIA Mks	ESE Mks	TOT. Mks
19UAD2CA	**COMPUTERAPPLICATIONS**	40	2	I&II	40	60	100
19UADFCA	**ONLINESELFLEARNINGCOURSE-** FoundationCoursefor Arts	40	3	I	50	-	50
19UADFCS	**ONLINESELFLEARNINGCOURSE-** FoundationCourseforScience	40	3	II	50	-	50
21UAD3ES	ProfessionalEthics	15	1	III	40	60	100
21UAD4ES	PersonalityDevelopment	15	1	IV	40	60	100
21UAD5ES	FamilyLifeEducation	15	1	V	40	60	100
21UAD6ES	LifeSkills	15	1	VI	40	60	100
19UAD5HR	HumanRights	15	2	V	40	60	100
	OUTREACHPROGRAMME- ReachOut to SocietythroughAction **ROSA**	100	3	V&VI	-	-	100
	PROJECT	30	4	VI	40	60	100
	READINGCULTURE	10/Semester	1	II-VI	-	-	-
	MOOC COURSES(DepartmentSpecificCourses/anyotherCourses)*	-	Minimum 2 Credit	-	-	-	

COURSE CODE	Courses	HRS	CRS	Semester inwhicht hecourse isoffered	CIA Mks	ESE Mks	TOT. Mks
	Studentscanoptotherth anthelistedcoursefrom UGC-SWAYAMUGC/CEC		s				
	TOTAL		22+				

EXTRACREDITCOURSE

CourseCode	Courses	Hrs.	Credits	Semester inwhicht hecourse isoffered	CIA Mks	ESE Mks	Total Marks
22ST4SL2	**SELFLEARNING COURSEforADVANCEDLEARNERS (offeredforIUG)** DIFFERENTIAL EQUATIONS			IV	40	60	100

I B.Sc.. STATISTICS

SEMESTER I

OLD

For those who joined in 2019 onwards

Skill Development-100%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USST	19ST1CC2	Probability Theory	Lecture	6	4

COURSE DESCRIPTION

This course introduces the concepts of functions and its properties, theorems related to random variables.

COURSE OBJECTIVES

To enable the students understand the concepts of random variable and distribution functions, expectation, conditional expectation and variance, generating functions, law of large numbers.

UNIT –I THEORY OF PROBABILITY I (18 HRS.)

Introduction – Basic Terminology – **Mathematical Probability – Statistical Probability – Subjective Probability – (**Self Study) – Mathematical Tools – Axiomatic Approach to Probability.

UNIT –II THEORY OF PROBABILITY II (18 HRS.)

Extended Axiom of Addition– (Self Study) and Axiom of Continuity – Bayes Theorem – Geometric Probability.

UNIT –III RANDOM VARIABLES AND DISTRIBUTION FUNCTIONS (18 HRS.)

Introduction – Distribution Function – Discrete Random Variable – Continuous Random Variable – Two Dimensional Random Variables.

UNIT –IV MATHEMATICAL EXPECTATION (18 HRS.)

Introduction – Mathematical Expectation – Expected Value of Function of a Random Variable – Properties of Expectation – Properties of

Variance – Covariance – Some Inequalities Involving Expectation – Moments of Bivariate Probability Distributions – Conditional Expectation and Conditional Variance.

UNIT –V GENERATING FUNCTIONS AND LAW OF LARGE NUMBERS(18 HRS.)

Moment Generating Function – Cumulants – Characteristics Function – Inversion Theorem – Uniqueness Theorem of Characteristics Function – Necessary and Sufficient Condition for Independence of Random Variables in Terms of Characteristics Functions – Hally Bray Theorem – Continuity Theorem for Characteristics Functions – Chebychve‟s Inequality – Convergence in Probability.

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 Gammapublishing house (2012).

IB.Sc..STATISTICSS

EMESTER I

NEW-5%

Forthosewhojoinedin2019onwards

Skill Development-100%

PROGRAMME CODE	COURSE CODE	COURSET ITLE	CATEGORY	HRS/WEEK	CREDITS
USST	19ST1CC2	Probability Theory	Lecture	6	4

PROGRAMME CODE	COURSE CODE	COURSET ITLE	CATEGORY	HRS/WEEK	CREDITS
USST	19ST1CC2	Probability Theory	Lecture	6	4

COURSEDESCRIPTION

Thiscourseintroducestheconceptsoffunctionsanditsproperties,theoremsrelatedtorandomvariables.

COURSEOBJECTIVES

To enable the students understand the concepts of random variableanddistributionfunctions,expectation,conditionalexpectationandvariance,generatingfunctions,lawoflargenumbers.

