B.Sc. STATISTICS (2017 - 2018)

Sl. No	SEM	Category	Paper Code	Title of the Paper	Maximum Marks			Minimum Marks for Pass			Hours Week	Credits
					CIA	EE	Total	CIA	EE	Total		
1	I	Part – I	17U1STT1/H1	Tamil – I / Hindi – I	25	75	100	10	30	40	6	3
2		Part – II	17U1STE1	English – I	25	75	100	10	30	40	6	3
3		Core	17U1STC1	Descriptive Statistics	25	75	100	10	30	40	5	4
4		Core	17U1STC2	Probability Theory and Random Variables	25	75	100	10	30	40	5	4
5		Allied	17U1STMAA1	Allied Mathematics-I	25	75	100	10	30	40	5	4
		Allied (NS)	17U2STMAA2	Allied Mathematics - II (N.S)	-	-	-	-	-	-	3	-
6		ES	17U1STES	Environmental Studies	-	100	100	-	40	40		1
7	II	Part – I	17U2STT2/H2	Tamil – II / Hindi – II	25	75	100	10	30	40	6	3
8		Part – II	17U2STE2	English – II	25	75	100	10	30	40	6	3
9		Core	17U2STC3	Discrete Distributions	25	75	100	10	30	40	5	5
10		Core	17U2STCP1	Major Practical - I (Descriptive Statistics)	40	60	100	16	24	40	4	3
11		Allied (NS)	17U2STMAA2	Allied Mathematics –II (NS)	25	75	100	10	30	40	3	4
12		Allied	17U2STMAA3	Allied Mathematics –III	25	75	100	10	30	40	5	4
13		SBE	17U2STS1	Skill Based Education – I Verbal Reasoning - I	25	75	100	10	30	40	1	1
14		VBE	17U2STVE	Value based Education	25	75	100	10	30	40	-	-
15	III	Part – I	17U3STT3/H3	Tamil – III / Hindi – III	25	75	100	10	30	40	6	3
16		Part – II	17U3STE3	English – III	25	75	100	10	30	40	6	3
17		Core	17U3STC4	Continuous Distributions	25	75	100	10	30	40	5	5
18		Core	17U3STC5	Statistical Inference – I: Theory of Estimation	25	75	100	10	30	40	5	5
19		Allied	17U3STCSA1	Allied Computer Programming in C	25	75	100	10	30	40	5	4
		Allied (NS)	17U4STCSAP1	Allied Computer Practical (NS)	-	-	-	-	-	-	3	-
20		GS	17U3MAGS	Gender Studies	-	100	100	-	40	40	-	-

Sl. No	SEM	Category	Paper Code	Title of the Paper	Maximum Marks			Minimum Marks for Pass			Hours / Week	Credits
					CIA	EE	Total	CIA	EE	Total		
21	IV	Part – I	17U4STT4/H4	Tamil-IV / Hindi-IV	25	75	100	10	30	40	6	3
22		Part – II	17U4STE4	English – IV	25	75	100	10	30	40	6	3
23		Core	17U4STC6	Statistical Inference - II : Testing of Hypothesis	25	75	100	10	30	40	5	5
24		Core	17U4STC7	Sampling Techniques	25	75	100	10	30	40	4	5
25		Allied	17U4STCSA2	Allied Data Mining	25	75	100	10	30	40	5	4
26		Allied (NS)	17U4STCSAP1	Allied Computer Practical (NS)	40	60	100	16	24	40	3	2
27		SBE	17U4STS2	Skill Based Education– II Verbal Reasoning - II	25	75	100	10	30	40	1	1
28	V	Core	17U5STC8	Operations Research – I	25	75	100	10	30	40	5	6
29		Core	17U5STC9	Statistical Quality Control	25	75	100	10	30	40	5	6
30		Core	17U5STC10	Game theory	25	75	100	10	30	40	5	5
31		Core	17U5STCP2	Major Practical -II (Using Calculator)	40	60	100	16	24	40	4	4
32		Major Elective – I	17U5STEL1A 17U5STEL1B	Demographic Methods (or) Econometrics	25	75	100	10	30	40	4	3
33		Major Elective - II	17U5STEL2A 17U5STEL2B	Simulation and Probabilistic Model (or) MATLAB	25	75	100	10	30	40	4	3
34		NME	17U5STNME	Non-Major Elective - Matrix Algebra	25	75	100	10	30	40	2	1
35		SSD	17U6STSSD	Soft Skill Development	-	100	100	-	40	40	1	-
36	VI	Core	17U6STC11	Numerical Analysis	25	75	100	10	30	40	4	5
37		Core	17U6STC12	Design of Experiments	25	75	100	10	30	40	5	5
38		Core	17U6STC13	Operations Research - II	40	60	100	16	24	40	5	4
39		Core	17U6STCP3	Major Practical -III (Using Statistical Software Package)	40	60	100	16	24	40	4	3
40		Major Elective–III	17U6STEL3A 17U6STEL3B	Actuarial statistics (or) Genetical Statistics	25	75	100	10	30	40	5	4
41		Major Elective- IV	17U6STEL4A 17U6STEL4B	Time series and Index numbers (or) Statistical Data Analysis	25	75	100	10	30	40	5	4
42		GK	17U6STGK	General Knowledge		100	100		40	40	1	-
43		CN	17U6STCN	Comprehensive Test		100	100		40	40	1	1
				Extension Activities	-	-	-	-	-	-	-	1
				Total	-	-	**4300**				**180**	**140**

B.Sc., STATISTICS (2017 - 2018)

Paper Code	Total No. Of Papers	Total Marks	Total Credits	Classification
Part - I	**04**	**400**	**12**	√
Part – II	**04**	**400**	**12**	√
Part – III Core Allied Major Elective	 16 06 04 **26**	 1600 600 400 **2600**	 76 20 14 **110**	√
Part – IV Environmental Studies Value based education Skill Based Elective Gender studies Non Major Elective Soft skill development G.K Comprehensive Test	 1 1 2 1 1 1 1 1 **9**	 100 100 200 100 100 100 100 100 **900**	 1 -- 2 -- 1 -- -- 1 **05**	√
Part – V	**Extension Activity**		**1**	X
Total	**43**	**4300**	**140**	√

A.VEERIYA VANDAYAR MEMORIAL SRI PUSHPAM COLLEGE (AUTONOMOUS),
POONDI, THANJAVUR DIST.

Question Pattern for UG and PG Programmes for students to be admitted during 2017 – 2018 and afterwards

Total Marks: 75

QUESTION PATTERN

SECTION – A
(Question 1 to 10)

10 x 2 = 20 Marks

1. Short Answer Questions
2. Two Questions from each units (All are answerable)

SECTION – B
(Question 11 to 15)

5 x 5 = 25 Marks

1. 5 Paragraph type questions with "either / or" type choice.
2. One question from each unit of the Syllabus.
3. Answer all the questions.

SECTION – C
(Question 16 to 20)

3 x 10 = 30 Marks

1. 5 Essay type questions – any three are answerable.
2. One questions from each unit of the Syllabus.

B.Sc. Statistics

Semester	Subject Code	Title Of The Paper	Hours Of Teaching / Week	No. of Credits
I	**17U1STT1**	**இக்கால இலக்கியம் (செய்யுள் , உரைநடை, சிறுகதை, புதினம், நாடகம்)**	**6**	**3**

கூறு: 1 செய்யுள் **நேரம்: 18**

1. இராமலிங்க அடிகளார் - திருவருட்பா - இறைத் திருக்காட்சி —1—10

2. பாரதியார் - தேசியகீதம் : பாரத தேசம் — எங்கள் நாடு,

3. பாரதிதாசன் - புதிய உலகம்: உலக ஒற்றுமை —பேரிகை, தளைஅறு, மானுட சக்தி

4. பட்டுக்கோட்டை கல்யாண சுந்தரம் -காடு வெளையட்டும் பெண்ணெ ,

5. நாமக்கல் கவிஞர் - என்றுமுளதென்றமிழ் ,

6. கவிமணி : ஒற்றுமையே ,உயர்வு நிலை—நாட்டுக்குழைப்போம்

கூறு: 2 உரைநடை **நேரம்: 18**

1. கேட்டிவி - இராகபாவம் (1 முதல் 15 வரை)

2. கேட்டிவி - பயணங்கள் தொடரும்

கூறு: 3 சிறுகதை **நேரம்: 18**

1. கேட்டிவி - குரல் கொடுக்கும் வானம்பாடி (1 முதல் 10 வரை)

2. கேட்டிவி - மனோரஞ்சிதம் முழுவதும்

கூறு: 4 புதினம் **நேரம்: 18**

கு.வெ. பாலசுப்பிரமணியன் - காளவாய்

கூறு: 5 நாடகம் , இலக்கிய வரலாறு **நேரம்: 18**

1. கலைவாணன் — கு.சா.கிருஷ்ணமூர்த்தி(NCBH வெளியீடு)

2. சிறுகதை, புதினம், நாடகம், கவிதை, உரைநடை

Semester	Subject Code	Title Of The Paper	Hours Of Teaching/ Week	No. of Credits
I	**17U1STE1**	**PART – II ENGLISH PROSE, POETRY AND COMMUNICATION SKILLS**	**6**	**3**

Objective:-

- To initiate the Students to understand English through Prose, Poetry and Basic Communicative Grammar.

Unit – I

Shakespeare - Shall I compare thee to a Summer's Day?

John Milton – On His Blindness.

William Wordsworth – The Solitary Reaper

P.B.Shelley – Song to the Men of England.

