B.STAT

SYLLABUS: 2011

CHOICE BASED CREDIT SYSTEM (CBCS)

St. JOSEPH'S COLLEGE (Autonomous)

Re-accredited with A+ Grade by NAAC

College with Potential for Excellence by UGC

TIRUCHIRAPPALLI - 620 002, TN

B. STAT: COURSE DETAIL – 2011

SEM.	Part	Code	Subject	Hours	Credit
I	I	11UGT110001	General Tamil – I / Hindi – I / French – I	4	3
	II	11UGE120101	General English – I	5	3
	III	11UST130201	Descriptive Statistics	7	4
	III	11UST130202	Computational Statistics – I (Internal)	4	4
	III	11UST130203	Computer Lab. – I	2	2
	III	11UST130401	Allied: Computers in Statistics – I (Office Automation)	6	5
	IV	11UFC141001	Value Education - I: Essentials of Ethics, Yoga & Stress Management	2	2
	IV	11UCE140801	Communicative English (spread over 90 hours)	-	5
			Total Credits for Semester – I	**30**	**28**
II	I	11UGT210002	General Tamil – II / Hindi – II / French – II	4	3
	II	11UGE220102	General English – II	5	3
	III	11UST230204	Probability Theory	5	4
	III	11UST230205	Computational Statistics – II (Internal)	4	4
	III	11UST230206	Computer Lab – II	2	2
	III	11UST230402	Allied : Computers in Statistics – II: (C – Programming)	6	5
	IV	11UFC241002	Value Education – II : Fundamentals of Human Rights	2	1
	IV	11UCE240802	Computer Literacy	2	2
			Total Credits for Semester – II	**30**	**24**
III	I	11UGT310003	General Tamil – III / Hindi – III / French – III	4	3
	II	11UGE320103	General English – III	5	3
	III	11UST330207	Discrete Probability Distributions	4	4
	III	11UST330208	Continuous Probability Distributions	5	4
	III	11UST330403A	Allied: Mathematics – I (OR)	(6)	(5)
	IV	11UST430403B	Allied: Accounts – I	6	5
	IV	11UCE340901	Environmental Studies	4	2
	IV	11UFC341003A	Professional Ethics – I: Social Ethics (OR)	(2)	(2)
	IV	11UFC341003B	Professional Ethics – I: Religious Doctrine	2	2
			Total Credits for Semester – III	**30**	**23**
IV	I	11UGT410004*	General Tamil – IV / Hindi – IV / French – IV	4	3
	II	11UGE420104	General English – IV	5	3
	III	11UST430209	Elements of Statistical Inference	9	4
	III	11UST430404A	Allied: Mathematics – II (OR)	(6)	(5)
	III	11UST430404B	Allied: Accounts – II	6	5
	IV	11UST430301A	Elective – I: Numerical Mathematics (OR)	(4)	(4)
	IV	11UST430301B	Elective – I: Real Analysis	4	4
	IV	11UFC441004A	Professional Ethics – II: Social Ethics (OR)	(2)	(2)
	IV	11UFC441004B	Professional Ethics – II: Religious Doctrine	2	2
			Total Credits for Semester – IV	**30**	**21**
V	III	11UST530210	Sampling Theory	6	4
	III	11UST530211	Applied Statistics	6	4
	III	11UST530212	Linear Models and Econometrics	6	4
	III	11UST530213	Operations Research - I	6	4
	III	11UST530302A	Elective – II: Actuarial Statistics (OR)	(4)	(4)
	III	11UST530302B	Elective – II: Elements of Stochastic Processes (OR)	(4)	(4)
	III	11UST530302C	Elective – II: R-Language – Theory & Practical	4	4
	IV	11UST540601	S. Elective – I: Data Analysis for Competitive Exams*	2	2
			Total Credits for Semester – V	**30**	**22**
VI	III	11UST630214	Design of Experiments	6	4
	III	11UST630215	Engineering Statistics	6	4
	III	11UST630216	Operations Research – II	7	4
	III	11UST630303A	Elective–III: Statistical Packages Theory & Practical-SPSS (OR)	(4)	(4)
	III	11UST630303B	Elective-III: Statistical Packages Theory & Practical-SAS	4	4
	III	11UST630304	Group Project	5	3
	IV	11UST640602	S. Elective – II: Statistics for Management	2	2
			Total Credits for Semester –VI	**30**	**21**
I to V	V	11UCE351001	Extension Service: SHEPHERD & Gender Studies	100	6
			TOTAL CREDITS FOR ALL SEMESTERS		**145**

பருவம் -1   மணி நேரம் - 4
11UGT110001   புள்ளிகள்   - 3

பொதுத்தமிழ் - I

நோக்கங்கள்

1. சமூக மாற்றச் சிந்தனைகளை உள்ளடக்கிய தற்கால இலக்கியங்களை அறிமுகம் செய்தல்.
2. புதுக்கவிதை, சிறுகதை, உரைநடை ஆகிய இலக்கியங்களின் நயம் பாராட்டுதல்.
3. சந்திப்பிழையின்றி எழுத மாணவர்களைப் பயிற்றுவித்தல்.

பயன்கள்

1. மாணவர்கள் சமூக மாற்றச்சிந்தனைகளை அறிந்துகொள்வர்.
2. சந்திப்பிழைகளை நீக்கி எழுதும் திறன் பெறுவர்.
3. புத்திலக்கியங்களைப் படைக்கும் திறனையும், திறனாய்வு செய்யும் திறனையும் பெறுவர்.

அலகு-1   (10 மணி நேரம்)

மகாகவி பாரதியார் கவிதைகள்
பாரதிதாசன் கவிதைகள்
உரைநடை–முதல் மூன்று கட்டுரைகள்
(கட்டுரைக்களஞ்சியம்)

அலகு-2   (12மணி நேரம்)

கவிமணி தேசிகவிநாயகம் கவிதைகள்
நாமக்கல்கவிஞர் வெ.இராமலிங்கம் கவிதைகள்
இலக்கணம் -வலிமிகும் இடங்கள்

அலகு-3   (10 மணி நேரம்)

கவிஞர் கண்ணதாசன் கவிதைகள்
இலக்கியவரலாறு- மூன்றாம் பாகம்
சிறுகதை- முதல் ஆறு சிறுகதைகள்

அலகு-4   (14 மணி நேரம்)

பாவலரேறு பெருஞ்சித்திரனார் பாடல்கள்
அப்துல் ரகுமான் கவிதைகள்
இலக்கிய வரலாறு – நான்காம் பாகம்
இலக்கணம் - வலி மிகா இடங்கள்

அலகு-5   (14 மணி நேரம்)

கவிஞர் மேத்தா கவிதைகள்
மொழிபெயர்ப்புக்கவிதைகள்
சிறுகதை- 7 முதல் 12 முடிய உள்ள சிறுகதைகள்
உரைநடை- 4முதல் 6 முடிய உள்ள கட்டுரைகள்
(கட்டுரைக்களஞ்சியம்)

பாடநூல்

1. பொதுத்தமிழ் - செய்யுள் திரட்டு- தமிழ்த்துறை வெளியீடு-2011-2014
2. சமூகவியல் நோக்கில் தமிழ் இலக்கிய வரலாறு, தமிழ்த்துறை வெளியீடு, தூய வளனார் கல்லூரி, திருச்சிராப்பள்ளி-2
3. உரைநடை நூல் - தமிழ்த்துறை வெளியீடு, 2011-2014
4. சிறுகதைத்தொகுப்பு
   (கட்டுரைக்களஞ்சியம்)

மதிப்பெண் பகிர்வு

பிரிவு	பாகம் -1	பாகம் -2	பாகம்-3
செய்யுள்	12 (12 வினாக்கள்)	8 (2 வினாக்கள்)	30 (2 வினாக்கள்)
இலக்கியவரலாறு	6 (6 வினாக்கள்)	8 (2 வினாக்கள்)	15 (1 வினா)
உரைநடை	--------------	--------------	15 (1வினா)
இலக்கணம்	2 (2 வினாக்கள்)	4 (1 வினா)	--------------
சிறுகதை	--------------	-------	15 (1 வினா)

Semester: I   **Hours :5**
Code:11UGE120101   **Credits: 3**

GENERAL ENGLISH – I

Objectives:
1. *To enable the students to develop their effective communicative skills in English.*
2. *To empower the students with fluency and accuracy in the use of English Language.*
3. *To transform them into globally employable persons with placement skills.*

UNIT-I   **12 Hrs**

Prose	Education.
	Employment.
	Unemployment.
Poem	William Shakespeare— "All the World's a Stage."
Letter Writing	Formal and Informal.
Short Story	O Henry – Robe of Peace. (Extensive Reading).

Essential English Grammar – 1-6 units

UNIT-II   **12 Hrs**

Prose	Application.
	Planning.
	Curriculum Vitae.
Poem	Ben Jonson—"On Shakespeare"
	Reading Comprehension
Short Story	Rudyard Kipling—The Miracle of Puran Bhagat (Extensive Reading).

Essential English Grammar – 7-12 units.

UNIT-III   **11 Hrs**

Prose	Interview.
	Reporting.
	General Knowledge.
Poem	Robert Herrick—"Gather Ye Rosebuds."
	Note Making
Short Story	H.G.Wells—The Truth About Pyecraft (Extensive Reading).

Essential English Grammar – 13-18 units

UNIT-IV   **20 Hrs**

Prose	Review.(Super Toys)
	Stress.
	No Time.
Poem	Oliver Goldsmith—" The Village Schoolmaster"
	Developing story from hints
Short Story	John Galsworthy—"Quality" (Extensive Reading).