UNIT–I THEORYOFPROBABILITYI (18HRS.)

Introduction–BasicTerminology–**MathematicalProbability–StatisticalProbability–SubjectiveProbability– (**Self Study) –MathematicalTools–AxiomaticApproachtoProbability.

UNIT–II THEORYOFPROBABILITYII (18HRS.)

Extended Axiom of Addition– (Self Study) and Axiom of Continuity –BayesTheorem–GeometricProbability.

UNIT –III RANDOM VARIABLES AND DISTRIBUTION FUNCTIONS(18HRS.)

Introduction– Distribution Function – Discrete Random Variable–ContinuousRandomVariable–TwoDimensionalRandomVariables.

UNIT–IV MATHEMATICALEXPECTATION (18HRS.)

Introduction–MathematicalExpectation–ExpectedValueofFunctionofaRandomVariable–PropertiesofExpectation–Propertiesof

Variance–Covariance–SomeInequalitiesInvolvingExpectation–MomentsofBivariateProbabilityDistributions– Conditional Expectation andConditionalVariance.

UNIT–

VGENERATINGFUNCTIONSANDLAWOFLARGENUMBERS(18HRS.)

MomentGeneratingFunction–Cumulants–CharacteristicsFunction –InversionTheorem–UniquenessTheoremofCharacteristicsFunction–Necessary and Sufficient Condition for Independence of Random VariablesinTermsofCharacteristicsFunctions–HallyBrayTheorem–ContinuityTheoremforCharacteristicsFunctions– Chebychve‟s Inequality – ConvergenceinProbability.

TEXT:

S.C.Gupta and V.K.Kapoor, *Fundamentals of Mathematical Statistics*, SultanChand&Sons,Revisededition(2014).

REFERENCES:

1. Arumugam and Thangapandi Isaac, *Statistics*, New Gammapublishinghouse(2012).

Module No.	Topic	No.ofLectures	Teaching Pedagogy	Teaching Aids
UNIT-1THEORYOFPROBABILITYI				
1.1	BasicTerminology	4	Lecture	PPT& White board
1.2	MathematicalProbability	4	Chalk &Talk	BlackBoard
1.3	StatisticalProbability	4	Discussion	BlackBoard
1.4	SubjectiveProbability	3	Discussion	BlackBoard
1.5	AxiomaticApproachtoProbability.	3	Chalk &Talk	BlackBoard
UNIT-2THEORYOFPROBABILITYII				
2.1	ExtendedAxiomofAdditionand	6	Discussion	BlackBoard
2.2	AxiomofContinuity	6	Chalk &Talk	BlackBoard
2.3	BayesTheorem	3	Chalk &Talk	BlackBoard
2.4	GeometricProbability.	3	Chalk &Talk	BlackBoard
UNIT-3RANDOMVARIABLESANDDISTRIBUTIONFUNCTIONS				
3.1	DistributionFunction	4	Chalk &Talk	BlackBoard
3.2	DiscreteRandomVariable	5	Chalk &Talk	BlackBoard
3.3	ContinuousRandomVariable	5	Chalk&	Black

Module No.	Topic	No.ofLectures	Teaching Pedagogy	Teaching Aids
			Talk	Board
3.4	TwoDimensionalRandomVariables	4	Chalk &Talk	BlackBoard
UNIT-4MATHEMATICALEXPECTATION				
4.1	ExpectedValueofFunctionofaRandomVariable	3	Chalk &Talk	BlackBoard
4.2	PropertiesofExpectation	3	Chalk &Talk	BlackBoard
4.3	PropertiesofVariance	3	Chalk &Talk	BlackBoard
4.4	Covariance	3	Chalk &Talk	BlackBoard
4.5	MomentsofBivariateProbabilityDistributions	2	Chalk &Talk	BlackBoard
4.6	ConditionalExpectation	2	Chalk &Talk	BlackBoard
4.7	ConditionalVariance	2	Chalk &Talk	BlackBoard
UNIT-5GENERATINGFUNCTIONSANDLAWOFLARGENUMBERS				
5.1	MomentGeneratingFunction	3	Chalk &Talk	BlackBoard
5.2	CharacteristicsFunction	3	Chalk &Talk	BlackBoard
5.3	InversionTheorem	1	Chalk &Talk	BlackBoard
5.4	NecessaryandSufficientConditionforIndependenceofRandomVariablesinTermsofCharacteristicsFunctions	3	Chalk &Talk	BlackBoard
5.5	ContinuityTheoremfor	3	Chalk&	Black

