KUNTHAVAI NAACCHIYAAR GOVERNMENT ARTS COLLEGE FOR WOMEN

An Autonomous College Affiliated to Bharathidasan UniversityRe-Accredited by NAAC with 'B' Grade

Thanjavur -613 007, Tamil Nadu, India.

CBCS & OBE

Scheme of Instruction and Syllabus for

B.Sc., Statistics

(I to VI Semester)

Effective from 2022 - 2023 and onwards

PG DEPARTMENT OF STATISTICS

STATISTICS BOARD OF STUDIES MEMBERS

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KUNTHAVAI NAACCHIYAAR GOVT. ARTS COLLEGE FOR WOMEN
(AUTONOMOUS) THANJAVUR – 7

I. VISION

The vision of the department is to equip the statistical system for timely dissemination of adequate, reliable and credible statistics on economic, social and environmental aspects at all the required levels of disaggregation within its decentralized structure so as to enable objective decision making within and outside the Government, stimulate research and promote informed debate on all aspects affecting the life of people.

II. Mission

The mission of the department is to streamline and modernise the statistical system to ensure adequacy, quality, reliability and timeliness of official statistics.

III. PROGRAMME OUTCOME(PO)

After the completion of B.Sc., Statistics CBCS Programme, the students will be able to:

PO	Focus of PO (F)	Program Outcomes
1	Nature and Objectives	Acquire the basic knowledge to continue and completean advanced degree
2	hypothesis, theory and Systems	Prepare for lifelong learning and successful careers usingtheir mathematical and statistical skills
3	Association and interactions	Apply their knowledge to retrieve, analyze andassimilate information
4	Reading and visualization skill	Afford the opportunity to pursue studies in a disciplineother than Statistics
5	Reasoning and relating the problems	Develop oral and written communication skills that allowthem to present the information effectively
6	Observation and abstracting complex issues	Procedural knowledge that creates different types of professionals related to subject area of Statistics, including professionals engaged in government/public service and private sectors

HOD

IV.Programme Stucture

KUNTHAVAI NAACCHIYAAR GOVT. ARTS COLLEGE FOR WOMEN
(AUTONOMOUS) THANJAVUR – 7
POST GRADUATE DEPARTMENT OF STATISTICS
B.Sc., Statistics., Course Structure under CBCS
(For the candidates admitted from the academic year 2022-2023 onwards)

Semester	Part	Code	Subject Code	Title of the Paper	Hrs	Credit	Exam Hrs	Marks		Total
								IA	EA	
I	I	LC 1	22K1T1	செய்யுள்(இக்கால இலக்கியம்), சிறுகதை, இலக்கிய வரலாறு, பயன்முறைத்தமிழ், தமிழ் இலக்கிய வரலாறு	6	3	3	25	75	100
	II	ELC 1	22K1E1	English for Effective Communication-I	6	3	3	25	75	100
	III	CC 1	22K1S01	Descriptive Statistics	6	6	3	25	75	100
		CC 2(P)		Practical - I (Descriptive Statistics)	3	-	-	-	-	-
		AC 1	22K1SAS1	Statistics and Mathematics – I	4	4	3	25	75	100
		AC 2(P)		Statistics and Mathematics – II (Practical)	3	-	-	-	-	-
	IV	VE	22K1VE	Value Education	2	2	3	25	75	100
				TOTAL	**30**	**18**				**500**
II	I	LC 2	22K2T2	செய்யுள்(இடைக்கால இலக்கியம்),புதினம், தமிழில் தொடர் இலக்கணம், தமிழ் இலக்கிய வரலாறு	6	3	3	25	75	100
	II	ELC 2	22K2E2	English for Effective Communication-II	6	3	3	25	75	100
	III	CC 2(P)	22K2S02P	Practical-I(Descriptive Statistics)	(3)+ 3	3	3	40	60	100
		CC 3	22K2S03	Probability Theory and Random Variables	6	6	3	25	75	100
		AC 2(P)	22K2SAS2P	Statistics and Mathematics – II	2	3	3	40	60	100
		AC 3	22K2SAS3	Statistics and Mathematics – III	5	2	3	25	75	100
	IV	ES	22K2ES	Environmental Studies	2	2	3	25	75	100
				TOTAL	**30**	**22**				**700**
III	I	LC 3	22K3T3	செய்யுள்(காப்பியங்கள்), உரைநடை, அலுவல் முறை மடல்கள், இலக்கிய வரலாறு	6	3	3	25	75	100
	II	ELC 3	22K3E3	English for Effective Communication-III	6	3	3	25	75	100
	III	CC 4	22K3S04	Discrete Distributions	6	6	3	25	75	100
		CC 5 (P)		Practical II (Bivariate Random Variables & Fitting)	2	-	-	-	-	-
		AC 4	22K3SAS4	Operations Research – I	5	4	3	25	75	100
	IV	A C 5(P)		Operations Research – II	3	-	-	-	-	-
		NME 1	22K3SELO1	Statistical Methods	2	2	3	25	75	100
		ECC 1	22K3ECCS1:1	Competitive Exam Skills (Contents in Tamil)	-	3*	3	-	-	100
			22K3ECCS1:2	MOOC(Value Added Course)						
		ECC 2	22K3ECCS2	Computational Statistics (Add on Course)	-	4*	-	-	-	-
				TOTAL	**30**	**18**				**500**

IV	I	LC 4	22K4T4	செய்யுள்(பண்டைய இலக்கியம்), நாடகம் பொதுக்கட்டுரை, தமிழ் இலக்கிய வரலாறு	6	3	3	25	75	100
	II	ELC 4	22K4E4	English for Effective Communication-IV	6	3	3	25	75	100
	III	CC 5(P)	22K4S05P	Practical II (Bivariate Random Variables & Fitting)	(2)+ 3	3	3	40	60	100
		CC 6	22K4S06	Continuous Distributions	5	5	3	25	75	100
		AC 5 (P)	22K4SAS5P	Operations Research - II	2	3	3	40	60	100
		AC 6	22K4SAS6	Operations Research – III	4	2	3	25	75	100
	IV	NME 2	22K4SELO2	Bio- Statistics	2	2	3	25	75	100
		SBEC 1	22K4SBEC1	Life Skills	2	2	3	25	75	100
		ECC3	22K4ECCS3:1	Quantitative Aptitude	-	3*	3	-	-	100
			22K4ECCS3:2	MOOC(Value Added Course)						
				TOTAL	**30**	**23**				**800**
V	III	CC 7	22K5S07	Statistical Inference – I	5	5	3	25	75	100
		CC 8	22K5S08	Sampling Techniques	5	5	3	25	75	100
		CC 9	22K5S09	Design of Experiments	6	5	3	25	75	100
		CC10(P)	22K5S10P	Practical - III, (Sampling & Design)	5	3	3	40	60	100
		MBE 1	22K5SELS1:1	Simulation and Inventory Control	5	5	3	25	75	100
			22K5SELS1:2	Fuzzy set Theory						
	IV	SBE C2	22K5SBEC2:1	Statistical Survey Analysis	2	2	3	25	75	100
			22K5SBEC2:2	Demographic Methods						
		SBEC3	22K5SBEC3:1	External Internship	-	2	-	50	50	100
			22K5SBEC3:2	Internal Internship						
			22K5SBEC3:3	Field work						
		SSD	22K5SSD	Soft Skills Development	2	2	3	25	75	100
				TOTAL	**30**	**29**				**800**
VI	III	CC 11	22K6S11	Statistical inference II	7	6	3	25	75	100
		CC 12	22K6S12	Numerical Analysis	6	6	3	25	75	100
		CC 13(P)	22K6S13P	Practical - IV(Inference II & Numerical)	6	6	3	40	60	100
		MBE 2	22K6SELS2:1	Statistical Quality Control	5	5	3	25	75	100
			22K6SELS2:2	Bayesian Inference						
		MBE 3	22K6SELS3:1	Programming in 'C'	5	5	3	25	75	100
			22K6SELS3:2	Stochastic Processes						
	V	GS	22K6GS	பாலினக்கல்வி (Gender Studies)	1	1	3	25	75	100
		Extn. Act.	22K6EA	Extension and Extra Curricular Activities	-	1	-	-	-	-
				TOTAL	**30**	**30**				**600**
				GRAND TOTAL	**180**	**140**				**3900**

ECC - Extra Credit Course1,2,3 : Total credits 10

V.Electives

B.Sc., Statistics - List of Elective Courses 2022-2023

Semester V	**Major Based Elective I**	**Code**	*Semester IV*	**Skill Based Elective I**	**Code**
MBE1:1	Simulation and Inventory Control	22K5SELS1	SBEC 1	Life Skills – Universal Human	22K4SBEC1
MBE1:2	Fuzzy set Theory	22K5SELS1	*Semester V*	**Skill Based Elective II**	
Semester VI	**Major Based Elective II**		SBEC 2:1	Statistical Survey Analysis	22K5SBEC2
MBE2:1	Statistical Quality Control	22K6SELS2	SBEC 2:1	Demographic Methods	22K5SBEC2
MBE2:2	Bayesian Inference	22K6SELS2	*Semester V*	**Skill Based Elective III**	
Semester VI	**Major Based Elective III**		SBEC 3:1	Internship – External	22K5SBEC3
MBE3:1	Programming in 'C'	22K6SELS3	SBEC 3:2	Internship – Internal	22K5SBEC3
MBE3:2	Stochastic Processes		SBEC 3:3	Field Work	22K5SBEC3

Non Major Elective - Semester III

Sl.NO	Course Title	Code	Department
1	பணித்தேர்வுத்தமிழ்	22K3TEL01	Tamil
2	ENGLISH FOR ENHANCED COMPETENCE – I	22K3ENEL01	English
3	History of freedom movement	22K3HIEL01	History
4	BASICS OF INDIAN ECONOMY	22K3ECEL01	Economics
5	Operations Research-I	22K3MEL01	Mathematics
6	Laser Physics	22K3PEL01	Physics
7	Agro chemistry	22K3CHEL01	Chemistry
8	Mushroom Technology	22K3BELO1	Botany
9	Poultry science	22K3ZEL01	Zoology
10	Geography for Competitive Examinations I	22K3GEL01	Geography
11	Statistical Methods	22K3SEL01	Statistics
12	Introduction to IT	22K3CSEL01	Computer Science
13	Basics of Insurance	22K3COEL01	Commerce
14	Introduction to Principles of Management	22K3BBEL01	Bussiness Administration

Non Major Elective - Semester IV

Sl.NO	Course Title	Code	Department
1	இணையமும்தமிழும்	22K4TEL02	Tamil
2	ENGLISH FOR ENHANCED COMPETENCE - II	22K4ENEL02	English
3	Panchayatraj with special reference to Tamilnadu	22K4HIEL02	History
4	ECONOMICS FOR COMPETITIVE EXAMINATION	22K4ECEL02	Economics
5	Operations Research- II	22K4MEL02	Mathematics
6	Solar Energy	22K4PEL02	Physics
7	Hydro Chemistry	22K4CHEL02	Chemistry
8	Horticultural practices and Gardening.	22K4BEL02	Botany
9	Vermiculture	22K4ZEL02	Zoology
10	Geography for Competive Examinations II	22K3GEL02	Geography
11	Bio- Statistics	22K4SEL02	Statistics
12	Fundamentals of Web designing	22K4CSEL02	Computer Science
13	General Commercial Knowledge	22K3COEL02	Commerce
14	Introduction to organisational behaviourcode	22K4BBEL02	Bussiness Administration

VI. Details on the number of courses and credits – UG Programmes

Course	Course Title	No. of Courses	Instruction Hour	Credit
Part I	Tamil	4	24	12
Part II	English	4	24	12
Part III	Core Course (Theory & Practical)	13 (9+4)	71	65
AC	Allied Course (Theory & Practical)	6 (4+2)	28	18
MBE	Major Based Elective	3	15	15
Part IV	Skill Based Elective	3	4	6
	Soft Skill Development	1	2	2
	Non Major Elective Course (NME)	2	4	4
	Environmental Studies	1	2	2
	Value Education	1	2	2
Part V	Extension Activities	-	-	1
	Gender Studies	1	1	1
	Total	**39**	**180**	**140**

VII. SEMESTER – WISE COURSE STRUCTURE

Semester	Course	Core Course	Total Papers	Ins. Hr/ week	Credit
I	LC1, ELC1, AC1, VE	CC1.	5	30	18
II	LC2, ELC2, AC2(P), AC3, ES	CC2(P), CC3.	7	30	22
III	LC3, ELC3, AC4,NME-1.	CC4,	5	30	18
IV	LC4, ELC4,AC5(P),AC6,SBEC1,NME 2	C5(P), CC6.	8	30	23
V	MBE 1, SBEC2,SBEC3,SSD.	CC7,CC8, CC9,C10(P)	8	30	29
VI	MBE 2,MBE 3, GS -1	CC11, CC12, C13(P)	6	30	30
TOTAL	**LC-4, ELC-4, AC-4,AC(P)-2, NME-2, MBE-3,SBE-3, EVS-1,VE-1,GS-1.**	**CC-9 CCP-4**	**39**	**180**	**140**

Extension activity- No hours, No Exam, Credit -1.

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM I	CC1	DESCRIPTIVE STATISTICS	22K1S01	Inst.Hrs:6	Credit: 6

Course objectives:

1. The course aims to introduce the basic concepts in statistics.
2. Learning the preliminary tools and concepts (diagrams and graphs)
3. To make the students aware of different type of data sets .
4. To solve graphical representations introducing of descriptive statistical measures, including those for two variables.

Course Outcomes:

Cos	Statements
CO 1	Describe the basic concepts in sample surveys and data. Knowledge of Statistics scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc.
CO2	Determine the various Statistical organizations in India and their functions for societal developments.
CO3	Estimate the various types of data, their organisation and evaluation of summary measures such as measures of central tendency and dispersion etc.
CO4	Describe the relationship and the direction of association between two variables. Develop the acquired knowledge to find relationship between More than two variables.
CO5	Analyse the data reflecting quality characteristics including concepts of independence and association between two attributes.

Unit – I: STATISTICS AND PRESENTATION OF DATA

Statistics – Definition – functions, scope and limitations of statistics – Primary and Secondary data – Methods of collecting Primary data and sources of secondary data, Classification – Definition – Objectives and Types of Classification Tabulation – Steps in tabulation and types of tables. Diagrams – Uses of diagrams – Types of diagrams – Bar diagrams – Simple, Component, Multiple and Percentage bar diagrams, Pie diagram, Graphs – Uses – Types of graphs – Histogram, frequency polygon, frequency curve and ogives.

Text Book ***Chapter 2 (Sec: 2.1-2.2)*** **Text Book** ***Chapter 1 (Sec: 1.1 - 1.4)***

Unit – II: MEASURES OF CENTRAL TENDENCY

Measures of Central tendency – Definition and Properties – Types of measures of Central tendency – Arithmetic mean, Median, Quartiles, Deciles, Percentiles, Mode, Geometric mean, Harmonic mean. **Text Book** ***Chapter 2 (Sec: 2.4-2.9),***

Unit – III: MEASURES OF DISPERSION

Measures of Dispersion – Range, Quartile deviation, Mean deviation and Standard deviation and co-efficient of variation. Skewness and Kurtosis – Definition, Types and measures of skewness and Kurtosis – Simple problems.

Text Book ***Chapter 3 (Sec:2.16,2.17)***

Unit – IV : CORRELATION ANALYSIS AND REGRESSION ANALYSIS

Correlation Analysis – Definition, types of correlation and properties of correlation. Methods of measuring correlation – Karl Pearson's Method, Concurrent deviation method and Spearman's Rank Correlation. Regression – Definition – Properties of Regression co-efficients, Regression equations and Regression co-efficients – Simple problems.

Text Book ***Chapter 10 (Sec: 10.1-10.7), Chapter 11 (Sec:11.1-11.4)***

Unit – V: ASSOCIATION OF ATTRIBUTES

Association of attributes – Class frequencies, order of frequencies – contingency table – finding missing frequencies – Yule's co-efficient of Association.

Text Book ***Chapter 15 (Sec: 15.6-15.6.4).***

Unit – VI : APPLICATIONS

Prepare the assignment for measures of central tendency problem. Contacted the quiz's program for Correlation, Regression and Association of Attributes.

Text Book

1. S.C.Gupta and V.K.Kapoor - Fundamentals of Mathematical Statistics, sultan and sons.

References Book

2. S.P.Gupta – Statistical Methods, sultan and sons. (Revised Edition 2001)

CO-PO Mapping for Descriptive Statistics

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	-	-	2	-
CO2	-	-	1	-	-	1
CO3	-	-	2	-	-	2
CO4	-	-	2	-	-	1
CO5	-	2	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM I	AC1	STATISTICS AND MATHEMATICS - I	22K1SAS1	Inst.Hrs:4	Credit: 4

Course objectives:

1. To develop the students ability to deal with numerical and quantitative issues in mathematics.
2. To enable the use of statistical and algebraic techniques wherever relevant.
3. To have a proper understanding of Statistical applications in mathematics.

Course outcomes:

Cos	Statements
CO 1	Describe and discuss the key terminology, concepts tools and techniques used in statistical analysis. Explore the principles and theory of probability sampling.
CO2	Understanding the methods of vital statistics.
CO3	Applying the methods of Matrix and used in mathematics concept.
CO4	Understanding the algebra methods.
CO5	Use appropriate method of matrix.

Unit – I : INDEX NUMBERS & TESTS FOR ADEQUACY

Index numbers – Definition, uses Problems in the constructions of index numbers. Methods of index numbers – simple aggregate index. Weighted index numbers – Laspeyre's, Paasche's and Fisher's index numbers. Time reversal and factor reversal tests. Cost of living index numbers – methods of construction (family budget method and aggregate expenditure method).

Text Book 3. *Chapter 3 (Sec: 3.1, 3.3:3.3.1-3.3.3) Chapter 3 (Sec:3.3.4,3.4,3.4.1-3.4.4, 3.5, 3.5.2-3.5.3, 3.6)*

Unit – II : VITAL STATISTICS

Vital statistics – Definition – Methods Fertility – crude birth rate, specific birth rate, general birth rate, total fertility rate, gross reproduction rate and Net reproduction rate – problems. Mortality – crude death rate, SDR life table – uses – problems.

Text Book 3: (Sec: 9.1-9.8)

Unit – III :EIGEN VALUES AND EIGEN VECTORS

Eigen values and Eigen vectors – power of matrix, Inverse of matrix – Cayley Hamilton – theorem (without proof) – simple problems.

Text Book 1: (Sec: 2.51-2.80).

Unit – IV :ALGEBRA

Algebra – Binomial theorem – Expansion of rational fractions, summation of the series, approximation. Exponential series – expansion – summation of the series, logarithmic series – summation of the series– simple problems.

Text Book 1: Chapter(1.1-1.87)

Unit – V :MATRICES

Matrices – Definition, Types of Matrices – Operations on matrices, Hamilton matrix, Orthogonal matrix, Rank of matrix. System of linear equations – Consistency – non-homogeneous linear equations, homogeneous linear equations, simple problems.

Text Book 1: Chapter(2.1-2.80)

Unit – VI :APPLICATIONS

To learn how to collect the samples. Prepare the assignment for Matrix problems.

Text Books

1.S.C.Gupta and V.K.Kapoor – Fundamentals of Mathematical Statistics, sultan and sons.

2.A.Singaravelu – Allied Mathematics – (paper II) (1998)

3.S.P. Gupa – Statistical Methods (Revised Edition 2001)

4.S.P. Gupta – Fundamental of Applied Statistics.

CO-PO Mapping for Statistics and Mathematics - I

	POs					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	-	3	-	-	2
CO2	-	-	1	-	2	-
CO3	-	-	2	-	5	-
CO4	-	-	2	-	-	2
CO5	2	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

SEM I	VE	VALUE EDUCATION	22K1VE	Ins.Hrs.2	Credit:2

CO	STATEMENT	
	After successful completion of the course, the students will be able to	
1	Know the value education by various religions.	K1
2	Learn and practice social value and responsibilities.	K2
3	Understand and start applying the essential steps to become good leaders.	K2
4	Analyse the personal value, mind culture value personal health.	K4
5	Collecting news details about value education and to encourage writing skills highlight moral value.	K6
K1 – Remember; **K2** - Understand; **K3** – Apply; **K4** – Analyse; **K5** – Evaluate; **K6** – Create		

UNIT - I

1. Introduction: Definition of Value Education – Need for Value Education – Teachings of values by various religions like Hinduism, Buddhism, Christianity, Jainism, Islam etc.