Robert Frost – The Road not Taken

Nissim Ezekiel - Night of the Scorpion

Unit – II

1) The Running Rivulets of Man, 2) Parliament is Marking Time,

3) The Lady in Silver Coat, 4) Mr. Applebaum at Play.

Unit – III

1) The Feigning Brawl of an Imposter, 2) Thy Life Is My Lesson,

3) Solve The Gamble, 4) The Stoic Penalty.

Unit – IV

1) Nobility In Reasoning, 2) Malu the Frivolous Freak,

3) Bharath! Gird Up Your Loins! 4) Honesty is the Cream of Chastity

Unit – V

Parts of Speech, Nouns, Pronouns, Conjunctions, Adjectives, Articles, Verbs, Adverbs, Interjection – sentence.

References Book:

A Melodious Harmony – Sri.KTV, Rajendra Publishing House, Poondi, 2017.

Flying Colours – Prof. K.Natarajan, New Century Book House (P) LTD., 2017.

Semester	Subject code	Title of the paper	Hours Of Teaching/ Week	No. of Credits
I	**17U1STC1**	**DESCRIPTIVE STATISTICS**	**5**	**4**

Subject description:

This course introduces the historical development of Statistics, presentation of data, descriptive measurers and fitting mathematical curves to the data.

Goal: To enable the students understand and apply descriptive measures in Statistics.

Objective:

On successful completion of the course students should have: known the history of Statistics and learnt data presentation in various forms.

UNIT-I: **15 Hrs**

Origin, scope, limitations and misuse of Statistics-Collection - Classification-Tabulation of data. Diagrammatic representation of data: One-dimensional and two-dimensional diagrams–graphic representation: line diagram, frequency polygon, frequency curve, Histogram and Ogive curves.

UNIT-II: **15 Hrs**

Measures of central tendency: Mean, Median, Mode, Geometric mean and Harmonic mean-Partition values: Quartiles, Deciles and Percentiles.

UNIT-III: **15 Hrs**

Measures of Dispersion: Mean deviation, Quartile deviation and Standard deviation – Coefficient of variation.

UNIT-IV: **15 Hrs**

Moments - measures of Skewness - Pearson's and Bowley's Coefficient of skewness, Coefficient of Skewness based on moments – Kurtosis.

UNIT-V: **15 Hrs**

Curve fitting: principle of least squares, fitting of the curves of the form $y=a+bx$, $y= a+ bx + cx^2$ and curves transformable to the above form.

Text book:

"Fundamental of Mathematical Statistics" (Sulthan chand &sons) - Guptha, S.C and Kapoor V.K

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
I	**17U1STC2**	**Probability Theory and Random Variables**	**5**	**4**

Subject description: This course introduces the various concepts, functions and properties and theorems related to random variables

Goal: To enable the students to understand and study random phenomena mathematically

Objective: On successful completion of the paper, the students should have understood the concepts of random variable, discrete, continuous, joint, marginal, conditional probability functions, expectation, conditional expectation and variance, generating functions, law of large numbers and central limit theorem and their applications.

Unit I : 15 Hrs

Mathematical Probability and limitations – Statistical Probability and limitation (Simple Problem Only) – Addition theorem of Probability, Conditional Probability – Multiplication Theorem of Probability, Stochastic independence, Baye's Theorem, Boole's Inequality – Simple Problems.

Unit-II: 15 Hrs

Random variables –discrete and continuous random variables –distribution function-properties- probability mass function and probability density function –various statistical measures of continuous probability distribution.

Unit-III: 15 Hrs

Joint, marginal and conditional distribution functions and density functions- independence of random variables –Transformation of variables (one and two dimensional-concepts only) - Simple Problems.

Unit-IV 15 Hrs

Mathematical expectation-properties-addition and multiplication theorems –conditional expectation and conditional variance.

Unit-V: 15 Hrs

Moment generating function, cumulant generating function, characteristic function and their properties - Simple Problems. Uniqueness theorem on M.G.F, Additive probability of M.G.F, Cumulants, Characteristics function, some important theorems

Books for study:

1. *"Fundamentals of Mathematical stat*istics" by Guptha, S.C &Kapoor, V.K (Sulthan chand &sons).
2. *"Introduction to Mathematical statistics"* by Hogg.R.V and and Craig, A.G. (Amerin.,).
   Unit I : Chapter 7: Sec 7.1 to 7.4
   Unit II : Chapter 5: Sec 5.2 to 5.4
   Unit III : Chapter 5: Sec 5.5 to 5.6
   Unit IV : Chapter 6: Sec 6.1 to 6.4
   Unit V : Chapter 6: Sec 6.10 to 6.12

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
I	**17U1PHMAA1 17U1CHMAA1 17U1STMAA1**	**ALLIED MATHEMATICS - I**	**5**	**4**

Objectives:

To introduce the basic concepts of summation of series, theory of equations, special types of matrices, trigonometry and calculus.

UNIT – I

Algebra: Binomial Theorem: Some standard expansions – general term – expansion of rational fractions – approximations – summation of series – Exponential Theory : results – summation of series – Logarithmetic series: Standard results.

UNIT – II

Theory of Equations: Fundamental theory of algebra – symmetric function of the roots – formation of equations – Diminishing of roots – Reciprocal Equations: Four types.

UNIT – III

Matrices: Rank of Matrix – elementary transformations – Linear Equations: Homogeneous and Non – Homogeneous equations – Characteristic Roots and Vectors – Properties of eigen vector – Cayley – Hamilton theorem.

UNIT – IV

Trigonometry : Expansion in series- expansion of $\cos^n\theta$ and $\sin^n\theta$ - expansion of $\cos n\theta$ and $\sin^n\theta$ - expansion of $\sin\theta$, $\cos\theta$ and $\tan\theta$ - Hyperbolic functions – relations – connecting hyperbolic functions and circular functions – period of hyperbolic function – Inverse hyperbolic functions.

UNIT – V

Differential Calculus: Curvature – radius of curvature in Cartesians – parametric form – Maxima and minima of a function of two variables – Lagrange's method of undetermined multipliers.

Textbook:-

Allied Mathematics, Paper –I, First Semester, P.Kandasamy and K.Thilagavathy, S.Chand & Company Pvt. Ltd., New Delhi, 2014.

Unit I : Algebra : Chapter II, III, IV
Unit II : Theory of Equations: Chapter I, II.
Unit III : Matrices : Chapter II, III, IV.
Unit IV: Differential Calculus Chapter IV, V.

References:

1. Algebra Volume I, T.K.M. Pillay, T.Natarajan and K.S.Ganapathy, S.Viswanathan (Printers & Publishers) Pvt. Ltd.
2. Calculus Voume I, S.Narayanan and T.K.Manicavachagom Pillay, S.Viswanathan Pvt. Ltd., 2014.
3. Trigonometry, Narayanan and T.K.Manicavachagom Pillay, S.Viswanathan Pvt. Ltd.,2013.

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
I & II	**17U2PHMAA2** **17U2CHMAA2** **17U2STMAA2**	**ALLIED MATHEMATICS – II (NS)**	**3+3**	**-**

Objectives:

- To introduce concepts of Hyperbolic function and correlation
- To introduce the concepts of numerical solution of ordinary differential equation and 3 dimensional analytical geometry

UNIT –I:

Definite Integral: Integration – Definite integral – methods of integration – integral of functions containing linear function of x – integrals of functions of different forms – integrals of rational algebraic functions – integrals of irrational functions.

UNIT – II

Properties of Definite integral: Properties of definite integral – integration by parts – Reduction formulae – Bernoulli's formula – integration as summation.

UNIT – III

Correlation – Karl Pearson coefficient of correlation – Rank correlation – Regression: Regression coefficients – Properties of regression coefficients.

UNIT – IV

Numerical solution of ordinary differential equation: Taylor series – Euler's method – Modified Euler's method – R. K method - 4^{th} order only.

UNIT – V

Planes: Standard Equation of planes – angle between the planes – **Straight lines:** Equations of straight lines – coplanar lines – S.D between two skew lines – **Sphere:** equation of sphere – centre and radius – length of the tangent from the point to the sphere.

Text Book:

1. Calculus, Volume II, S. Narayanan, T.K.M.Pillai, 2008
   Unit I : Chapter – I (Sec 1 – 10)
   Unit II : Chapter – I (Sec. 11- 15.2)
2. Fundamentals of Mathematical Statistics, S.C. Gupta, V. K. Kapoor, Sulthan, 2002.
   Unit III: Chapter – 10(Sec.10.2–10.4, 10.7), Chapter – 11(Sec.11.1–11.2.2)
3. Numerical methods, P. Kandasamy, Thilagavathi and Gunavathi
   Unit IV : Chapter – 11(Sec.11.5, 11.9, 11.11 – 11.3)
4. Analytical Geometry 3D - T.K.M.Pillai, 2015
   Unit V: Chapter – 2(Sec.1-7), Chapter – 3(Sec.1-4, 7, 8), Chapter – 4(Sec.1-4)

General References:

1. Trigonometry - S.Arumugam
2. Statistics - M.Sivathanupillai
3. Ancillary Maths - P.R.,Vittal, Margam Publications.

B.Sc. Statistics

Semester	Subject Code	Title Of The Paper	Hours Of Teaching / Week	No. of Credits
II	**17U2STT2**	**இடைக்கால இலக்கியம் – பயன்முறைத் தமிழ் –இலக்கண வரலாறு**	**6**	**3**

கூறு: I **நேரம்: 18**

1. திருஞானசம்பந்தர் - தேவாரம் - கோளறு திருப்பதிகம்
2. திருநாவுக்கரசர் -தேவாரம் -தனித்திருக் குறுந்தொகை - மாசில்வீணையும் - 1—10 பதிகம்
3. சுந்தரர் -தேவாரம் - திருநொடித்தான்மலைப் பதிகம் —தானெனை முன்படைத்தான்
4. மாணிக்கவாசகர் - திருவாசகம் - திருப்பொன்னூசல்