Essential English Grammar – 19-24 units

UNIT-V   **15 Hrs**

Prose	Killers.
	Galloping Growth.
	A Short Story.
Poem	William Blake—" From Auguries of Innocence"
	Précis Writing
Short Story	William Somerset Maugham— Mabel (Extensive Reading).

Essential English Grammar – 25-30 units

Text Books
1. Krishnaswamy. N, Sriraman T. Current English for Colleges. Hyderabad: Macmillan Indian Ltd,2006.
2. Dahiya SPS Ed. Vision in Verse, An Anthology of Poems. New Delhi: Oxford University Press,2002.
3. Murphy, Raymond. Essential English Grammar. New Delhi: Cambridge University Press,2009.
4. Seshadri, K G Ed. Stories for Colleges.Chennai: Macmillan India Ltd,2003.

SEMESTER – I   Hours/week : 7
11UST130201   Credits   : 4

DESCRIPTIVE STATISTICS

Objective:
To explain how to analyse the given data. At the end of the course a student should be able to solve simple real life problems.

UNIT – I   Collection and Scrutiny of Data
Origin and meaning of statistics – general uses-relation with other disciplines-Limitations and misuses of statistics.
Methods of collection: Complete enumeration – sample survey-Primary data; methods of collection; secondary data sources.

UNIT – II   Presentation of Data
Presentation of data by tables and diagrams- construction of tables (univariate and bivariate)- classification – graphical representation of a frequency distribution by histogram, frequency polygon and Ogives.
Diagrammatic presentation: Line diagram, Bar diagrams: Simple, multiple, subdivided and percentage-Pie chart, comparative pie chart.

UNIT – III   Analysis of Data (Univariate)
Measures of central tendency: Arithmetic mean-weighted mean-median-partition values-mode-geometric mean-Harmonic mean-choice of an average-characteristics of a good average.
Measures of dispersion: range-quartile deviation-mean deviation - standard deviation - relative measures of dispersion - Coefficient of variation-Lorenz curve.
Measures of skewness and kurtosis.

UNIT – IV   Analysis of Data (Bivariate)
Correlation: Scatter plot-coefficient of correlation-probable error-coefficient of determination-Spearmen's rank correlation coefficient-correlation coefficient for bivariate frequency table-correlation ratio-partial

and multiple correlations (with respect to three variables only).
Association of attributes: Dichotomy-order of classes association and disassociation-methods: (I) comparison of observed and expected frequencies (II) proportion method, (III) Yule's coefficient of association, (iv) coefficient of colligation.

UNIT – V   Analysis of Data (Fitting of Mathematical Models)
Simple regression analysis: Distinction between regression analysis and correlation- Linear regression: Finding regression equations by Graphical method, method of least squares and using statistical constants($\overline{x}, \overline{y}$, s_y, s_x and r). Properties of linear regression coefficients. Curvilinear regression: Fitting of second degree Parabola, exponential and power curves.
Note: Probability and Expectation concepts are to be avoided.

TEXT BOOK:
1.   Gupta,S.C. and Kapoor, V.K. : "Fundamentals of Mathematical Statistics", Sultan & Chand & SONS,New Delhi, 11th Ed, 2002.

REFERENCE BOOKS:
1.   Saxena H .C. : Elementary Statistics. S. Chand & Co., 1983.

Note: The qustion paper may consist of Theory and Problems in the ratio 50:50.

SEMESTER – I	Hours/week : 4
11UST130202	Credits : 4

COMPUTATIONAL STATISTICS – I (Internal)

Objective:

To impart the computational skills to the students.

UNIT – I

Frequency Distributions – Univariate, Bivariate and cross-tabulation. Graphs: Histogram, Frequency polygon, Frequency curves, Ogives, Lorenz curve. Diagrams: Cluster bar diagrams, Stacked bar diagrams, Pie chart, Pictograms, Scatter diagram.

UNIT – II

Measures of Central Tendency: Mean, Median, Mode, Geometric mean, Harmonic mean, Weighted mean, Partition values. Measures of Dispersion: Range, Mean Deviation, Quartile Deviation, Standard Deviation, Combined Standard Deviation, Coefficient of Variation.

UNIT – III

Skewness and Kurtosis: Raw moments, Central moments Karl Pearsons coefficient of skewness, Bowley's coefficient of skewness β_1, β_2, γ_1, γ_2.

UNIT – IV

Correlation: Karl Pearson's correlation coefficient, Spearman's rank correlation coefficient, coefficient of determination. Theory of attributes: Independence of attributes, consistency of data, Yule's coefficient of association and Yule's coefficient of colligation.

UNIT – V

Regression analysis: Lines of regression, exponential curves, Power curves, Parabola. Partial and multiple correlation coefficients with respect to three variables.

SEMESTER – I	Hours/week : 2
11UST130203	Credits : 2

COMPUTER LAB – I
(OFFICE AUTOMATION)

Objective:

To train the students to solve practical problems with the help of the constituents of MS Office.

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. Entering Text in Cells of Excel worksheet and entering formulas.

5. Formatting Cells, Centering across selection and changing font and size.

6. Preparing Pie chart and Bar charts.

7. Creating a new presentation in Power Point, numbering and copying slides.

8. Changing fonts and colours, inserting Clip Art and Formatting options.

9. Inserting Bullets and Pictures, Creating Tables and Inserting Autoshapes.

10. Calculation of Statistical constants using Excel functions.

SEMESTER – I   Hours/week : 6
11UST130401   Credits   : 5

ALLIED: COMPUTERS IN STATISTICS – I
(OFFICE AUTOMATION)

Objectives:
- To train the students to get acquainted with the essential features of constituents of MS-Office.

UNIT - I   Windows 2007

Windows Explorer – My Computer - My Documents - Folder Creation – Creating, Copying, Editing and Deleting a File – Find and Replace Facility – Desktop Configuration – File Compression and extraction.

UNIT – II   MS – Word Basics

Creating, saving, Previewing and Printing a Word document - Editing : cut, copy, paste, find, replace, undo, redo, book working - Applying Basic formatting : changing font and font size – bold, italic and under line features - color selection – alignment – Bullet and Numbered Lists.

UNIT – III   MS Word – Working with Tables and Graph

Adding a Table to your document – deleting, merging and splitting cells – Adding and deleting columns and rows.

Inserting a Picture – clip Art, Shape and Smart Art – Designing and Reviewing a word document – Headers and Footers – Page margins, page orientation, page breaks – Performing Spelling and grammar checks.

UNIT – IV   MS Excel Work Sheet Basics

Data Entry on the Worksheet – Built-in functions for good use – operations on Table – printing the data and results.

UNIT – V   MS Excel – Statistical Applications

Construction of Line charts, Bar charts, Pie charts and scatter diagrams – Exporting data to Word and Power point.

Descriptive Statistics – Data Analysis PAK in Excel –Frequency Distribution, Histogram, Cross Tabulation and Pivot Tables – Summary Statistics (Measures of central Tendency, Variation, Skewness and kurtosis) – correlation and Regression Analysis.

TEXT BOOKS:
1.   Office 2007 in simple steps, kogent solutions Team, Dream Tech., 2010 (chapters 1 to7)
2.   Statistics made simple, K.V.S. Sharma, PHI, 2006 (chapters 4 to 7 and 9).

பருவம் -2   மணி நேரம் - 4
11UGT210002   புள்ளிகள்   - 3

பொதுத்தமிழ் - II

நோக்கங்கள்

1. சமய நல்லிணக்க உணர்வை வளர்த்தல்.
2. தமிழ்க் காப்பியங்களில் அழகும், அறிவுணர்வும் ஊட்டும் பகுதிகளைப் படித்துப் புரிந்து கொள்ளுதல்.
3. உரைநடைக் கட்டுரை எழுதும் திறன் பெறுதல்.

பயன்கள்

1. தமிழைத் திருத்தமாகப் படிக்கவும், பேசவும், பிழையின்றி எழுதவும் கூடிய திறன் பெறுவர்.
2. இலக்கியங்களில் படித்தவற்றை முறையாக வாழ்க்கையில் கடைப்பிடிப்பர்.

அலகு : 1   *(12 மணி நேரம்)*

சிலப்பதிகாரம்   –அடைக்கலக் காதை - மதுரைக் காண்டம்
இலக்கிய வரலாறு –சைவம் வளர்த்த தமிழ் முதல் புராணங்கள் முடிய.