UNIT - II

2 **Living & Social Values**

2.1 Living Values: Peace, respect, co-operation, freedom, happiness, honesty, humility, love, responsibility, simplicity, tolerance, optimism and positive thinking

2.2 Social values: Love and Compassion, Sharing and Generosity, Politeness and Courtesy, Gratitude, Duty and Responsibilities towards Society, Tolerance and Unity.

UNIT - III

3.1 **Role of Visionaries and Leaders in Social Reforms**: Rajaram Mohan Roy, Mahatma Gandhi, Swami Vivekananda, EVR Periyar, Mother Therasa.

3.2 **Value Crisis**: Religious Fundamentalism and Terrorism – Corruption in Society– commerce without Ethics – Education without Character – Wealth without efforts

3.3 Time Management

UNIT - IV

4. **Yoga**: Teaching yoga – Manavalakkalai- by Qualified Yoga Teachers – The aim is to acquire Physical Health – Mental Acuteness- Strength of Life Forces and Wisdom – to achieve a holistic way of life- to take up and get involved in Social Welfare Activities – to learn their commitment to society.

UNIT - V

5.1 **Human Rights** : Child Labour – Womens Rights – Bonded Labour – Problems of Refuges.

5.2 **Role of State Public service Commission:**Constitution provisions and formation-methods of recruitment – rules and notification , syllabi for different exams – written and oral – placement.

Teaching Learning Process

1. Conventional chalk and board teaching.
2. Class interaction and discussions.
3. Power point presentations for important topics.

References

1. Radhakrinshnaan, "Religion and Culture"(1968), Orient paperbacks, New delhi.
2. Das,M.S.&Guptha,V.K.(1995),"Social Values among Youth Adults: A Changing Scenario", New Delhi.
3. Venkataiah. M(ed.), (1998), "value Education New Delhi, A PH Publishing Corporation.

SEM I	VE	விழுமக் கல்வி	22K1VE	Ins.Hrs.2	Credit:2

அலகு - I

1.1 **முகவுரை** : விழுமக்கல்வி என்பதன் வரையறை – விழுமக் கல்வியின் அவசியம் - பல்வேறு சமயங்களில் கல்வியின் மதிப்பு பற்றிய போதனைகள் - இந்து சமயக்கல்வி, புத்த சமயக்கல்வி, கிறிஸ்தவ சமயக்கல்வி, ஜைனமத நன்னெறிகள், இஸ்லாமிய சமயக்கல்வி.

அலகு – II

2 **வாழ்க்கை மற்றும் சமூக நெறிமுறைகள்**

2.1 **வாழ்க்கை நெறிமுறைகள்** : அமைதி, மதிப்பு, ஒற்றுமை, சுதந்திரம், மகிழ்ச்சி, நேர்மை, தாழ்மை, அன்பு, பொறுப்பு, எளிமை, சகிப்புத்தன்மை, நம்பிக்கை தளராதிருத்தல் மற்றும் நேர்மறை எண்ணங்கள்.

2.2 **சமூக நெறிமுறைகள்** : அன்பு மற்றும் இரக்கம், பகிர்தல் மற்றும் உதாரகுணம், பணிவு மற்றும் மரியாதை, நன்றி மனநிலை, கடமை மற்றும் பொறுப்பு, சகிப்புத்தன்மை மற்றும் ஒற்றுமை.

அலகு – III

3.1 தொலைநோக்கு சிந்தனையாளர்களின் சமுதாய சீர்திருத்தங்கள் ராஜாராம் மோகன் ராய், மகாத்மா காந்தி, சுவாமி விவேகனந்தா, ஈ.வே.இரா பெரியார், அன்னை தெரசா.

3.2 **விழுமச் சீரழிவு** : சமயசார்பு நம்பிக்கை மற்றும் பயங்கரவாதம் சமுதாயத்தில் ஊழல் - நீதியில்லாத வணிகம் - நல்லொழுக்கமில்லாத கல்வி – உழைப்பில்லாத செல்வம்.

3.3 நேரத்தை நிர்வகித்தல்.

அலகு – IV

4.1 **யோகா** : யோகா கற்பித்தல் - மனவளக்கலை – தகுதி வாய்ந்த யோகா ஆசிரியர்கள் - உடல் ஆரோக்கியம் மேம்படுவதற்கான நோக்கம் - மனத்திடம் - வாழ்க்கையின் வலிமை மற்றும் ஞானம் - வாழ்க்கையின் முழுமையை அடைய வழி – சமூக நல ரீதியான செயல்பாடுகளில் தேர்தெடுத்தல் மற்றும் ஈடுபடுதல்.

அலகு - V

5.1 மனித உரிமைகள் : குழந்தை தொழிலாளர் - பெண்கள் உரிமைகள் - ஒப்படைத்த தொழிலாளர் - அகதிகளின் பிரச்சனைகள்.

5.2 மாநில அரசு பணியாளர் தேர்வாணையத்தின் பங்கு : அரசியலமைப்பு ஒதுக்கீடுகள் மற்றும் உருவாக்கம் - பணியமர்த்துதங்களின் முறைகள் - விதிகள் மற்றும் அறிவிப்புகள், வெவ்வேறு தேர்வுக்களுக்கான பாடத்திட்டம் - எழுத்து மற்றும் வாய்வழி – வேலைவாய்ப்பு.

CO – PO Mapping :

Value Education **Code : 22K1VE**

CO/PO	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										

1 – Low, 2 – Moderate, 3 – High correlation

21.3.2022

HOD of Chemistry,
Kunthavai Naachiyaar Government
Arts College for Women (Autonomous),
THANJAVUR - 613 007, TN.

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM II	CC2(P)	PRACTICAL – I (DESCRIPTIVE STATISTICS)	22K2S02P	Inst.Hrs:6(3+3)	Credit: 3

Course objectives:

To provide students with demonstrate their understanding of descriptive statistical data.

Course outcomes:

Cos	Statements
CO 1	Understanding the frequency table. Draw the diagram and graph based on the data.
CO2	Analyse the central tendency of the data.
CO3	Analyzing the central dispersion of the data.
CO4	Describe the differences between variables.
CO5	Generate the regression equations

Unit – I :CONSTRUCTION OF UNIVARIATE AND BIVARIATE FREQUENCY

Construction of Univariate and Bivariate frequency tables. Diagrams – Bar Diagrams and Pie Diagrams. Graphs – Histogram, Frequency Polygon, Frequency curves and Ogives.

Text Book 1: ***Chapter 2 (Sec: 2.2-2.3)***

Unit – II :COMPUTATION OF MEASURES OF CENTRAL TENDENCY ,

Computation of Arithmetic Mean, Median, Quartiles, Deciles, Percentiles, Mode, Geometric mean and Harmonic mean.

Text Book1: ***Chapter 2 (Sec: 2.4-2.9)***

Unit – III :COMPUTATION OF MEASURES OF DISPERSION

Computation of Dispersion – Quartile Deviation, Mean deviation, Standard deviation and co-efficient of variation.

Text Book 1: ***Chapter 2 (Sec: 2.12-2.14),***

Unit – IV :COMPUTATION OF KARL PEARSON'S CO-EFFICIENT OF SKEWNESS AND BOWLEY'S

Computation of Karl Pearson's co-efficient of Skewness and Bowley's co-efficient of skewness, kurtosis.

Text Book1 :*Chapter 3 (Sec:2.16)*

Unit – V: COMPUTATION OF CORRELATION, REGRESSION EQUATIONS

Computation of Karl Pearson's co-efficient of Correlation, Concurrent deviation method and Spearman's Rank Correlation. Computation of Regression equations. Testing consistency of data and computation of Yule's co-efficient of Association.

Text Book1 :*Chapter 1(Sec: 2.3-2.9), Chapter 3 (Sec:3.1- 3.9, 3.13, 3.14)*
Chapter 10 (Sec: 10.1-10.7), Chapter 11 (Sec:11.1-11.4)

Unit – VI :APPLICATIONS

Draw the diagram and graph based on the data. Calculate the central tendency dispersion of the data.

Kunthavai Naacchiyaar Govt. Arts College (W)Autonomous, Thanjavur

SEM II	CC3	PROBABILITY THEORY AND RANDOM VARIABLES	22K2SO3	Inst.Hrs:6	Credit: 6

Course objectives

1. To learn adapt to the distributions in the various fields (especially chance factors in all disciplines)
2. To introduce the notion of probability, random variable and expectation, based on which statistical theory and tools have been developed.

Course outcomes:

Cos	Statements
CO 1	Identify the type of statistical situation to which different distributions can be applied.
CO2	Evaluate and apply moments, characteristic functions and random phenomenon
CO3	Use different distributions to solve simple practical problems
CO4	Ability to distinguish between random and non-random experiments
CO5	Discrete distributions expose the real-life applications.

Unit – I :PROBABILITY

Random experiment, sample space, Types of events – Definition classical approach to probability – Mathematical and Statistical definition, axiomatic approach to probability. Addition Theorem & Multiplication theorem on probability, conditional probability, Baye's theorem and Boole's inequality with proof – simple problems.
Text Book1: ***Chapter 3 (Sec: 3.8 – 3.9).***

Unit – II : RANDOM VARIABLE

Random variable – Definition – Discrete random variable – probability mass function – Distribution function – properties – simple problems. **Text Book1:** ***Chapter 5 (Sec: 5.1-5.3).***

Unit – III : CONTINUOUS RANDOM VARIABLE

Continuous random variable – Definition – Distribution function of continuous random variable – properties – probability density function – simple problems.
Text Book1: ***Chapter 5(Sec: 5.4).***

Unit – IV: MATHEMATICAL EXPECTATION

Mathematical Expectation – Definition – properties of Expectation, Addition and Multiplication Theorems, variance, covariance, and its properties – Simple problems.
Text Book1*Chapter 6(Sec: 6.1-6.4, 6.6)*

Unit – V : BIVARIATE PROBABILITYP DISTRIBUTION

Bivariate probability distribution – joint probability mass function and joint probability density function, joint probability distribution function, marginal probability density functions, conditional probability density functions, conditional Expectation, conditional variance, stochastic independence – Definition and simple problems.
Text Book1: ***(Sec:6.9).***

Unit – VI :APPLICATIONS

Describe the axiomatic formulation of modern probability theory and random variables. Illustrate real-world problems into probability models.

Text Books

1. **S.C. Gupta and V.K. Kapoor** - Fundamentals of Mathematical Statistics, sultan and sons.
2. **Rohatgi.V.K.** – An Introduction to probability Theory and Mathematical Statistics, latest Edition
3. **S.C. Gupta and V.K. Kapoor** – Fundamentals of Mathematical Statistics, latest Edition .

CO-PO Mapping for Probability Theory and Random Variables

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	-	1	-	-	-
CO2	-	-	2	-	-	2
CO3	-	-	2	-	-	1
CO4	-	-	2	-	2	-
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W)Autonomous, Thanjavur

SEM II	AC2(P)	STATISTICS AND MATHEMATICS - II	22K2SAS2P	Inst.Hrs:5(3+2)	Credit: 3

Course objectives:

1. To develop the students ability to deal with numerical and quantitative issues in mathematics
2. To enable the use of Statistical decision theory, Differentiation wherever relevant.
3. To have a proper understanding of Statistical applications in mathematics

Course outcomes:

Cos	Statements
CO 1	Describe and discuss the key terminology, concepts tools and techniques used in statistical analysis
CO2	Derive the Statistical decision theory use these techniques to generate data from various distributions.
CO3	Derive the Differentiation, differentiation of implicit function
CO4	Derive the Partial derivatives.
CO5	Derive the Complex numbers techniques used in statistical analysis.

1. Index numbers Poblems
2. Time series problems
3. Vital statistics problems
4. Eigen values and Eigen vectors
5. Inverse of matrix problems
6. Matrices , Rank of matrix problems

Text Books

1. Dr.S. Arumugam and A. Thangapandi Issac – Calculas Volume 1. (Differentiation and Applications) (1999)
2. Calculus Vol-I, S.Narayanan, T.K.Manicavachagom Pillay.(2010)
3. A. Singaravelu – Allied Mathematics – I (2002)
4. A. Singaravelu – Allied Mathematics (Paper II), (1998)
5. S.P.Gupta – StatisticalMethods (Revised Edition 2001)

CO-PO Mapping for Statistics and Mathematics - II

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2	-	1	-	-	-
CO2	-	-	2	-	-	2
CO3	-	-	2	-	-	1
CO4	-	-	2	-	2	-
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W)Autonomous, Thanjavur

SEM II	AC3	STATISTICS AND MATHEMATICS - III	22K2SAS3	Inst.Hrs:5	Credit: 2

Course objectives:

1. To develop the students ability to deal with numerical and quantitative issues in mathematics
2. To enable the use of Analysis of Time series, Business forecasting wherever relevant.
3. To have a proper understanding of Statistical applications in mathematics.

Course outcomes:

Cos	Statements
CO 1	Describe and discuss the key terminology, concepts tools and techniques used in statistical analysis
CO2	Derive the Analysis of Time series, Business forecasting use these techniques to generate data from various distributions.
CO3	Derive the Integration and Trigonometric Substitution
CO4	Derive the Integration of Rational algebraic function techniques used in statistical analysis
CO5	Evaluate the Reduction formula.

Unit – I :SAMPLING TECHNIQUES, ANALYSIS OF TIME SERIES

Census method – sampling method, Non – probability sampling – Judgement sampling, Quota sampling – advantages and disadvantages, probability sampling – Simple random sampling, stratified random sampling, systematic sampling – sampling errors. Analysis of Time series – uses, components of time series, measurements of trend – Free hand method, Semi – average method moving Average method and Method of least squares – Problems.

Text Book:1 Chapeter:7(Sec: 7.1-7.11)

Unit – II: DIFFERENTIATION, DIFFERENTIATION OF IMPLICIT FUNCTION

Differentiation – Definition, formulae, simple problems, Inverse function, Differentiation by transformation, differentiation of implicit function, higher derivatives, simple problems.
Text Book:2 (67, 90 – 109, 117 – 137, 202 – 203. 165 – 180)Text Book:2 (2.17 – 2.47).

Unit – III :INTEGRATION TRIGONOMETRIC SUBSTITUTION

Integration – Definition. Important results (simple problems). Integration by the method of substitution (9 important formulas). Trigonometric Substitution- simple problems.
Text Book:3 Chapeter:7(3.39 – 3.47, 3.86 – 3.103)

Unit – IV :INTEGRATION OF RATIONAL ALGEBRAIC FUNCTION

Integration of Rational algebraic function. Type I - $\int P(x)/Q(x)$ - problems. Integration by the method of partial fractions- Simple problems. Type II – partial fractions. Type III - $\int \frac{dx}{ax + bx + c}$ and simple problems. **Text Book:1** 440 – 458

Unit V : REDUCTION FORMULA

Reduction formula for $\int \sin^n x dx, \int \cos^n x dx, \int \sin^m x \cos^n x dx, \int \tan^n x dx$ - simple problems. **Text Book:4 Chapeter3 (Sec:3.86)** .

Unit – VI : APPLICATIONS

Derive the Analysis of Time series, the Integration and Trigonometric Substitution, Integration of Rational algebraic function techniques used in statistical analysis

Text Books

1. S.C. Gupta and V.K. Kapoor - Fundamentals of Applied Statistics, sultan and sons
2. Dr.S. Arumugam and A. Thangapandi Issac – Calculas Volume 1. (Differentiation and Applications)
3. Calculus Vol-II, S.Narayanan, T.K.Manicavachagom Pillay(2010).
4. A. Singaravelu – Allied Mathematics – I (2002).
5. S.P.Gupta – StatisticalMethods (Revised Edition 2001).

CO-PO Mapping for Statistics and Mathematics - III

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	1	-	-	-
CO2	-	-	2	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	-	-	2	1
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

SEM II	ES	ENVIRONMENTAL STUDIES	22K2ES	Inst. Hrs 2	Credit 2

CO	STATEMENT
1	To learn the concept and importance of Environmental Studies.
2	To create awareness about the essentials of the preservation of Natural Resources.
3	To explore India as a Land of Mega Bio-Diversity.
4	To study various Environmental Pollutions and to create awareness on reducing the Pollutions.
5	To understand the close connection between Pollution and Environment.

UNIT I

Definition, Scope and Importance – Need for Public Awareness.

UNIT II

Natural Resources – Forest Resources – Water Resources – Mineral Resources – Food Resources – Energy Resources – Land Resources.

UNIT III

Eco Systems remaining – Forest Eco system – Grassland Eco system – Desert Eco system – Aquatic Eco system – Bio Geographical classifications of India – Hot-spots of Bio Diversity.

UNIT IV

Environmental Pollution – Air Pollution – Creating Awareness on reducing the usage of Fireworks – Water Pollution – Soil Pollution – Noise Pollution – Thermal Pollution – Nuclear Hazards – Pollution case studies.

UNIT V

Human Population and Environment – Population Explosion – Family Welfare Programme – Environment and Human Health – Human Rights – HIV / AIDS – Women and Child Welfare.

UNIT VI

Multidisciplinary Nature of Environment – Mental Studies – Essentials of the Preservation of Natural Resources – Endangered Species of India – India as a Mega Biodiversity Nation.

Text Book:

[1] K Kumaraswamy, A Alagappa Moses, M Vasanthy, "Environmental Studies", Bharathidasan University, Trichy – 620 024.
[2] P Chandrasekaran, "சுற்றுச்சூழல் பயில்வுகள்", U.G.C Core Module Course in Environmental Studies, T k Publication, Pudukkottai.
[3] N Arumugam, "Survey of the Environmental Studies".
[4] V Kumaresan, "Plan Ecology and Phytogeography".
[5] D Dharmaraj, "Environmental Science".

References:

[1] N Arumugam, "Environmental Studies".
[2] B Chandrasekaran, "Environmental Studies".
[3] Purohit, "A Text Book of Environmental Sciences".
[4] M P Mishara, "Our Environmental Pollution Control and Future Strategies".

Dhanathanam
1/3/22.
HOD – History.

SEM II	ES	சுற்றுச் சூழல் கல்வி	22K2ES	Inst. Hrs 2	Credit 2

அலகு I

சுற்றுச்சூழல் கல்வி – விளக்கம் – நோக்கம் மற்றும் முக்கியத்துவம் – சுற்றுச்சூழல் பற்றிய பொது மக்களின் விழிப்புணர்வின் அவசியம்.

அலகு II

இயற்கை வளங்கள் – வன வளங்கள் – நீர் வளங்கள் – கனிம வளங்கள் – உணவு வளங்கள் - ஆற்றல் வளங்கள் – நில வளங்கள்.

அலகு III

எஞ்சிய சூழல் – காட்டு சூழல் – புல் நில சூழல் முறை – பாலைவன சூழல் முறை – நீர் வள சூழல் முறை – இந்தியாவில் உள்ள உயிர்ப் புவியியலின் வகைகள் – பல்லுயிர்ப் பெருக்கம்.

அலகு IV

சுற்றுச்சூழல் மாசுபாடு – காற்று மாசுபாடு – பட்டாசு பயன்பாட்டை குறைப்பது பற்றிய விழிப்புணர்வை ஏற்படுத்துதல் – நீர் மாசுபாடு – மண் மாசுபாடு – ஒலி மாசுபாடு – அனல் மின் மாசுபாடு – அணு ஆபத்து – மாசு பற்றிய ஆய்வறிக்கை.

அலகு V

மக்கள் தொகை பெருக்கமும் சுற்றுச்சூழலும் – மக்கள் தொகை பெருக்கம் – குடும்ப நல திட்டம் – சுற்றுச்சூழலும் மனித ஆரோக்கியமும் - மனித உரிமைகள் – HIV / எய்ட்ஸ் – பெண்களும் குழந்தை நலனும்.