கூறு: 2 **நேரம்: 18**

1. குலசேகராழ்வார்: திருவித்துவக்கோட்டம்மான் : 1—10 பாடல்கள்
2. நம்மாழ்வார் - திருவாய் மொழி -இரண்டாம்பத்து —1—10 பாடல்கள்
3. ஆண்டாள் - நாச்சியார் திருமொழி —வாரணமாயிரம் 1—10 பாடல்கள்
4. திருமங்கையாழ்வார் - சிறிய திருமொழி —1—10 பாடல்கள்

கூறு: 3 **நேரம்: 18**

1. திருமூலர் - திருமந்திரம் - அட்டாங்க யோகம் —1—10 பாடல்கள்
2. குமரகுருபரர் - மீனாட்சியம்மை பிள்ளைத் தமிழ்: வருகைபருவம்
3. திரிகூடராசப்பக் கவிராயர் - குற்றாலக் குறவஞ்சி - நாட்டு வளம்
4. வீரமாமுனிவர் - திருக்காவலூர்க் கலம்பகம் — முதல் 5 பாடல்கள்
5. குணங்குடி மஸ்தான் சாகிபு - ஆனந்தக் களிப்பு —முழுதும்

கூறு: 4 பயன்முறைத் தமிழ் **நேரம்: 18**

வாக்கிய அமைப்பு - புணர்ச்சி வகைகள் - வலிமிகும், வலி மிகா இடங்கள் - எழுத்துப்பிழை நீக்கம் லகர, ளகர, ழகர வேறுபாடுகள் - சொற்களைப் பிரித்துப் பொருள் காணும் முறை - நிறுத்தற் குறியீடுகள் - சரியான தமிழ் வடிவம் அறிதல்.

சொல்லியல் - சொல் வகை - இலக்கண வகை - இலக்கிய வகை - பெயர்ச்சொல் - இடுகுறி - காரணம் - அறுபொருட் பெயர் (பொருள், இடம், காலம், சினை, குணம், தொழில்) - வினைச்சொல் - இடைச் சொல் - உரிச்சொல் - முற்று - எச்சம் - விகுதிகள் - இடைநிலை - தன்வினை - பிறவினை - தெரிநிலை வினை - குறிப்பு வினை-வழுவமைதி.

கூறு: 5 இலக்கண வரலாறு **நேரம்: 18**

இலக்கண வரலாறு - தமிழ்த் துறை வெளியீடு.

Semester	Subject Code	Title Of The Paper	Hours Of Teaching/ Week	No. of Credits
II	**17U2STE2**	**PART – II ENGLISH EXTENSIVE READERS AND COMMUNICATIVE SKILLS**	**6**	**3**

Objective

- To impart language and communicative skills through short stories, one act plays and communicative grammar

Unit – I

Shakespeare – The Seven Stages of Man

Long Fellow – A Psalm of Life

Nissim Ezakiel - Enterprise

William Wordsworth – The world is too much with us

Unit – II

Anton Chekov – The Proposal

J.B.Priestly - Mother's Day

Unit - III

William Faulkner - A Rose for Emily

P. Lankesh - Bread

Katherine Mansfield - The Doll's House

Unit – IV

Tense, Question Tag, Dialogue Writing, Paragraph Writing, Adjectives, Adverb

Unit – V

Voices, Degrees of Comparison, Direct and Indirect

Book Prescribed:

Unit I , II, III , Voices of vision in English (Vol. I & II), Board of Editors, Pavai Printers (P) Ltd., Chennai, 2016.

Unit IV & V – Communicative grammar by the Department of English, Poondi, 2017.

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
II	**17U2STC3**	**Discrete Distributions**	**5**	**5**

Subject description: This course introduces for discrete distribution that are defined for different probabilistic situations.

Goal: To enable the students to understand the properties and applications of various probability functions

Objective: On successful completion of the course, the students should have understood the applications and nature of the Discrete distributions such as binomial, Poisson...Normals.

Unit I: 15 Hrs

Discrete distribution; Binomial distribution –Definition, concepts and Derivation of moments, moments Generating function, Additive property, Characteristic function and Recurrence relation for moments – simple problems

Unit II: 15 Hrs

Additive property of Binomial distribution – Characteristic – cumulants recurrence relation for cumulants of Binomial distribution. Probability Generating function of binomial distribution – Recurrence relation for the probabilities of Binomial distribution.

Unit III: 15 Hrs

Poison distribution–moments, mode, Recurrence relation for moments–M.G.F characteristic function – cumulants, additive property of independent Poisson variable.

Unit IV: 15 Hrs

Geometric distribution–moments M.G.F – Hyper geometric distribution distribution – mean and variance, M.G.F. Binomial as a limiting from of Hyper – Geometric distribution – multinomial distribution – moments.

Unit V: 15 Hrs

Negative – Binomial distribution – moments M.G.F., cumulants, additive property, recurrence relation for the probabilities.(Simple Problems)

Books recommended for study:

1. "*Fundamentals of mathematical statistics*" By Gupta, S.C and Kapoor, V.K.,(Sultan chand & sons)
2. "*Introduction to Mathematical Statistics*", Hogg R.V and Craig, A.G., (Amerind.)

Unit I : Chapter 8 : Sec 8.1 to 8.4 to 8.46
Unit II : Chapter 8 : Sec 8.4.7 to 8.4.12
Unit III: Chapter 8 : Sec 8.5
Unit IV: Chapter 8 : Sec 8.7 to 8.9
Unit V : Chapter 8 : Sec 8.6

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
II	**17U2STCP1**	**MAJOR PRACTICAL - I DESCRIPTIVE STATISTICS**	**4**	**3**

1. Formation of frequency distribution, Calculation of arithmetic, geometric mean, median and mode, Calculation of percentile

2. Formation of charts and diagrams: Histogram, bar diagram, Pie diagram frequency line, and scatter diagram. Formation of Ogive curves.

3. Calculation of measures of dispersion: Range, Variance, Standard Deviation, Mean deviation, Quartiles

4. Calculation of Skewness and kurtosis

5. Problems related to curve fitting

6. Calculation of correlation and regression coefficients and formation of regression lines

7. Fitting straight line, non-linear trend lines and calculation of trend values using moving averages

8. Calculation of Index numbers

Note: Students should be given exposure in handling basic statistical data.

Three questions are to be answered out of five question

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
I & II	**17U2PHMAA2 17U2CHMAA2 17U2STMAA2**	**ALLIED MATHEMATICS – II (NS)**	**3+3**	**4**

Objectives:

- To introduce concepts of Hyperbolic function and correlation
- To introduce the concepts of numerical solution of ordinary differential equation and 3 dimensional analytical geometry

UNIT –I:

Definite Integral: Integration – Definite integral – methods of integration – integral of functions containing linear function of x – integrals of functions of different forms – integrals of rational algebraic functions – integrals of irrational functions.

UNIT – II

Properties of Definite integral: Properties of definite integral – integration by parts – Reduction formulae – Bernoulli's formula – integration as summation.

UNIT – III

Correlation – Karl Pearson coefficient of correlation – Rank correlation – Regression: Regression coefficients – Properties of regression coefficients.

UNIT – IV

Numerical solution of ordinary differential equation: Taylor series – Euler's method – Modified Euler's method – R. K method - 4^{th} order only.

UNIT – V

Planes: Standard Equation of planes – angle between the planes – **Straight lines:** Equations of straight lines – coplanar lines – S.D between two skew lines – **Sphere:** equation of sphere – centre and radius – length of the tangent from the point to the sphere.

Text Book:

1. Calculus, Volume II, S. Narayanan, T.K.M.Pillai, 2008
   Unit I : Chapter – I (Sec 1 – 10)
   Unit II : Chapter – I (Sec. 11- 15.2)
2. Fundamentals of Mathematical Statistics, S.C. Gupta, V. K. Kapoor, Sulthan, 2002.
   Unit III: Chapter – 10(Sec.10.2–10.4, 10.7), Chapter – 11(Sec.11.1–11.2.2)
3. Numerical methods, P. Kandasamy, Thilagavathi and Gunavathi
   Unit IV : Chapter – 11(Sec.11.5, 11.9, 11.11 – 11.3)
4. Analytical Geometry 3D - T.K.M.Pillai, 2015
   Unit V: Chapter – 2(Sec.1-7), Chapter – 3(Sec.1-4, 7, 8), Chapter – 4(Sec.1-4)

General References:

1. Trigonometry - S.Arumugam
2. Statistics - M.Sivathanupillai
3. Ancillary Maths - P.R.,Vittal, Margam Publications.

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
I	**17U2STMAA3**	**ALLIED MATHEMATICS - III**	**5**	**4**

Objectives:

- To study vector differentiation and vector integration with application
- To study ordinary Differential equation and partial differential equation
- To study Fourier series and Laplace transforms

Unit-I: - 15 Hrs

Differential Equation:- Second order differential elation with constant coefficient of the types $ay'' + by' + cy = e^{ax}$, $g(x)$, x^n, $\sin ax$, and $\cos ax$ only – solution of partial differentials of the form $f(p, q) = 0$; $f(z, p, q) = 0$; $f(x, p, q) = 0$; $f(Y, p, q) = 0$; $f(x, p) = g(Y, q)$; $z = px + qy + f(p, q)$ - Lagrange's method for solving $P_p + Q_q = R$.