அலகு : 2   *(12 மணி நேரம்)*

மணிமேகலை   – சிறைக்கோட்டம் அறக்கோட்டம் ஆக்கிய காதை
பெரியபுராணம்   – திருநாளைப்போவார் நாயனார் புராணம்
உரைநடை   – 7 முதல் 9 முடிய உள்ள கட்டுரைகள்
                   (கட்டுரைக்களஞ்சியம்)

அலகு : 3   *(12 மணி நேரம்)*

கம்பராமாயணம்   –   வாலி வதைப்படலம்
செம்மொழியான தமிழ்மொழியே:1 – 20 பக்கங்கள்
இலக்கணம்   –   எழுத்திலக்கணம்

அலகு : 4   *(12 மணி நேரம்)*

தேம்பாவணி   –   மகன் நேர்ந்த படலம்
சீறாப்புராணம்   –   அபீராகு வதைப்படலம்
உரைநடை   –   10 முதல் 12 வரையிலான கட்டுரைகள்
செம்மொழியான தமிழ்மொழியே –   21- 37 பக்கங்கள

அலகு : 5   *(12 மணி நேரம்)*

இராவண காவியம்   –   ஆரியப் படலம்
இலக்கிய வரலாறு   –   தமிழ் இலக்கண நூல்கள் முதல்
                          சிற்றிலக்கியங்கள் முடிய.
இலக்கணம்   –   சொல்லிலக்கணம்

பாடநூல்கள்

1. செய்யுள் திரட்டு – தமிழாய்வுத்துறை வெளியீடு, 2011 – 2014.
2. இலக்கிய வரலாறு, தமிழாய்வுத்துறை வெளியீடு, 2010.
3. உரைநடைநூல், தமிழாய்வுத்துறை வெளியீடு, 2011-2014
4. செம்மொழியான தமிழ்மொழியே, சங்கம் வெளியீடு, மதுரை.2010

மதிப்பெண் பகிர்வு

பிரிவு	பாகம் -1	பாகம் -2	பாகம்-3
செய்யுள்	12 (12 வினாக்கள்)	8 (2 வினாக்கள்)	30 (2 வினாக்கள்)
இலக்கியவரலாறு	4 (4 வினாக்கள்)	4 (1 வினா)	15 (1 வினா)
உரைநடை	--------------	--------------	15 (1வினா)
இலக்கணம்	2 (2 வினாக்கள்)	4 (1 வினா)	--------------
செம்மொழி	2 (2 வினாக்கள்)	4 (1 வினா)	15 (1 வினா)

Sem: II   Hours :5
Code: 11UGE220102   Credits: 3

GENERAL ENGLISH –II

Objectives:

1. *To enable the students to develop their effective communicative skills in English.*
2. *To empower the students with fluency and accuracy in the use of English Language.*
3. *To transform them into globally employable persons with placement skills.*

UNIT-I   **12 Hrs**

Prose   Environment.
                    A Dead Planet.
                    Riddles.
Poem   William Wordsworth—Nutting.
                    Shelley- Ozymandias.
                    Filling Money Order Chalan and Bank Chalan
Short Story G.K.Chesterton – The Hammer of God (Extensive Reading)
Essential English Grammar: -31-36 Units

UNIT-II   **12 Hrs**

Prose   Qahwah
                    A Dilemma
                    Computeracy
Poetry   John Keats—La Belle Dame Sans Merci
                    Robert Browning- The Last Ride Together
Short Story Katherine Mansfield—A Cup of Tea (Extensive Reading)
Dialogue Writing
Essential English Grammar:37-42Units

UNIT-III   **11 Hrs**

Prose   Review (Use Your English)
                    Entertainment
                    You and Your English
Poetry   Walt Whitman- I Celebrate Myself.
                    Mathew Arnold—Dover Beach.

Short Story Thomas Wolfe—The Far and the Near (Extensive Reading)
Conversations
Essential English Grammar:43-48Units

UNIT-IV   **20 Hrs**

Prose   War Minus Shooting .
                    Usage and Abusage.
Poetry   Sarojini Naidu—The Gift of India..
                    Robert Frost—Design .
Short Story R.K. Narayan—Half a Rupee Worth (Extensive Reading)
                    Manohar Malgonkar—Bacha Lieutenant
Story Telling
Essential English Grammar:49-54Units

UNIT-V   **15 Hrs**

Prose   Who's Who.
Poetry   Nissim Ezekiel. The Night of The Scorpion
Short Story Anita Desai—A Devoted Son (Extensive Reading)
                    Ruskin Bond—The Boy Who Broke the Bank(Extensive Reading)
                    Report Writing
Letter to the Editor
Essential English Grammar: 55-60Units

Text Books

1. Krishnaswamy. N, Sriraman T. Current English for Colleges. Hyderabad: Macmillan Indian Ltd,2006.
2. Dahiya SPS Ed. Vision in Verse, An Anthology of Poems. New Delhi: Oxford University Press,2002.
3. Murphy, Raymond. Essential English Grammar. New Delhi: Cambridge University Press,2009.
4. Seshadri, K G Ed. Stories for Colleges.Chennai: Macmillan India Ltd, 2003.

SEMESTER – II	**Hours/week : 5**
11UST230204	**Credits : 4**

PROBABILITY THEORY

Objective:

Inferential Statistics helps one to make inferences about a whole group by studying a part of it. This is the vital reason for the present importance and popularity of Statistics in diversified fields. The techniques in Inferential Statistics by and large depend on Probability concepts. Hence the study of Probability theory in this Semester serves as a pre-requisite for all the subsequent Semesters.

UNIT – I

Random experiment sample point, sample space, algebra of events, Operation on events, classical and relative frequency approach to probability-discrete probability space, axiomatic approach to probability.

UNIT – II

Addition theorem of probability - Conditional probability-independence of events-multiplication theorem-Baye's theorem and its application.

UNIT – III

Definition of discrete and continuous random variables - probability mass function, probability density functions, distribution function and their properties. Expectation of random variables and its properties. Joint distribution of two random variables, marginal and conditional distributions. Independence of random variables. Covariance, Correlation.

UNIT – IV

Moment generating functions - Characteristic functions – Inversion and Uniqueness theorems. (Statement only) cumulant generating functions and its properties. Moments, measures of central tendency, dispersion, skewness and kurtosis.

UNIT – V

Chebyshev's Inequality and applications-Markov inequality-Concept of convergence in probability - Weak law of large numbers - Central limit theorems (De-Moivre and Levy - Lindeberg Levy theorem).

TEXT BOOK:

1. Gupta, S.C. and Kapoor, V.K.: "Fundamentals of Mathematical Statistics", Sultan & Chand & SONS, New Delhi, 11th Ed., 2002.

REFERENCE BOOKS:

1. Dudewicz, E.J. and Mishra,S.N. Introduction to Mathematical Statistics, John Wiley, 1988.
2. Hogg, R.V. and Craig,A.T.: Introduction to Mathematical Statistics, Prentice Hall, England, 5th Ed, 1999.

SEMESTER – II   **Hours/week : 4**
11UST230205   **Credits : 4**

COMPUTATIONAL STATISTICS – II (Internal)

Objective:

To impart the computational skills to the students

UNIT – I

Problems under the following: Random experiment sample point, sample space, algebra of events, Operation on events, classical and relative frequency approach to probability-discrete probability space, axiomatic approach to probability.

UNIT – II

Problems under the following: Addition theorem of probability - Conditional probability-independence of events-multiplication theorem- Baye's theorem.

UNIT – III

Problems under the following: Discrete and continuous random variables - probability mass function, probability density functions, distribution function. Expectation of random variables. Measures of central tendency, dispersion, skewness and kurtosis.

UNIT – IV

Problems under the following: Joint distribution of two random variables, marginal and conditional distributions. Independence of random variables. Covariance, Correlation.

UNIT – V

Problems under the following: Moment generating functions - Characteristic functions – Chebyshev's Inequality and applications – Weak law of large numbers.

SEMESTER – II   **Hours/week : 2**
11UST230206   **Credits : 2**

COMPUTER LAB – II
(C Programming)

Objective:

To train the students to design and execute a variety of C programs on Computers.

List of Exercises

1. Use of GETC, PUTC, GETS and PUTS statements.

2. Use of SCANF and PRINTF statements.

3. Calculation of mean and variance.

4. Squeezing a given character string (Elimination of all white charaters).

5. Writing a character string in reverse order.

6. Computation of correlation and Regression Coefficients.

7. A problem involving Recursion or Palindrome.

8. A problem involving Pointers and Functions.

9. Creation and updating of a sequential file

10. Creation and updating of a random file

SEMESTER – II   **Hours/week : 6**
11UST230402   **Credits : 5**

ALLIED : COMPUTERS IN STATISTICS – II
(C Programming)

Objective:

    To explain the main features of C language, which plays a pivotal role in the programming field.

UNIT – I   **Intoductory concepts**

    Introduction to C - Fundamentals of C - Constants, Variables, Declarations - Expressions - Special Arithmetic operators - Conversions- Library routines - Execution of C programs in UNIX Environment.

UNIT – II   **Simple and Control Statements**

    Simple statements- GETC, PUTC, GETS, PUTS, SCANF, PRINTF and assignment statements – Illustrations.

    Control statements- IF statements, SWITCH statements, GOTO statement- FOR, WHILE, DO WHILE statements – Problems.

UNIT – III   **Functions and Arrays**

    Functions- Importance of Functions in C – Declaration – Usage- Argument passing methods-Storage classes.

    Arrays-Declarations-Dimensions-Usage-Arrays with Functions- Applications.

UNIT – IV   **Pointers**

    Pointers-Importance-Declaration-Pointer Arithmetic-Pointer Expression-Passing of Pointers- Pointers with Arrays-Pointers to Pointers.

UNIT – V   **File Processing**

    File Processing(Sequential and Random)- File organizations- Accessing methods-File processing statements-Simple Applications- Creation, Processing and Updating of files.

TEXT BOOKS:
1. Balagurusamy, E.: Programming in ANSIC, Tata McGraw – Hill publishing Company Ltd.1992.
2. Byron S Gottfried, Theory and problems of programming with C, SCHAUM Out line Seires, International Editions.

REFERENCE BOOKS:
1. Herbert Schildt, Osborn : C made Simple, McGraw Hil Publications
2. Kernighan and Ritchie: C Programming Language, Prentice Hall of India Pvt. Ltd., 2000.