1/3/2022.

1400 – 1HrsHy.

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur.

SEM III	CC 4	DISCRETE DISTRIBUTIONS	22K3S04	Ints.Hrs :6	Credit:6

Course objectives:

To learn adapt to the distributions in the various fields (especially chance factors in all disciplines)

Course outcomes:

Cos	Statements
CO 1	Identify the type of statistical situation to which different distributions can be applied.
CO2	Use different distributions to solve simple practical problems
CO3	Ability to distinguish between random and non-random experiments
CO4	Evaluate and interpret various properties of both discrete
CO5	Discrete distributions expose the real-life applications.

Unit – I: DISTRIBUTIONS

Moment Generating Function – Definition, Properties, Characteristic function – Definition and Properties. Inversion Theorem(statement only) . Cumulants – Definition and properties. Moments – Raw moments, central moments and their relationships.

Text Book1: Chapter8(sec 8.1,8.2,)

Unit – II: BERNOULLI & BINOMIAL DISTRIBUTION

Bernoulli distribution – Definition. Binomial distribution – Definition, Derivation of Binomial probability distribution, Derivation of moments, β_1, β_2 co-efficients, cumulants. Recurrence relation for moments, mode. Additive property moment generating function, characteristic function and simple problems.

Text Book1: Chapter8(sec:8.3,8.6)

Unit – III: POISSON DISTRIBUTION

Poisson distribution - Limiting form of Binomial distribution– Definition, properties, Derivation of moments, β_1, β_2, Recurrence relation for moments, cumulants, mode, additive property, M.G.F, Characteristic Function and simple problems.

Text Book1: Chapter8(sec:8.5)

Unit – IV: NEGATIVE BINOMIAL DISTRIBUTION

Discrete uniform distribution – Definition ,derivation of mean and variance. Negative Binomial distribution – Definition, properties ,derivation of mean and variance, moment generating function. Cumulants, Poisson distribution as a limiting case of Negative Binomial distribution.

Text Book1: Chapter8(sec8.6)

Unit – V: GEOMETRIC DISTRIBUTION

Geometric distribution – Definition, properties moments, moment Generating function. Hyper-geometric distribution – Definition, Mean and Variance.

Text Book 1:Chapter8(sec:8.7)

Unit – VI: APPLICATIONS

Perform calculations relating to probability distributions for discrete distributions apply distributions theory in real-life Variables problems.

Text Books

1.S.C.Gupta and V.K.Kapoor – Fundamental of Mathematical Statistics, Sultan Chand and Sons, Eleventh thoroughly revised edition.

2. Rohatgi. V.K. – An Introduction to Probability Theory and Mathematical Statistics.

CO-PO Mapping for Discrete Distributions

	Pos					
COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	1	-	-	-
CO2	-	-	2	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	-	-	2	1
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naachiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM III	AC IV	OPERATIONS RESEARCH - I	22K3SAS4	Inst.Hrs:5	Credit:4

Course objectives:

1.To provide the students with knowledge on the application of various optimization techniques
2.which can help making decisions for practical problems in industries.

Course outcomes:

Cos	Statements
CO 1	Minima/Maxima in graphical Linear Programming Problem.
CO2	Deals with minimization of cost or maximization of profit.
CO3	Used in Production engineering, Mathematics of finance, Networking, etc.
CO4	Solve Artificial variable technique – Two-Phase Method -Big-M method
CO5	Solve specialized programming problems like transportation and assignment problems

Unit – I: LINEAR PROGRAMMING PROBLEM–I

Introduction – Origin – Nature of OR – Structure – Characteristics – OR in Decision making – Models in OR – Phase of OR – Uses and Limitations of OR – LPP- Mathematical formulation of LPP – Graphical Method.

Text Book *Chapter 1,2&3 (sec 1.2, 1.3, 1.4,1.6,2.2,3.2)*

Unit – II: LINEAR PROGRAMMING PROBLEM-II

LPP – Standard form of LPP - Maximization – Minimization – Simplex method –Artificial variable technique – Two-Phase Method -Big-M method.

Text Book Chapter 4 (sec 4.1,4.2,4.3,4.4)

Unit – III: DUALITY IN LINEAR PROGRAMMING

Duality in LPP – Formulation of Dual LPP – Primal – Dual relationship – Solving LPP using Dual concepts – Dual Simplex Method.

Text Book Chapter 5(sec 5.1,5.2,5.3,5.4,5.7,5.9)

Unit – IV: TRANSPORTATION PROBLEM

Transportation problem – Balanced, Unbalanced Transportation Problem – Initial basic feasible solution – North West Corner Rule- Row Minima – Column Minima – Matrix Minima (LCM) – Vogel's Approximation Method – Optimality Test – MODI method (simple problems only).

Text Book Chapter10 (sec 10.1,10.2,10.5,10.8,1

Unit – V: ASSIGNMENT PROBLEM

Assignment problem – Introduction – Balanced – Unbalanced – Maximization – Minimization – Hungarien Method.

Text Book Chapter 11(sec 11.1,11.2,11.3)

Unit – VI: APPLICATIONS

To provide the students with knowledge on the application of various optimization techniques .which can help making decisions for practical problems in industries.

Text Book

1. **KANTI SWARUP, P.K.GUPTA,** and **MANMOHN** (1980) – "**OPERATIONS RESEARCH**", Sultan Chand and sons, New Delhi.

Reference Book

2. **J. K. SHARMA** (1997), "**OPERATIONS RESEARCH**" and Application, Mc.Millan and Company, New Delhi.

3. **NITA H. SHAH, RAVI M. GOR** and **HARDIK SONI** (2010) -"**OPERATIONS RESEARCH**", PHI Learning Private Limited, New Delhi

CO-PO Mapping for OPERATIONS RESEARCH – I

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	-	1	1	-	-
CO2	-	-	2	-	1	2
CO3	-	-	2	-	-	-
CO4	-	-	-	-	2	1
CO5	1	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM III	NME 1	STATISTICAL METHODS	22K3SEL01	Inst.Hrs:2	Credit:2

Course objectives

1. The course aims to introduce the basic concepts in statistics.
2. Learning the preliminary tools and concepts (diagrams and graphs)
3. To make the students aware of different type of data sets .

Course outcomes:

Cos	Statements
CO 1	Knowledge of Statistics scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc.
CO2	Describe the basic concepts in sample surveys and data.
CO3	Evaluate the diagrammatic representation
CO4	Draw the graph based on the data
CO5	Analyze data from surveys using various sampling plans .Use appropriate method of sampling.

Unit – I: CLASSIFICATION & TABULATION

Definition of Statistics – Characteristics, Uses in business and limitations of statistics. Classification- Types – Tabulation – different parts of Table and Types.
Text Book 1 Chapter:6

Unit – II: COLLECTION OF DATA

Collection of data - Definition of primary and secondary data – methods of collecting primary data and secondary data.
Text Book 1 Chapter:4

Unit – III: PRESENTATION OF DATA

Diagrams – Definition and uses – Types of diagrams – simple bar, sub-divided, multiple bar diagrams and pie diagram- Simple Problems.
Text Book 1 Chapter:7

Unit – IV: GRAPHS

Graphs – Definition and uses, difference between diagrams and graphs. Types of graphs – Histogram, frequency polygon and frequency curve - Simple Problems.
Text Book 1 Chapter:8

Unit – V:SAMPLING TECHNIQUES

Sampling – Definition of population, Sample, parameter, statistic. Difference between census and sampling – Merits and demerits of sampling. Methods of sampling – Simple Random Sampling – Stratified and Systematic sampling.
Text Book 1 Chapter:5

Unit – VI: APPLICATIONS

To construct the frequency table. Analyze the central tendency dispersion of the data. Describe the differences between variables. Generate the regression equations.

Text Book

1. Statistics – R.S.N. Pillai & V. Bagavathi
2. Statistical Methods – S.P. Gupta

CO-PO Mapping for Statistical Methods

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	2	-	-	-	-
CO2	-	1	1	-	-	1
CO3	-	-	-	1	-	-
CO4	-	-	-	1	-	-
CO5	1	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-)

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM III	ECC I	Competitive Exam Skills (Contents in Tamil)	22K3ECC1	-	Credit -3

Course objectives:

On successful completion of this course, students will beable to .

Course Outcomes:

COs	Statements
CO1	Recognize the benefits and pre-preparations of competitiveexams
CO2	understand the pattern and techniques to solve the questions
CO3	develop a scientific aptitude and sense of reasoning
CO4	utilize the mathematical, statistical, and quantitativeinformation
CO5	apply the quantitative methods to solve the real-lifeproblems

UNIT – I

(i) இலக்கணம் :

இலக்கணம் - பொருத்துதல் - பிரித்து எழுதுதல் - எதிர்சொல் - பிழைதிருத்தம் - ஆங்கில சொல்லுக்கு நேரான தமிழ் சொல் அறிதல் - அகரவரிசைப்படி எழுதுதல் - இலக்கணக் குறிப்பு அறிதல் - வினையின் வகைகள் - உவமையால் பொருத்தமான பொருளைத் தேர்ந்தெழுதுதல் - எதுகை, மோனை, இயைபு.

(ii)இலக்கியம் :

திருக்குறள் (பத்தொன்பது அதிகாரங்கள் மட்டும்) – அறநூல்கள் தொடர்பான செய்திகள் - கம்பராமாயணம், புறநானூறு, அகநானூறு – தொடர்பான செய்திகள் - சிலப்பதிகாரம், ஐஞ்சிறு காப்பியம் - பெரியபுராணம், சிற்றிலக்கியம், மனோன்மணியம், நாட்டுபுறபாட்டு மற்றும் சமய முன்னோடிகள் பற்றிய செய்திகள்.

UNIT – II

தமிழ் அறிஞர்கள் ஆற்றிய தொண்டு, இயல், இசை, நாடகம் மற்றும் உரைநடை பற்றிய செய்திகள்.

UNIT – III

பொது அறிவியல் :

(i) இயற்பியல் :

பொது அறிவியல் விதிகள் - தேசிய அறிவியல் ஆராய்ச்சிக் கூடங்கள் - பருப்பொருளின் பண்புகளும், இயக்கங்களும் - இயற்பியல் அளவுகள், அளவீடுகள் மற்றும் அலகுகள் - விசை,
இயக்கம் மற்றும் ஆற்றல் - காந்தவியல், மின்சாரவியல் மற்றும் மின்னனுவியல் - வெப்பம், ஒளி மற்றும் ஒலி.

(ii) வேதியியல் :

தனிமங்கள் மற்றும் சேர்மங்கள் - அமிலங்கள், காரங்கள் மற்றும் உப்புகள் - செயற்கை உரங்கள், உயிர் கொல்லிகள் - நுண்ணுயிர் கொல்லிகள்.

(iii) தாவரவியல் :

உயிரினங்களின் பல்வேறு வகைகள் - உணவூட்டம் மற்றும் திட்ட உணவு – சுவாசம்.

(iv) விலங்கியல் :

இரத்தம் மற்றும் இரத்த சுழற்சி - இனப்பெருக்க மண்டலம் - மனிதனின் நோய்கள் - பரவும் மற்றும் பரவா நோய்கள் உட்பட- தற்காத்தல் மற்றும் தீர்வுகள் - விலங்குகள், தாவரங்கள் மற்றும் மனித வாழ்வு

UNIT – IV

(i) புவியியல் :

பூமியும் பேரண்டமும் - சூரிய குடும்பம் - பருவக்காற்று, மழைபொழிவு, காலநிலை மற்றும் தட்பவெப்பநிலை – நீர்வள ஆதாரங்கள் - இந்தியாவிலுள்ள ஆறுகள் - மண் வகைகள், கனிமங்கள் மற்றும் இயற்கை வளங்கள் - காடுகள் மற்றும் வன உயிர்கள் - விவசாய முறைகள்.

(ii)இந்திய அரசியல் :

இந்திய அரசியல் அமைப்பு – மத்திய மாநில மற்றும் மத்திய ஆட்சிப்பகுதிகள் - குடியுரிமை – உரிமைகளும், கடமைகளும் - மனித உரிமை சாசனம் - இந்திய நாடாளுமன்றம் - பாராளுமன்றம் - மாநில நிர்வாகம் - மாநில சட்டமன்றம் - சட்ட சபை – உள்ளாட்சி அரசு – பஞ்சாயத்து ராஜ் - இந்திய தணிக்கை மற்றும் கண்காணிப்பு தலைவர் - தகவல் அறியும் உரிமை – பெண்கள் முன்னேற்றம் - நுகர்வோர் பாதுகாப்பு அமைப்புகள்.

(iii)இந்திய பொருளாதாரம் மற்றும் தேசிய இயக்கம் :

இந்திய பொருளாதாரத்தின் இயல்புகள் - ஐந்தாண்டு திட்டங்கள் - வேளாண்மையில் அறிவியலின் பயன்பாடு – தொழில் வளர்ச்சி – கிராம நலம் சார்ந்த திட்டங்கள் - சமூகம் சார்ந்த பிரச்சனைகள் - மக்கட்தொகை, கல்வி, சுகாதாரம், வேலைவாய்ப்பு, வறுமை – தேசிய மறுமலர்ச்சி – தேசத்தலைவர்களின் எழுச்சி (காந்தி, நேரு, தாகூர்) – பல்வேறு போராட்ட முறைகள் - சுதந்திர போராட்டத்தில் தமிழ் நாட்டின் பங்கு (இராஜாஜி, வ.உ.சி, பெரியார், பாரதியார் மற்றும் பலர்)

(iv)இந்தியா மற்றும் தமிழ்நாடு வரலாறு மற்றும் பண்பாடு :

சிந்து சமவெளி நாகரிகம் - குப்தர்கள், டெல்லி சுல்தான்கள், மொகலாயர்கள் மற்றும் மராட்டியர்கள் - விஜய நகரத்தின் காலம் மற்றும் பாமினிகள் - தென் இந்திய வரலாறு, பண்பாடு மற்றும் தமிழ் மக்களின் புராதாணம் - இந்திய சுதந்திரம்.

UNIT – V

(i) திறனறிவு மற்றும் புத்திக் கூர்மை தேர்வுகள் :

தகவல்களை விவரங்களாக மாற்றுதல் - விவரம் சேகரித்தல், தொகுத்தல் மற்றும் பார்வைக்கு உட்படுத்துதல் - அட்டவணைகள், புள்ளி விவர வரைபடங்கள் - விவர பகுப்பாய்வு விளக்கம் - சுருக்குதல் - சதவிகிதம் - மீப்பெரு பொது வகுத்தி (HCF) – மீச்சிறு பொது மடங்கு (LCM) – விகிதம் மாற்று சரிவிகிதம் - தனிவட்டி - கூட்டுவட்டி – பரப்பளவு – கனஅளவு – நேரம் மற்றும் வேலை – தர்க்க அறிவு – புதிர்கள் - பகடை – காணொளிதர்க்க அறிவு – எண் கணிததர்க்க அறிவு – எண் தொடர்கள்.

(ii) நடப்பு நிகழ்வுகள் :

செய்திகளில் இடம் பெறும் புகழ்பெற்ற நபர்கள் மற்றும் இடங்கள் - விளையாட்டு மற்றும் போட்டிகள் - நூல்களும் நூலாசிரியர்களும் - விருதுகளும் மற்றும் பட்டங்களும் - இந்தியாவும் அதன் அண்டை நாடுகளும்.

Books for Study :

Unit – I & Unit – II

6-ஆம் வகுப்பு முதல் 10-ஆம் வகுப்பு வரை உள்ள தமிழ் பாடபுத்தகங்கள்.

Unit – III

6-ஆம் வகுப்பு முதல் 10-ஆம் வகுப்பு வரை உள்ள அறிவியல் பாடபுத்தகங்கள்.

Unit – IV

6-ஆம் வகுப்பு முதல் 10-ஆம் வகுப்பு வரை உள்ள சமூக அறிவியல் பாடபுத்தகங்கள்.

Unit – V

6-ஆம் வகுப்பு முதல் 10-ஆம் வகுப்பு வரை உள்ள கணிதப் பாடபுத்தகங்கள் மற்றும் அன்றாட செய்திதாள்கள்.

CO-PO Mapping for Competitive Exam Skills

COs	Pos					
	PO1	PO2	PO3	PO4	PO5	PO6
CO-1	-	3	-	1	1	-
CO-2	-	3	-	2	-	1
CO-3	2	-	2	3	-	-
CO-4	2	-	2	2	-	2
CO-5	3	1	1	-	-	3

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SEM III	ECC 2	Computational Statistics (Add on Course)	Credit -4

List of Experiments :

1. Entering a letter, aligning, editing, spell check and printing.
2. Creating Tables, inserting rows and columns and formatting.
3. Creating main document, data source and using mail merge facility.
4. Prepare frequency distribution using Excel function.
5. Preparing Pie chart and Bar charts.
6. Calculation of Statistical constants using Excel functions.
7. Calculation of correlation and regression Co-efficients.
8. Creating a new presentation in PowerPoint, numbering and copying slides.
9. Changing fonts and colors, inserting Clip Art and Formatting options. Inserting Bullets and Pictures, Creating Tables and Inserting Auto shapes

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SEM IV	CC 5 (P)	Practical - II (Bivariate Random Variables & Fitting)	22K4S05P	Inst.Hrs:5(2+3)	Credit:3

Course objectives:

1. Practiced to the realized concept of preliminary tools
2. To understand to types of the distributions functions

Cos	Statements
CO 1	Learn to obtain and sketch densities of order statistics
CO2	Students will be able to implement methods estimation and testing by using appropriate methods and computing formulae.
CO3	Practiced into the basic level statistical tools
CO4	Fitting of discrete distributions – Binomial, Poisson.
CO5	Fitting of Continuous distribution.

Unit – I : GOODNESS OF FIT FOR BINOMIAL DISTRIBUTION

Fitting Binomial distribution. Testing goodness of fit using Chi-Square test.

Text Book 1 Chapter 8

Unit – II : GOODNESS OF FIT FOR POISSON DISTRIBUTION

Fitting Poisson distribution. Testing goodness of fit using Chi-Square test.

Text Book 1 Chapter 8

Unit – III : GOODNESS OF FIT FORNEGATIVE BINOMIAL DISTRIBUTION

Fitting Negative Binomial distribution. Testing goodness of fit using Chi-Square test.

Text Book 1 Chapter 8

Unit – IV : BIVARIATE DISCRETE PROBABILITY DISTRIBUTIONS

Bivariate Discrete probability Distributions – Marginal and conditional distributions – Expectation, variance, covariance, correlation co-efficient for Bivariate discrete r.v.'s. Calculation of conditional expectation and conditional variance.

Text Book 1 Chapter 5

Unit – V : GOODNESS OF FIT FOR NORMAL DISTRIBUTION

Fitting Normal distribution (Area Method). Testing goodness of fit using Chi-Square test.

Text Book 1 Chapter 9

Unit – VI : APPLICATIONS

To prepare assignment problem for fitting of Binomial, Poisson and Normal.

Text Book

1. S.C.Gupta and V.K.Kapoor – Fundamental of Mathematical Statistics, Sultan Chand and Sons, Eleventh thoroughly revised edition.
2. R.S.N.Pillai and Bagavathi - Statistics theory and practice

CO-PO Mapping for Practical - II (Bivariate Random Variables & Fitting)

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	1	-	-	-
CO2	-	-	2	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	-	-	2	1
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

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SEM IV	CC 6	CONTINUOUS DISTRIBUTIONS	22K4S06	Inst.Hrs:5	Credit:5

Course objectives:

1. The students should have understood the applications and nature of the probability distributions such as Normal, t, χ^2 and F.
2. To compute of Partial, Multiple Correlation Coefficients and Multiple Linear Regression line

Course outcomes:

Cos	Statements
CO 1	Use the Normal probability distribution including standard normal curve calculations of appropriate areas.
CO2	Practice and solve the various distributions to simple practical problems.
CO3	Expose the real-life applications of continuous distribution
CO4	Apply in Convergence in probability
CO5	Relationship between t, F and Chi-Square distributions.