Unit-II: - 15 Hrs

Laplace Transforms:- Definition – Laplace Transform of function e^{at}, $\cos at$, $\sin at$ and t^n where 'n' is positive integer-First Shifting theorem – Laplace transforms of $e^{at} \cos bt$, $e^{at} \sin bt$, $e^{at} \sin hbt$, $e^{at} \cos hbt$, $e^{at}\, t^n$. Transforms of $f'(t)$ and $f''(t)$ – Inverse transforms relating to the above standard forms. Application of solution of ordinary differential equation with constant coefficients (involving the above transforms).

Unit-III: - 15 Hrs

Fourier series:- Definition – finding Fourier coefficients for a d given periodic function with period 2π-odd, even functions – Half range series.

Unit-IV: - 15 Hrs

Vector differentiation:- Velocity and acceleration – scalar and vector fields – Divergence and *curl*-application – Laplalce operator.

Unit-V: - 15 Hrs

Vector integration:- Application of Gauss and Stoke's theorems (no proof of the theorem).

Text Books:

Unit I: Chapter 2 & 4	Differential Equations – TKM Pillai
Unit II: Chapter5	Calculus Volume III – TKM Pillai
Unit III: Chapter6 Section 1 to 5	Calculus Volume III – TKM Pillai
Unit IV: Chapter IV	Vector Algebra & Analysis – TKM Pillai
Unit V: Chapter VI	Vector Algebra & Analysis – TKM Pillai

General References:

1. Engineering Mathematics – A Singaravelu(Volume I & II)
2. Vector Calculus – K.Viswanbathan and S.Selvaraj
3. Ancillary Mathematics – P.R.Vittal, Morgam Publications

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
II	**17U2STS1**	**SKILL BASED EDUCATION – I(NS) Verbal Reasoning - I**	**1**	**1**

Unit I: **- 8 Hrs**

Series completion- Number series - Alphabetic series, Coding and decoding- Letter coding- Number coding and Blood Relations- Deciphering jumbled up descriptions- Relation puzzle.

Unit II: **- 7 Hrs**

Puzzle Test- Seating/ Placing arrangements- Comparison test and Logical Venn diagram.

Text Book:

"A modern approach to verbal reasoning" - R.S. Aggarawal, S.Chand and company Ltd., New Delhi- 55

Unit I : Chapter 1 (1-21); Chapter 4 (194-210); Chapter 5 (261-276).

Unit II: Chapter 6 (Page 288 to 296,) (307-310) (328-334)

Chapters 9 (441-449).

B.Sc. Statistics

Semester	Subject Code	Title Of The Paper	Hours Of Teaching / Week	No. of Credits
III	**17U3STT3**	**காப்பியங்கள், கட்டுரைகள், இலக்கிய வரலாறு**	**6**	**3**

கூறு: 1 காப்பியங்கள் 1 **நேரம்: 18**

1. சிலப்பதிகாரம் - புகார்க் காண்டம்—மனையறம்படுத்த காதை

2. மணிமேகலை - ஆதிரை பிச்சையிட்ட காதை

3. சீவக சிந்தாமணி - மண்மகள் இலம்பகம்

4. கம்பராமாயணம் - மிதிலைக் காட்சிப் படலம்

கூறு: 2 காப்பியங்கள் 2 **நேரம்: 18**

1. பெரிய புராணம் -மெய்ப்பொருள் நாயனார் புராணம் —முழுதும்

2. அரிசந்திரபுராணம் —மயான காண்டம்

3. தேம்பாவணி - திருமணப் படலம்—1—10 பாடல்கள்

4. சீறாப்புராணம் -நபி அவதாரப் படலம் —1—10 பாடல்கள்

கூறு: 3 கட்டுரைத் தொகுப்பு **நேரம்: 18**

கட்டுரைத் தொகுப்பு - தமிழ்த்துறை வெளியீடு

கூறு: 4 பொதுக்கட்டுரை, மொழிபெயர்ப்புப் பயிற்சி **நேரம்: 18**

பயிற்சிக் கட்டுரைகளும் கடிதங்களும் -பாவை வெளியீடு

கட்டுரைப் பயிற்சி - 10 மதிப்பெண்

மொழிபெயர்ப்புப் பயிற்சி - 5 மதிப்பெண்

கலைச்சொல்லாக்கம்

கூறு: 5 **நேரம்: 18**

அ. இலக்கிய வரலாறு

பக்தி இலக்கியங்கள் - காப்பிய இலக்கியங்கள் - சிற்றிலக்கியங்கள்

Semester	Subject Code	Title Of The Paper	Hours Of Teaching /Week	No. of Credits
III	**17U3STE3**	**PART – II ENGLISH SHAKESPEARE, EXTENSIVE READERS AND COMMUNICATIVE SKILLS**	**6**	**3**

Objective

- To introduce the language of the world renowned dramatist and novelist to enhance the vocabulary and communicative skills of the learners.

Unit – I

Funeral Oration – Julius Caesar

Trial for a Pound of Flesh – The Merchant of Venice

Unit – II

He Kills Sleep – Macbeth

The gulling scene of malvalio – Twelfth Night

Unit – III

Romeo and Juliet

In Love is a "Midsummer Madness" – Tempest

Unit – IV

R.L. Stevenson – Treasure Island

Unit – V

Note making, Hints Developing, Expansion of Ideas and Proverbs, Clauses and sentence, Structure simple, Compound and Complex.

Book Prescribed:

Unit – I, II & III: Selected scenes from Shakespeare, Prof.K.Natarajan, Pavai Printers (p) Ltd., 2017.

Unit IV: Treasure Island Abridged by E.F. Dodd.

Unit V: Communicative Grammar by Department of English, Poondi, 2017.

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
III	**17U3STC4**	**CONTINUOUS DISTRIBUTIONS**	**5**	**5**

Subject description: This courses introduces the continuous distribution that are defined as different probabilistic situations.

Objective: On completion of the course, the students should have understood the application and nature of the continuous distribution such as Normal, Gamma, Beta, Weibul, Cauchy distribution.

Unit – I **- 15 Hrs**

Chebychv's inequality, Cauchy – Schwartz inequality, convergence in probability, weak law of large numbers and central limit theorem.

Unit – II **- 15 Hrs**

Normal distribution – limiting form of Binomial distribution , properties , median, mode, moments, M.G.F, cumulants, mean deviation , area property , simple problems – rectangular distribution – moments . M.G.F, characteristic function, mean deviation.

Unit – III **- 15 Hrs**

Gamma , Beta distribution of Ist kind and IInd kind – constants – exponential distributions – additive property.

Unit – IV **- 15 Hrs**

Weibul distribution –moments, characteristic logistic distribution– moment, Cauchy distribution – Characteristic function –moments of Cauchy distribution.

Unit – V **- 15 Hrs**

Function of normal random variable to ψ^2, t and F – distributions –inter relationship between the distributions and their properties.

Reference Books:

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

Unit I : Chapter 6 : Sec 6.11 , 6.13, 6.14, 6.15

Unit II : Chapter 9 : Sec 9.2 to 9.3

Unit III : Chapter 9 : Sec 9.5 to 9.7

Unit IV : Chapter 9 : Sec 9.10 to 9.12

Unit V : Chapter 15,16 : Sec 15.3 , 16.2 , 16.5

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
III	**17U3STC5**	**STATISTICAL INFERENCE – I: Theory of Estimation**	**5**	**5**

Subject description: This course introduces concepts, methods and properties relating to estimation

Goal: To enable the students to understand and apply various estimation procedures

Objective: On successful completion of this course, the students should have understood the concepts of Point estimation and interval estimation, and their properties, calculation of partial and multiple correlation coefficients and multiple linear regression line.

Unit I: - 15 Hrs

Concept of Statistical Inference- Parametric estimation- Sampling distribution – Standard Error. Derivation of Standard Error of mean, variance, proportion, difference between means variances and Proportions-concept of ordered statistics

Unit II - 15 Hrs

Point Estimation: Estimator, properties of point estimator – unbiasedness, consistency, Crammer Rao inequality – efficiency – asymptotic efficiency and sufficiency of the estimator – Rao Blackwell theorem.

Unit III: - 15 Hrs

Methods of point estimation: method of maximum likelihood, method of minimum chi-square and method of moments - properties of estimators obtained by these methods (Without proof).

Unit IV: - 15 Hrs

Interval Estimation: Fiducial limits-derivation of confidence intervals based on Normal t, χ^2 and F distributions. Confidence intervals- using Cramer – Rao inequality-Partial and multiple correlation and regression coefficients – Multiple linear regression lines.

Unit V: - 15 Hrs

Numerical problems in interval estimation, multiple and partial correlation and regression–simple problems only.

Books for study:

1.Fundamentals of Mathematical statistics by S.C. Gupta & V.K.Kapoor

Unit I : Chapter 14,9 : Sec14.1 – 14.8 Theory only & Sec 9.15 – 9.15.5
Unit II : Chapter 17 : Sec 17.1- 17.3,17.5
Unit III: Chapter 17 : Sec 17.6
Unit IV: Chapter 17,12 : Sec 17.7 & 12.4 – 12.11
Unit V : Chapter 12: Sec12.4 ,12.7 ,12.8 &Problems 12.7 -12.15

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
III	**17U3STCSA1**	**Allied Computer Programming in C**	**5**	**4**

Objectives:

- To introduce the techniques of C- Programming
- To solve the numerical problems using C

Unit I **- 15 Hrs**

Constants, variables and Data Types- Operators and Expressions-

Input and Output Operators.

Unit II **- 15 Hrs**

Decision Making and Branching- Decision Making and Looping.

Unit III **- 15 Hrs**

Arrays- handling of Character Strings.

Unit IV **- 15 Hrs**

User Defined functions.

Unit V **- 15 Hrs**

Structures and Unions.