Module No.	Topic	No.ofLectures	Teaching Pedagogy	TeachingAids
	CharacteristicsFunctions		Talk	Board
5.6	Chebychve‟sInequality	2	Chalk &Talk	BlackBoard
5.7	HallyBrayTheorem	1	Chalk &Talk	BlackBoard
5.8	ConvergenceinProbability	2	Chalk &Talk	BlackBoard

Levels	C1	C2	C3	C4	C5	TotalScholasticMarks	NonScholasticMarks C6	CIA Total	% ofAssessment
	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	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%
NonScholastic	-	-	-	-	-		5	5	12.5%
Total	10	10	5	5	5	35	5	40	100%

CIA	
Scholastic	35
NonScholastic	5
	40

- ✓ **ThelevelsofCIAAssessmentbasedonRevisedBloom'sTaxonomyare:**

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

EVALUATIONPATTERN

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

COURSEOUTCOMES

Onthesuccessfulcompletionofthecourse,studentswillbeableto:

NO.	COURSEOUTCOMES	KNOWLEDGE LEVEL(ACCORDINGTOREVISEDBLOOM'STAXONOMY)	PSOsADDRESSED
CO1	Identifyfromaprobabilityscenarioeventsthataresimple,complementary, mutually exclusive,andindependent.	K3	PSO4
CO2	Recognizemultiplicationrulefortwoindependentevents,theadditionrulefororunionoftwoevents,andthecomplementrule.	K1&K2	PSO1
CO3	Describethemainpropertiesofprobabilitydistributionandrandomvariables.	K1&K3	PSO5
CO4	Applygeneralpropertiesoftheexpectation and varianceoperators	K3	PSO4
CO5	Identifyandexaminegeneratingfunctionsandlaw of largenumbers	K3&K4	PSO3

MappingofC0swithPSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	2	2	3	2	1
CO2	3	2	2	2	1	1
CO3	2	2	2	2	3	2
CO4	2	2	2	3	2	2
CO5	2	2	3	2	2	2

MappingofC0swithPOs

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

Note: ♦StronglyCorrelated–**3** ♦ModeratelyCorrelated–**2**

♦ WeaklyCorrelated-**1**

COURSEDESIGNER:

1. **Mrs.K.Bhuvaneswari**
2. **Ms.K.SaranyaF**

orwardedBy

Dr.E.Helena

I B.Sc. STATISTICS

SEMESTER II -OLD

For those who joined in 2019 onwards

Skill Development-100%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USST	19ST2CC3	Descriptive Statistics	Lecture	6	4

COURSE DESCRIPTION

This course introduces measurement of relationship in terms of quantitative and qualitative data.

COURSE OBJECTIVES

This course imparts the knowledge of correlation, regression and association of attributes to students.

UNIT –I SKEWNESS, MOMENTS AND KURTOSIS (18 HRS.)

Introduction – Tests of Skewness – Measures of Skewness – Moments – Kurtosis.

UNIT –II CORRELATION ANALYSIS I (18 HRS.)

Introduction – Significance of the Study of Correlation – Correlation and Causation – Types of Correlation – Methods of studying Correlation – Graphic Method – **Karl Pearson's Coefficient of Correlation – Coefficient of Correlation – (**Self Study) and Probable Error**.**

UNIT –III CORRELATION ANALYSIS II (18 HRS.)

Coefficient of Determination – Properties of the Coefficient of Correlation – Rank Correlation Coefficient.

UNIT –IV REGRESSION ANALYSIS (18 HRS.)

Introduction – Uses of Regression Analysis – Correlation and Regression Analysis: A Comparison – Regression Lines – Regression Lines –

Regression Equations – Regression Equations in case of Correlation Table –Standard Error of Estimate.

UNIT –V ASSOCIATION OF ATTRIBUTES (18 HRS.)

Introduction –Difference between Correlation and Association – Notation and Terminology – Consistency of Data – Association and Disassociation – Methods of Studying Association – Association of Three Attributes.

TEXT:

S.P.Gupta, *Statistical Methods*, Sultan Chand & Sons, Revised edition(2014).

Chapters: 9, 10, 11, 12.

REFERENCES:

1. S.C.Gupta and V.K.Kapoor, *Fundamentals of Mathematical statistics,* Sultan Chand & Sons, Revised edition (2014).
2. Arumugam and Thangapandi Isaac, *Statistics*, New Gammapublishing house, (2012).

IB.Sc.STATISTICS

SEMESTERII-NEW-15%

Forthosewhojoinedin2019onwards

Skill Development-100%

PROGRAMMECODE	COURSECODE	COURSETITLE	CATEGORY	HRS/WEEK	CREDITS
USST	19ST2CC3	Descriptive Statistics	Lecture	6	4

COURSEDESCRIPTION

This course introduces measurement of relationship interms of quantitative and qualitative data.