Unit – I: UNIFORM AND EXPONENTIAL DISTRIBUTION

Continuous Uniform distribution – Definition, Derivation of moments, Moment Generating function (M.G.F) Characteristic function. Exponential distribution – Mean and Variance, M.G.F. and Properties.

Text Book 1 Chapter 9

Unit – II : NORMAL DISTRIBUTION

Normal Distribution – Definition, Properties, Derivation of mean and variance, moments, mode, Median, M.G.F., Characteristic function. Cumulant generating function and Additive property of Normal distribution.

Text Book 1 Chapter 9

Unit – III: BETA AND GAMMA DISTRIBUTION

Beta Distribution of first kind and Beta distribution of second kind – Definition, Derivation of mean, variance and Harmonic mean- properties. Gamma distribution – Definition, Moments, M.G.F. C.G.F. and Additive property.

Text Book 1 Chapter 9

Unit – IV: CONVERGENCE IN PROBABILITY

Convergence in probability – definition , Chebychev's inequality with proof, weak law of large numbers with proof. Convergence in distribution – definition , Central limit theorem (statement only). Exact sampling distribution– Chi-Square distribution – Definition, mean, variance, M.G.F., C.F., Mode and Skewness, Additive property, limiting form of Chi-Square distribution and applications.

Text Book 1 Chapter 7

Unit – V: SAMPLING DISTRIBUTION

Student's t distribution – definition, Derivation, Constants, Properties, limiting form of Student's t distribution. F-distribution – definition, Derivation, Constants. Relationship between t, F and Chi-Square distributions.
Text Book 1 Chapter16

Unit – VI: APPLICATIONS

To solve the continuous distribution, t, F and Chi-Square distributions.

Text Book

1. S.C.Gupta and V.K.Kapoor – Fundamental of Mathematical Statistics, Sultan Chand and Sons, Eleventh thoroughly revised edition.
2. An introduction to probability theory and Mathematical statistics – V.K.Rohatgi.

CO-PO Mapping for Continuous Distributions

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	1	-	-	-
CO2	-	1	1	-	-	-
CO3	-	-	2	-	-	2
CO4	-	-	-	-	2	1
CO5	-	1	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

SEM IV	AC5(P)	OPERATIONS RESEARCH – II	22K4SAS5P	Inst.Hrs:5(3+2)	Credit:3

Course objectives:

1.To understand the practical of optimization methods and algorithms

2.To develops for solving various types of practical orientated optimization problems.

Course outcomes:

Cos	Statements
CO 1	Solve the real life analysis problems.
CO2	Apply linear programming problems in real life situations
CO3	Perform analysis and Two – Phase methods
CO4	Solve the Transportation problem.
CO5	Solve the Network Problems.

LIST OF PROBLEMS:

i. Graphical Method.
General Linear Programming Problem - Graphical Method.
ii. Simplex method.
Linear Programming Problem - Simplex method.
iii. Big-M method.
Use of Artificial Variables – Big-M method(Method of Penalties)
iv. Two – Phase Method
Linear Programming Problem – Tow-Phase Method
v. Transportation Problem.
i)North- West Corner Method ii) Least-Cost Method or Matrix Minima Method iii)Vogel's Approximation Method.(VAM) Unbalance Transportation Problem.
vi. Assignment Problem.
Solution Method of Assignment Problem and Unbalance Assignment Problem.
vii. Game Theory.
Two-Person Zero-Sum Games, The Maximin – Minimaz Principle, Games without Saddle Points – Mixed Strategies(Value of Game), Graphic Solution of 2xn and mx2 games.
viii. Sequencing.
Processing n jobs Through two Machines, Processing n jobs Through k Machines, Processing 2 jobs Through k Machines.
ix . Network Problems.
Critical Path Method (CPM) – Probability Considerations in PERT –simple problems.

Text Books

1. **KANTI SWARUP, P.K.GUPTA,** and **MANMOHN** (1980) – "**OPERATIONS RESEARCH**", Sultan Chand and sons, New Delhi.

References Book:

1. **J. K.SHARMA** (1997), "**OPERATIONS RESEARCH AND APPLICATION**", Mc.Millan and Company, New Delhi.
2. **NITA H.SHAH, RAVI M. GOR,** and **HARDIK SONI** (2010) - "**OPERATIONS RESEARCH**", PHI Learning Private Limited, New Delhi.

CO-PO Mapping for OPERATIONS RESEARCH – II

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	-	1	1	-	-
CO2	-	-	2	-	1	2
CO3	-	-	2	-	-	-
CO4	-	-	-	-	2	1
CO5	-	1	-	1	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM IV	AC 6	OPERATIONS RESEARCH – III	22K4SAS6	Inst.Hrs:4	Credit:2

Course objectives:

1. To train the students with Optimization techniques
2. To solving decision making problems based on deterministic and probabilistic models
3. To impart an insight of the applications of Operations Research in Management.

Course outcomes:

Cos	Statements
CO 1	Model of minima/maxima problems as optimization techniques. The fundamentals of game theory.
CO2	A basic terms of sequencing problems.
CO3	Study on deferent types of queuing system.
CO4	Study on Classification of queuing models .
CO5	Construct of network analysis.

Unit – I: GAME AND STRATEGIES

Introduction - Two - person - zero - sum games - some basic terms - the maximin – minimax principle, Games without saddle points - mixed strategies 2 x 2 games – graphic solution of 2xn and mx2 games – dominance property - Simple problems.

Text Book Chapter 17(sec 17.1,17.2,17.3,17.4,17.5,17.6)

Unit – II: SEQUENCING PROBLEM

Sequencing – Basic Terms – Processing n jobs through two Machines, Processing n jobs through k Machines, Processing 2 jobs through k Machines.

Text Book Chapter 12(sec 12.1,12.2,12.3,12.4,12.5,12.6)

Unit – III: QUEUEING THEORY

Queuing system – elements of queuing system – operating characteristics of a queuing systems – deterministic queuing system – probability distribution in queuing system.

Text Book Chapter 21(sec 21.1,21.2,21.3,21.4,21.5,21.6)

Unit – IV: QUEUEING MODELS

Classification of queuing models – definition of transient and steady states – Poisson queuing system – Model I: {(M/M/1): (/FIFO)} and Model II: {(M/M/1): (/SIRO)} – Simple Problems.

Text Book Chapter 21 (sec 21.7,21.8,21.9)

Unit – V:NETWORK SCHEDULING

Network analysis – Basic components – Constraints in network – Construction of network rules – Critical Path Method (CPM) – Probability considerations in PERT –simple problems.

Text Book Chapter 25 (sec 25.1,25.2,25.4,25.6,25.7,25.8)

Unit – VI: APPLICATIONS

To train the students with Optimization techniques. To impart an insight of the applications of Operations Research in Management.

Text Books

1. **KANTI SWARUP, P.K.GUPTA,** and **MANMOHN** (1980) – **"OPERATIONS RESEARCH"**, Sultan Chand and sons, New Delhi.

References Book:

1. **J. K.SHARMA** (1997), **"OPERATIONS RESEARCH AND APPLICATION"**, Mc.Millan and Company, New Delhi.
2. **NITA H.SHAH, RAVI M. GOR,** and **HARDIK SONI** (2010) - **"OPERATIONS RESEARCH"**, PHI Learning Private Limited, New Delhi.

CO-PO Mapping for OPERATIONS RESEARCH – III

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1		2		1	-	-
CO2	-	2		1		
CO3	-	-	2	-	-	1
CO4	-	2	-	-		1
CO5		2	-	1	-	-

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous,Thanjavur

SEM IV	NME 2	BIO STATISTICS	22K4SEL02	Inst.Hrs:2	Credits:2

Course objectives:

1. The course gives the application of statistics in handling survival data.
2. The course introduces the concept of censoring and the various distributions used to analyse such data. Various models are also suggested to deal with survival data.

Cos	Statements
CO1	Know the theory behind fundamental bioinformatics analysis methods.
CO2	Describe statistical methods and probability distributions relevant for molecular biological data
CO3	Perform and interpret bioinformatics and statistical analyses with real molecular biological data.
CO4	Solve the problem of Measures of central tendency
CO5	Solve the Correlation and regression.

Unit – I: COLLECTION OF DATA

Definition of Bio – Statistics, characteristics of Statistics. Data collection of primary and secondary data – Definition and methods of collecting primary and secondary data.
Text Book 1 Chapter 4

Unit – II: CLASSIFICATION AND TABULATION

Processing of data – Classification – Objectives & types of classification. Tabulation – Objectives – Components of Tables and types of Tables. Formation of frequency distribution – discrete & continuous.
Text Book 1 Chapter 6

Unit – III: DIAGRAMMATIC REPRESENTATION

Diagrammatic representation – definition, Rules for constructing diagrams and uses. Simple bar diagram, Component bar diagram, multiple bar diagram and pie diagram. Use any one of the Agriculture data for practice.
Text Book 1 Chapter 7

Unit – IV: MEASURES OF CENTRAL TENDENCY AND DISPERSION

Measures of central tendency – Mean, Median, Mode. Measures of dispersion – Range and standard deviation – Simple problems. Use any one of the weather data for practice.
Text Book 1 Chapter 9,10

Unit – V: CORRELATION AND REGRESSION ANALYSIS

Correlation – definition, Types of correlation, Methods of studying correlation – Karl Pearson's coefficient of correlation, Rank Correlation (without repeated ranks), simple Regression lines (two variables only)-simple problems. Use any one of the medical data for practice.
Text Book 1 Chapter 12,13

Unit – VI: APPLICATIONS

To apply the various models are also suggested to deal with survival data. Compute the Measures of central tendency, dispersion, correlation and regression.

Text Book

1. Statistics theory and practice- R.S.N.Pillai, Bagavathi
2. Bio-statistics – P.Ramakrishna
3. Statistical methods for Biologists – S. Palanichamy & M.Manoharan.
4. Bio-Statistics – Gurusamy.

CO-PO Mapping for Bio statistics

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	1	-	-	-
CO2	-	-	2	-	1	-
CO3	1	-	2	-	-	-
CO4	-	1	-	1	-	-
CO5	1	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Government Arts College For Women (Autonomous)
Thanjavur-613007
Department of English
For All Undergraduate Candidates admitted from 2022-2023 onwards under CBCS pattern

LIFE SKILLS: LOVE AND COMPASSION

Semester	Course	Sub Code	Hours	Credits	Exam Hours	Marks	
						IA	EA
IV	SBEC1	22K4SBEC1	2	2	3	25	75

COURSE OUTCOME

1. Students can learn how to understand other points of view and manage strong emotions and build stronger relationships with friends.
2. Students can develop the ability to tolerate the distressing feelings, and be motivated to act or help others.
3. They can learn the importance of patience and understanding.
4. Students can cultivate compassion through training.
5. Students can increase the sense of wellbeing and improve the learning environment for all learners.

UNIT-I

Introduction, Words and Meaning of Love, Forms of love-for self, parents, family, friend, spouse, community, nation, humanity and other beings, both for living and non-living.

UNIT -II

Love and Systems of Ethical Thought, Love and Compassion and inter relatedness.

UNIT-III

Love in Action at Work in the Business Community, Love in Action in Non-Governmental Organizations.

UNIT -IV

Compassion for oneself, cultivating compassion for others.

UNIT- V

Love, compassion, empathy, sympathy and non-violence.

UNIT VI (For Internal Examination only)

Difference between Compassion and Friendship, Teaching Compassion in Education.

Books for Reference

1. Joshi Rokeach The *Nature of Human values,* New York: The Free Press, 1973.

2. Shanikumar Ghosh,Universal *Values*,The Ramakrishna mission, Kolkata

3. Dalai Lama, *Book of Love and Compassion*, Harper Collins, India.
4. Pandit Rajmani Tigunait, *Lighting the Flame of Compassion.*, Himalayan Institute Press.

Kunthavai Naacchiyaar Government Arts College For Women (Autonomous)
Thanjavur-613007
Department of English
For All Undergraduate Candidates admitted from 2022-2023 onwards under CBCS pattern

LIFE SKILLS: LOVE AND COMPASSION

Semester	Course	Sub Code	Hours	Credits	Exam Hours	Marks	
						IA	EA
IV	SBEC1	22K4SBEC1	2	2	3	25	75

QUESTION PATTERN FOR THE PAPER TITLED LIFE SKILLS : LOVE AND COMPASSION

Questions should be chosen from all the constituents of the five units.

S. No	Section	Questions	Type	Marks	Total Marks
1	Section- A	1-8	Any Five Paragraph Questions out of Eight	5X5=25	25
2	Section - B	9-16	Any Five Essay Questions out of Eight	5x10 = 50	50
				Total	75

Signature of the Faculty- in- Charge

R. Ramapriya

Signature of the Head of the Department

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM IV	ECC 3	QUANTITATIVE APTITUDE	22K4ECC3	-	Credit:3

Course objectives:

On successful completion of this course, students will beable to .

Course Outcomes:

COs	Statements
CO1	Recognize the benefits and pre-preparations of competitiveexams
CO2	understand the pattern and techniques to solve the questions
CO3	develop a scientific aptitude and sense of reasoning
CO4	utilize the mathematical, statistical, and quantitativeinformation
CO5	apply the quantitative methods to solve the real-lifeproblems

Unit – I

Numbers- operations on numbers, H.C.F and L.C.M. of numbers, decimal fractions, simplification, square roots and cube roots, problems on numbers.

Unit – II

Average, problems on ages, surds and Indices, percentage.

Unit – III

Profit and Loss , Partnership , Chain Rule , Time and Work ,Ratio and Proportion.

Unit – IV

Time and Distance , Problems on Trains Pipes and Cistern , Allegation or Mixture, Area ,Volume and Surface Area.

Unit – V

Simple Interest, Compound Interest, Stocks and Shares, True Discount and Bankers Discount.

Unit – VI

Prepare the general Quantitative Aptitude questions.

Books for Study :

1. Quantitative Aptitude – Dr.R.S.Aggarwal

CO-PO Mapping for Quantitative Aptitude

COs	Pos					
	PO1	PO2	PO3	PO4	PO5	PO6
CO-1	-	3	-	1	1	-
CO-2	-	3	-	2	-	1
CO-3	2	-	2	3	-	-
CO-4	2	-	2	2	-	2
CO-5	3	1	1	-	-	3

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM V	CC – 7	Statistical Inference –I	22K5S07	Hrs:5	Credit:5

Course objectives:

1. To gain on statistical concept to include measurements of probability distribution
2. knowledge about important inferential aspects such as point estimation, test of hypotheses and associated concepts

Course outcomes:

Cos	Statements
CO1	Explain the concept of estimation of parameters. Calculate the problems related to point estimation and interval estimation.
CO2	Explain the concepts of testing of hypotheses (large sample test small sample test)
CO3	concept of random sample from a distribution, sampling distribution of a statistic, standard error of important estimates such as mean and proportions
CO4	Explain the Interval estimation
CO5	Explain the Confidence interval.

Unit – I: THEORY OF ESTIMATION

Theory of Estimation – Definition, Parameter, Statistic, sampling distribution, standard error, level of significance, utility of standard error, Hypothesis – Definition of Null and alternative hypothesis, Type – I and Type – II errors, one – tailed and two –tailed tests, Critical region. Testing a hypothesis – General procedure (in section –C, two 5 marks questions may be asked as (a) and (b)). Text book: 1 chapter:18(sec 18.2)

Unit – II: POINT ESTIMATION

Point estimation – properties of good estimator – consistency, unbiasedness, efficiency and sufficiency. Cramer Rao inequality with proof. Neymann factorization theorem statement only. Simple problems based on Binomial, Poisson, Normal and Exponential distribution.Text book:1 Chapter: 17(sec 17.1, 17.2)

Unit – III : METHODS OF ESTIMATION

Methods of estimation – Methods of maximum likelihood estimation (MLE) and methods of moments – simple problems based on Binomial, Poisson, Normal and exponential distribution. Rao Blackwell theorem . Properties of MLE's without proof.
Text book:1 Chapter: 17(sec 17.6)

Unit – IV: INTERVAL ESTIMATION

Interval estimation – Definition, confidence interval & confidence limits. Confidence interval based on normal distribution – confidence interval for single proportion and difference between proportions, confidence interval for single mean and difference of means – procedures and simple problems. Text book:1 Chapter: 17(sec 17.7),Chapter 14(sec 14.1-14.8)

Unit – V: CONFIDENCE INTERVAL

Confidence interval based on 't', 'F' and Chi-square distribution. Confidence interval for single mean and difference of means. Confidence interval for variance and Confidence interval for variance ratio – Procedure and Simple problems. Text book:1 Chapter 16 (sec 16.1-16.7)

Unit – VI: APPLICATIONS

To calculate the point estimation, Methods estimation interval estimation and statistical hypotheses.

Text Books and Reference

1. Fundamentals of Mathematical Statistics – S.C. Gupta and V.K.Kapoor, Sultan chand & sons, New Delhi, 11th thoroughly revised edition.
2. Statistical Methods – S.P. Gupta, Sultan chand & Sons, New Delhi, 35th revised edition 2007.
3. An outline of Statistical Theory – Goon A.M. Gupta, M.A. and B.Das Gupta.

CO-PO Mapping for Statistical Inference – I

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	2	-	-	-
CO2	-	-	2	-	1	-
CO3	1	-	1	-	-	-
CO4	-	1	-	-	1	
CO5	-	-	-	2	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM –VI	CC – 8	SAMPLING TECHNIQUES	22K5S08	Hrs :5	Credit : 5

Course objectives:

1. The main objective is to provide the knowledge of concept of sample and population in statistics and also the various sampling schemes and estimation of population parameters and their respective standard errors.
2. To equip students with Sampling Techniques used in conducting sample surveys.

Course outcomes:

Cos	Statements
CO1	Explore the principles and theory of probability sampling.
CO2	Explain the concepts of sampling variability and strategies for removing them.
CO3	Analyse data from surveys using various sampling plans
CO4	Use appropriate method of sampling.
CO5	Evaluate the different methodology to estimate population parameters for sampling methods.

Unit – I : SAMPLE SURVEY

Definitions – Parameter, Statistic, Population, Sample, Sampling distribution, Standard error. Principal steps in a sample survey, principles of sample survey, sampling and non-sampling errors. Limitations of sampling. Text Book :2 Chapter :7[7.1-7.7]

Unit – II : SIMPLE RANDOM SAMPLING

Simple Random sampling – Selecting SRSWR & SRSWOR , Merits and limitations – Derivation of sample mean & variance, unbiased estimates of mean & variance, Comparison of SRSWOR with SRSWR (Variance alone). Text Book :2 Chapter :7[7.9]

Unit – III : STRATIFIED RANDOM SAMPLING

Stratified Random Sampling – Derivation of unbiased estimates of mean and variance – Optimum Allocation and Proportional Allocation – Comparison of SRS with stratified sampling (variance alone) – Gain in efficiency due to stratification, merits of stratified Random sampling. Text Book :2 Chapter :7[7.10]

Unit – IV: SYSTEMATIC SAMPLING

Systematic sampling – Estimation of population mean and variance, merits of systematic sampling. Comparison of SRS, Stratified and systematic sampling using variance. Text Book :2 Chapter :7[7.11]

Unit – V: METHOD OF RATIO ESTIMATOR

Method of Ratio estimator – definition, notations, estimation of the mean and variance from a sample, comparison of the variance of ratio estimator with the mean per unit – Bias of the ratio estimator Text Book :1 Chapter :6[6.1-6.8]

Unit – VI : APPLICATIONS

How to collect the sample by using the sampling techniques of (SRS and Stratified systematic)

Text Books

1. Sampling Techniques – W.G. Cochran
2. Fundamental of Applied Statistics – V.K. Kapoor and S.P.Gupta

CO-PO Mapping for - Sampling Techniques

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	1	-	-	-
CO2	-	-	1	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	-	-	2	1
CO5	-	-	-	-	-	2

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM - V	CC – 9	DESIGNS OF EXPERIMENTS	22K5S09	Hrs:6	Credit:5

Course objectives:

1. To provide orientation of statistics while designing statistical experiments, particularly in agricultural set-up and in pharmaceutical production processes.
2. Exposure to various statistical designs leading to the analysis of variance, eliminating heterogeneity of the data, construction of designs will be provided.