Text Book:

"Programming in Ansi C" by E.Balagurusamy; Second Edition, 1992, Tata Mc Graw- Hill Publishing Company Limited, New Delhi.

Unit I : Chapters 2, 3 & 4

Unit II : Chapter 5 & 6

Unit III : Chapter 7 & 8

Unit IV : Chapter 9

Unit V : Chapter 10

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
III & IV	**17U4STCSAPL**	**Allied Computer Practical (NS)**	**3**	**-**

Programs for the following problems only
(For both theory and practical)

Programs

1. Pay bill calculation
2. Mark list
3. Ascending and descending orders
4. Test for palindrome word
5. (a). Mean, Standard deviation and coefficient of variation for raw data

   (b). Sorting a list and find its Median
6. Coefficient of correlation and regression equations
7. Matrix multiplication
8. Lagrange's interpolation
9. Range-kutta method (IV Order)
10. Trapezoidal rule and simpson rule

Reference

Chapter 2 to 7,

Chapter 8 (8.1, 8.2 & 8.8),

Chapter 9 (9.4 to 9.5),

Chapter 10,

Chapter 11 (11.1 to 11.8),

Chapter 12 (12.1 to 12.4, 12.6)

– Treatment as in

'*Programming in ANSI C*' by E.Balagurusamy, Second Edition, 1992. Tata McGraw Hill Publishing Company Limited, New Delhi.

Semester	Subject Code	Title Of The Paper	Hours Of Teaching / Week	No. of Credits
IV	**17U4STT4**	**சங்க இலக்கியம் – அற இலக்கியம் – செம்மொழி – இலக்கிய வரலாறு**	**6**	**3**

கூறு: 1 **நேரம்: 18**

குறுந்தொகை

1. குறிஞ்சி - (பா.எ.:3) 2. முல்லை - (பா.எ.94)
3. மருதம் - (பா.எ.45) 4. நெய்தல் - (பா.எ.:49)
5. பாலை - (பா.எ.:41)

நற்றிணை

1. குறிஞ்சி - (பா.எ. 32) 2. முல்லை - (பா.எ. 81) 3. மருதம் - (பா.எ. 210)
4. நெய்தல் - (பா.எ. 226) 5. பாலை - (பா.எ.229)

கலித்தொகை

1. பாலை - (பா.எ. 6) 2. குறிஞ்சி - (பா.எ. 38)

அகநானூறு

1. குறிஞ்சி : - (பா.எ. 68) 2. மருதம் - (பா.எ. 86)

கூறு: 2 **நேரம்: 18**

ஐங்குறுநூறு

குறிஞ்சி - தோழிக்கு உரைத்த பத்து: பாடல் எண்கள் —111—120

புறநானூறு

பாடல் எண்கள் 8,17,20,95,141,159,184,186,188,206

பதிற்றுப்பத்து

ஏழாம் பத்து —பாடல் எண். 1

பரிபாடல்

எட்டாம் பாடல் : செவ்வேள்

கூறு: 3 **நேரம்: 18**

நெடுநல்வாடை முழுவதும்

திருக்குறள் : வான்சிறப்பு, பெருமை, காதற் சிறப்புரைத்தல்

கூறு: 4 **நேரம்: 18**

செம்மொழி வரலாறு

மொழி - விளக்கம் - மொழிக்குடும்பங்கள் - உலகச் செம்மொழிகள் - இந்தியச் செம்மொழிகள் - செம்மொழித் தகுதிகள் - வரையறைகள் - வாழும் தமிழ்ச்செம்மொழி - தொன்மை - தமிழின் சிறப்புகள் - தமிழ்ச் செம்மொழி நூல்கள்.

கூறு: 5 **நேரம்: 18**

அ. இலக்கிய வரலாறு

சங்க இலக்கியங்கள், பதினெண்கீழ்க்கணக்கு நூல்கள்

Semester	Subject Code	Title of The Paper	Hours of Teaching/ Week	No. of Credits
IV	**17U4STE4**	**PART – II ENGLISH ENGLISH FOR COMPETITIVE EXAMINATIONS**	**6**	**3**

Objective

- To prepare the learners for competitive examinations and to know the fundamentals of practical communication.

Unit – I

Grammar – Number, Subject, Verb, Agreement, Articles, Sequence of Tenses, Common Errors.

Unit – II

Word Power - Idioms & Phrases, one word substitutes, Synonyms, Antonyms, Words we often confuse, foreign words & phrases, spelling.

Unit – III

Reading & Reasoning – Comprehension, Jumbled Sentences.

Unit - IV

Writing Skills – Paragraph, Precis Writing, Expansion of an idea, Report Writing, Essay, Letters, Reviews (Film & Book)

Unit – V

Speaking- Public speaking, Group Discussion, Interview, Spoken English.

Prescribed Text:

English for Competitive Examinations, by Ayothi, Trichy, 2017.

Semester	Subject code	Title of the Paper	Hours of Teaching/ Week	No. of Credits
IV	**17U4STC6**	**STATISTICAL INFERENCE – II: Testing of Hypothesis**	**5**	**5**

Subject description: This courses introduces the concepts of hypothesis testing

Goal: To enable the students to give inference on statistical population based on sample statistics

Objective: On completion of the course, the students should have gained knowledge on the methods of testing the hypothesis on different distributions and the nature of statistics to which such test procedure can be used.

Unit-I: -15 Hrs

Testing of Statistical hypothesis: Statistical hypothesis -simple and composite hypothesis, null and alternative hypotheses-sample and parameter space –two types of errors – critical region-power a test –Neyman- Pearson Lemma –simple applications

Unit-II: -15 Hrs

Most powerful tests-uniformly most powerful and unbiased tests based on Normal, t, and χ^2 and F distributions - likelihood ratio criterion –definition and simple applications

Unit –III: -15Hrs

Test of significance –Asymptotic and exact tests based on Normal, t, and χ^2 and F distributions with regard to mean, proportion, variance, Standard deviation, coefficient of correlation, regression coefficients, partial and multiple correlation coefficients-Concept of observed significance level.

Unit-IV: -15 Hrs

Contingency table –Test for independence by contingency tables –goodness of fitness tests –tests of homogeneity of variances, correlation and proportions. Test of Normality (application only).

UNIT-V: -15 Hrs

Elementary ideas on distribution –free and non-parametric tests –Run, Median, Sign and Mann Whitney tests (without proof)-Equality of two distributions.

Books for study

1. *Fundamentals of Mathematical statistics* by Guptha S.C and Kapoor V.K (Sulthan chand & sons)
   Unit I : Chapter 18 : Sec 18.1 -18.3 ,18.5
   Unit II : Chapter 18 : Sec 18.4
   Unit III : Chapter 16 : Sec 16.3
   Chapter 18 : Sec,18.6
   Unit IV : Chapter 15 : Sec 15.6
   Unit V : Chapter 18 : Sec 18.7

Semester	Subject code	Title of the Paper	Hours of Teaching/ Week	No. of Credits
IV	**17U4STC7**	**SAMPLING TECHNIQUES**	**4**	**5**

Subject description: This course introduces the concept, methods and analysis of sampling techniques

Goal: To enable the students to understand and apply the sampling procedures to different situations

Objective: On successful completion of the course the students should have understood sample and census surveys, errors that occur in surveys and various sampling methods and the different types of populations to which these sampling methods are applicable.

Unit-I: -15 Hrs

Sampling from a finite population –Random sampling –simple sampling with and without replacement –unbiased estimates of the mean and the variance of the population and of the variance of the estimator of the mean - Estimation of the sample size.

Unit-II: -15 Hrs

Stratified sampling – proportional and optimum allocation with regard to stratified random sampling-unbiased estimates of the mean and the variance of the population and of the variance of the estimator of the mean.

Unit-III: -15 Hrs

Systematic sampling –Unbiased estimates of the mean and the variance of the population and of the variance of the estimator of the mean.

Unit-IV: -15 Hrs

Cluster and two stage sampling –unbiased estimates of the mean and variance of the population and of the variance of the estimator of the mean.

Unit-V: .

Design, organization and execution of sample surveys –sampling and non-sampling errors and methods to deal with sampling errors.

Books for study:

1. Sampling Techniques by Cochran, W.G (Wiley Est)
2. Sampling theory of survey with applications by Sukathme P.V and sukathme B.V (Asia pub.House)
3. Sampling theory and Methods by Murthy, M.N (Statistical publishing
   Unit I : Chapter 7 : Sec 7.1 to 7.9
   Unit II : Chapter 7 : Sec 7.10 to 7.10.4
   Unit III: Chapter 7 : Sec 7.11 to 7.11.3
   Unit IV: Chapter 7 : Sec 7.12, 10.1 to 10.4
   Unit V : Chapter 7 : Sec 7.1 to 7.9

Semester	Subject code	Title of the Paper	Hours of Teaching/ Week	No. of Credits
IV	**17U4STCSA2**	**ALLIED DATA MINING**	**5**	**4**

Objective: To know about the architecture and concepts of data warehousing and mining.

UNIT I: -15Hrs

Introduction – data mining – data mining functionalities – classification of data mining systems – data mining task primitives – integration of a data mining system with a database or data warehouse system – descriptive data summarization.

UNIT II: -15 Hrs

Data processing – data cleaning – data integration and transformation – data reduction – data discretization and concept of hierarchy generation – data ware housing and OLAP technology – a multidimensional data model – data warehouse architecture.

UNIT III: -15 Hrs

Classification and prediction – what is classification?-What is prediction? – Issues regarding classification and prediction – Bayesian classification.

UNIT IV: -15 Hrs

Cluster analysis – types of cluster analysis partitioning methods – Hierarchial methods – Density based methods.