பருவம் - 3   மணி நேரம் - 4
11UGT310003   புள்ளிகள் - 3

பொதுத் தமிழ் - III

நோக்கங்கள்

1. செம்மொழித் தமிழ்ச்செய்யுள்களான பதிணென்மேல் கணக்கு, பதிணென்கீழ்க் கணக்குப் பாடல்களைப் படித்துப் பொருள் புரிந்து கொள்ளும் திறன் பெறுதல்

2. பண்டைய இலக்கியங்களில் அமைந்துள்ள சமூகக் கருத்துக்களை உணர்தல்.

3. மரபுக் கவிதை வடிவங்களை அறிதல்.

4. கவிதைகளில் அணிகள் அமைந்துள்ள பாங்கைப்புரிதல்.

5. புதினம் வழித் தற்காலச் சமுதாயச் சிக்கல்களையும், அதற்கான தீர்வுகளையும் ஆராய்ந்தறிதல்.

பயன்கள்

1. செம்மொழியாம் தமிழ் மொழியின் சிறப்பை அறிந்துகொள்வர்.

2. பண்டைய இலக்கியங்கள் உணர்த்தும் அறக்கருத்துக்களை அறிந்து, மாணவர் ஒழுக்க நெறியில் வாழ்ந்து சமூகத்தை மேம்படுத்துவர்.

3. மாணவர் புதினத்தைக் கற்பதன் மூலம் சமுதாயச் சிக்கல்களை உணர்ந்து அவற்றிற்குத் தீர்வு காண்பர்.

அலகு : 1   *(16 மணி நேரம்)*

பத்துப்பாட்டு - குறிஞ்சிப்பாட்டு (முழுமையும்)

அலகு : 2   *(10 மணி நேரம்)*

நற்றிணை, குறுந்தொகை, யாப்பிலக்கணம் (வெண்பா, ஆசிரியப்பா)

அலகு : 3   *(10 மணி நேரம்)*

இலக்கிய வரலாறு   – 'தமிழ்மொழியின் தொன்மையும் சிறப்பும்' முதல் 'சங்கத் தொகை நூல்கள்' முடிய.

புதினம்   – முழுமையும்.

அலகு : 4   *(12 மணி நேரம்)*

கலித்தொகை, பதிற்றுப்பத்து, புறநானூறு, அணியிலக்கணம்.

அலகு : 5   *(12 மணி நேரம்)*

திருக்குறள்
இலக்கிய வரலாறு – சங்க இலக்கியங்களின் தனித்தன்மைகள் முதல் இரட்டைக் காப்பியங்கள் முடிய.

பாடநூல்கள்

1. செய்யுள் திரட்டு, தமிழாய்வுத்துறை வெளியீடு (2011 - 2014)

2. சமூகவியல் நோக்கில் தமிழிலக்கிய வரலாறு, தமிழாய்வுத்துறை வெளியீடு, 2010

3. புதினம் (ஒவ்வொரு கல்வியாண்டும் ஒவ்வொரு புதினம்).

மதிப்பெண் பகிர்வு

பிரிவு	பாகம் -1	பாகம் -2	பாகம்-3
செய்யுள்	12 (12 வினாக்கள்)	8 (2 வினாக்கள்)	30 (2 வினாக்கள்)
இலக்கியவரலாறு	6 (6 வினாக்கள்)	8 (2 வினாக்கள்)	30 (2 வினாக்கள்)
புதினம்	--------------	--------------	15 (1வினா)
இலக்கணம்	2 (2 வினாக்கள்)	4 (1 வினா)	--------------

Sem: III   **Hours :5**
Code: 11UGE320103   **Credits: 3**

GENERAL ENGLISH -III

Objectives:

1. To enable the students to complete the pre-reading task to comprehend the local and global issues in the lessons..
2. To enable the students to complete the post-reading task centering on Grammar and Skill Development
3. To empower the students with globally employable skills.

UNIT-I   **12 Hrs**

Larry Collins & Dominque Lapierre
Freedom at Midnight (Extract)
Alfred Uhry
Driving Miss Daisy
Extensive Reading—Robinson Crusoe (Chapters 1-3)
Essential English Grammar—61-66.

UNIT-II   **12 Hrs**

Alfred Lord Tennyson
Ulysses
Nathanial Branden
Our Urgent Need for Self-esteem
Extensive Reading—Robinson Crusoe (Chapters 4-6)
Essential English Grammar—67-72.
Reader's Mail :The Hindu

UNIT-III   **11 Hrs**

Daniel Goleman
Emotional Intelligence
Marcel Junod
The First Atom Bomb.
Extensive Reading—Robinson Crusoe (Chapters 7-9)
Essential English Grammar—73-78.
Job Application.

UNIT-IV   **20 Hrs**

E.K.Federov
Climate Change and Human Strategy.
Paolo Mauro
Corruption: Cases, Consequences and Agenda for further Research.
Extensive Reading—Robinson Crusoe (Chapters 10-12)
Essential English Grammar—79-84.
Minutes Writing.

UNIT-V   **15 Hrs**

Anne Frank
The Diary of Young Girl
A.P.J.Abdul Kalam
Wings of Fire
Extensive Reading—Robinson Crusoe (Chapters 13-15)
Essential English Grammar— 85-90.
Resume Writing.

Text Books

1. Elango K. *Insights.* Hyderabad: Orient Blackswan Pvt Ltd,2009.

2. Murphy, Raymond. *Essential English Grammar*. New Delhi. Cambridge University Press India Ltd,2009.

3. Defoe, Daniel. *Robinson Crusoe*. Chennai: MacMillan India Ltd,2009.

4. Stevenson R L. *Treasure Island*. Chennai: MacMillan India Ltd,2009.

5. Ram N Ed. *The Hindu*. Tiruchirappalli.

SEMESTER – III	Hours/week : 4
11UST330207	Credits : 4

DISCRETE PROBABILITY DISTRIBUTIONS

Objective:

To expose the various important discrete probability models and real life situations where these distributions provide appropriate models.

UNIT – I   Bernoulli and Binomial Distributions

Bernoulli Distribution-Introduction to Binomial Distribution-Moments-recurrence relation for the moments-mean deviation about mean, mode-MGF-Additive property-cumulants-recurrence relation for cumulants-Fitting of Binomial Distribution.

UNIT –II   Poisson Distribution

Introduction to Poisson Distribution – moments - mode - Recurrence relation for the moments-MGF-Characteristic function – Cumulants - Additive property- Fitting of Poisson Distribution.

UNIT – III   Negative Binomial Distribution

Introduction to Negative Binomial Distribution - MGF of Negative Binomial Distribution - Cumulants - Poisson as limiting case.

UNIT – IV   Geometric and Hypergeometric Distributions

Geometric Distribution - Lack of memory concept - moments of Geometric Distribution - Hypergeometric Distribution - Mean and Variance of Hypergeometric Distribution. Approximation to Binomial Distribution.

UNIT – V   Multinomial and Power Series Distributions

Multinomial Distribution - moments of Multinomial Distribution - Introduction to Power Series distribution(Concept only).

TEXT BOOK:

1. Gupta, S.C. and Kapoor, V.K.: "Fundamentals of Mathematical Statistics", Sultan & Chand & Sons, New Delhi, 11th Ed., 2002.

REFERENCE BOOKS:

1. Johnson, N.L. and Kotz, S: "Discrete Distributions", John Wiley and Sons, 1969.
2. Johnson, N.L. and Kotz, S.: "Continuous univariate Distributions", Vol.I & Vol. II, John Wiley and Sons, 1970.

SEMESTER – III   **Hours/week : 5**
11UST330208   **Credits : 4**

CONTINUOUS PROBABILITY DISTRIBUTIONS

Objective:

To expose the various important continuous probability models and real life situations where these distributions provide appropriate models.

UNIT – I   Normal Distribution

Introduction to Normal Distribution-Limiting form of Binomial Distribution-Chief characteristics and its curve-Mean, median, Mode - M.G.F, moments and Cumulants -Points of Inflexion- Area property-Importance of Normal Distributions -fitting of normal distribution.

UNIT – II   Rectangular, beta and Gamma Distributions

Introduction to Rectangular Distribution: -M.G.F-moments, mean deviation about mean-Beta and Gamma Distributions :M.G.F, mean, harmonic mean, moments, and relationship between Beta and Gamma Distributions.

UNIT – III   Exponential and Cauchy Distributions

Exponential Distribution- MGF of Exponential Distribution - Cauchy's distribution: characteristic function, additive property and Moments – Lognormal distribution.

UNIT – IV   Bivariate Normal Distribution

Bivariate Normal distribution: MGF-Marginal and conditional distribution of bivariate normal distribution and distribution of Order Statistics.

UNIT – V

Sampling distributions: t, χ^2 and F distributions:-Derivations of the distributions, Constants and M.G.F -Inter relationship between these distribution.

TEXT BOOK:

Gupta, S.C. and Kapoor, V.K. : "Fundamentals of Mathematical Statistics", Sultan & Chand & SONS,New Delhi, 11th Ed, 2002.

REFERNECE BOOKS:

1.   Johnson, N.L. and Kotz, S: "Discrete Distributions", John Wiley and Sons, 1969.
2.   Johnson, N.L. and Kotz,S.: "Continuous univariate Distributions", Vol.I & Vol.II, John Wiley and Sons, 1970.

SEMESTER – III   **Hours/Week : 6**
11UST330403A   **Credits   : 5**

ALLIED   MATHEMATICS I

[For II B.Sc Statistics]

UNIT – I

Partial Fractions, Solving cubic equations with rational coefficients by trial and error method.

UNIT – II

Binomial theorem for positive integral index and rational index – Exponential Series and Logarithmic Series – only approximations in all the three series.