Course Outcomes:

COS	Statements
CO1	Review the concepts of conducting an experiment
CO2	Explain the issues and principles of design of experiment
CO3	Carryout one way and two way Analysis of Variance
CO4	Derive the analysis for various designs
CO5	Interpret statistical results from an experiment and report them in non- technical language

Unit – I : ANALYSIS OF VARIANCE

Analysis of variance - definitions, Assumptions, Cochran's Theorem (Statement only) . One-way classification, Two-way classification –statistical analysis of one way & two way classification (Simple problems). Text book:1 Chapter: 5 (sec 5.1-5.4)

Unit – II: COMPLETELY RANDOMISED DESIGN

Experimental Designs – terms and definitions – efficiency of a design. Basic Principles of an experimental design. Completely Randomised Design (CRD) - Advantages and disadvantages – applications – Statistical analysis of CRD – Least Square estimates of effects – expectation of sum of squares(Simple problems).
Text book:1 Chapter: 6 (sec 6.5)

Unit – III :RANDOMIZED BLOCK DESIGN

Randomized Block Design (RBD) – Layout of RBD, advantages and disadvantages, statistical analysis of RBD for one observation only. Least square estimates and expectation of mean sum of squares, efficiency of RBD relative to CRD one & two missing observations in RBD (Simple problems). Text book:1 Chapter: 6 (sec 6.6)

Unit – IV: LATIN SQUARE DESIGN

Latin square design - advantages and disadvantages – statistical analysis for one observation only, least square estimate and expectation of mean sum of squares. Efficiency of LSD over CRD & RBD. Estimation of missing values in LSD - (Simple problems). Text book:1 Chapter: 6 (sec 6.7)

Unit – V : FACTORIAL EXPERIMENTS

Factorial experiments – 2^2, 2^3 factorial designs – main effects and interactions. Contrast, Orthogonal contrast –Statistical analysis of 2^2, 2^3 designs . Confounding and Partial confounding-definition only. Text book:1 Chapter: 6 (sec 6.8)

Unit – VI : APPLICATIONS

Exposure to various statistical designs leading to the analysis of variance, eliminating heterogeneity of the data, construction of designs will be provided.

Text Books

1.S.C.Gupta and V.K.Kapoor – Fundamental of applied Statistics, Sultan Chand and Sons,4th thoroughly revised edition, Jan 2007.

2.Experimental Design – 2nd Edition – William G. Cochran & Gertrude M.Cox., John Wiley & Sons, Classic library edn. 1992.

3. Design & Analysis of Experiment- Montgomery.

CO-PO Mapping for Design of Experiments

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	1	-	-	-
CO2	-	-	1	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	-	-	2	1
CO5	-	-	-	-	-	2

(High correlation -3, Moderate correlation-2), No correlation-(-)

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM - V	CC –10P	Practical – III (Sampling and Design)	22K5S10P	Hrs:5	Credit:3

Course objectives:

1.The students with methodological tools and statistical techniques for sample test
2.To understand will help them to undertake various sampling plans.
3.To provide orientation of statistics while designing statistical experiments, particularly in agricultural set-up and in pharmaceutical production processes.

Course outcomes:

Cos	Statements
CO1	This paper explored systematic enquiry in understanding the cause and consequences of events and use to improve research technique in various fields.
CO2	Analyse data from surveys using various sampling plans
CO3	Use appropriate method of sampling.
CO4	Derive the analysis for various designs.
CO5	Interpret statistical results from an experiment and report them in non-technical language

Unit – I: ESTIMATION OF SRSWOR AND SRSWR

Estimation of mean and variance of the population of SRSWR and SRSWOR. Estimation of mean and variance of stratified random sampling using Neyman's optimum Allocation method and proportional allocation. Text Book :1 Chapter :7[7.7-7.9]

Unit-II: ESTIMATION OF SYSTEMATIC AND STRATIFIED SAMPLING

Estimation of mean and variance of systematic sampling. Comparison of simple random sampling, stratified and systematic sampling using variance and estimation of gain in efficiency.. Text Book :1 Chapter :7[7.10,7.11]

Unit – III: ANALYSIS OF CRD AND RBD

Analysis of CRD, RBD with one or two observations Per cell. Missing plot techniques in RBD (one or two observations missing). Text book:2 Chapter: 6 (sec 6.5,6.6,)

Unit – IV: ANALYSIS OF CRD AND RBD

Latin Square Design with one or two missing observations. Text book:2 Chapter: 6(sec 6.7)

Unit – V: ANALYSIS OF FACTORIAL EXPERIMENTS

Analysis of 2^2 and 2^3 factorial Designs with Confounding. Text book:2 Chapter: 6 (sec 6.9)

Unit – VI: APPLICATIONS

Exposure to various statistical designs leading to the analysis of variance, eliminating heterogeneity of the data, construction of designs will be provided.

Text Books and Reference

1. S.C.Gupta and V.K.Kapoor – Fundamental of Mathematical Statistics, Sultan Chand and Sons, Eleventh thoroughly revised edition.
2. Experimental Design – 2nd Edition – William G. Cochran & Gertrude M.Cox., John Wiley & Sons, Classic library edn. 1992.

CO-PO Mapping for Practical – III (Sampling and Design)

Cos	Pos					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	1	-	-	-
CO2	-	-	2	-	-	2
CO3	-	-	1	-	-	2
CO4	-	-	-	-	2	1
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-)

Kunthavai Naacchiyaar Govt.ArtsCollege (W) Autonomous,Thanjavur.

SEM - V	MBE- 1:1	SIMULATIONAND INVENTORY CONTROL	22K5SELS1	Hrs:5	Credit:5

Course objectives:

1. Explain the meaning and objective, describe the meaning and objective of inventory management
2. Know the factor affecting the level of inventory
3. Also understand the various techniques of inventory control

Course outcomes:

Cos	Statements
CO1	Discuss the role information technology in managing inventories
CO2	Determine in the order quantity
CO3	Describe the function and costs of an inventory system,
CO4	Determination of inventory problems with no shortages
CO5	Determination of inventory problems with shortages

Unit – I: INTRODUCTION TO SIMULATION AND LIMITATIONS OF SIMULATION

Simulation -Introduction, Reasons for applying simulation technique, Methodology of simulation, simulation models, Advantages and Limitations of simulation. Event – type simulation – Simple problems. Generation of random numbers – various methods of generation of random numbers. Monte – Carlo simulation and its general procedure – simple problems.
Text Book :1 Chapter 22

Unit – II: INTRODUCTION TO INVENTORY

Introduction of Inventory – Objectives of Scientific Inventory control – Reasons for maintaining Inventories – Types of Inventories – Cost associated with Inventories – Factors affecting Inventory control. The concept of EOQ.

Deterministic Inventory Model (EOQ Model) :Model : I – Derivation of EOQ model with uniform rate of demand, Infinite production rate, no shortage & lead time is zero – simple problems. Text Book :1 Chapter 19,20

Unit – III: INVENTORY PROBLEMS WITHOUT SHORTAGES

Deterministic inventory problems with no Shortages :Model : II – Derivation of EOQ model with several production runs of unequal length, no shortage and lead time is zero – simple problems.

Model : III – Derivation of EOQ model with uniform rate of demand, finite production rate, no shortage and lead time is zero – simple problems.
Text Book :1 Chapter:19

Unit – IV: INVENTORY PROBLEMS WITH SHORTAGES

Deterministic inventory problem with Shortages :Model : IV – Derivation of EOQ model with infinite production and variable order cycle time, shortage allowed and lead time is zero – simple problems.

Model :V – Derivation of EOQ model with finite production, shortage allowed and lead time is zero – simple problems.

Text Book :1 Chapter :19

Unit – V: INVENTORY PROBLEMS

Inventory problems with uncertain demand – Determining optimum buffer stock . Systems of Inventory control – Fixed order quantity system (Q-System), Periodic Review System (P- System) – simple problems. Comparison between Q-System and P- System.

Text Book :1 Chapter :19,20

Unit – VI: APPLICATIONS

Explain the meaning and objective; describe the meaning and objective of inventory management. Know the factor affecting the level of inventory also understand the various techniques of inventory control.

Text Book :1 Chapter:19(19.5)

Text Books

1.Kanthi Swarup, Gupta, P.K. & Man Mohan : Operations Research – Suttan Chand & Sons – New Delhi.

CO-PO Mapping for SIMULATION AND INVENTORY CONTROL

COs	Pos					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	1	-	-	-
CO2	-	-	-	-	1	2
CO3	-	-	1	2	-	-
CO4	-	-	-	-	1	1
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naachiyaar Govt.ArtsCollege (W) Autonomous,Thanjavur.

SEM –V	MBE – 1:2	FUZZY SET THEORY	22K5SELS1	Hrs : 5	Credit :5

Objectives

Fuzzy set theory can be used in the development of intelligent systems for decision making, identification, pattern recognition, optimization, and control.

Course outcomes:

Cos	Statements
CO1	Understand the concept of fuzziness involved in various systems.
CO2	Comprehend the fuzzy logic control and adaptive fuzzy logic and to design the fuzzy control using genetic algorithm.
CO3	Practice and solve the various distributions to simple practical problems.
CO4	Expose the real-life applications of continuous distribution.
CO5	Analyse the application of fuzzy logic control to real time systems.

Unit – I: FROM CLASSICAL (CRISP) SETS TO FUZZY SETS

Introduction –Crisp sets: An overview – Fuzzy sets: Basic Types.

Unit – II: FUZZY SETS

Basic concepts – Characteristics and significance of theparadigm shift – Additional properties of α-cuts.

Unit – III: FUZZY SETS VERSUS CRISP SETS

Representations of Fuzzy set –Extension principle for Fuzzy sets – Types of operations.

Unit – IV: OPERATIONS ON FUZZY SETS

Fuzzy complements–FuzzyIntersections: t-norms- Fuzzy unions; t-conforms.

Unit – V: TWO TYPES OF OPERATIONS

Combinations of operations – Aggregation operations.

TEXT BOOK:

George j. Klir / bo yuan, **"fuzzy sets and fuzzy logic theory andapplication"**, prentice hall of india private ltd., new delhi, 2008.

1. (Ch. 1: § 1.1 – 1.3)
2. (Ch. 1: § 1.4, 1.5 & Ch. 2: § 2.1)
3. (Ch. 2: §2.2, 2.3 & Ch. 3: § 3.1)
4. (Ch. 3: §3.2 – 3.4)
5. (Ch. 3: §3.5, 3.6)

REFERENCE BOOK:

S. Nanda, & N.R. Das, **"Fuzzy Mathematical Concepts"**, Narosa PublishingHouse, New Delhi.

CO-PO Mapping for FUZZY SET THEORY

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	1	-	-	-
CO2	-	-	1	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	-	-	2	1
CO5	-	-	-	-	-	2

(High correlation -3, Moderate correlation-2), No correlation-(-)

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM-V	SBEC 2:1	STATISTICAL SURVEY ANALYSIS	22K5SBEC2	Hrs:2	Credit:2

Course Objectives:

1. Students should know the steps involved in qualitative data collection.
2. Students should know the types of qualitative data typically collected in a qualitative study.
3. Identify and discuss the role and importance of research in the social sciences.
4. This course describes the various methods used for modeling and evaluating survival data.

Course Outcomes:

Cos	Statements
CO1	After completing this course we will be able to describe survival data format it appropriately for analysis and understanding.
CO2	Apply the knowledge for Survival analysis including survival time and event censoring and survival function and hazard functions.
CO3	Learn how to select and apply appropriate scaling and scoring metrics, how to create an analysis plan and how to present survey findings in useful tables and charts.
CO4	To design a good qualitative purpose statement and a good central question in qualitative research
CO5	To create scientific knowledge, to integrate ideas into a solution, to propose an action plan, to formulate a new classification scheme

Unit – I :.

Organizing a statistical survey- Planning the survey, Executing the survey - Drafting an effective questionnaire, difference between questionnaire and schedule.

Unit – II:

Sampling - Census and Sample method. Sampling and Non-sampling errors.

Unit – III:.

Collection of data - Primary data - methods of collecting primary data. Internet Survey and Telephone Survey. Secondary data - methods of collecting secondary data and precautions while using secondary data.

Unit – IV:

Classification of data – Types of Classification - Chronological classification, Geographical classification, Quantitative classification and Qualitative classification. Formation of discrete frequency distribution and Formation of continuous frequency distribution.

Unit – V:

Tabulation of data - Parts of a table and general rules of tabulation. Types of tables - simple and complex table, Machine tabulation and Cross tabulation – Practical Survey and Report Writing.

Unit – VI:

Planning the survey based on the data. Collection of data of the data.

Text Book

Gupta. S.P, Statistical Methods , Sultan Chand & Sons, New Delhi.

CO-PO Mapping for Statistical Survey Analysis

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-		2	-	-
CO2	-	-	2	-	1	1
CO3	-	-	1	-	-	-
CO4	1	-	-	2	1	-
CO5	1	-2	-	-	1	1

(High correlation -3, Moderate correlation-2), No correlation-(-)

Kunthavai Naachiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM - V	SBEC2:2	DEMOGRAPHIC METHODS	22K5SBEC2	Hours: 2	Credits: 2

Course Objective:

The course aims to study the applications of Statistics in the field of Health statistics.

Course outcomes:

Cos	Statements
CO1	Enumerate the source of vital statistics
CO2	Calculate basic measures to evaluate vital Statistics
CO3	Determine fertility and mortality rates.
CO4	Derive information from the life tables.
CO5	Extract information from the life tables.

Unit – I : DEMOGRAPHY DEFINITION

Demography – definition, sources of demographic data – Population Census – Demography surveys – Registration method: vital registration – Population register and other administrative records, registrat

Text Book :2 Chapter :16

Unit – II: MEASUREMENT OF MORTALITY

Measurement of mortality: Crude death rate – Specific death rate – Age specific death rate – Infant mortality rate – Standardized death rate – Direct method of standardization – Indirect method of standardization – Simple problems. Text Book :2 Chapter :16

Unit – III :MEASURE OF FERTILIDY

Measure of fertility: Crude birth rate – General fertility rate – Specific fertility rate –Age specific fertility rate – Total fertility rate – Simple problems..

Text Book :2 Chapter :16

Unit – IV: PROBLEMS IN DEMOGRAPHY

Gross reproduction rate – Net reproduction rate – Simple problems.

Text Book :2 Chapter :16

Unit – V: USESLIFE TABLES

Life tables – Uses of life tables – Curate expectation of life and complete expectation of life – Central mortality – Description of a life table – Construction of a life table – Simple problems .

Text Book :2 Chapter :16

Text Books:

D. C. Sancheti&V.K.Kapoor: Statistics

S.P. Gupta: Statistical Methods.

CO-PO Mapping for DEMOGRAPHIC METHODS

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	1	-	-	-
CO2	-	-	1	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	-	-	2	1
CO5	-	-	-	-	-	2

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM V	SBEC3	FIELD WORK/ INTERNSHIP/EXTERNSHIP	22K5SBEC3	Hrs:	Credit:2

1.Students are , Exposed to real work environment.
2.Trained to use statistical concepts for .
3.real world problems, Able to prepare report.
4.Able to explain practical utility in real life situations.

SEM V	SSD	SOFT SKILLS DEVELOPMENT	22K5SSD	Ins.Hrs:2	Credit: 2

COURSE OBJECTIVES:

Today's world is all about relationship, communication and presenting oneself, one's ideas and the company in the most positive and impactful way. This course intends to enable students to achieve excellence in both personal and professional life.

Course Outcomes:

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

CO1 – Help the students to understand themselves
CO2 – Identify the ways to improve relationships
CO3 – Have an introduction to art of speaking and listening.
CO4 – Develop Confidence with correct body language
CO5 – Manage stress.

UNIT I

Know Thyself/ Understanding Self

Importance of soft skills. How to Practice soft skill? Self discovery- Importance of knowing yourself. Process of knowing yourself. SWOT Analysis. Benefits of positive attitude. Ways to help you develop positive attitude. Steps to overcome negative attitude.

UNIT II

Interpersonal Skills/ Understanding Others

Skills needed for teamwork. Characteristics of effective team. Role of a team leader. Nine persons a successful team should have. Groups – Definition, Why are groups formed? Types of group, Stages of group development. Group cohesiveness –Definition, factors influencing group cohesiveness.

UNIT III

Communication Skills / Communication with others:

Art of speaking: Tips for effective communication, Conversation TIPS, Points to be kept in mind while communicating with others. Barriers to communication.

Art of listening: Meaning of Listening, Benefits/ advantages of active listening, Kinds of listening. Poor Listening habits.

UNIT IV

Corporate Skills / Working with Others:

Benefits of etiquette. Tips to Develop Confidence with correct body language. Tips for professional etiquette. Manners to be followed in order to get respect from others. Mobile phone etiquettes to be followed. Annoying office habits.

UNIT V

Selling Self

Tips for writing a CV. Do's and Don'ts in Writing a resume. Do's and Don'ts while attending an Interview. Essentials elements of a Group Discussion. Etiquettes to be followed in Group discussion. Tips for managing stress.

TEXT BOOKS:

Alex K. (2012) Soft Skills – Know Yourself & Know the World, S.Chand & Company LTD, Ram Nagar, New Delhi- 110 055.

REFERENCE BOOKS:

(i) Developing the leader within you John c Maxwell
(ii) Good to Great by *Jim Collins*
(iii) The seven habits of highly effective people Stephen Covey
(iv) Emotional Intelligence Daniel Goleman
(v) You can win Shiv Khera
(vi) Principle centred leadership Stephen Covey

PO-CO MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10
CO 1										
CO 2										
CO 3										
CO 4										
CO 5										

1-Low , 2-Moderate, 3- High Correlation

Mahalakshmi Balu
1/3/2022

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM - VI	CC – 11	Statistical Inference – II	22K6S11	Hrs:4	Credit:6

Course objectives:

1.On completion of this paper, students will be able to understand the general principles and methods involved in doing Testing of Hypothesis and familiarizes.

2.The students with methodological tools and statistical techniques, explaining large sample test .

3.To understand small sample test will help them to undertake empirical research independently.

Course outcomes:

Cos	Statements
CO1	This paper explored systematic enquiry in understanding the cause and consequences of events and use to improve research technique in various fields.
CO2	Solve the Partial correlation and Regression coefficient.
CO3	Apply in Chi-square test –Application
CO4	The one-sample runs test for randomness – The Sign test – Wilcoxon's Signed Rank Test.
CO5	Application of– Wilcoxon-Mann-Whitney U-test, Kolmogorov – Smirnov two- sample test

Unit – I: TESTING OF HYPOTHESIS

Testing of hypothesis – definition, Simple and composite hypothesis, power of a test, most powerful test. Test of significance based on Normal distribution – Test of Significance for single mean and difference of means, Test for single proportion and difference of proportions Test for single S.D & difference of S.D – Simple problems. Text book:1 Chapter: 18 (sec 18.2), Chapter 14 (14.1-14.8)

Unit – II: SMALL SAMPLE TEST

Small sample test based on 't' distribution assumptions application – Test of significance for single mean and difference of means, Paired 't' test, Test of significance of correlation coefficient- Partial correlation and Regression coefficient - simple problems. Text book:1 Chapter: 16 (sec 16.3.3)

Unit – III : APPLICATION OF STATISTICAL HYPOTHESIS

F- Test - Application- Test for equality of population variances , Test for observed multiple correlation coefficient, observed sample correlation ratio, linearity of Regression. Text book:1 Chapter: 16 (sec 16.3.4)

Unit – IV: APPLICATION OF CHI-SQUARE TEST

Chi-square test –Application- Test of significance based on population variance, test for goodness of fit and test for independence of attributes – simple problems. Text book:1 Chapter: 16 (sec 16.8)

Unit – V: NON - PARAMETRIC TEST

Non-parametric tests – Definition, advantages and disadvantages – Run test, Median test, Sign test and Mann Witney U-test (One sample and two samples) – Simple problems.Text book:1 Chapter: 18(sec 18.7)

Unit – VI : APPLICATIONS

To solve the testing of hypothesis (Large sample, small sample) and calculating the Non-parametric test.