UNIT V: -15 Hrs

Applications and trends in data mining – data mining application, social impacts of data mining – trends in data mining – data mining system products and research prototypes.

References:-

1. "Data mining concepts and techniques", Jiawei Han and Micheline Kamber, second edition, Morgam Kaufman Publications – 2006.

2. "Data warehousing in the real world", Sam Anahory and Dennis Murray, Addition Wesely, Pearson Education Asia Pvt. Ltd – 2000.

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
III & IV	**17U4STCSAP1**	**Allied Computer Practical (NS)**	**3+3**	**2**

Programs for the following problems only
(For both theory and practical)

Programs

1. Pay bill calculation
2. Mark list
3. Ascending and descending orders
4. Test for palindrome word
5. (a). Mean, Standard deviation and coefficient of variation for raw data

   (b). Sorting a list and find its Median
6. Coefficient of correlation and regression equations
7. Matrix multiplication
8. Lagrange's interpolation
9. Range-kutta method (IV Order)
10. Trapezoidal rule and simpson rule

Reference

Chapter 2 to 7,
Chapter 8 (8.1, 8.2 & 8.8),
Chapter 9 (9.4 to 9.5),
Chapter 10,
Chapter 11 (11.1 to 11.8),
Chapter 12 (12.1 to 12.4, 12.6)

– Treatment as in

'*Programming in ANSI C*' by E.Balagurusamy, Second Edition, 1992. Tata McGraw Hill Publishing Company Limited, New Delhi.

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
IV	**17U4STS2**	**SKILL BASED EDUCATION – II** **Verbal Reasoning- II**	**1**	**1**

Unit I:

Number, Ranking and Time sequence test and Mathematical operations- Problem solving by substitution- interchange of signs and numbers.

Unit II:

Arithmetical reasoning, inserting the missing character and Data sufficiency.

Text Book:

"A modern approach to verbal reasoning" - R.S. Aggarawal, S.Chand and company Ltd., New Delhi- 55

Unit I: Chapter 12 (542-550); Chapter 13 (569-579).

Unit II: Chapter 15 (Page 601 to 609); Chapters 16 (Page 628 to 640)

Chapter 17 (654-662).

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
V	**17U5STC8**	**OPERATIONS RESEARCH – I**	**5**	**6**

Objective: This course introduces the concepts, models and problem solving techniques of optimization problems. To enable the students gain knowledge about various optimization techniques like linear programming, duality in linear programming and integer programming.

UNIT – I: -19 Hrs

Introduction to O.R. Introduction – origin and development – nature and features – modeling in O.R. – general solution methods – scientific method – methodology of O.R. – applications of O.R. – opportunities and shortcomings of O.R. – limitations of O.R.- Linear Programming Problem - Mathematical formulation of L.P.P. – graphical solution of L.P.P.

UNIT – II: -19 Hrs

Simplex methods – problems - Use of artificial variable – big-M method – two phase methods – problems - Concepts of Primal and dual problems.

UNIT–III: -19 Hrs

Transportation and Assignment model in O.R.:- General transportation problem – transportation table – loops in transportation tables – L.P.formulation of the T.P. – north west corner method – least cost or matrix minima method – Vogels' approximation method –Assignment problem**:** Introduction – Mathematical formulation of the problem –assignment method.

UNIT – IV: -18 Hrs

Game theory:- Introduction – method of solving game theory problems – games with mixed strategies – game with dominance – games with Arithmetic method – use of linear programming in solving a game – graphical solution to a game – approximate solution of a game.

UNIT – V:

PERT/CPM:- Introduction – Concept of network – rules for construction of network – dummy activities – to find the critical path – algorithm for critical path – PERT model – CPM model .

TEXT BOOK: *Operations Research*, Sultan Chand & Sons, New Delhi (2006) P.K.Gupta, Kanti Swarup and Man Mohan.

Unit I : Chapter 1 : Sec 1.1 to 2.2
Unit II : Chapter 8 : Sec 8.4
Unit III : Chapter 10: Sec. 10.1 – 10.9
Chapter 11 : Sec. 11.1 – 11.6
Unit IV : Chapter 17 : Sec. 17.1 – 17.11
Unit V : Chapter 21 : Sec 21.1 to 21.7

Books for Reference:

- *Problems in Operations Research*, Sultan Chand & Sons, New Delhi (2006). - P.K.Gupta and Man Mohan.
- *Operations Research-An Introduction*, Mac Millan Publishing Company, New York (1982). – Hamdy A.Taha.

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
V	**17U5STC9**	**Statistical Quality Control**	**5**	**6**

Subject description: This course introduces the application of statistical tools on industrial environment to study, analyze and control the quality of products.

Goal: To enable the students to know the concepts of process control and product control.

Objective: On successful completion of the course, the students should have understood various tools used such as control charts, sampling plans, quality system standards and reliability concepts to control the quality of industrial outputs.

Unit – I **-19 Hrs**

Introduction to SQC – Chance and Assignable Causes of Variation – Uses of SQC – Process and Product Control – Control chart for Variables – X-Bar and RChart – Revised Control Charts

Unit – II **-19 Hrs**

Control Chart for Attributes – Control Chart for Fraction Defective (p-Chart) – Control Chart for Number of Defectives (d-chart, for fixed and variable sample size) – Control Chart for Number of Defectives per unit (c- Chart) – Natural Tolerance Limit and Specification Limits.

Unit –III **-19 Hrs**

Acceptance sampling by Attributes – Acceptance Quality Level (A.Q.L) – Lot Tolerance Proportion or Percent Defective (LTPD) – Process Average Fraction Defective (p) – Consumer□s Risk(β) – Producer□s Risk(α) – Rectifying Inspection Plan – Average Outgoing Quality Level (AOQL)

Unit – IV **-18 Hrs**

Operating Characteristic Curve (OC-curve) – Average Sample Number (ASN) – Average Amount of Total Inspection (ATI) – Single Sampling Plan – Determination of „n□ and „c□, AOQL, OC-curve – Double Sampling Plan – ASN and ATI of Double Sampling Plan – Single sampling Vs Double Sampling plan.

Unit –V

Sequential Sampling – Sequential Probability Ratio Test (SPRT) – ASN Function of Sequential Sampling Plan

Text Book: Gupta,S.C. & Kapoor,V.K (2014), Fundamentals of Applied Statistics, 4th Edition, Sultan Chand & Sons, New Delhi.

Book for Reference: Mahajan, M., Statistical Quality Control, Dhanpat Rai & Co.

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
V	**17U5STC10**	**Game Theory**	**5**	**5**

Unit I: – **19 Hrs**

Introduction game theory – Definition of game, Application of game and its uses, properties

Unit II: – **19 Hrs**

Method of solving game theory problems - maximin, minimax principle, saddle point

Unit III: – **19 Hrs**

Two person Zero sum game - games with mixed strategies – problems

Unit IV: – **18 Hrs**

Dominance property- game with dominance – games with Arithmetic method – problems

Unit V:

Linear programming in solving a game – graphical solution to a game (mx2 and 2xn) - approximate solution of a game – problems.

Books for Reference:

Unit 1: Chapter 1

TEXT BOOK:

- Introduction to Game Theory – Stef Tijs

Unit 2: Chapter 20
Unit 3: Chapter 20
Unit 4: Chapter 20
Unit 5: Chapter 2

TEXT BOOK:

- *Problems in Operations Research*, Sultan Chand & Sons, New Delhi (2006).- P.K.Gupta and Man Mohan.

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
V	**17U5STCP2**	**MAJOR PRACTICAL - II (USING CALCULATOR)**	**4**	**4**

Problems:

UNIT-I Statistical inference-1: – 12 Hrs

1. Estimation of parameters of the distribution by the methods of moments and maximum likelihood with regard to discrete and continuous distributions
2. Confidence intervals based on Normal, χ^2, *t* and *F* distributions
3. Determination of partial and multiple correlation coefficients-Multiple linear regression line and linear prediction involving three variables when the sums of squares and products are given.

UNIT-II Basic sampling theory: – 12 Hrs

1. Estimation of mean and variance of the population and the variance of the estimator of the mean using Simple random procedure.
2. Stratified random sampling –Estimation of mean and variance of the population and of the variance of the estimator of the mean under proportional and optimum allocation.
3. Systematic sampling.

UNIT-III Design of experiments: – 12 Hrs

1. Analysis RBD and LSD lay outs
2. Missing plot techniques in RBD and LSD
3. Analysis of 2^2, 2^3 and 3^2 factorial designs with and without confounding.
4. Analysis of covariance with one concomitant variable to RBD.

UNIT-IV: Statistical inference-II: – 12 Hrs

1. Standard Normal and exact tests of significance with regard to mean, variance, proportion, correlation and regression coefficients and partial multiple correlation coefficients
2. Test for homogeneity several variances-Bartlett test

UNIT-V: Statistical quality control: – 12 Hrs

1. Control chat for attributes and variables**:**□□*X, R, p, np* and *c* charts
2. Single sampling plan for attributes: OC, ATI, AOQ curves.

Three questions to be answered out of five questions. **One question to be asked from each unit.**

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
V	**17U5STEL1A**	**Major Elective – I DEMOGRAPHIC METHODS**	**4**	**3**

Subject description: This course introduces the concepts, methods and analysis of data relating to vital events such as births, deaths… marriage… migration ….
Goal: To enable the students to have an exposure on the application of Statistical methods to analyze the demographic problems.
Objective: On successful completion of the course the students should have understood about registered information of vital events, measurement of the events such as birth and death rates, life tables and population projection techniques.