UNIT – III

Matrices – different types of matrices – Minors, Cofactors of elements of a square matrix – computation of adjoint and Inverse of a square matrix – solution of linear equations using matrix inversion.

UNIT – IV

Differentiation – Successive differentiation upto 2nd order only -Partial differentiation upto 2nd order – Application (and **not** verification) of Euler's theorem.

UNIT – V

Integration of the following types only:

Type I $\rightarrow$ direct application of formulae

Type II $\rightarrow$ Integration using Substitution

Type III $\rightarrow \int \dfrac{(lx + m)}{(ax^2 + bx + c)} dx$ 　　　　Type IV $\rightarrow \int \dfrac{(lx + m)}{\sqrt{(ax^2 + bx + c)}} dx$

Type V $\rightarrow \int \dfrac{(p \sin x + q \cos x)}{(a \sin x + b \cos x)} dx$ 　　Type VI $\rightarrow \int \dfrac{dx}{(a \sin x + b \cos x + c)}$

Note: i) The syllabus **does not include** the proof of any theorem .

ii) The students are to be trained in **simple** illustrative examples only

Text Book:

Ancillary Mathematics by Narayanan and Manickavachagam pillai—Relevant volumes.

REFERENCE:

Allied Mathematics by P. Kandasamy & K. Thilagavathy - Relevant Volumes.

SEMESTER – III   **Hours/Week : 6**
11UST330403B   **Credits   : 5**

ALLIED : ACCOUNTS - I

OBJECTIVES

* To enable the students to have a thorough knowledge of the fundamental concept basic principles of accountancy.
* To provide knowledge on the importance of maintaining various book of accounts.

UNIT – I   (18 Hours)

Accounting principle concepts- subsidiary books – ledger

UNIT – II   (18 Hours)

Trail balance – bank reconciliation statement- rectification of errors

UNIT – III   (18 Hours)

Trading, Profit and Loss Accounts – Balance Sheet of a sole trader (Simple Adjustments)

UNIT – IV   (18 Hours)

Non-trading organization – Preparation of income and expenditure account form receipts and payment accounts (simple adjustments)

UNIT – V   (18 Hours)

Single entry or Accounts from incomplete records.

TEXT BOOK

Shukla MC, Grewal TS and Gupta SC, (2006), Advanced Accounts Volume I, S.Chand and Company Ltd, New Delhi.

REFERENCES

1. Reddy TS and Murthy A, (2006), Financial Accounting, Margham Publications, Chennai.
2. Gupta RL and Gupta VK, (2006), Financial Accounting, Sultan Chand and Sons, New Delhi.
3. Gupta RL and Radhaswamy, (2006), Advanced Accountancy, Volume I, Sultan Chand and Sons, New Delhi.
4. Jain SP, Narang KL,(2004), Advanced Accountancy Volume I, Kalyani Publishers.
5. Maheshwari SN and Maheshwari SK, (2005), Introduction to Accountancy, Vikas Publishing House PVT. Ltd. New Delhi.

பருவம் - 4   மணி நேரம் - 4
11UGT410004   புள்ளிகள் - 3

பொதுத் தமிழ் - 4

நோக்கங்கள்

1. நாடகத்தின் நோக்கம், அதன் போக்கு, உத்திகள், பாத்திரப் பாங்கு, உரையாடல் முறை, கற்பனைத்திறம் போன்றவற்றை வெளிப்படுத்துதல்.
2. புதிய நாடகங்களைப் படைக்கும் திறனை மாணவர்களிடையே உருவாக்குதல்.

பயன்கள்

1. நாடகவழி அழகியல் உணர்வுகளை வளர்த்துக் கொள்வர்.
2. நாடகங்களைச் சமூகப் பயன்பாட்டிற்கு ஏற்ப உருவாக்கும் திறன் பெறுவர்.

அலகு : 1   *(12 மணி நேரம்)*

மனோன்மணீயம், பாயிரம், அங்கம் - 1, களம் 1 - 5 வரை.

அலகு : 2   *(12 மணி நேரம்)*

மனோன்மணீயம், அங்கம் - 2, களம் 1 - 3 வரை.

உரைநடை நாடகம் - ஈரோடு தமிழன்பன் - ஈர நெருப்பு
(முதல் மூன்று நாடகங்கள்)

அலகு : 3   *(12 மணி நேரம்)*

மனோன்மணீயம், அங்கம் - 3, களம் 1 - 4 வரை.

அலகு : 4   *(12 மணி நேரம்)*

மனோன்மணீயம், அங்கம் - 4, களம் 1 - 5 வரை.

அலகு : 5   *(12 மணி நேரம்)*

மனோன்மணீயம், அங்கம் - 5, களம் 1 - 3 வரை.

உரைநடை நாடகம் - ஈரோடு தமிழன்பன் - ஈர நெருப்பு,
(4, 5, 6 ஆம் நாடகங்கள்)

பாடநூல்கள்

1. சுந்தரனார், பெ. மனோன்மணீயம், தமிழாய்வுத்துறை (பதிப்பு), தூய வளனார் கல்லூரி, திருச்சிராப்பள்ளி-2. *(அங்கம் - 3 இல் களம் - 4 நீங்கலாக)*

2. உரைநடை நாடகம் - ஈரோடு தமிழன்பன் - ஈர நெருப்பு, அய்யா நிலையம், நாஞ்சிக் கோட்டை சாலை, தஞ்சாவூர் - 613 006.

மதிப்பெண் பகிர்வு

பிரிவு	பாகம் -1	பாகம் -2	பாகம்-3
மனோன்மணீயம்	20 (20 வினாக்கள்)	20 (5 வினாக்கள்)	60 (4 வினாக்கள்)
உரைநடை நாடகம்	-----------	-----------	15 (1 வினா)

Sem: IV   **Hours :5**
Code: 11UGE420104   **Credits: 3**

GENERAL ENGLISH -IV

Objectives:

1. *To enable the students to complete the pre-reading task to comprehend the local and global issues in the lessons..*
2. *To enable the students to complete the post-reading task centering on Skill Development and Grammar..*
3. *To empower the students with globally employable soft skills.*

UNIT-I   **12 Hrs**
Life Stories   F.G.Herod
                        Mother Teresa
                        R.K.Narayan
                        Swami and Friends
Extensive Reading   Treasure Island (1-4)
Essential English Grammar   91—95.
Film Review (The Hindu).

UNIT –II   **12 Hrs**
                        Imogen Grosberg
                        See Off the Shine
                        George Orwell
                        The Porting Spirit
Extensive Reading   Treasure Island (5-8)
Essential English Grammar   96-100.
Article Writing on Current Issues.

UNIT-III   **11 Hrs**
                        Philip Agre
                        Building an Internet Culture
                        Satyajit Ray
                        Odds Against Us
Extensive Reading   Treasure Island (9-12)
Essential English Grammar   101-105.
Mock Interviews

UNIT-IV   **20Hrs**
                        Jerzy Kosinski
                        TV as Babysitter.
                        E.F.Scumacher
                        Technology With Human Face.
Extensive Reading   Treasure Island (13-17)
Essential English Grammar   106-110.
Mock Group Dynamics

UNIT-V   **15 Hrs**
                        Aluizio Borem, Fabrico
                        R.Santos & David E.Bower
                        Advent of Biology
                        Mark Ratner & Daniel Ratner
                        Nanotechnology
Extensive Reading   Treasure Island (18-22)
Essential English Grammar   111-114.
Presentation Skills

Text Books
1. Elango K. *Insights.* Hyderabad: Orient Blackswan Pvt Ltd,2009.
2. Murphy, Raymond. *Essential English Grammar*. New Delhi. Cambridge University Press India Ltd,2009.
3. Defoe, Daniel. *Robinson Crusoe*. Chennai: MacMillan India Ltd,2009.
4. Stevenson R L. *Treasure Island*. Chennai: MacMillan India Ltd,2009.
5. Ram N Ed. *The Hindu*. Tiruchirappalli.

SEMESTER – IV   **Hours/week : 9**
11UST430209   **Credits   : 4**

ELEMENTS OF STATISTICAL INFERENCE

Objective:

    To enable the students to clearly understand the concepts of statistical estimation and statistical hypothesis testing.

    Good knowledge in Probability is the pre-requisite for this paper. Inferential Statistics helps us to infer about a whole group(population) by just studying a part of it (sample). When a population is to be studied, two distinct situations usually arise: I) To know the unknown population characteristics(parameters), (ii) There may be some assumptions (hypotheses) about the population which should be tested for their validity. The Estimation theory is needed to tackle the first type of situations and Testing of Hypothesis is instrumental in dealing with the second type of situations. It is not an exaggeration to state that these are the two eyes of Statistical Inference. At the end of the course, the student will definitely be in a position to solve many social, economical, biological and other practical real-life problems.

UNIT – I   Point Estimation Theory

    Parametric Estimation: Estimator-Consistency and unbiasedness of an estimator-Cramer-Rao Inequality. Efficiency-Asypmtotic efficiency of an estimator- Estimators based on sufficient statistics- Neyman's Factorization Theorem(without proof)- Rao-Blackwell Theorem. Method of Moments, Method of Maximum Liklihood and Method of minimum chi-square-Properties of estimators obtained by these methods (without proof).

UNIT – II   Testing of Hypothesis

    Simple and composite hypothesis - two kinds of errors, level of significance, size and power a test-desirable properties of a good test, most powerful test, Neyman-pearson lemma and its use – Simple example, Uniformly most powerful tests and unbiased tests based on normal Likelihood ratio test (without proof) and its properties. Applicaton of LR test for single mean.