Text Books and Reference

1. Fundamentals of mathematical statistics – S.C.Gupta & V.K.Kapoor, Sultan chand & sons, New Delhi, 11th thoroughly revised edition.
2. Statistical Methods- S.P. Gupta, Sultan chand & sons, New Delhi, 35th revised edition – 2007.

CO-PO Mapping for Statistical Inference - II

	Pos					
COs	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	2	-	-	-
CO2	-	2		-	1	1
CO3	-	2	1	-	-	-
CO4	-	-	-	1	-	1
CO5	1	-	1	-	-	2

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM-VI	CC–12	NUMERICAL ANALYSIS	22K6S12	Hrs:7	Credit:6

Course objectives:

The course aims to provide students with the specialized knowledge in advanced numerical analysis.

2. Understand analytical, developmental and technical principles that the relate to numerical methods for solving differential equations.

Course outcomes:

Cos	Statements
CO1	Aware of using numerical methods in modern scientific computing.
CO2	Analyse and evaluate the accuracy of common numerical methods.
CO3	Apply numerical methods to obtain solution to mathematical
CO4	Determine appropriate method for approximating numerical results.
CO5	Apply numerical methods to obtain approximate solutions to mathematical solution.

Unit – I: FINITE DIFFERENCES

Finite Differences – Forward and Backward differences, operators Δ, ∇ & E, and their basic properties – Interpolation with equal intervals – Newton's Forward & Backward Difference formula – Simple problem. Text Book :1 Chapter :19[19.1]

Unit – II: INTERPOLATION WITH UNEQUAL INTERVALS

Interpolation with unequal intervals – Divided differences and their properties – Newton's divided difference formula – Lagrange's formula – Simple problems. Text Book :1 Chapter :19[19.3]

Unit – III:CENTRAL DIFFERENCE INTERPOLATION FORMULA

Central difference interpolation formula – Gauss Forward and Backward difference formula – Stirling's, Bessel's Central difference formula – Simple problems. Text Book :1 Chapter :19[19.1-19.5]

Unit – IV: INVERSE INTERPOLATION

Inverse interpolation : Lagrange's method – Interaction of successive approximation method – simple problems. Text Book :1 Chapter :19[19.4]

Unit – V: NUMERICAL INTEGRATION

Numerical Integration : Trapezoidal Rule – Simpson's $1/3^{rd}$ & $3/8^{th}$ rules – Weddle's Rule – Euler's summation formula – Simple problems. Text Book :1 Chapter :19[19.5]

Unit – VI: APPLICATIONS

The course aims to provide students with the specialized knowledge in advanced numerical analysis. Understand analytical, developmental and technical principles that the relate to numerical methods for solving differential equations.

Text Books

1.Fundamentals of Mathematical Statistics.

2.Scarborough, B.Numerical Mathematical Analysis, OUP.

3.Sastry, S.S. Introductory method of numerical Analysis, P.H.I.

4.Balasubramanian : Numerical Mathematics, Vol I & II.

(Data can be taken from online)

CO-PO Mapping for Numerical Analysis

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	1	-	-	-
CO2	-	-	1	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	-	-	2	1
CO5	-	-	-	-	-	2

(High correlation -3, Moderate correlation-2), No correlation-(-)

SEM – VI	CC– 13(P)	PRACTICAL – IV (INFERENCE AND NUMERICAL)	22K6S13P	Hrs:5	Credit:6

Course objectives:

1. To development of the computer technology, it is necessary
2. To develop efficient algorithms for solving problems in science and technology.
3. The main objective is to provide the knowledge of concept of sample and population in statistics and also the various sampling schemes and estimation of population parameters and their respective standard errors.

Course outcomes:

Cos	Statements
CO1	This paper explored systematic enquiry in understanding the cause and consequences of events and use to improve research technique in various fields.
CO2	Analyse and evaluate the accuracy of common numerical methods.
CO3	Apply numerical methods to obtain solution to mathematical
CO4	Determine appropriate method for approximating numerical results.
CO5	Apply numerical methods to obtain approximate solutions to mathematical solution.

Unit – I: TESTING OF HYPOTHESIS FOR NORMAL DISTRIBUTION

Test of significance based on Normal distribution – test of significance for single mean and difference of means, single proportion and difference of proportions for large samples. Small sample tests based on 't' distribution – test of significance for single mean and difference of means (paired t - test) χ^2 – tests for independence of attributes and goodness of fit. Text book:1 Chapter: 14 (sec 14.7,14.8,14.4)

Unit – II: CONFIDENCE INTERVAL

Confidence interval for single proportion, difference between proportions, single mean and difference of means using Normal distribution. confidence interval for single mean and difference of means (Using 't' statistic), confidence interval for variance (using 'χ^2' statistic) and confidence interval for variance ratio (using 'F' statistic). Text book:1 Chapter: 17(sec 17.7)

Unit – III: NON- PARAMETRIC TEST

Non-parametric tests – Run test, Median test, sign test and Mann whitney U – test (one sample and two samples).To test of significance based on Normal distribution and confidence interval and solve the central difference interpolation method. Text book:1 Chapter:18 (sec 18.7)

Unit – IV: NEWTON'S FORWARD FORMULA AND LAGRANGE'S FORMULA

Newton's Forward and Backward difference formula. Interpolation with unequal intervals. Newton's divided difference formula and Lagrange's formula.

Text Book :1 Chapter :19[19.4] Text Book :1 Chapter :19[19.1]

Unit – V: CENTRAL DIFFERENCE INTERPOLATION FORMULA

Central difference interpolation formula – Sterling's and Bessel's formula. Numerical Integration : Trapezoidal Rule, Simpson's $1/3^{rd}$ and $3/8^{th}$ rules, Weddle's rule. . Text Book :1 Chapter :19[19.5] Text Book :1 Chapter :19[19.1]

Unit – VI: APPLICATIONS

To solve the testing of hypothesis (Large sample, small sample) and calculating the Non-parametric test. The course aims to provide students with the specialized knowledge in advanced numerical analysis.

Text Books:

1.Fundamentals of Applied Statistics – S.C. Gupta and V.K. Kapoor, Sultan Chand and Sons. 4^{th} thoroughly revised edition, Jan 2007.
2.Statistical Quality Control – R.C.Gupta, kanna Publishers, Delhi.
3.Fundamentals of mathematical statistics – S.C.Gupta & V.K.Kapoor, Sultan chand & sons, New Delhi, 11^{th} thoroughly revised edition.

CO-PO Mapping for Practical – Iv (Inference And Numerical)

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	1	-	-	-
CO2	-	-	1	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	-	-	2	1
CO5	-	-	-	-	-	2

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM - VI	MBE2:1	STATISTICAL QUALITY CONTROL	22K6SELS2	Hrs:5	Credit:5

Course objectives:

1. The objective of this course is to equip the students with knowledge of industrial statistics as well as applications of various industries.
2. This paper gives an exposure to quality control and its concepts and also explains the reliability concept.

Course outcomes:

Cos	Statements
CO1	Although descriptions of specific characteristics are helpful, they are not enough to identify whether there is a problem with quality.
CO2	The tools in each of these categories provide different types of information for use in quality analysis.
CO3	Acceptance sampling can help to solve this problem.

Unit – I: CONCEPT OF SQC

Statistical quality control – definition –Basis of SQC. Chance and assignable causes – Benefits of SQC – process and product control – control charts – 3σ control limits – tools for SQC. . Text Book :1 Chapter :1[1.1-1.3]

Unit – II: CONTROL CHARTS FOR VARIABLES

Control charts for variables – steps for $\overline{X}$ and R charts – control limits for $\overline{X}$ charts and R charts – criterion for detecting lack of Control in $\overline{X}$ charts and R charts. Interpretation of $\overline{X}$ charts and R charts. Control charts for standard deviation. . Text Book :1 Chapter :1[1.5]

Unit – III: CONTROL CHART FOR ATTRIBUTES

Control charts for attributes – Types of attributes – p chart and d chart – definition, mean and variance. Three methods of p and d charts for variable Sample size. Interpretation of p chart. Text Book :1 Chapter :1[1.6]

Unit – IV: CONTROL CHART

Control charts for no. of detectives per unit (c – charts) – definition – limits, mean and variance, c - chart for variable sample size – application – Natural tolerance limits and specification limits – interpretation. Text Book :1 Chapter :1[1.7]

Unit – V: ACEPTING SAMPLING

AQL, LTPD, Consumer's risk, Producer's risk, AOQL, O.C curve, ASN - Definitions. Dodge and Roming rectifying sampling inspection – Single sample plan, determination of n and c. Text Book :1 Chapter :1[1.10]

Unit – VI: APPLICATIONS

To solve the control chart for variables and attributes using the sampling inspection plan(single and double).

Text Books

1.Fundamentals of Applied Statistics – S.C. Gupta and V.K. Kapoor, Sultan Chand and Sons. 4th thoroughly revised edition, Jan 2007.

2.Statistical Quality Control – R.C.Gupta, kanna Publishers, Delhi.

3.Statistical Quality Control –Montgomery.

CO-PO Mapping for Statistical Quality Control

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	1	-	-	-
CO2	-	-	1	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	-	-	2	1
CO5	-	-	-	-	-	2

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM – VI	MBE– 2:2	BAYESIAN INFERENCE	22K6SELS2	Hrs:5	Credit:5

Course Objectives:

To develop the Bayesian frame work for data analysis and its flexibility and be able to demonstrate.

Course Outcomes:

Cos	Statements
CO1	Understand the concepts of prior and posterior distributions
CO2	Be able to differentiate between classical and Bayesian inference.
CO3	Applications of various loss and risk functions.
CO4	Be able to apply the concept of Bayesian inference in different fields of applications.
CO5	Develop the Bayesian frame work for data analysis and its flexibility and be able to demonstrate.

Unit-I: BAYESIAN POINT ESTIMATION

Bayesian point estimation: as a prediction problem from posterior distribution. Bayes estimators for (i) absolute error loss (ii) squared error loss (iii) 0-1 loss.

Unit-II: GENERALIZTION OF FUNCTIONS

Generalization to convex loss functions. Evaluation of the estimate in terms of the posterior risk. theorem – prior and posterior distributions. Conjugate priors and Jeffrey's priors, examples.

Unit-III: BAYESIAN INTERVAL ESTIMATION

Bayesian interval estimation: Credible intervals. Highest posterior density regions. Interpretation of the confidence coefficient of an interval and its comparison with the interpretation of the confidence coefficient for a classical confidence interval.

Unit-IV : BAYESIAN TESTING OF HYPOTHESIS

Bayesian testing of hypotheses : Specification of the appropriate form of the prior distribution for a Bayesian testing of hypothesis problem. Prior odd's Posterior odds.

Unit-V: BAYESIAN FACTORS OF TYPES OF HYPOTHESIS PROBLEMS

Bayes factor for various types of testing hypothesis problems depending upon whether the null hypothesis and the alternative hypothesis are simple or composite.

Unit-VI : APPLICATIONS

Bayesian testing of statistical hypothesis and Different types of Errors and their problems.

Text Book:

Berger,J.O. : Statistical decision theory and Bayesian analysis, Springler Verlag.
Robert, C.P. and Casella, G.Monte Carlo : Statistical methods, Springer Verlag.
Leonard, T. and Hsu, J.S.J. : Bayesian methods, Cambridge University press.
Degroot, M.H. : Optimal statistical decisions, McGraw Hill.
Bernando, J.M. and Smith, A.F.M. : Baysian theory, John Wiley and sons.
Robert, C.P. : The Bayesian choice : A decision theoretic motivation, Springer.

CO-PO Mapping for Bayesian Inference

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	1	-	-	-
CO2	-	-	1	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	-	-	2	1
CO5	-	-	-	-	-	2

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM VI	MBE -3:1	PROGRAMMING IN 'C'	22K6SELS3	Hrs:5	Credit:5

Course objectives:

1. To the features and syntax of the C - programming language and train the students to write the efficient program in C.
2. To understand the practical Training in C - programming language and problems occurred in systems.
3. To explore the concepts of information technology and communication via computers

Course outcomes:

Cos	Statements
CO1	Various basic concepts, features and components related to C programming language, and structure of C program
CO2	Various operators used like logical, assignment, conditional, bitwise in C program
CO3	Control statements, conditional statements, break and continue statements, arrays, etc. in C program
CO4	Understand the dynamics of memory by the use of pointers andfunctions
CO5	Develop skills towards write, compile and debug programs inC language

Unit – I: INTRODUICTION AND DEFINITIONS

Introduction to 'C' ,Importance of C, Printing a Message, Adding two Numbers ,Constants, Variables, Data types – Declaration of Variables, Declaration of Storage Class Assigning Values to Variables.

Unit – II: OPERATORS

Arithmetic Operators – Special Operators, Arithmetic Expressions – Type conversions in Expressions, Operator Precedence and Associativity, Mathematical Functions.

Unit – III: TYPES OF STATEMENT

Decision Making with if statement, Simple if Statement – The Else if Ladder, The Switch Statement – Goto Statement, The While Statement – The For Statement.

Unit – IV: TYPES OF ARRAYS

One-dimensional Arrays – Multi-dimensional Arrays, Declaring and Initializing String Variables – Writing Strings to Screen, Comparison of Two Strings, String-handling Functions.

Unit –V: FUNCTIONS

Introduction, Elements of User – defined functions – Recursion, Introduction – Structure Initialization.

Unit - VI : APPLICATIONS

To understand the practical Training in C – programming language and problems occurred in systems.

Text Books

Balagurusamy.E, "Programming in ANSI C",Tata McGraw Hill Publishing company.
Unit- I(Chapter 1(1.1 to 1.4, & 1.8 to 1.10) Chapter 2(2.1 to 2.10).
Unit- II Chapter 3 (3.1 to 3.16).
Unit- III Chapter5(5.1 to 5.9),Chapter6(6.1 to 6.5).
Unit- IV Chapter 7(7.1 to 7.7), Chapter 8(8.1 to 8.4 & 8.7 ,8.8).
Unit -V Chapter 9 (9.1,9.4 to 9.16)Chapter 10(10.1 to 10.5)

CO-PO Mapping for Programming in 'C'

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-		2	-	-
CO2	-	-	2	-	1	1
CO3	-	-	1	-	-	-
CO4	1	-	-	2	1	-
CO5	1	-2	-	-	1	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM-VI	MBE3:2	STOCHASTIC PROCESSES	22K6SELS3	Ints.Hrs:5	Credit:5

Course Objective:

To analyze the stochastic models and utilities

Course Outcomes :

Cos	Statements
CO1	Explain basic concepts of Stochastic processes.
CO2	Implement and apply appropriate stochastic models.
CO3	Explain various stochastic processes
CO4	Calculate transition probability matrix.
CO5	Illustrate stochastic models clearly, in verbal form

Unit – II : Stochastic Processes

Stochastic processes – Definition - Classification of Stochastic processes – Examples of Stochastic processes

Unit – II : Markov Chains

Markov Chains – Definition and examples – Higher transition probabilities – Chapman –Kolmogorov equation – Classification states.

Unit – III: Poisson Process

Poisson process – Poisson process and related distributions – Birth and death process.

Unit – IV: Branching Process

Branching Process – Properties of generating functions of branching process.

Unit –V: Stationary Process

Stationary process like – Moving average – Autoregressive – Autoregressive moving averageprocesses.

Unit –VI : Problems of Stochastic Process

Simple problems of moving average and auto moving average

Text Books:

Medhi, J. : Stochastic Processes

Books for Reference:

Karlin, S. And Taylor, H.M. : A First Course in Stochastic ProcessesRoss, S.M. : Stochastic Processes

CO-PO Mapping for Stochastic Processes

Cos	Pos					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	2		1	1	-	-
CO2	-	1		-	2	
CO3	1	-	2	1	-	2
CO4	-	-	-	-		
CO5	2	-1	-	1	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

பாலினக்கல்வி (Gender Studies)

பருவம் - VI கற்பித்தல் : 1 தரப்புள்ளி : 1 பாடகுறியீட்டுஎண்: 22K6GS

நோக்கம் : சங்க இலக்கியங்களின் சிறப்பையும், பொருமையையும் உணர்தல், நாடக இலக்கியங்களின் இயல்பு, சிறப்பு உத்திகள் பற்றி அறிதல்

பயன்கள் : இலக்கியம் பற்றிய சிறந்த அறிவையும், நாடகப் படைப்பாற்றலையும் பெறச்செய்தல்

அலகு 1 பாலியல் பாலின உடற்கூறுரீ தியாக நிர்ணயித்தல் -ஆணாதிக்கம்-பெண்ணியம்-பாலினபாகுபாடு-வேலைப்பாடு-பாலினஒருபடித்தவைகள்-பாலினஉணர்வூட்டல்-பாலின சமவாய்ப்பு-பாலின சமத்துவம்-பாலினமைய நீரோட்டமாக்கல்-அதிகாரப்படுத்துதல்

அலகு 2 பாலின சமத்துவக் கல்வி-பல்கலைக் கழகமானிய குழுவின் வழிகாட்டுதல்கள்-ஏழாவது ஐந்தாண்டு திட்டம் முதல் பதினோராவது ஐந்தாண்டுத் திட்டம்-பாலின சமத்துவக்கல்வி, பெய்ஜிங் மாநாடு மற்றும் பெண்களுக்கு எதிரான அனைத்துவரன் முறைகளையும் ஒழிப்பதற்கான சர்வதேச உடன்படிக்கை-இணைத்தல்-உட்படுத்தல்-ஒதுக்கல்

அலகு 3 : பாலியல் பாகுபாட்டிற்கான தளங்கள் குடும்பம்-பாலினவி கிதாச்சாரம்-கல்வி ஆரோக்கியம்-ஆளுமை, மதம்வேலைVs வேலைவாய்ப்பு-சந்தைஊடகங்கள்-அரசியல்-சட்டம்-குடும்பவன்முறை-பாலியல்துன்புறுத்தல்-அரசுகொள்கைகள் மற்றும் திட்டங்கள்

அலகு 4 : பெண்கள் மேம்பாடு மற்றும் பாலின சமத்துவ மேம்பாடு-முயற்சிகள்-சர்வதேச பெண்களுக்கான சகாப்தம்-சர்வதேசபெண்கள்ஆண்டு-பெண்களின் மேம்பாட்டிற்கான தேசியகொள்கை-பெண்கள்அதிகா ஆண்டு 2001-சர்வதேச கொள்கைகளை மைய நீரோட்டமாக்கல்

அலகு 5 : பெண்கள் இயக்கங்கள் மற்றும் பாதுகாப்பு நிறுவன ஏற்பாடுகள்-தேசியமற்றும் மாநிலமகளிர் ஆணையம்-அனைத்து மகளிர் காவல் நிலையங்கள்-குடும்பநீதிமன்றங்கள்-குடும்பவன் முறையிலிருந்து பெண்களைப் பாதுகாக்கம் சட்டம் 2005 பணியிடங்களில் பெண்கள் மீதான பாலியல் துன்புறுத்தல்களை தடுப்பதற்கான உச்சநீதி மன்ற வழிகாட்டுதல்கள்-தாய்சேய் சேமநலசட்டம்-பெண்சிசுக்களை கருவிலேயே கண்டறியும் தொழில் நுட்பம் (முறைப்படுத்தல் மற்றும் தவறாகப் பயன்படுத்தலை தடைசெய் திருச்சட்டம்-ாவ்டிசிங் (பெண்களைத் தொல்லை செய்தல்) தடுப்பச்சட்டம்-சுயஉதவிக்குழுக்கள்-பஞ்சாயத்து அமைப்புகளுக்கான73வது மற்றும்74வது சட்ட சீர்திருத்தம்)

அலகு 6 : பாலின உடற்கூறுகள் பற்றி புரியச்செய்தல்-பாலின சமத்துவக்கல்வி-பெண்மேம்பாட்டுத்திட்டம் யாது எனகண்டறிதல்-ஊடகங்களின் வழிவிழிப்புணர்வை ஏற்பட செய்தல்-வன்கொடுமைக்கு எதிரானசட்டங்களை தெரிந்து பயன்படுத்துதல்

11/3/2022

விளைவுகள் :

1. பாலினக்கல்வியை உடற்கூறுரீதியாக வகைபாடுசெய்து புதியதெளிந்த சிந்தனையோடு உருவாக்குதல்.
2. பாலினக் கல்வியுடன் உட்கூறுகளை மானியக்குழு வழிகாட்டுதலின்படி நுண்நோக்குடன் பயிற்று வித்து மாணவர்களை உயர்த்துதல்.
3. பாலினப்பாகு பாட்டிற்கான இயங்குதளங்களை தொடர்புபடுத்துவதுடன் பாலினமரபின் ஆக்கத்தை மதிப்பீட்டை வளர்த்தல்.
4. பெண்களுக்கான தரமேம்பாட்டையும் சிறப்புக்கூறுகளையும் உருவாக்கி பிரபஞ் சஅறிவில்மேம் படச்செய்தல்
5. பாலினமரவசார்ந்த சமூகசீர்திருத்தங்களை வடிவமைத்து மேம்படுத்தும் இயக்கங்கள், நிறுவனங்களை உயர்த்துதல்.