COURSEOBJECTIVES

Thiscourseimpartstheknowledgeofcorrelation,regressionandassociationofattributestostudents.

UNIT–I SKEWNESS,MOMENTSANDKURTOSIS (18HRS.)

Introduction–TestsofSkewness–MeasuresofSkewness–Moments –Kurtosis.

UNIT–II CORRELATIONANALYSISI (18HRS.)

Introduction–SignificanceoftheStudyof Correlation – CorrelationandCausation–TypesofCorrelation–MethodsofstudyingCorrelation–GraphicMethod–**KarlPearson'sCoefficientofCorrelation–CoefficientofCorrelation–(**SelfStudy)andProbableError**.**

UNIT–III CORRELATIONANALYSISII (18HRS.)

Coefficient of Determination – Properties of the Coefficient ofCorrelation–RankCorrelationCoefficient.

UNIT–IV REGRESSIONANALYSIS (18HRS.)

Introduction – Uses of Regression Analysis – Correlation andRegressionAnalysis:AComparison–RegressionLines–RegressionLines–

RegressionEquations–RegressionEquationsincaseofCorrelationTable–StandardErrorofEstimate.

UNIT–V ASSOCIATIONOFATTRIBUTES (18HRS.)

Introduction–DifferencebetweenCorrelation and Association – NotationandTerminology–ConsistencyofData–AssociationandDisassociation–MethodsofStudyingAssociation–AssociationofThreeAttributes.

TEXT:

S.P.Gupta,*StatisticalMethods*,SultanChand&Sons,Revisededition(2014).

Chapters:9,10,11,12.

REFERENCES:

3. S.C.Guptaand V.K.Kapoor, *Fundamentals of Mathematical statistics,* SultanChand&Sons,Revisededition(2014).

4. Arumugam and Thangapandi Isaac, *Statistics*, New Gammapublishinghouse,(2012).

COURSECONTENTS&LECTURESCHEDULE:

Module No.	Topic	No.ofLectures	Teaching Pedagogy	Teaching Aids
UNIT-1SKEWNESS,MOMENTSANDKURTOSIS				
1.1	TestsofSkewness	3	Chalk &Talk	BlackBoard
1.2	MeasuresofSkewness	3	Chalk &Talk	BlackBoard
1.3	Moments	6	Chalk &Talk	BlackBoard
1.4	Kurtosis.	6	Chalk &Talk	BlackBoard
UNIT-2CORRELATIONANALYSISI				
2.1	SignificanceoftheStudyofCorrelation	3	Chalk &Talk	BlackBoard
2.2	CorrelationandCausation,TypesofCorrelation	4	Chalk &Talk	BlackBoard
2.3	MethodsofstudyingCorrelation	3	Chalk &Talk	BlackBoard
2.4	KarlPearson‟sCoefficientofCorrelation	4	Discussion	BlackBoard
2.5	CoefficientofCorrelationandProbableError.	4	Discussion	BlackBoard
UNIT-3CORRELATIONANALYSISII				
3.1	CoefficientofDetermination	5	Chalk &Talk	BlackBoard
3.2	PropertiesoftheCoefficientofCorrelation	5	Chalk &Talk	BlackBoard
3.3	Rank CorrelationCoefficient	8	Chalk &Talk	BlackBoard

Module No.	Topic	No.ofLectures	TeachingPedagogy	TeachingAids
UNIT-4REGRESSIONANALYSIS				
4.1	UsesofRegressionAnalysis	5	Chalk &Talk	BlackBoard
4.2	CorrelationandRegression Analysis:AComparison–RegressionLines	5	Chalk &Talk	BlackBoard
4.3	EquationsincaseofCorrelationTable	4	Chalk &Talk	BlackBoard
4.4	StandardErrorofEstimate	4	Chalk &Talk	BlackBoard
UNIT-5ASSOCIATIONOFATTRIBUTES				
5.1	DifferencebetweenCorrelationandAssociation	5	Chalk &Talk	BlackBoard
5.2	ConsistencyofData–AssociationandDisassociation	5	Chalk &Talk	BlackBoard
5.3	MethodsofStudyingAssociation	4	Chalk &Talk	BlackBoard
5.4	AssociationofThreeAttributes.	4	Chalk &Talk	BlackBoard

Levels	C1	C2	C3	C4	C5	TotalScholasticMarks	NonScholasticMarks C6	CIA Total	% ofAssessment
	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	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%
NonScholastic	-	-	-	-	-		5	5	12.5%
Total	10	10	5	5	5	35	5	40	100%