Unit-I: -15 Hrs

Mortality measurements: crude death rate- specific death rates-standardized death rates-direct and indirect methods.

Unit- II: -15 Hrs

Mortality Table or Life Table – Stationary population –Stable population – Central mortality rate – force of mortality – Assumptions, Description & construction of life table – Uses of life tables.

Unit- III: -15 Hrs

Abridged life table – Reed – Merrell method – Greville's method – king's method.

Unit- IV: -15 Hrs

Fertility- Crude Birth rate – General Fertility Rate – Specific Fertility rate – Total Fertility Rate.

Unit -V:

Measurement of population Growth – Crude rate of Natural increase and pearel's vital Index – Gross Reproduction rate – Net reproduction rate.

Books for study:

1. Indian Population Problems by Agarwala, S.N (Tata Mc Graw Hill, Bombay)
2. Fundamentals of Applied Statistics by Guptha ,S.C and Kapoor ,V.K (S.Chand &Co)
3. An introduction to the study of population by Mishra D.E (South India publishers, Madras)
4. Fundamentals of Demography by DR.Hansraj (Surjeet publications Delhi)
5. Fundamentals of applied statistics by S.C.Gupta & V.K.Kapoor
   Unit I : Chapter 9 :Sec 9.1-9.4
   Unit II: Chapter 9 : Sec 9.5
   Unit III: Chapter 9: Sec 9.6
   Unit IV: Chapter 9: Sec 9.7
   Unit V : Chapter 9: sec 9.8

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
V	**17U5STEL1B**	**Major Elective – I ECONOMETRICS**	**4**	**3**

Unit – I **15 Hrs**

Introduction to Econometrics – Nature and scope of Econometrics – Limitations

Unit – II **-15 Hrs**

Concepts of price, Demand, supply, elasticity of demand, elasticity of price, elasticity of supply – simple problem

Unit – III **-15 Hrs**

Simple linear model and general linear models – Simple application

Unit – IV **-12 Hrs**

Ordinary Least Square (OLS) estimation – Prediction – Simple illustrations

Unit – V

Statistical problems of Econometric methods – Hetroscedasiticity and Multi colinearity

Reference Books:

1. J. Johnston (1985) Econometric methods, John Wiley & Inc, New York.

2. S. P. Singh, Anil. K, Parashar and H. P.Singh (1984). Econometrics, S.Chand and Company Ltd, New Delhi.

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
V	**17U5STEL2A**	**Major Elective – II SIMULATION AND PROBABILISTIC MODEL**	**4**	**3**

Objectives:

- To introduce the techniques of constitution of Probabilistic Model.
- To introduce the simulating techniques of Model.

Unit I: -15 Hrs

Probabilistic Model-I – single period model with uniform rate of demand without setup cost (discrete and continuous units) – simple problems only.

Unit II: -15 Hrs

Probabilistic Model-II – Single period model with instantaneous demand without setup cost (discrete and continuous units) – simple problems only.

Unit III: -15 Hrs

Replacement problems – definition – replacement of equipment that deteriorates gradually – simple problems only.

Unit IV: -15 Hrs

Replacement policy when value of money does not change with time and money charges with time – simple problems only.

Unit V:

Individual replacement policy – Group replacement policy – ABC analysis – Simple problems only.

Books for Study:

1. Kanthi Swarup, Gupta P.K. and Man Mohan, - *"Operations Research",* Sultan and Chand and Sons, New Delhi.

   Unit I : Chapter 19: Sec 12.1
   Unit II : Chapter 19: Sec 12.2
   Unit III : Chapter 18
   Unit IV: Chapter 18
   Unit V : Chapters 23,24

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
V	**17U5STEL2B**	**Major Elective – II MATLAB**	**4**	**3**

Unit – I: **-15 Hrs**

Starting with Matlab - Creating arrays - Mathematical operations with arrays

Unit – II: **-15 Hrs**

Script files - Functions and function files

Unit – III: **-15 Hrs**

Two-dimensional plots - Three-dimensional plots

Unit – IV: **-15 Hrs**

Programming in MATLAB

Unit – V:

Polynomials, Curve fitting and interpolation - Applications in numerical analysis

Text Book:

"MATLAB An Introduction with Application" by **A. Gilat,** John Wiley & Sons, Singapore, 2004.

Unit – I : Chapter 1, Chapter 2, Chapter 3.
Unit - II : Chapter 4, Chapter 6.
Unit - III : Chapter 5, Chapter 9.
Unit - IV : Chapter 7.
Unit - V : Chapter 8, Chapter 10.

Reference Books:

1. *Getting Started with MATLAB – A Quick Introduction for Scientists and Engineers"* by **R. Pratap**, Oxford University Press, New Delhi, 2006.
2. "*Introduction to Matlab 7 for Engineers"* by **W.J. Palm,** McGraw-Hill Education, New York, 2005.
3. "*Introduction to MATLAB 7"* by **D. M. Etter, D. C. Kuncicky and H.Moore**, Prentice Hall, New Jersy, 2004.

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
V	**17U5STNME**	**Non Major Elective MATRIX ALGEBRA**	**2**	**1**

Unit- I **-8Hrs**

Definition of Matrix – Addition, Subtraction, Multiplication of Matrices

Unit-II **-7 Hrs**

Transpose of a Matrix – Adjoint of a Matrix – Inverse of the Matrix.

Unit-III **-8Hrs**

Symmetric, Skew symmetric, Hermitian and Skew Hermitian Matrix – Problems.

Unit-IV **-7Hrs**

Rank of the Matrix- Definition – Finding Rank of the Matrix – Problems up to 3x3 Matrix.

Unit-V

Cayley Hamilton Theorem (Statement only) – Problems only

Text Books:

1. Dr.P.R. Vittal -Allied Mathematics - Margham Publications, Chennai-17 (2000)

Semester	Subject Code	Title Of The Paper	Hours Of Teaching/ Week	No. of Credits
V	**17U5STSSD**	**SOFT SKILLS DEVELOPMENT**	**1**	**-**

Unit : I

Proficiency in English – Group Discussion - Interview – Presentation Skills – Percentage and its application – Error Correction.

Unit : II

Communication Skills – Art of Listening, Art of Reading, Art of Writing. Corporate Skill – Time Management, Stress Management.

Text Books

1. Meena K and Ayothi (2013) A Book on Development of Soft Skills (Soft. Skills: A Road Map to Success) P.R. Publishers & Distributors, No. B -20 & 21 V.M.M. Complex, Chatiram Bus Stand, Tiruchirappalli – 620002.
2. Hariharan S, Sundararajan N and Shanmugapriya S.P. (2010) Soft Skills, MJP Pubglishers, Chennai – 600 005.

References

1. Alex K (2012) Soft Skills – Know yourself & Know the world, S.Chand & Company LTD. Ram Nagar, New Delhi – 110 055.
2. Martin Avis, Effective Time Management Skills for everyone, Avis Consultancy, London.

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
VI	**17U6STC11**	**NUMERICAL ANALYSIS**	**4**	**5**

Subject description: This course introduces the concepts and methods to analyze numerical data.
Goal: To enable the students to establish mathematical functions using numerical data.
Objective: On successful completion of the course, the students will be able to estimate functional relationship, interpolate and extrapolate the value of dependent variable of the estimated function.

Unit I: -19 Hrs

Iteration method or Method of successive approximation – Newton's method (or) Newton-Raphson method- Solution of simultaneous linear algebraic equations: Gauss Elimination Method – Gauss-Jordan Method – Jocobi's (or Gauss-Jocobi's) Iteration Method

Unit II: -19Hrs

Interpolation: Newton's Forward Interpolation formula – Backward Differences – Newton's Backward Interpolation formula – Central Differences: Gauss 's Forward Formula – Gauss's Backward Formula – Stirling's Formula.

Unit III: -19 Hrs

Interpolation with unequal intervals: Divided differences – Newton's divided difference interpolation formula for unequal intervals – Lagrange's Interpolation formula.

Unit IV: -18Hrs

Quadrature formula for equidistant ordinates: Trapezoidal rule - Romberg's method– Simpson's *1/3*rd and *3/8*th rules Rule – Truncation error in the Trapezoidal rule –Truncation error in Simpson's rule.

Unit V:

Runge-Kutta method for simultaneous first order differential equations - Predictor Corrector methods: Milne's Predictor Corrector formulae–Adam Bashforth (or Adam's) Predictor Corrector formulae.

Books for study:

1. *Numerical Methods* by Kandasamy. P.Thilagavathy,. K and Gunavathy.K (2003), S.Chand & Co, New Delhi.
2. *Numerical Methods* by A.Singaravelu, Meenakshi Agency, Chennai-2.

   Unit I : chapter 3,4: Sec3.2,3.4,4.2,4.2.1,4.8
   Unit II : Chapter 6,7 : Sec 6.1-7.8
   Unit III: Chapter 8 : sec 8.1 -8.8
   Unit IV : Chapter 9 : Sec 9.7-9.16
   Unit V : Chapter 11: Sec 11.14,11.16,11.17,11.18

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
VI	**17U6STC12**	**DESIGN OF EXPERIMENTS**	**5**	**5**

Subject description: This course introduces various experimental designs, selection of appropriate designs in planning a scientific experimentation

Goal: To enable the students to understand the principles of experimentation and employ suitable designs in experiments

Objective: On successful completion of this course the students should have understood the concept of analysis of v**a**riance, to compare more than two treatments with the help of F distribution for various designs employed, to estimate missing observations, to compare the efficiencies of various designs and the concept of ANCOVA

Unit-I: -15 Hrs

Linear design models-Least Square estimates of parameters and variance of estimates –Analysis of variance: One way and two way classifications.