UNIT – III   Tests of Significance

    Tests of significance-Asymptotic and exact tests based on normal,t, chi-square and F distributions with regard to mean, variance, standard deviation, coefficient of correlation, regression coefficients, partial and multiple correlation coefficients. contingency tables-tests for goodness of fit and test for independence of attributes. Tests for homogenity of variances, proportions and correlation coefficients.

UNIT – IV   Interval Estimation
Confidence Intervel:

    Interval estimation for proportions, mean(s), Variance(s) based on Chi-square, student's t, F and Normal distributions.

UNIT – V

    Non-parametric tests – Kolmogorov -Smirnov test, Sign test, Wald-Wolfowitz run test, run test for randomness, median test, Wilcoxon test and Wilcoxon – Mann-Whitney test.

TEXT BOOK:

1.   Gupta, S.C. and Kapoor, V.K.: "Fundamentals of Mathematical Statistics", Sultan & Chand & Sons,New Delhi, 11th Ed, 2002.

REFERENCE BOOKS:

1.   Kendall, M. and Stuart, A.: "The advanced theory of Statistics" Vol.II, Charles Griffin, 1961.
2.   Rohatgi, V.K. : "Statistical Inference", John Wiley and sons, 1984.
3.   Hogg,R.V, Craig.A.T., and Tannis : "Introduction to mathematical statistics", Prentice Hall, England, 1995.
4.   Dudewicz. E.J and Mishra.S.N. : "Modern Mathematical statistics", John Wiley and sons, 1988.

SEMESTER – IV   **Hours/Week : 6**
11UST430404A   **Credits   : 5**

ALLIED   MATHEMATICS II
[For II B.Sc Statistics]

UNIT - I

Integration of the following types only:

Type I   Definite Integrals - direct application of formulae for

$$\int_0^a f(x)dx; \quad \int_{-a}^a f(x)dx \text{ when } f(x) \text{ is even or odd } \& \int_0^{2a} f(x)dx$$

Type II $\rightarrow$ Integration by parts

Type III $\rightarrow$ Bernoulli's formula

Type IV $\rightarrow$ Double Integral with constant limits only

Type V $\rightarrow$ Triple Integral with constant limits only

UNIT – II

Differential Equations of the First Order – Variables Separable – Homogeneous equations – Linear Equations.

UNIT – III

Differential Equations of the II order with constant co-efficients with particular Integral for e^{kx}, sin kx, cos kx and x^n– Homogeneous Differential Equations of II order with variable co-efficients.

UNIT – IV

Complex numbers – finding the modulus and the amplitude of a complex number-Simple applications of De Moivre's theorem. Fourier series in the interval $[-\pi, \pi]$ and $[0, 2\pi]$ only.

UNIT – V

Solving differential equations using Taylor series method – Picards method – Euler's method – Modified Euler's method – Runge-kutta method of second order

Note: i) The syllabus **does not include** the proof of any theorem .

ii) The students are to be trained in **simple** illustrative examples only

Text Book:

Ancillary Mathematics by Narayanan and Manickavachagam pillai— Relevant volumes.

REFERENCE:

Allied Mathematics by P. Kandasamy and K. Thilagavathy.

Semester – IV   **Hours/Week : 6**
11UST430404B   **Credits   : 5**

ALLIED : ACCOUNTS - II

OBJECTIVE
*   * To impart basic knowledge of partnership and company accounts
*   * To help students to know the treatment of account in different situations.

UNIT – 1   (20 Hours)
Partnership accounts I – admission – meaning of goodwill valuation of goodwill – treatment of goodwill – revaluation of assets and liabilities – new profit sharing ratio - capital accounts – balance sheet of after admission.

UNIT – 2   (20 Hours)
Retirement and death of partners – revaluation of assets and liabilities – treatment of goodwill – closing of retiring partner's capital a/c – joint life policy – balance sheet after retirement and death.

UNIT – 3   (20 Hours)
Partnership accounts II – Dissolution – realization account – dissolution of firm – insolvency of partners Garner Vs Murray – Piece meal distribution.

UNIT – 4   (15 Hours)
Company accounts – Principles of company accounts – application – allotment – forfeiture – reissue of share.

UNIT – 5   (15 Hours)
Company Final Account (Simple Adjustments)

TEXT BOOK
Reddy TS and murthy A, (2006), Financial Accounting, Margham Publications, Chennai.

REFERENCES
1. Shukla MC, Grewal TS, (2006), Advanced Accounts Volume I & II, S.Chand and company Ltd, New Delhi.
2. Gupta RL, Gupta V.K, (2006), Finanacial Accounting, Sultan Chand and Sons, New Delhi.
3. Gupta RL, and Radhaswamy M, (2006), Advanced Accountancy, Volume I and II, Sultan Chand and sons New Delhi.
4. Maheshwari SN, Maheshwari SK, (2005), Introduction to Accouncy, Vikas Publishing House Pvt.Ltd, New Delhi.

SEMESTER – IV   **Hours/week : 4**
11UST430301A   **Credit   : 4**

ELECTIVE – I: NUMERICAL MATHEMATICS

Objectives
1.   To tackle the practical situations demands the use of interpolation and extrapolation.
2.   To solve Mathematical calculus problems, whenever the classical approach fails.
3.   To solve mathematical calculus problems through computers.

UNIT – I   Interpolation

Interpolation – Symbolic relations – Newton's Forward and Backward difference formulae, Newton's divided difference (general) formula – Lagrange's formula.

UNIT – II   Central Difference Formulae

Gauss forward and backward formulae-Stirling's formula-Bessel's formula-Everett's formula-Appropriateness of formulae.

UNIT – III   Inverse Interpolation

Inverse Interpolation: Method of successive approximation-Elimination of third order difference-Lagrange's formula applied inversely.

UNIT – IV   Solutions of Algebraic Equations

Bisection method, Regula falsi method and Newton-Rapson method.

UNIT – V   Numerical differentiation and Integration

Numerical differentiation: Numerical differentiation up to second order-maxima and minima of a tabulated function.

Numerical integration: Trapezoidal rule - Simpson's one third and three eighth rules - Weddle's rule.

TEXT BOOKS:
1.   Sastry.S.S. :Introductory Methods of Numerical Analysis, PHI 2000.
2.   Atkinson. K, Elementary Numerical Analysis, John Wiley & Sons, 1993.

REFERENCE BOOK:
1.   Gerald,C.F. and Wheatley,P.O.: Applied Numerical Analysis (4th Ed.), Addison-Wesley.

Note: The question paper may consists of Theory and Problem in the ratio 40:60.

SEMESTER – IV   Hours/week : 4
11UST430301B   Credits   : 4

ELECTIVE – I : REAL ANALYSIS

Objectives:

To introduce the basic concepts in Real Analyses, which will help the students to easily understand probability concepts & inference concepts at a later stage in the course.

UNIT – I   Fundamental concepts

Definition of a sequence-limit of a sequence-convergence and divergence of sequence - Bounded sequence-monotone sequence - Operations on convergent and divergent sequences. Limit superior and Limit inferior-Cauchy's general principle of convergence (statement only).

UNIT – II   Series

Series - sequence of partial sums - Convergence of series. A necessary condition for convergence of a series with non – negative terms – Tests for the convergence of series: Direct comparison test, Comparison test by limits, p test, D'Alembert's ratio test and Cauchy's root test. Alternating series: Leibinitz test for the convergence of an alternating series – conditional convergence and absolute convergence – Simple problems.

UNIT – III   Differential Calculus

Concepts of Derivatives – Algebra of derivatives – Rolle's theorem – Mean value theorem - Cauchy's formula – Taylor's series and Maclaurin's series of functions of one variable. Simple problems (ex, log(1+x), cosx, sinx).

UNIT – IV   Integral Calculus

Definition of Riemann Integral – Necessary and Sufficient condition for Riemann integral. Darboux theorem – Fundamental theorems of Integral calculus – First mean value theorem.

UNIT – V   Improper Integrals

Improper Integrals: First kind, Second kind – Beta and Gamma integrals and their properties – Simple problems.

TEXT BOOKS:

1.   Goldberg, R.R.: Methods of Real Anaylsis, Oxford &IBH, 1964.
2.   Ranjit Singh and Arora: First course in Real Analysis, Sultan Chand, 1974.
3.   Narayanan and Manickavasagam pillai, Ancillary Mathematics.

REFERENCE BOOKS:

1.   Tom Apostol: Mathematical Analysis, 2nd Ed, Narosa publishing House, 1994.
2.   Malik, S.C.: Mathematical Analysis (wiley Eastern), 1984.

SEMESTER – V   **Hours/week : 6**
11UST 530210   **Credits   : 4**

SAMPLING THEORY

Objective:

To impart the basic knowledge of statistical sampling concepts. At the end of the Course, the student should be able to select the suitable sampling techniques. Also, he should be in a position to conduct sample survey independently.

UNIT – I   Sample Survey

Complete enumeration Vs Sampling – need and limitations of sampling design -Organization and Execution of Sample Surveys-Essential aspects of Sample Survey-Pilot Survey-Sources of Error in a survey. Sampling and Non-sampling errors.

UNIT – II   Simple Random Sampling

Simple random sampling (WR and WOR) - Use of Random number Table-Unbiased estimates of Mean and Variance-Estimation of Sample Size-Sampling for attributes.

UNIT – III   Stratified Random Sampling

Stratified Random Sampling : Properties of the estimates - Unbiased estimates of Mean and Variance-Optimum and Proportional allocations-Comparison of different allocation.