CIA	
Scholastic	35
NonScholastic	5
	40

- ✓ **ThelevelsofCIAAssessmentbasedonRevisedBloom'sTaxonomyare:**

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

EVALUATIONPATTERN

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

COURSEOUTCOMES

Onthesuccessfulcompletionofthecourse,studentswillbeableto:

NO.	COURSEOUTCOMES	KNOWLEDGE LEVEL(ACCORDINGTOREVISEDBLOOM'STAXONOMY)	PSOsADDRESSED
CO1	Evaluatesandinterpretsthe natureofskewnessandkurtosis	K2&K4	PSO2
CO2	Identifythedirectionandstrengthofacorrelationbetweentwofactors.	K3	PSO1
CO3	Computeandinterpretthespearmancorrelationcoefficient.	K2&K4	PSO3
CO4	Recognize regression analysis applications for purpose ofdescriptionandprediction	K1,K2&K3	PSO4
CO5	Explainthemethodsof associationofattributes	K2&K4	PSO6

MappingofC0swithPSOs

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

MappingofC0swithPOs

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

Note: ♦StronglyCorrelated–**3** ♦ModeratelyCorrelated–**2**

♦ WeaklyCorrelated-**1**

COURSEDESIGNER:

1. **Dr.P.Vetriselvi**
2. **Mrs.K.Bhuvaneswari**

ForwardedBy

Dr.E.Helena

III B.Sc.
STATISTICS
SEMESTER
V-OLD
For those who joined in 2019 onwards

Skill Development-100%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USST	19ST5CC12	Real Analysis	Lecture	5	4

COURSE DESCRIPTION

This course introduces the basic concepts in analysis and to enable the students understand fundamental ideas and theorems in analysis.

COURSE OBJECTIVES

To enable the students understand the basic concepts of sequences and series, connectedness and compactness and proof techniques.

UNIT –I REAL VALUED FUNCTIONS AND REAL SEQUENCE (15 HRS.)

Real valued functions **- equivalence - countability- real numbers –** (Self Study) – least upper bound- definition of sequence and subsequence – limit of a sequence.

UNIT –II CONVERGENT AND DIVERGENT SEQUENCES (15 HRS.)

Convergent sequences –divergent sequences-bounded sequences- monotone sequences- operations on convergent sequences- operations on divergent sequences- Cauchy sequences

UNIT –III SERIES OF REAL NUMBERS (15 HRS.)

Series- convergence and divergence of series – series with non-negative terms – alternating series- conditional convergence and absolute convergence- test for absolute convergence

UNIT –IV LIMITS AND METRIC SPACES (15 HRS.)

Limit if a function on the real line- metric spaces- limit in metric spaces- functions continuous on a metric space- functions continuous on the real line

UNIT –V CONNECTEDNESS, COMPLETENESS AND COMPACTNESS (15 HRS.)

Open sets- closed sets- more about open sets- connected sets- bounded sets- complete metric spaces- compact metric spaces

TEXT:

Richard R. Goldberg, *Methods of Real Analysis*, Oxford & IBH Publishing co. Pvt. Ltd.

REFERENCES:

S. Arumugam and A. Thangapandi Issac, *Modern Analysis*

Copson, *Metric spaces*, Universal book stall, New Delhi (1989).

Walter Rudin, *Mathematical Analysis*, MC-craw hill international, Third edition

III B.Sc STATISTICS

SEMESTER –V-NEW 15%

For those who joined in 2019 onwards

Skill Development-100%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USST	19ST5CC12	Real Analysis	Lecture	5	4

COURSE DESCRIPTION

This course introduces the basic concepts in analysis and to enable the students understand fundamental ideas and theorems in analysis.

COURSE OBJECTIVES

To enable the students understand the basic concepts of sequences and series, connectedness and compactness and proof techniques.

UNIT –I REAL VALUED FUNCTIONS AND REAL SEQUENCE (15 HRS.)

Real valuedfunctions **- equivalence - countability- real numbers–** (Self Study)– least upper bound- definition of sequence and subsequence – limit of a sequence.

UNIT –IICONVERGENT AND DIVERGENT SEQUENCES (20 HRS.)

Convergent sequences –divergent sequences-bounded sequences-monotone sequences- operations on convergent sequences- operations on divergent sequences- Cauchy sequences

UNIT –III SERIES OF REAL NUMBERS (20 HRS.)

Series- convergence and divergence of series – series with non-negative terms – alternating series- conditional convergence and absolute convergence- test for absolute convergence

UNIT –IV LIMITS AND METRIC SPACES (10 HRS.)