Unit-II: 15 Hrs

Fundamentals of experimentation: Plot and pen techniques –determination of shape and size of plots – Uniformity trials –Replication, randomization and local control techniques

Unit-III: -15 Hrs

Analysis of different experiments: CRD, RBD and LSD and their efficiencies

Unit-IV: 15 Hrs

Missing plot techniques (atmost two values)-Analysis of covariance (ANCOVA) with one concomitant variable to CRD and RBD.

Unit-V:

Factorial designs -2^2, 2^3 and 3^2 factorial designs with and without confounding.

Books for study:

1. Statistical theory in research by Anderson RL and Bangrtt TA (McGraw HILL)
2. The design of Analysis of Experiments by Kempthrone,B (Wiley Eastern)
3. Design and Analysis of Experiments by Das, M.N., and Giri, N.L (wiley Eastern)

Unit I : Chapter 5 : Sec 5.1 -5.3
Unit II: Chapter 6: Sec 6.1 -6.4
Unit III: Chapter 6 : Sec 6.5 – 6.7
Unit IV:Chapter 6 : Sec 6.6.4 , 6.7.3
Unit V : Chapter 6 : Sec 6.8-6.9

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
VI	**17U6STC13**	**OPERATIONS RESEARCH - II**	**5**	**4**

Unit – I **-19 Hrs**

Dynamic Programming: Introduction – Recursive Relationship – Dynamic Programming Algorithm – Solved Problem.

Unit – II **-19 Hrs**

Queuing Problem: Introduction – Classification of Queue – The Queuing Models – (M/M/1) : (∞/FCFS), (M/M/1)⊛N/FCFS) is (M/M/C); (∞/FCFS) – Solved problems.

Unit – III **19 Hrs**

Inventory Problems: Introduction – Deterministic Models – I, II, III & IV, Purchasing Problem with no shortages, production problem with no shortage, purchasing problem with shortages is production problem with shortages – solved problems.

Unit – IV **-18 Hrs**

Replacement problems: Introduction – Replacement policy for Equipment which Deteriorates gradually – Replacement of items that fail suddenly – problem in mortality and staffing – solved problems.

Unit – V

Simulation: Introduction – Basic steps in simulation – simulation Models – solved problems.

Reference Books:

1.Problems in Operations Research : Sultan Chand & sons, New delhi (2006) – P.K.Gupta & Man Mohan.

Unit I : Chapter 18 : PageNo.: 379 - 391

Unit II : Chapter 22 : :PageNo. : 495 - 507

Unit III : Chapter 23 : :PageNo.: 529 - 541

Unit IV : Chapter 24 : :PageNo. : 574 – 585 & 588 - 591

Unit V : Chapter 29 :PageNo. : 725 - 741

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
VI	**17U6STCP3**	**MAJOR PRACTICAL - III (Using Statistical Software Package)**	**4**	**3**

UNIT I: -12 Hrs

Essential terminology for all SPSS users-getting to SPSS for windows - the components of window - SPSS for windows screens – crucial preliminaries-entering data into SPSS- editing data-saving data file-retrieving data file.

Unit II: -12 Hrs

Merging data files –adding scores to existing cases –add variables – running a simple analysis and obtaining the output.

Unit-III: -12 Hrs

Checking the data –Box plots of score distributions –listing of the data using case summaries –graphs –bar, line, pie chart, scatter plots and histograms.

Unit IV: -12 Hrs

Frequency distribution-measures of frequency distributions-cross tabulations – obtaining two sample chi-square tests-log linear analysis –parametric statistical tests – comparing means- paired and unpaired t-tests

Unit V: -12Hrs

Correlation and multiple regession - analysing nominal and ordinal data-non parametric analysis - Wilcoxon, mann - whitney, Kruskal Wallis tests –ANOVA: Analysis of CRD,RBD and LSD.

Books for study and reference

1. Clifford E.Lunneborg (2000). "*Data analysis by resampling: concepts and applications"*. Dusbury Thompson learning .Australia.
2. Everrit ,B.S and Dunn,G(2001). "*Applied multivariate data analysis*". Amol London.
3. Jeremy J.foster(2001). "*Data analysis using spss for windows*". New edition. Versions 8_10.sage publications .London
4. Michael S, Louis-Beck (1995). "*Data analysis an introduction, Series: quantitative applications in the social sciences*". Sage publications. London.

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
VI	**17U6STEL3A**	**Major Elective – III ACTUARIAL STATISTICS**	**5**	**4**

Unit - I: -19 Hrs

Present value and accumulated value at fixed rate and varying rates of interest – effective rate of interest corresponding to a nominal rate of interest and vice-ersa – Simple problems – annuity – types of annuities excluding perpetuity – derivation of the formula for an%, sn%, a..n% and s..p% simple problems.

Unit – II: - 19 Hrs

Derivation of the formula for a(p) n%, s(p) n%, a..(p) n% and s..(p) n% simple problems – redemption of loan by uniform early payment – definitions of sinking fund – redemption of loan by a sinking fund (uniform early payment) simple problems.

Unit – III -19 Hrs

Mortality table: Definition- Uses – mentioning the types and the construction of a mortality table – complete and incomplete mortality table – computing the probabilities of survival and death using LIC (1970-1973) Mortality table- defining expectation of life, complete expectation of life and central death rate – simple problems.

Unit – IV -18 Hrs

Principles of Insurance – Types of assurance – temporary assurance, pure endowment assurance, endowment assurance and whole life assurance – Expressions for present values of assurance benefits under temporary assurance, pure endowment assurance, endowment assurance and whole life assurance plans – simple problems

Unit – V:

Definitions of premium, Natural premium level, Annual Premium, Net Premium and Office Premium – Expressions for level annual premium under temporary assurance, pure endowment assurance, endowment assurance and whole life assurance plans – simple problem involving the calculations of level annual present annual premium, office premium and the four types of plans only.

Reference Books:

1. Mathematics Basis of Life Insurance – Insurance Institute of India.
2. Mathematics of Finance – Scheme Series.

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
VI	**17U6STEL3B**	**Major Elective – III GENETICAL STATISTICS**	**5**	**4**

Unit – I **- 19 Hrs**

Chromosomes and Genes – meaning of basic terms

Unit – II **- 19 Hrs**

Genotype and phenotype, dominance & recessiveness

Unit – III **- 19 Hrs**

Autosomal linkage - crossing over – sex – linked inheritance sample space – Random events – probability

Unit – IV **-18 Hrs**

Compound events–Laws of probability–conditional probability–Rendel's laws (I & II)

Unit – V

Genotypes and phenotypes in experimental populations–No.of genotypes and phenotypes – Evaluation of phenotypic ratios in the off spring of inter crosses and back crosses, using generating function.

References Books:

1. Ragira C. Elandt : Probability models and Statistical methods in Genetics, John – Wiley and Sons Inc, New Delhi.

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
VI	**17U6STEL4A**	**Major Elective - IV TIME SERIES AND INDEX NUMBERS**	**5**	**4**

Objectives:

- To introduce the techniques of Statistic tools
- To solve the numerical problems using time series index numbers an vital statistics

Unit I: 19 Hrs

Concept of time series – additive and multiplicative models, uses of time series, measurement of trend – graphic method, method of semi-averages – method of moving averages, method of least squares (linear quadratic and exponential) – simple problems.

Unit II: -19 Hrs

Measurement of seasonal fluctuations – method of simple averages – ratio to trend method ratio to moving average and link relative method – concept of cyclic variations and irregular movements.

Unit III: -19 Hrs

Definition and types of index numbers – construction and used of index numbers calculations of index numbers – fixed base and chain base index numbers.

Unit IV: -18 Hrs

Simple aggregate method and weighed aggregate method – Laspeyre's, Paasche's, Bowley's, Marshall- Edgeworth and Fisher's ideal index numbers – simple problems.

Unit V:

Weighted average of price relative method (by using A.M. and G.M.) – construction of chain indices - The criteria of a good index number – time reversal and factor reversal methods and family budget method – simple problem

List of books for study/reference

1. S.C.Gupta and V.K.Kapoor – *"Fundamentals of Applied Statistics",* Sultan Chand and Sons, New Delhi.
2. Goon.A.M.M.A Gupta and Das Gupta B – *"Fundamentals of Statistics",* Vol. II, World Press, Calcutta.

Unit I : Chapter 2 : Sec2.1 -2.4
Unit II: Chapter 2 : Sec2.5 -2.6
Unit III: Chapter 3: Sec 3.1-3.10
Unit IV: Chapter 12: sec 7 (Pg No. 12.7 – 12.15)
Unit V : Chapter 12 : Sec 7 (Pg. No. 12.18 -12.25)

Semester	Subject code	Title of the Paper	Hours Of Teaching/ Week	No. of Credits
VI	**17U6STEL4B**	**Major Elective – IV** **STATISTICAL DATA ANALYSIS**	**5**	**4**

Unit I: -19 Hrs

Collection of statistical data - primary and secondary – methods - preparation of questionnaire and schedules.

Unit II: -19 Hrs

Classification and tabulation – bar diagrams – pie diagram – histogram – frequency polygon – frequency curve – merits and demerits.

Unit III: -19 Hrs

Measures of central tendency – mean, median, mode – measures of dispersion – range, mean deviation, standard deviation and coefficient of variation.

Unit IV: -18 Hrs

Measures of skewness – definition – types – methods – Karl Pearson's skewness – Bowley's skewness – merits and demerits – simple problems only.

Unit V:

Correlation analysis – Karl Pearson's coefficient of correlation – Spearman's rank correlation coefficient – simple problems only.

List of books for study / reference:

S.P.Gupta – *"Statistical Methods",* Sultan and Chand and Sons, New Delhi