UNIT – IV   Systematic Sampling

Need for Systematic Sampling-Estimation of Mean and Variance of the Estimated mean-Comparison of Simple and Stratified random sampling with Systematic sampling-systematic sampling when the population with linear Trend.

UNIT – V   Ratio & Regression Estimators

Ratio estimators: Ratio estimates, Variance of the Ratio Estimates-Ratio Estimator as BLUE- Bias of the ratio estimate. Regression estimators:

Linear Regression estimates- Simple Estimate of Variance-Bias of the linear regression estimate-linear regression estimator under a linear regression model.

TEXT BOOKS:

1.   Gupta, S.C. and Kapoor, V.K.: Fundamentals of Applied Statistics, Sultan Chand & Co., 11th ed., 2002 (Units I-IV).
2.   William G. Cochran. : Sampling Techniques, John Wiley Sons, 1999.
3.   Sukhatame, P.V. and Sukhatame,B.V. : Sampling Theory of Surveys with Applications, ISAS publishers, 3rd Ed, 1957.
4.   Sampath, S : Sampling Theory and Methods, Narosa Publishing House, 2001

REFERENCE BOOKS:

Daroga Singh and Choudary, F.S. : Theory and Analysis of Sample Survey Designs, New age international publishers, 1986.

SEMESTER – V   **Hours/week : 6**
11UST530211   **Credits   : 4**

APPLIED STATISTICS
(Economic Statistics, Demography and Psychometry)

Objective:

To provide fundamental ideas about application of statistical concepts in the real world.

Statistics finds innumerable applications in almost all walks of life. One cannot exhaust all such applications in a course. Due to this reason, this paper is devoted to discuss the application of Statistics in three vital areas, namely Economics, Poluation studies, Psychology and Education.

Economic Statistics

UNIT – I   Time Series

Concepts of time series – Components of time series – Additive and multiplicative models for the analysis of time series measurement of trend by (i) Graphic method, (ii) Semi Average method, (iii) Method of Curve Fitting by principle of least squares. Moving Averages Measurement of Seasonal Variations by (i) Method of simple average, (ii) Ratio-to-trend method, (iii) Ratio-to-Moving Average Method, (iv) Link Relatives method. Measurement of cyclic variations by residual approach. Random Component of a time series – variate difference method.

UNIT – II   Index Numbers

Index numbers and their definitions, construction and uses – Commonly used index numbers – Laspeyre's Paasche's and Fisher's ideal numbers – Criteria of a good index numbers. Test for index numbers like time-reversal test, factor – reversal test, Circular test. Fixed and Chain base index numbers – Cost of living index number – Base shifting, splicing and Deflating of index numbers.

UNIT – III   Demography

Official sources of vital statistics – Morality rates: crude, specific and standardized death rates – Graduations of mortality rates by Compertz's law and Makehalm's law.

UNIT – IV   Life Table

Complete life table and its essential characteristics. Fertility and reproduction rates: Crude birth rates – General and specific fertility rates – Gross and net reproduction rates – Population projection – Use of logistic curve in the study of population growth.

UNIT – V   Psychometry

Methods of Standardisation of scales and tests. Z-scores, Standard scores, T scores, Percentile scores, Intelligent quotient and its measurement and uses – Validity of test scores and its determinations.

TEXT BOOK:

Gupta,S.C. and Kapoor, V.K.: Fundamentals of Applied Statistics (ForUNITs I, II, III and IV), Sultan Chand & Co, 11th Ed, 2002.

BOOK FOR REFERENCE:

Garret, H.E.: Educations psychological Statistics. (For UNIT – V).

SEMESTER – V   **Hours/Week : 6**
11UST530212   **Credits   : 4**

LINEAR MODELS AND ECONOMETRICS

Objective:

The knowledge of Probability Theory, Quadratic forms and vector spaces in Mathematics is the pre-requisite for this paper. The purpose of this paper is to explain how to deal with multivariate (linearly related) situations. As an applications, Econometrics is introduced as a component.

UNIT – I   Multivariate Normal Distribution

Introduction to multivariate normal distribution – Marginal distribution – Moments of the Multivariate distribution – Linear functions of Normal variables – Independence in Multivariate normal distribution. Condition for independence.

UNIT – II   Linear Model

Linear function – Measurement error – Equation error – Linear Model – 5 types of linear model, namely, functionally related Models, Mean related Models, Experimental design Models, Variance – Components Models and Regression Models - Models for Disaster Management.

UNIT – III   General Linear Model

General linear hypothesis model of full rank – Point estimation under normal and non-normal cases – Gauss Markow theorem – Interval estimation – Testing of hypothesis of $y = x\beta$ (main hypothesis only)

UNIT – IV   Econometrics

Definition – Scope – Objective – Limitations – Divisions of Econometrics. National Income – Method of Estimation of National Income in India – Difficulties in estimation.

UNIT – V   Problems of Single Equation Model

Autocorrelation – Multi-collinearity – Heteroscdasticity – Specification problems and bias – Errors in variables.

BOOKS FOR STUDY:

1.   Graybill, F.A.: An Introduction to linear Statistical Models – Vol. I (Chapters 3, 5 & 6, McGraw Hill, 1961.
2.   Singh, S.P., Parashar, K. and Singh, H.P.: Econometrics, (UNITs IV & V) Sultan Chand & Co, 1980.

BOOKS FOR REFERENCES :

1.   Rao, C.R.: Linear Statistical Inference and its applications, John Wiley & Sons, 1972.2
2.   Johnson, J (1984): Econometrics Methods, McGraw Hill Book Co, 1984.

SEMESTER – V   **Hours/week : 6**
11UST530213   **Credits   : 4**

OPERATIONS RESEARCH – I

Objective :

    To import basic knowledge of various optimization techniques.

    Resources are scarce in many a situation. Any decision making process may have to take into account, a set of constraints. The optimization in such situation is of vital importance. This paper involves few important optimization techniques that are free from Statistical concepts.

UNIT – I   Nature of OR and LPP

    Different types of models in OR, their construction and general methods of solution. Linear Programming: Introduction-Formulation of LPP-Simplex method-Degeneracy and unbounded solution-Two phase method-The Big M method (Algorithms and Simple Problems only).

UNIT – II   Advanced Topics in LPP

    Duality theory and its applications-Framing dual program- relationship between dul and primal problem-Dual simplex method(simple problems only).

UNIT – III   Transportation Problem

    Transportation problem-Linear programming formulation-Finding an Initial basic feasible solution by Northwest corner rule and Vogel's rule-Optimality-Degeneracy.

UNIT – IV   Assignment Problem

    Assignment problem-Solving an assignment problem by Koney method(Hungarian)-Travelling Salesman Problem.

UNIT – V   Sequencing and Replacement Problems

    Sequencing Problem-Processing n jobs through two machines-Processing n jobs through three machies-Processing n jobs through m-machines.

    Replacement Problems : Replacement of items whose maintenance costs increases with time and the value of the money remains the same during the period.

TEXT BOOK

Kanti Swarup, Gupta, P.K. and Man Mohan: "Operations Research", Sultan Chand & sons,New Delhi, 13th ed, 2007.

REFERENCE BOOKS:

1.   Philips, D.T., Ravindran, A and Solberg,J.J.: "Operations Research-Principle and Practice"

2.   Taha, H.A : "Operations Research – An Introduction", PHI, 1998.

SEMESTER – V   **Hours/week : 4**
11UST530302A   **Credits : 4**

ELECTIVE – II : ACTUARIAL STATISTICS

Objective:

    To study the vital application of statistics in the field of actuarial science

UNIT – I

    Accumulated value and present value of a sum under fixed and varying values of interest. Nominal and effective values of interest – Annuity – Classifications of annuties – Present accumulated values of annuties – Immediate annuity due and deferred annuity.

UNIT – II

    Redemption of loans – Redemption of loans by installments payable times in a year interest being p.a. effective. Role of probability distribution in general insurance (Weibull, Exponential).

UNIT – III

    Vital Statistics – meaning and uses of vital statistics – Measures of mortality – C.D.R., S.D.R., A.S.D.R. – Central mortality rate – Force of mortality – measures of fertility – C.B.R., G.F.R., A.S.F.R., T.F.R., G.R.R. and N.R.R.

UNIT – IV

    Mortality Table – Columns of mortality table – Completing an incomplete mortality table uses of mortality table – Expectation of life – Computing probabilities of survival and death using mortality tables – select mortality table – Ultimate mortality table – Aggregate mortality table.

UNIT – V

    Principle of insurance – Assurance benefits – Types of assurance – Endowment assurance, pure endowment assurance, whole life insurance and temporary assurance – Premiums – Natural premium – Level premium – Net premium – Office premium – Bonus loading with profit and without profit – Policy value – Retrospective policy value and prospective policy value.

TEXT BOOKS:

1.   Mathematical basis of Life Assurance (IC-81): Published by Insurance Institute of India, bombay.
2.   Gupta, S.C. and Kapoor, V.K.: Fundamentals of Applied Statistics (for UNIT - III only), Suntan Chand & Co. 3rd Ed.

SEMESTER – V   **Hours/week : 4**
11UST530302B   **Credits   : 4**

ELECTIVE – II : ELEMENTS OF STOCHASTIC PROCESSES

Objective:

Any characteristic that changes with respect to some parameter, say time, constitutes a process. When those changes are unpredictable (i.e., random or stochastic), the tools and techniques available in Stochastic process comes to our help to deal with such circumstances. This field is gaining momentum by being applied in many advanced scientific fields.

Wide spectrum of its applications are dealt with in the higher level courses. However the basic ideas will motivate the students to learn more about this fascinating area. This paper serves this purpose.