Limit of a function on the real line- metric spaces- limit in metric spaces

UNIT –V CONTINUOUS FUNCTIONS (10 HRS.)

Functions continuous on a metric space- functions continuous on the real line

TEXT:

Richard R. Goldberg, *Methods of Real Analysis*, Oxford & IBH Publishing co. Pvt. Ltd.

REFERENCES:

S. Arumugam and A. Thangapandi Issac, *Modern Analysis*

Copson, *Metric spaces*, Universal book stall, New Delhi (1989).

Walter Rudin, *Mathematical Analysis*, MC-craw hill international, Third edition.

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 REAL VALUED FUNCTIONS AND REAL SEQUENCES				
1.1	Real valued functions	1	Chalk & Talk	Black Board
1.2	Equivalence	1	Discussion	PPT & White board
1.3	Countability, real numbers	2	Discussion	PPT & White board

1.4	Least upper bound	2	Chalk & Talk	Black Board
1.5	Definition of sequence and subsequence	4	Chalk & Talk	Black Board
1.6	Limit of a sequence.	5	Chalk & Talk	Black Board
UNIT -2 CONVERGENT AND DIVERGENT SEQUENCES				
2.1	Convergent sequences	4	Chalk & Talk	Black Board
2.2	Divergent sequences	4	Chalk & Talk	Black Board
2.3	Bounded sequences-monotone sequences	4	Chalk & Talk	Black Board
2.4	Operations on convergent sequences	3	Chalk & Talk	Black Board
2.5	Operations on divergent sequences	3	Chalk & Talk	Black Board
2.6	Cauchy sequences.	2	Chalk & Talk	Black Board
UNIT -3 SERIES OF REAL NUMBERS				
3.1	Convergence and divergence of series	4	Chalk & Talk	Black Board
3.2	Series with non-negative terms	4	Chalk & Talk	Black Board
3.3	Alternating series	4	Chalk & Talk	Black Board
3.4	Conditional convergence and absolute convergence	4	Chalk & Talk	Black Board

3.5	Test for absolute convergence	4	Chalk & Talk	Black Board
UNIT -4 LIMITS AND METRIC SPACES				
4.1	Limit if a function on the real line-metric spaces	5	Chalk & Talk	Black Board
4.2	Limit in metric spaces	5	Chalk & Talk	Black Board
UNIT -5 CONTINUOUS FUNCTIONS				
5.1	Functions continuous on a metric space	5	Chalk & Talk	Black Board
5.2	Functions continuous on the real line.	5	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 Schol astic	-	-	-	-	-		**5**	**5**	12.5 %
Total	**10**	**10**	**5**	**5**	**5**	**35**	**5**	**40**	**100 %**

CIA	
.astic	
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	Describe fundamental ideas and theorems on sequences.	K1	PSO1& PSO2

CO 2	Distinguish convergent and divergent sequences	K2 & K4	PSO2
CO 3	Distinguish convergent and divergent series	K3 & K4	PSO3
CO 4	Explain the concept of limits and metric space and their roles in the real line	K1, K2 & K3	PSO3
CO 5	Organize theorems in a correct mathematical way	K2 & K4	PSO3

Mapping of COs with PSOs

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

Mapping of COs with POs

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

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

COURSE DESIGNER:

Mrs. J. Annaal Mercy

Dr. K. Mano

Forwarded By

Dr. E. Helena

III B.Sc.
STATISTICS
SEMESTER
VI-OLD
For those who joined in 2019 onwards

Skill Development-100%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USST	19ST6CC14	Stochastic Processes	Lecture	5	4

COURSE DESCRIPTION

This course covers Markov chains in discrete time, the Poisson process and the Markov processes in continuous time

COURSE OBJECTIVES

To expose the students to the basics of stochastic process and to clarify Markov chain, Poisson process and pure birth

UNIT –I STOCHASTIC PROCESSES (15 HRS.)

Definition of stochastic process, classification of stochastic process according to time parameter space and state space - examples of stochastic process. Concept of Stationary and independent increment process

UNIT –II MARKOV CHAIN (15 HRS.)

Markov chain – definitions and examples – higher transition probabilities – Chapman – Kolmogorov equations (discrete) - simple problems only.

UNIT –III POISSON PROCESS (15 HRS.)

. **Poisson Process – (**Self Study) – Postulates – Properties – Related distributions – exponential, uniform, geometric and **negative binomial distributions – (**Self Study).

UNIT –IV BIRTH AND DEATH PROCESS (15 HRS.)