CO	KEY ATTRIBUTES(K)	STATEMENTS
	வகைபாடு தெளித்தசிந்தனை உருவாக்குதல்	பாலினக்கல்வியை உடற்கூறுரீதியான வகைபாடு செய்துபுதிய தெளிந்த சிந்தனையோடு உருவாக்குதல்
	உட்கூறுகள் நுண்நோக்கி உயர்த்துதல்	பாலினக் கல்வியின் உட்கூறுகளை மானியக்குழு வழிகாட்டுதலின்படி நுண்நோக்குடன் பயிற்றுவித்து மாணவர்களை உயர்த்துதல்
	இயங்குதளம் தொடர்புபடுத்தல் ஆக்கம்	பாலினப் பாகு பாட்டிற்கான இயங்கு தளங்களை தொடர்படுத்து வதுடன் பாலின மரபின் ஆக்கத்தை மதிப்பீட்டை வளர்த்தல்
	தரமேம்பாடு சிறப்புக்கூறுகள் பிரபஞ்சஅறிவு	பெண்களுக்கான தரமேம்பாட்டையம் சிறப்புக் கூறுகளையும் உருவாக்கி பிரபஞ்சஅறிவில் மேம்படச் செய்தல்.
	அமைப்பு வடிவமைப்பு உயர்த்துதல்	பாலின மரவசார்ந்த சமூக சீர்திருத்தங்களை வடிவமைத்து மேம்படுத்தும் இயக்கங்கள், நிறுவனங்களை உயர்த்துதல்.

JUSTIFICATION/ LEVEL OF CORRELATION

CoK1	po(F)
வகைபாடு தெளிந்தசிந்தனை உருவாக்குதல்	பாகுபாடு சிந்தனைத்தளம் படைப்புத்திறன்

Probability of co1 to po8=p(k2)+p(k8)+p(k2)=(1+1+1)/3 so correlation is =3

CoK2	po(F)
உடகூறுகள் நுண்நோக்கு உயர்த்துதல்	பாடுபொருள் நுட்பம் மேம்படுத்துதல்

Probability of co2 to po6=p(k1)+p(k6)+p(k5)=(1+1+1)/3 so correlation is =3

Co3	po(F)
இயங்குதளம் தொடர்புபடுத்துதல் ஆக்கம்	இயங்கும்ஆற்றல் ஒப்பீடு ஆற்றல்

Probability of co3 to po11=p(k5)+p(k11)+p(k8)=(1+1+1)/3 so correlation is =3

Co4	po(k)
தரமேம்பாடு சிறப்புக்கூறு பிரபஞ்சஅறிவு	தரம் புதியசிந்தனைத்தளம் உலகியல்அறிவு

Probability of co4 to p011 =p(k11)+p(k8)+p(k6)=(1+1+1)/3 so correlation is =3

Co5	po(k)
பாலினமரபு வடிவமைப்பு உயர்த்துதல்	இனமரபுமுன்னோடி கட்டமைப்பு மேம்படுத்துதல்

Probability of co5 to p012 =p(k1)+p(k12)+p(k5)=(1+1+1)/3 so correlation is 3

Co/po correlation probability: *பாலினக்கல்வி* (Gender Studies)

Co/po	1	2	3	4	5	6	7	8	9	10	11	12
1								1				
2	1				1	1						
3					1			1			1	
4						1		1			1	
5	1				1							1

பாடநூல்கள்:

1. பாலியலைப் புரிந்துகொள்வோம், ஏக்தா, மதுரை
2. O.P.Mishra, Law Relating to Women and Child Central Law Agency 2001
3. Chairleclavathi, Know your Rights, Tamilnadu Social Welfare Board, Madras 1987
4. Sexual Warasment at the work place - A Luidesakshi 1991, New Delhi
5. அஜிதா, குடும்பவன் முறைகளிலிருந்து பெண்களைப்பாதுகாக்கும் சட்டம் ஏக்தா, மதுரை 2005
6. வனஜா, சியாமாசுந்தரி, பெண்களுக்கான சட்டங்கள், உலகத்தோழமையம், செகந்திராபாத்
7. குடும்பவன் முறையிலிருந்து பெண்களைப் பாதுகாக்கும்சட்டம் - 2015
8. ஜி.ஆர்.ரவிந்திரநாத்ராகிங் ஒழிப்போம், ராவ்டிசிங் ஒழிப்போம், I.D.P.D வெளியீடு, சென்னை

Allied courses

Kunthavai Naachiyaar Govt. Arts College (W)Autonomous, Thanjavur

SEM III	AC1	MATHEMATICAL STATISTICS – I	22K3MAS1	Inst.Hrs:4	Credit: 3

Course objective:

1. The course aims to introduce the basic concepts in statistics.
2. Learning the preliminary tools and concepts (diagrams and graphs)
3. To solve graphical representations introducing of descriptive statistical measures, including those for two variables.
4. To learn adapt to the distributions in the various fields (especially chance factors in all disciplines)
5. To introduce the notion of probability, random variable and expectation, based on which statistical theory and tools have been developed.

Course Outcomes:

Cos	Statements
CO 1	Knowledge of various types of data, their organization and evaluation of summary measures such as measures of central tendency and dispersion etc.
CO2	Information about various Statistical organizations in India and their functions for social developments.
CO3	Identify the type of statistical situation to which different distributions can be applied.
CO4	Use the Mathematical expectation to solve simple practical problems.
CO5	Use the discrete distribution based binomial and Poison distribution.

Unit – I : STATISTICAL DATA, VARIOUS MEASURES OF CENTRAL TENDENCY

Statistical data – primary and secondary (definition only). Formation of frequency distribution. Various measures of central tendency – Mean and Properties median, mode, geometric mean, Harmonic mean – Simple problems.

Text Book ***Chapter 1 (Sec: 1.1 - 1.4) ,Chapter 2 (Sec: 2.3-2.9),***

Unit – II :MEASURES OF DISPERSION

Measures of Dispersion – Range, Quartile deviation, Mean deviation, standard deviation – their coefficients – merits and demerits skewness – Karl Pearson's and Bowley's coefficient (Simple problems). **Text Book** ~~*Chapter 3 (See:3.1- 3.9, 3.13, 3.14)*~~ [Sec: 2.13, 2.14]

Unit – III : PROBABILITY, DISCRETE AND CONTINUOUS RANDOM VARIABLES

Probability – Definition, Axiomatic approach to probability – Additive and multiplicative laws of probability (Two variables only) and conditional probability. Concept of Random variables – Discrete and Continuous Random variables – Distribution function, pmf, pdf and their properties (simple problems). T B: 1 Chapter: 8,9.

Unit – IV : MATHEMATICAL EXPECTATION

Mathematical Expectation – Addition and Multiplication theorems (two variables only). Moment generating and characteristics functions, their properties. Conditional expectation and conditional variance (simple problems).

T.B: 1 Chapter: 6 [6.1-6.4]

Unit – V : BINOMIAL AND POISSON DISTRIBUTIONS

Binomial and poisson distributions – moments, β_1, β_2, moment generating function and cumulant generation function. Fitting binomial distribution and poisson distribution (simple problems). Text Book : 1 Chapter 8 [8.4, 8.5]

Unit – VI :APPLICATIONS

To solve the measure of central tendency, dispersion and also distribution

Text Books

1. S.C.Gupta and V.K.Kapoor – Fundamentals of Mathematical Statistics, sultan and sons.
2. S.P.Gupta – Statistical Methods, sultan and sons. (Revised Edition 2001)

CO-PO Mapping for Mathematical Statistics – I

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	-	-	2	-
CO2	-	-	2	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	2	-	-	1
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W)Autonomous, Thanjavur

SEM IV	AC2(P)	MATHEMATICAL STATISTICS – II (Allied Practical)	22K4MAS2P	Inst.Hrs:5	Credit: 3

Course objectives:

1. Practiced to the realized concept of preliminary tools
2. To understand to types of the distributions functions

Course Outcomes:

Cos	Statements
CO 1	Students will be able to implement Measures of central tendency and dispersion
CO2	Students will be able to implement methods estimation and testing by using appropriate methods and computing formulae.
CO3	Practiced into the basic level statistical tools
CO4	Practiced into the basic level statistical tools correlations and regression Equations.
CO5	Discrete distributions expose the real-life applications

Unit – I: MEASURES OF CENTRAL TENDENCY AND MEASURES OF DISPERSION

Measures of central tendency – A.M, Median, G.M and H.M. Measures of Dispersion – Quartile deviation, Mean deviation (from mean & median), SD and their coefficient. Measures of Skewness, Calculation of first four moments, central moments, β_1 and β_2. **Text Book :1*Chapter 2 (Sec: 2.3-2.9), Chapter 3 (Sec:3.1- 3.9, 3.13, 3.14)***

Unit – II : BIVARIATE DISCRETE PROBABILITY DISTRIBUTION

Bivariate discrete probability distribution – Marginal distribution and conditional distribution. Calculation of Mean, Variance, Covariance, Correlation coefficient, expectation, conditionalexpectationandconditionalVariance.

Text Book 1:*Chapter 2 (Sec: 2.1-2.2) Chapter 5 (Sec:5.4.2), Chapter 6 (Sec: 6.10, 6.11, 6.12, 6.12.1)*

Unit – III : FITTING OF BINOMIAL, POISSON ANDNORMAL DISTRIBUTIONS

Fitting of binomial distribution, Poisson distribution and Normal distributions (area method only). **Text Book :1 Chapter :8,9[8.4,8.5][9.2]**

Unit – IV :KARL PEARSON'S COEFFICIENT OF CORRELATION

Calculation of Karl Pearson's coefficient of correlation, Spearman's Rank Correlation coefficient and Regression equation.

Text Book1 :*Chapter 1(Sec: 2.3-2.9), Chapter 3 (Sec:3.1- 3.9, 3.13, 3.14)*
Chapter 10 (Sec: 10.1-10.6), Chapter 11 (Sec:11.1-11.8)

Unit – V: LARGE SAMPLE TESTS

Large sample tests – Test of Single mean, difference between means, single proportion and difference between proportions. Exact sample test – 't' – test for single mean, difference. between means, paired t – test, chi square test for goodness of fit and independence of attributes.

Text Book 1:*Chapter 14 (Sec: 14.3-14.8),*

Unit – VI: APPLICATIONS

To solve the probability distributions such as Normal, t, χ^2 and F(Large sample and small sample

Text Books

1. S.C.Gupta and V.K.Kapoor – Fundamentals of Mathematical Statistics, sultan and sons.
2. S.P.Gupta – Statistical Methods, sultan and sons. (Revised Edition 2001)

CO-PO Mapping for Mathematical Statistics – II(Allied Practical)

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	-	-	2	-
CO2	-	-	2	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	2	-	-	1
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W) Autonomous, Thanjavur

SEM 4	AC2	MATHEMATICAL STATISTICS – III	22K4MAS3	Inst.Hrs:4	Credit: 3

Course objectives:

1. The students should have understood the applications and nature of the probability distributions such as Normal, t, χ^2 and F.
2. The students with methodological tools and statistical techniques, explaining large sample test
3. To understand small sample test will help them to undertake empirical research independently.

Course Outcomes:

Cos	Statements
CO 1	This paper explored systematic enquiry in understanding the cause and consequences of events and use to improve research technique in various fields.
CO2	Practice and solve the various distributions to simple practical problems.
CO3	Generate the Correlations and Regression equations
CO4	Explain the concepts of testing of hypotheses (large sample test)
CO5	Explain the concepts of testing of hypotheses (small sample test)

Unit – I : NORMAL DISTRIBUTION

Normal distribution – mean, median, mode, moments, β_1 and β_2, moment generating function and uses of Normal distribution. Normal distribution as a limiting form of Binomial distribution. Text Book :1 Chapter :9[9.2]

Unit – II : CONTINUOUS DISTRIBUTIONS

Continuous distributions – Rectangular, Exponential, Beta, and their Probability Density Function, Moment Generating Function, mean and variance.
Text Book :1 Chapter :9[9.3,9.5,9.6,9.7]

Unit – III: CORRELATION AND REGRESSION

Correlation – Definition and uses, Karl Pearson's coefficient of correlation, Spearman's rank correlation and their properties. Simple linear regression lines, regression coefficient and their properties. Text Book :1 Chapter :10,11

Unit – IV: TESTS OF SIGNIFICANCE, TESTING OF HYPOTHESIS, LARGE SAMPLE TEST

Tests of significance – Definition of Null hypothesis, alternative hypothesis, sampling distribution, standard error and critical region. Type I and Type II errors, one tailed and two tailed tests. Large sample test for single mean, difference between means, single proportion and difference between proportions. Text Book :1 Chapter :18

Unit – V : SMALL SAMPLE TESTS, CHI – SQUARE TEST

Small sample tests – 't'- test for single mean, Difference between means. Paired 't' test, Chi – Square test for goodness of fit and independence of attributes. Text Book :1 Chapter :15,16

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Unit – VI: APPLICATIONS

To solve the probability distributions such as Normal, t, χ^2 and F(Large sample and small sample).

Text Books

1. S.C.Gupta and V.K.Kapoor – Fundamentals of Mathematical Statistics, sultan and sons.
2. S.P.Gupta – Statistical Methods, sultan and sons. (Revised Edition 2001)

CO-PO Mapping for Mathematical Statistics – III

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	-	-	2	-
CO2	-	-	2	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	2	-	-	1
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W)Autonomous, Thanjavur

SEM III	AC 1	APPLIED STATISTICS-1	22K3GAS1	Inst.Hrs:4	Credit:3

Course objectives

1. The course aims to introduce the basic concepts in statistics.
2. To provide students with demonstrate their understanding of descriptive statistical data
3. Learning the preliminary tools and concepts (diagrams and graphs)
4. To make the students aware of different type of data sets.
5. To solve graphical representations introducing of descriptive statistical measures, including those for two variables

Course Outcomes:

Cos	Statements
CO 1	Knowledge of Statistics scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc.
CO2	Evaluate the diagrammatic representation
CO3	Knowledge of various types of data, their organisation and evaluation of summary measures such as measures of central tendency and dispersion etc.
CO4	Knowledge of various types of data, their organisation and evaluation of summary measures such as measures of dispersion etc.
CO5	Evaluation of skewness and kurtosis.

Unit – I : CLASSIFICATION AND TABULATION

Definition of Statistics – functions and Characteristics. Statistical Data – Primary and Secondary. Methods of collecting primary data & secondary data, GIS Definition and meaning only. Classification – Definition, objects of Classification and types of classification. Tabulation – Definition, rules for tabulation, Parts of a table and types of tables. **Text Book** ***Chapter 1 (Sec: 1.1 - 1.4)***

Unit – II: DIAGRAMMATIC REPRESENTATION

Diagrammatic representation – Significance, rules for construction, Types of diagrams – Simple bar diagram ,component bar diagram, and pie diagram. Graphs of frequency distributions – Histogram and ogives, Problems related to Rainfall, weather data. **Text Book** ***Chapter 2 (Sec: 2.1-2.2)***

Unit – III : MEASURES OF CENTRAL TENDENCY

Measures of Central Tendency – Arithmetic mean, median, mode, Geometric mean & Harmonic mean, Quartiles – merits and demerits and problems related to weather and climate. **Text Book** ***Chapter 2 (Sec: 2.3-2.9),***

Unit – IV: MEASURES OF DISPERSION

Measures of Dispersion – Range, Quartile Deviation and Standard deviation – their coefficients, merits & demerits, problems. **Text Book** ***Chapter 3 (Sec:3.1- 3.9, 3.13, 3.14)***

Unit – V: MEASURES OF SKEWNESS AND KURTOSIS

Measures of Skewness – Karl Pearson's co-efficient of skewness and Bowley's co-efficient of skewness – problems. Kurtosis - Concept only. **Text Book *Chapter 3 (Sec:3.13, 3.14)***

Unit – VI: APPLICATIONS

To make the students aware of different type of data sets. To solve graphical representations introducing of descriptive statistical measures, including those for two variables

Text Books:

1. Statistics Theory and practice – R.S.N. Pillai & Bagavathi.
2. Statistical Methods – S.P. Gupta.

CO-PO Mapping for Applied Statistics – I

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	-	-	2	-
CO2	-	-	2	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	2	-	-	1
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W)Autonomous, Thanjavur

SEM IV	AC2P	PRACTICAL-II(APPLIED STATISTICS – II)	22K4GAS2P	Inst.Hrs:3	Credit: 3

Course objectives:

1. To provide students with demonstrate their understanding of descriptive statistical data

Course Outcomes:

Cos	Statements
CO 1	Knowledge of Statistics scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc.
CO2	Evaluate the diagrammatic representation
CO3	Knowledge of various types of data, their organisation and evaluation of summary measures such as measures of central tendency and dispersion etc.
CO4	Knowledge of various types of data, their organisation and evaluation of summary measures such as measures of dispersion etc.
CO5	Evaluation of skewness and kurtosis.

Unit – I : DIAGRAMS AND GRAPHS

Construction Diagrams – Bar Diagrams and Pie Diagrams. Graphs – Histogram, Frequency Polygon, Frequency curves and Ogives. Text Book 1 Chapter 1,2

Unit – II : MEASURES OF CENTRAL TENDENCY

Computation of Arithmetic Mean, Median, Mode, Geometric mean and Harmonic mean. Text Book 1 Chapter 2

Unit – III: MEASURES OF DISPERSION

Computation of Dispersion – Quartile Deviation, Mean deviation, Standard deviation . Text Book 1 Chapter 2

Unit – IV :MEASURES OF SKEWNESS,

Computation of Karl Pearson's co-efficient of Skewness and Bowley's co-efficient of skewness. Text Book 1 Chapter 2

Unit – V: CORRELATION, REGRESSION EQUATIONS

Computation of Karl Pearson's co-efficient of Correlation, Concurrent deviation method and Spearman's Rank Correlation. Yule's co-efficient of Association. Text Book 1 Chapter 10,11

Unit – VI : APPLICATIONS

Draw the diagram and graph based on the data. Calculate the central tendency dispersion of the data.

CO-PO Mapping for Practical –II (APPLIED STATISTICS – II)

Cos	Pos					
	PO1	PO2	PO3	PO4	PO5	PO6
CO1	-	-	1	-	-	1
CO2	-	-	2	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	2	-	2	-
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W)Autonomous, Thanjavur

SEM IV	AC3	APPLIED STATISTICS – III	22K4GAS3	Inst.Hrs:3	Credit: 3

Course objectives:

1.The students with methodological tools and statistical techniques, explaining large sample test

2.Tounderstand small sample test will help them to undertake empirical research independently.

3. The students should have understood the applications and nature of the probability distributions such as test in t and χ^2.

4. To gain on statistical concept to include measurements of probability distribution

5. knowledge about important inferential aspects such as point estimation, test of hypotheses and associated concepts

Course outcomes:

Cos	Statements
CO1	Knowledge of other types of data reflecting quality characteristics including concepts of independence and association between two attributes,
CO2	Generate the Correlations and Regression equations
CO3	Apply the concepts of time series and index numbers in real life situation
CO4	Explain the concepts of testing of hypotheses (large sample test)
CO5	Explain the concepts of testing of hypotheses (small sample test)

Unit – I: ASSOCIATION OF ATTRIBUTES

Association of Attributes (two attributes), Nine Square table, types of association, Methods of studying association – Yule's Co-efficient of association – Definition and problems.

Text Book 1:Chapter :17

Unit – II: CORRELATIONAND REGRESSION

Simple correlation – Definition and types of correlation – Methods of studying correlation – Scatter diagram, Karl Pearson's coefficient of correlation, Spearman's rank correlation coefficient and Simple Linear Regression analysis (problems).

Text Book 1:Chapter :12,13

Unit – III : TIME SERIES

Time Series – concept and definition, Components of Time Series – Secular trend, Seasonal variation, cyclical variation and Irregular variation. Measurement of Trend only by the method of moving average and method of least squares.

Text Book 1:Chapter :15

Unit – IV: TESTING OF HYPOTHESIS

Testing of hypothesis – Definition of hypothesis – null hypothesis and alternative hypothesis, standard error, level of significance, critical region, parameters and statistic. Type I and Type II errors, one tailed and two tailed tests, Test procedure.

Text Book 1:Chapter :20

Unit – V:SAMPLING METHODS AND PROBABILITY

Basic sampling methods – Simple random Sampling, Stratified random Sampling, Systematic Sampling and Quota Sampling (No derivations).

Elements of set theory, definition of sample space. Probability, its definition, additive and multiplicative laws of probability(Concepts and statements only) Simple problems(No derivations).

Text Book 1:Chapter :19

Unit – VI: APPLICATIONS

The students with methodological tools and statistical techniques, explaining large sample test and small sample test will help them to undertake empirical research independently.

Text Books

1. Statistics theory and Practice – R.S.N. Pillai & V.Bagavathi(VII Edition)(Reprint -2013).
2. Comprehensive Statistical Methods –P.N.Arora,Sumeet Arora,S.Arora (IV Edition)(Reprint- 2013).

CO-PO Mapping for Applied Statistics – III

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	-	-	2	-
CO2	-	-	2	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	2	-	-	1
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W)Autonomous, Thanjavur

SEM III	AC1	STATISTICS FOR ECONOMICS – I	22K3ECAS1	Inst.Hrs:4	Credit: 3

Course objectives:

1. The course aims to introduce the basic concepts in statistics.
2. To provide students with demonstrate their understanding of descriptive statistical data
3. Learning the preliminary tools and concepts (diagrams and graphs)
4. To make the students aware of different type of data sets.
5. To solve graphical representations introducing of descriptive statistical measures, including those for two variables.

Course Outcomes:

Cos	Statements
CO 1	Knowledge of Statistics scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc.
CO2	Information about various Statistical organizations in India and their functions for societal developments,
CO3	Knowledge of various types of data, their organization and evaluation of summary measures such as measures of central tendency and dispersion etc.
CO4	Generate the Correlations and Regression equations
CO5	Evaluation of skewness and kurtosis.

Unit – I : COLLECTION AND CLASSIFICATION

Definition of Statistics – its functions and Characteristics. Statistical data – Primary and Secondary data. Methods of collecting primary and secondary data. Classification – definition, objects of classification and types of classification. **Text Book** ***Chapter 1 (Sec: 1.1 - 1.4)***

Unit – II: DIAGRAM AND GRAPHS

Diagram -Types of diagrams – Simple bar diagram and component bar diagram. Simple Pie diagram . Graphs – Histogram and frequency polygon. **Text Book** ***Chapter 2 (Sec: 2.1-2.2)***

Unit – III: MEASURES OF CENTRAL TENDENCY

Measures of Central Tendency – Arithmetic Mean, Median, Mode, Geometric mean and Harmonic mean – merits & demerits, Quartiles. **Text Book** ***Chapter 2 (Sec: 2.3-2.9), Chapter 3 (Sec:3.1- 3.9, 3.13, 3.14)***

Unit – IV: MEASURES OF DISPERSION

Measures of Dispersion – Range, Quartile deviation, Mean deviation and standard deviation – their coefficients, merits and demerits – simple problems. **Text Book** ***Chapter 3 (Sec:3.1- 3.9, 3.13, 3.14)***

Unit – V: MEASURES OF SKEWNESS AND KURTOSIS

Measures of Skewness – Karl Pearson's coefficient of Skewness and Bowley's coefficient of Skewness – problems. Concepts of Kurtosis only. **Text Book *Chapter 3 (Sec: 3.13, 3.14)***

Unit – VI: APPLICATIONS

To make the students aware of different type of data sets. To solve graphical representations introducing of descriptive statistical measures, including those for two variables.

Text Books

1. S.C.Gupta and V.K.Kapoor - Fundamentals of Mathematical Statistics, sultan and sons.
2. S.P.Gupta - Statistical Methods, sultan and sons. (Revised Edition 2001)

CO-PO Mapping for Statistics For Economics – I

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	-	-	2	-
CO2	-	-	2	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	2	-	-	1
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

SEM IV	AC2	STATISTICS FOR ECONOMICS – II	22K4ECAS2	Inst.Hrs:4	Credit: 3

Course objectives:

1.The students with methodological tools and statistical techniques, explaining large sample test

2.To understand small sample test will help them to undertake empirical research independently.

3. The students should have understood the applications and nature of the probability distributions such as test in t and χ^2.

4. To gain on statistical concept to include measurements of probability distribution

5. knowledge about important inferential aspects such as point estimation, test of hypotheses and associated concepts

Course outcomes:

Cos	Statements
CO1	Knowledge of other types of data reflecting quality characteristics including concepts of independence and association between two attributes,
CO2	Generate the Correlations and Regression equations
CO3	Apply the concepts of time series and index numbers in real life situation
CO4	Explain the concepts of testing of hypotheses (large sample test)
CO5	Explain the concepts of testing of hypotheses (small sample test)

Unit – I: ASSOCIATION OF ATTRIBUTES

Association of Attributes (two attributes), Nine Square table, types of association, Methods of studying association – Yule's Co-efficient of association – Definition and problems. Text Book 1 Chapter 17

Unit – II: CORRELATION AND REGRESSION

Simple correlation – Definition and types of correlation – Methods of studying correlation – Scatter diagram, Karl Pearson's coefficient of correlation, Spearman's rank correlation coefficient and Simple Linear Regression analysis (simple problems only).
Text Book 1 Chapter 12,13

Unit – III : TIME SERIES

Time Series – concept and definition, Components of Time Series – Secular trend, Seasonal variation, cyclical variation and Irregular variation. Measurement of Trend only by the method of moving average and method of least squares. Text Book 1 Chapter 15

Unit – IV: TESTING OF HYPOTHESIS

Testing of hypothesis – Definition of hypothesis – null hypothesis and alternative hypothesis, standard error, level of significance, critical region, parameters and statistic. Type I and Type II errors, one tailed and two tailed tests, Test procedure. Text Book 1 Chapter 20

Unit – V: LARGE AND SMALL SAMPLE TESTS

Large sample tests – Test for single mean and difference between two means. Test for single proportion and difference between proportions – Procedure and problems
Small sample tests – Chi-square test for independence of attributes (Two attributes only), 't' test for single mean, difference between two means and paired 't' test (Procedure and problems). Text Book 1 Chapter 19

Unit – VI: APPLICATIONS

The students with methodological tools and statistical techniques, explaining large sample test and small sample test will help them to undertake empirical research independently.

Text Books

3. Statistics theory and Practice – R.S.N. Pillai & V.Bagavathi(VII Edition)(Reprint -2013).
4. Comprehensive Statistical Methods –P.N.Arora,Sumeet Arora,S.Arora (IV Edition)(Reprint- 2013).

CO-PO Mapping for – Statistics for Economics – II

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	-	-	2	-
CO2	-	-	2	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	2	-	-	1
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

Kunthavai Naacchiyaar Govt. Arts College (W)Autonomous, Thanjavur

SEM II	AC1	STATISTICS AND MATHEMATICS FOR MANAGEMENT	22K2BBAS1	Inst.Hrs:4	Credit: 3

Course objectives

1. The course aims to introduce the basic concepts in statistics.
2. Learning the preliminary tools and concepts (diagrams and graphs)
3. To make the students aware of different type of data sets .
4. To solve graphical representations introducing of descriptive statistical measures, including those for two variables

Cos	Statements
CO 1	Describe the basic concepts in sample surveys and data. Knowledge of Statistics scope and importance in various areas such as Medical, Engineering, Agricultural and Social Sciences etc.
CO2	Estimate the various types of data, their organisation and evaluation of summary measures such as measures of central tendency and dispersion etc.
CO3	Generate the Correlations and Regression equations and **estimate** various index numbers
CO4	Solve the real life analysis problems.
CO5	Use appropriate method of matrix.

Unit – I : CLASSIFICATION AND TABULATION, DIAGRAM, GRAPHS

Statistics – Definition, Merits and demerits. Methods of collecting Primary data and Secondary data. Classification and Tabulation – Objectives, Types and Uses. Bar Diagram – Simple, Component, Multiple, Percentage and Pie diagram. Graphs – Histogram & Ogives.

Unit – II: MEASURES OF CENTRAL TENDENCY

Measures of Central Tendency – Mean, Median, Mode. Merits, Demerits and simple problems. Measures of Dispersion Range, Quartile Deviation, Standard Deviation.

Unit – III: CORRELATION AND REGRESSION

Simple correlation – Karl Pearson's correlation coefficient and Spearman's rank correlation coefficient. Simple Regression lines – Simple problems.

Unit – IV: INDEX NUMBERS

Index numbers – Laspeyre's, Paasche's and Fisher's Index numbers – Simple problems.

Unit – V: LINEAR PROGRAMMING PROBLEM, GRAPHICAL METHOD

Definition of Linear programming problem, Decision variable – Basic Assumptions – Mathematical formulation of the Problem – Procedure of solving LPP by Graphical Method – Simple problems (Two variables only)

Unit – VI: APPLICATIONS

To solve graphical representations introducing of descriptive statistical measures, including those for two variables.

Text Books:

1. Statistics Theory and Practice – R.S.N. Pillai & V.Bagavathi (VII Edition)(Reprint - 2013).
2. Comprehensive Statistical Methods – P.N.Arora,Sumeet Arora,S.Arora (IV Edition) (Reprint- 2013).
3. OperationResearch-S.Kalavathy – II Edition (Reprint - 2007)
4. A. Singaravelu – Allied Mathematics – II .

CO-PO Mapping for Statistics and mathematic for management

	Pos					
Cos	PO1	PO2	PO3	PO4	PO5	PO6
CO1	1	-	-	-	2	-
CO2	-	-	2	-	-	2
CO3	-	-	2	-	-	2
CO4	-	-	2	-	-	1
CO5	-	-	-	-	-	1

(High correlation -3, Moderate correlation-2), No correlation-(-).

IV. Continuous Internal Assessment System

	Maximum	Components			Passing Minimum
		Attendance	CIA	Seminar / Assignment	
Theory	25	05	15	05	10
Practical*	40	05	15	20 (Record)	16

** Department specific*

V. Question Pattern

	Part A	Part B	Part C
Semester Exam: Theory (75)	20 X 1=20 (Answer All)	5 X 5= 25 (Internal choice)	3 X10 =30(Open choice)
Semester Exam: Practical (60)	5X10 = 50*	-	-
Semester Exam: SBEC Theory (75)	5 X 5= 25 (Internal choice)	5 X10 =50(Open choice)	-
CIA Exam: Theory (50)	10 X 1=10 (Answer All)	4 X 5= 20 (Internal choice)	2 X10 =20(Open choice)
CIA SBEC Theory (50)	4 x5 = 20 (Internal choice)	3 X10 =30(Open choice)	-
Model Exam Thoery (75)	20 X 1=20 (Answer All)	5 X 5= 25 (Internal choice)	3 X10 =30(Open choice)
Model Exam: Practical (50) *	5X10 = 50	-	-

** Department specific*

X . Question Allocation and Blooms Taxonomy for (Direct) Assessment

Unit	Section & Marks	Question Number	Blooms Level	Action Verbs
I	A (1 mark)	1-4	I / II	***Level 1:*** *Choose, Define, Find, How, Label, List, Match, Name, Select, Show, Tell, What, When, Where, Which, Who, Why*
	B (5 mark)	21 (a) and (b)	I / II	***Level II:*** *Classify, Compare, Contrast, Demonstrate, Explain, Extend, Illustrate, Infer, Interpret, Outline, Relate, Show, Summarize, Translate*
	C (10 mark)	26	I / II	
II	A (1 mark)	5-8	I / II	***Level III:*** *Apply, Build, Choose, Construct, Develop, Experiment with, Identify, Interview, Make use of, Model, Organize, Plan, Select, Solve, Utilize*
	B (5 mark)	22 (a) and (b)	I / II	
	C (10 mark)	27	I / II	
III	A (1 mark)	9-12	I / II	***Level IV:*** *Analyze, Assume, Categorize, Discover, Dissect, Distinguish, Divide, Examine, Function, Inference, Inspect, Motive, Relationships, Simplify, Survey, Take part in, Test for, Theme*
	B (5 mark)	23 (a) and (b)	III / IV	
	C (10 mark)	28	III / IV	
IV	A (1 mark)	13-16	I / II	***Level V:*** *Agree, Appraise, Assess, Award, Conclude, Criteria, Criticize, Decide, Deduct, Defend, Determine, Disprove, Estimate, Evaluate, Importance, Influence, Interpret, Judge, Justify, Mark, Measure, Opinion, Perceive, Prioritize, Prove, Rate, Recommend, Rule on, Select, Support, Value*
	B (5 mark)	24 (a) and (b)	III / IV	
	C (10 mark)	29	V / VI	
V	A (1 mark)	17-20	I / II	***Level VI:*** *Adapt, Combine, Compile, Compose, Construct, Create, Delete, Design, Develop, Discuss, Elaborate, Estimate, Formulate, Happen, Imagine, Improve, Invent, Make up, Maximize, Minimize, Modify, Original, Originate, Plan, Predict, Propose, Solution, Solve, Suppose, Test, Theory*
	B (5 mark)	25 (a) and (b)	V / VI	
	C (10 mark)	30	V / VI	

BL	No. Of Questions (Sections)			Total Marks	% of Marks
	A	B	C		
I. Remembering	12	4	2	12	50
II. Understanding	08			48	
III. Applying	-	4	2	20	33
IV. Analyzing	-			20	
V. Evaluating	-	2	1	10	17
VI. Creating	-			10	
Total Questions	20	10	5	120	100

XI. Teaching Methodology Adopted: (department specific) + Department may adopted at least a 20 % of ICT enabled classes out of total hours of each course work and proper documents *(Date, Hour, Course and unit, name of the faculty and sign of the representative student)* to be maintained for the same

XII. Outline of Learning Outcomes- based Curriculum Frame work (LOCF)

(All the following categories of courses will be given with definition, procedure and system of implementation)

1. **LC:** Language Course (Part I):
2. **ELC:** English Language Course (Part II):
3. **CC** : Core Course :
4. **AC :** Allied Course
5. **EC**: Elective Course :
6. **MBE**: Major Based Elective:
7. **SBEC:** Skill Based Elective Courses:
8. (A) Internship-External
   (B) Internship-Internal
   (C) Field Work
9. **VA**: Value Added courses:
10. **NME** : Non-Major Elective:
11. **VE:** Value Education
12. **ES:** Environmental Studies
13. **SSD:** Soft Skill Development:
14: Extension and Extra Curricular Activities:
15. **ECC** - Extra Credit Course:
    (A) **SS**-Self Study:
    (B) **MOOC**:
    (C) Add on Course:

* add-on Certificate Courses with 10-30 contact hrs conducting by Course Coordinator of the department /College

\# List of MOOC Courses will be given by the Course Coordinator

$ External or Internal Internship: 2 weeks During Month of March - AprilExecuted by Internship Coordinator through internal guide

OR

Field work: Can be a field study / industrial visit During Month of March - April Executed by Internship Coordinator through internal guide with submitting a 10 to15 page report.

QUESTION BLUE PRINT (75 Marks)

Q.No	*Unit*	*Blooms Level*
	Part A	
1	1	Remembering I / Understanding II
2	1	Remembering I / Understanding II
3	1	Remembering I / Understanding II
4	1	Remembering I / Understanding II
5	II	Remembering I / Understanding II
6	II	Remembering I / Understanding II
7	II	Remembering I / Understanding II
8	II	Remembering I / Understanding II
9	III	Remembering I / Understanding II
10	III	Remembering I / Understanding II
11	III	Remembering I / Understanding II
12	III	Remembering I / Understanding II
13	IV	Remembering I / Understanding II
14	IV	Remembering I / Understanding II
15	IV	Remembering I / Understanding II
16	IV	Remembering I / Understanding II
17	V	Remembering I / Understanding II
18	V	Remembering I / Understanding II
19	V	Remembering I / Understanding II
20	V	Remembering I / Understanding II
	Part B	
21 (a)	I	Remembering I / Understanding II
(b)	1	Remembering I / Understanding II
22 (a)	II	Remembering I / Understanding II
(b)	II	Remembering I / Understanding II
23 (a)	III	Applying III / Analyzing IV
(b)	III	Applying III / Analyzing IV
24 (a)	IV	Applying III / Analyzing IV
(b)	IV	Applying III / Analyzing IV
25 (a)	V	Creating V / Evaluating V I
(b)	V	Creating V / Evaluating V I
	Part C	
26	I	Remembering I / Understanding II
27	II	Remembering I / Understanding II
28	III	Applying III / Analyzing IV
29	IV	Applying III / Analyzing IV
30	V	Creating V / Evaluating V I

KUNTHAVAI NAACCHIYAAR GOVT. ARTS COLLEGE (W) AUTONOMOUS,
THANJAVUR - 613 007.
POST GRADUATE DEPARTMENT OF STATISTICS
U.G. Distribution of Credits and Hours for 2022-2023 Batch - Science

Part I

Language Course

Course	Sem.	Hrs.	Credit
I	I	6	3
II	II	6	3
III	III	6	3
IV	IV	6	3
Total		24	12

Part II

English Language Course

Course	Sem.	Hrs.	Credit
I	I	6	3
II	II	6	3
III	III	6	3
IV	IV	6	3

Part IV

Value Education

Course	Sem.	Hrs.	Credit
1	1	2	2
Total		2	2

Environmental Studies

Course	Sem.	Hrs.	Credit
I	II	2	2
Total		2	2

Non Major Elective Course

Course	Sem.	Hrs.	Credit
I	III	2	2
II	IV	2	2
Total		4	4

Skill Based Elective Course

Course	Sem.	Hrs.	Credit
I	IV	2	2
II	V	2	2
III		-	2
Total		4	6

Soft Skills Development

Course	Sem.	Hrs.	Credit
I	V	2	2
Total		2	2

Part III

Core Course

Course	Sem.	Hrs.	Credit
I	I	6	6
II	II	6	3
III	II	6	6
IV	III	6	6
V	III	5	3
VI	IV	5	5
VII	IV	5	5
VIII	V	6	5
IX	V	5	5
X	V	5	3
XI	VI	7	6
XII	VI	6	6
XIII	VI	6	6
Total		74	65

Allied Course

Course	Sem.	Hrs.	Credit
I	I	4	4
II	II	5	3
III	II	5	2
IV	III	5	4
V	IV	5	3
VI	IV	4	2
Total		28	18

Major Based Elective Course

Course	Sem.	Hrs.	Credit
I	V	5	5
II	VI	5	5
III		5	5
Total		15	15

Part V – Gender Studies, Extension and Extra Curricular Activities

Course	Sem.	Hrs.	Credit
I	VI	1	1
II		-	1
Total		1	2

Skill Based Elective Courses
IV Semester – Life Skills
V Semester – value Added Course
V Semester – Internship / Field Work

Total Credits – 140
Total Hours – 180