Pure Birth Process – Yule-Fury process – Birth and Death Process – Immigration - Emigration processes

UNIT –V TIME SERIES Time Series - **Introduction Moving Average Process – (**Self Study) – Autoregressive Process - Autoregressive Process of Order Two – Autoregressive Moving Average process (ARMA Process

TEXT BOOKS:

J. Medhi, *Stochastic Process*, New age International, edition (2009).

Chapter 1(1.5,) Chapter 2(2.1, 2.2), chapter 3(3.1, 3.2, 3.3.3, 3.4),

Chapter10(10.1, 10.2).

T. Veerarajan, *Probability, Statistics and Random Processes*, Second edition, Tata McGraw-Hill Publishing Company Ltd., New Delhi (2003).

REFERENCE BOOKS:

W. Feller, *Introduction to Probability Theory and its Applications*, Volume I, Wiley Eastern Ltd, New York (1972).

S. Karlin and H.M.Taylor, *A Fist course in Stochastic Processes*, Academic Press, New York (1975).

S.M. Ross, *Stochastic Processes*, John Wiley and Sons, New York (1983).

III B.Sc. STATISTICS

SEMESTER –VI-NEW-15%

For those who joined in 2019 onwards

Skill Development-100%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USST	19ST6CC14	Stochastic Processes	Lecture	5	4

COURSE DESCRIPTION

This course covers Markov chains in discrete time, the Poisson process and the Markov processes in continuous time

COURSE OBJECTIVES

To expose the students to the basics of stochastic process and to clarify Markov chain, Poisson process and pure birth

UNIT –I STOCHASTIC PROCESSES (15 HRS.)

Definition of stochastic process, classification of stochastic process according to time parameter space and state space - examples of stochastic process. Concept of Stationary and independent increment process

UNIT –II MARKOV CHAIN (15 HRS.)

Markov chain – definitions and examples – higher transition probabilities – Chapman – Kolmogorov equations (discrete) - simple problems only.

UNIT – III MARKOV CHAIN CONT. (15 HRS.)

Generalization of independent Bernoulli trails: Sequence of chain – Dependent trails – Correlated random walk – Classification of states and chain – Transient and persistent States

UNIT –IV POISSON PROCESS (15 HRS.)

. **Poisson Process – (**Self Study) – Postulates – Properties – Related distributions – exponential, uniform, geometric and **negative binomial distributions – (**Self Study).

UNIT –V BIRTH AND DEATH PROCESS (15 HRS.)

Pure Birth Process – Yule-Fury process – Birth and Death Process – Immigration - Emigration processes

TEXT BOOKS:

J. Medhi, *Stochastic Process*, New age International, $4^{t}{}_{h}$ edition (2009).

T. Veerarajan, *Probability, Statistics and Random Processes*, Second edition, Tata McGraw-Hill Publishing Company Ltd., New Delhi (2003).

REFERENCE BOOKS:

W. Feller, *Introduction to Probability Theory and its Applications*, Volume I, Wiley Eastern Ltd, New York (1972).

S. Karlin and H.M.Taylor, *A Fist course in Stochastic Processes*, Academic Press, New York (1975).

S.M. Ross, *Stochastic Processes*, John Wiley and Sons, New York (1983).

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 STOCHASTIC PROCESS				
1.1	Definition of stochastic process	3	Lecture	PPT & White board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1.2	Classification of stochastic process according to time parameter space and state space-	4	Chalk & Talk	Black Board
1.3	Examples of stochastic process	4	Chalk & Talk	Black Board
1.4	Concept of Stationary and independent increment process.	4	Chalk & Talk	Black Board
UNIT -2 MARKOV CHAIN				
2.1	Markov chain	3	Chalk & Talk	Black Board
2.2	Higher transition probabilities	4	Chalk & Talk	Black Board
2.3	Chapman – Kolmogorov equations	4	Chalk & Talk	Black Board
2.4	Simple problems	4	Chalk & Talk	Black Board
UNIT -3				
3.1	Generalization of independent Bernoulli trails: Sequence of chain	4	Chalk & Talk	Black Board
3.2	Dependent trails – Correlated random walk–	4	Chalk & Talk	Black Board
3.3	Classification of states and chain	4	Chalk & Talk	Black Board
3.4	Transient and persistent States	3	Chalk & Talk	Black Board
UNIT -4 POISSON PROCESS				
4.1	Poisson Process– Postulates	3	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4.2	Properties – Related distributions	5	Chalk & Talk	Black Board
4.3	Exponential, uniform, geometric and negative binomial distribution	7	Discussion	PPT & White Board
UNIT -5 BIRTH AND DEATH PROCESS				
5.1	Pure Birth Process	3	Discussion	PPT & White Board
5.2	Yule-Fury process	4	Chalk & Talk	Black Board
5.3	Birth and Death Process	4	Chalk & Talk	Black Board
5.4	Immigration - Emigration processes	4	Chalk & Talk	Black Board

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	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	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 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	Explain the concept of stoch processes and stationary appreciate their significance	K1 & K2	PSO1& PSO2
CO 2	Compute probabilities of transition between states and identify classes of states in Markov chains and characterize the classes	K1, K2 & K3	PSO3
CO 3		K1 & K2	PSO5
CO 4	Explain Poisson process and its related distributions	K2 & K4	PSO5 & PSO6
CO 5	Demonstrate the knowledge in Pure and Death process	K1 & K2	PSO5

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	3	3

Mapping of COs with POs

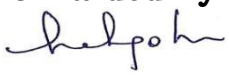
CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	2	1
CO2	2	3	2	2
CO3	2	2	3	3
CO4	2	2	2	3
CO5	3	2	2	2

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

COURSE DESIGNER:

Dr. M. Mano Prabha
Mrs. K. Bhuvaneswari

Forwarded By



II B.Sc. STATISTICS

SEMESTERIII-OLD

For those who joined in 2019 onwards

Employability-100%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
USST	**19ST3SB1**	**PRACTICAL STATSTICS-I**	**Lecture & Practicsl**	**2**	**2**

COURSE DESCRIPTION

The course provides problems related to measure of central tendency, measure of dispersion, and measures of association of attributes.

COURSE OBJECTIVES

To expose the students the analysis of statistical techniques in real life situations.

Problems based on measure of central tendency

Problems based on measure of dispersion..

Problems based on moments, skewness and kurtosis

Computation of Karl Pearson correlation co-efficient.

Correlation coefficient for a bivariate frequency distribution.

Concurrent deviation

Rank correlation.

Regression Equations..

Computation of various measures of associations of attributes.

TEXT:

S.C.Gupta and V.K.Kapoor, *Fundamentalsof Mathematicalstatistics*,SultanChand&Sons,Revisededition(2002).

IIB.Sc.STATISTICS

III SEMESTER NEW

Forthosewhojoinedin2019onwards

Employability-100%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
USST	19ST3SB1	PracticalStatisticsI	Lecture&Practical	2	2

COURSEDESCRIPTION

Thecourseprovidesproblemsrelatedtomeasureofcentraltendency,measureofdispersion,andmeasuresofassociationofattributes.

COURSEOBJECTIVES

Toexposethestudentstheanalysisofstatisticaltechniquesinreallifesituations.

1. Problemsbasedonmeasureofcentraltendency
2. Problemsbasedonmeasureofdispersion..
3. Problemsbased on moments, skewness and kurtosis
4. ComputationofKarlPearsoncorrelationco-efficient.
5. Correlationcoefficientforabivariatefrequencydistribution.
6. Concurrentdeviation
7. Rankcorrelation.
8. RegressionEquations..
9. Computationofvariousmeasuresofassociationsofattributes.

TEXT:

1. S.C.Gupta and V.K.Kapoor, *Fundamentalsof Mathematicalstatistics*,SultanChand&Sons,Revisededition(2002).

Levels	C1	C2	C3	C4	C5	TotalScholasticMarks	NonScholasticMarks C6	CIA Total	% ofAssessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/ PPT 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%
NonScholastic	-	-	-	-	-		5	5	12.5%
Total	10	10	5	5	5	35	5	40	100%

CIA	
Scholastic	35
NonScholastic	5
	40

- **ThelevelsofCIAAssessmentbasedonRevisedBloom'sTaxonomyare:**

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

EVALUATIONPATTERN

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

COURSEOUTCOMES

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

NO.	COURSEOUTCOMES	KNOWLEDGELEVEL(ACCORDINGTOREVISEDBLOOM'STAXONOMY)	PSOs ADDRESSED
CO1	Calculate measure of central tendency.	K1	PSO1&PSO2
CO2	Classify measures of dispersion, skewness and kurtosis.	K1,K2	PSO5 &PSO6
CO3	Computer correlation, regression and measures of association of attributes.	K3,K4	PSO5 &PSO6

Mapping of C0s with PSOs

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

Mapping of C0s with POs

CO/PSO	PO1	PO2	PO3	PO4
CO1				
CO2				
CO3				

Note: ♦StronglyCorrelated–**3** ♦ModeratelyCorrelated–**2**

- WeaklyCorrelated-**1**

COURSEDESIGNER:

1. **Dr.P.Vetriselvi**

D.K.Pon Ovya ForwardedBy