UNIT – I   Types of Stochastic Processes

Elements of Stochastic Processes: Review of basic terminology: Classification of stochastic processes according to state space and index set – Elementary ideas on Poisson processes, Wineer processes, Martingales, Markov Processes and Stationary processes.

UNIT – II   Markov Chain

Markov Chain: Definition – transition probability matrix – Examples of Markov chains (A spatially Homogeneous Markov chains – one dimensional random walk – Etherfest model – A discrete Queuing Markov chain – Inventory model – success run – Branching processes).

UNIT – III

Classification of states of Markov chain. Recurrent Markov chain with examples – Periodicity Ergodic state – concepts, results and problems concerning limiting probabilities (i.e), $p_{ij}(n)$ as n   (proof are excluded) Simple problems.

UNIT – IV   Continuous time Markov Chain

Classical examples of continuous time Markov chains – Poisson processes, General pure birth processes and Yule's process. Birth and death processes and their differential equations with solutions. Examples: Linear growth with immigration process and M/M/1 queuing model.

UNIT – V   Renewal Theory

Renewal process: Introduction – Definitions and examples – Renewal function and renewal density – renewal equation – The Poisson process as a renewal process – Elementary renewal theorem and applications, statement and uses of key renewal theorem.

TEXT BOOK: Treatment strictly as in

1.   Samuel Karlin and Taylor: A First course in Stochastic Processes, Academic Press, New York, 1975. chapters 1,2&3– Its entirety chapter 4–(exclude sections 3,7 and in (I) counter models, Birth and Death processes with absorbing states and Finite state continuous time Markov chain). Chapter 5 – Sections 1,2,3 (excluding counter models),4,5&6.

REFERENCE BOOKS:
1.   Medhi,J: Stochastic Processes, Wiley Eastern, 2nd., 1994.
2.   Adke,S.R. and Manjunath, S.M.: An Introduction to finite Markov processes, WileyEastern. 1984.

SEMESTER – V   Hours/week : 4
11UST530302C   Credits   : 4

ELECTIVE II : R-LANGUAGE – THEORY & PRACTICAL

Objectives:

Students of Statistics must learn to anlyse the statisticsl data for survey and experimental data.This practical paper gives them on hand experience of analysis and intrepetation of statistical data.

1. Matrix Operations: Addition, Subtraction, Multiplication, Determinant and Inverse
2. Formation of discrete and continuous frequency distributions-descriptive statistics.
3. Fitting of distributions and curves.
4. Graphs and diagrams: Pie, bar, line and scatter diagrams
5. Correlation coefficient rank correlation, partial and multiple correlations.
6. Regression : Simple and multiple linear regression.
7. Compare means: Independent sample test and paired t-test.
8. Cross tabulation and χ^2 – test.
9. One way and two way ANOVA,CRD,RBD and LSD.
10. Non-parametric test: Binomial tests, run test, sign test, Median test, Mann-Whitney test,   Kruskal-Wallis, Kendall's and Fried man tests.

TEXT BOOK:

Brian Everitt and Torsten Hothorn. "*A Handbook of Statistical Analyses Using R*". Chapman & Hall/CRC, Boca Raton, FL, 2006. ISBN 1-584-88539-4.

REFERENCE BOOKS:

1. William N. Venables and Brian D. Ripley. "*Modern Applied Statistics with S*". *Fourth Edition,* Springer, New York, 2002. ISBN 0-387-95457-0
2. John Maindonald and John Braun. "*Data Analysis and Graphics Using R*". Cambridge University Press, Cambridge, 2003. ISBN 0-521-81336-0.
3. Julian J. Faraway. "*Linear Models with R*". Chapman & Hall/CRC, Boca Raton, FL, 2004. ISBN 1-584-88425-8.
4. John Fox. "*An R and S-Plus Companion to Applied Regression*". Sage Publications, Thousand Oaks, CA, USA, 2002. ISBN 0-761-92279-2.
5. Michael J. Crawley. *Statistics: "An Introduction using R".* Wiley, 2005. ISBN 0-470-02297-3.
6. Robert H. Shumway and David S. Stoffer. "*Time Series Analysis and Its Applications With R Examples*". Springer, New York, 2006. ISBN 978-0-387-29317-2.

SEMESTER – V	**Hours/week : 2**
11UST540601	**Credit : 2**

SKILL BASED ELECTIVE – I: DATA ANALYSIS FOR COMPETITIVE EXAMINATIONS

Objective:

To impart quantitative aptitude to take part in the competitive examination.

UNIT – I

Algebraic simplification – Bodmas rule – Ratio and Proportions, Percentages

UNIT – II

Averages – combined averages – Simple interest & Compound interest.

UNIT – III

Profit and loss – time and work

UNIT – IV

Graph Reading – Number Series.

UNIT – V

Tabulating the data and data sufficiency.

TEXT BOOK:

R.S. Aggarwal, "Quantitative Aptitude". S.Chand & Co., New Delhi, 2005.

SEMESTER – VI	**Hours/week : 6**
11UST630214	**Credit : 4**

DESIGN OF EXPERIMENTS

Objective :

* To expose the essential ideas about designing and executing and interpretting statistical field experiments.

* Statistical experiments shall be designed and studied to identify the best agricultural inputs, like the best fertilizers etc. In a country like ours, which is basically an agricultural one, one ought to know how to select the best agricultural inputs and reap the maximum yeild. Through this paper, the student is enabled to acquire the knowledge about this vital area and help the society (agriculturists) with his knowledge.

UNIT – I   Fundamental priniciple of Experiments

Fundamental principles of experimentation – Randomization, Replication and Local control techniques. Uniformity trials – Transformation of data and its uses..

UNIT – II   The Analysis of variance and Analysis of Covariance

ANOVA – One way and two way classification – Illustration. Concepts of 3 way classification Analysis of Covariance for a one way layout with one concomitant variable – Analysis of Covariance for an RBD with one concomitant variable.

UNIT – III   Basic designs

Completely randomized experiments(CRD)-Randomized block designs(RBD)-Latin square designs(LSD)-Missing plot techniques- efficiency of the above designs.

UNIT – IV   Factorial Experiments

Factorial experiments designs: $2^2, 2^3$ and 3^2 factorial designs-confounding in 2^2, 2^3 and 3^2 experiments. Partial confounding in 2^3 experiments. Concept on asymetrical factorial design only.

UNIT – V   BIBD

Balanced incomplete block design(BIBD), Intra block analysis of BIBD – Parametric relationship of BIBD.

TEXT BOOKS:

1. Das, M.N. and Giri,N.C. : Design and analysis of Experiments, New age international Publication 2nd ed, 1986.

2. Doughlas,C. Montgomery: Design and analysis of Experiemnts, John Wiley & sons, 1976.

REFERENCE BOOKS:

1. Gupta, S.C. and Kapoor, V.K. : Fundamentals of Applied Statistics, Sultan Chand & Co, 3rd ed, 1984.

2. Oscar Kempthrone: Design and analysis of experiments, John wiley and Sons, 1952.

SEMESTER – VI   Hours/week : 6
11UST630215   Credits   : 4

ENGINEERING STATISTICS

Objective :

To provide essential inputs about applicability of statistical concept, in the sphere of quality control and quality management. Industrialization is another vital sector that is needed for the balanced growth of any nation. When a stiff competitive environment prevails in the production sector, quality assurance and reliability of the products become the moot points. The ways and means to achieve these are taught through this paper.

UNIT – I   General Theory of Control Charts

Concepts of Statistical Quality Control: Meaning-causes of variation-process control-process capability-General theory for control charts-Analysis and evaluation of Control charts, Statistical toleranceing.

UNIT – II   Attribute and Variable Control Charts

Control Charts for variables-X, R, s charts, run charts, revision of controls.Control charts for attributes-p,np,C charts-CUSUM control charts.

UNIT – III   Acceptance Sampling

Types of Inspection,Sampling vs 100% Inspection, Concepts of operating characteristics (OC) curves, AOQ,AQL,LTPD.
Single Sampling Plan for attributes and variables, Published Sampling Plans MIL 105E & IS 2500 part1&2. Double Sampling plan.

UNIT – IV   Reliability

Concepts and measures, components and systems, coherent systems, reliability of systems, cuts and paths, modular decomposition, bounds on system reliability.
Accelerated life testing,reliability estimate based on failure times number of failures and stress-strength analysis, reliability demonstration plan.

UNIT – V   Quality systems and Quality Assurance

Concepts of Quality Management-Inspection, Quality Control and Quality Assurance.Systems approach for Quality-ISO9000 Standards-Implications and requirements. Quality Audits, Assessments and Surveillance. Concepts of Total Quality Management.

TEXT BOOKS::
1.   Montgometry D.C., : Statistical Quality Control , John Wiley and sons, 2nd Ed, 1991.
2.   Juran, J.M. : Quality Control Handbook, McGraw Hill, 1998.
3.   Barlow, R.E. and Proschan: Statistical Theory of Reliability and life testing, Holt, Rinehart and Winston, INC, 1975.

REFERENCE BOOKS:
1.   Mahajan : Statistical Quality Control, Dhanpat rai & sons, 1997.
2.   Mann, Schafer & Singpurwarla(1974): Methods for Statistical Analysis of Reliability & life data, John Wiley & sons, NewYork, 1974.
3.   Feigunbaum, A.V.: Total Quality Control, 3rd Ed, McGraw Hill, 1991.
4.   ISO 9000 standards: Issued by Bureau of India.

SEMESTER – VI   Hours/week : 7
11UST630216   Credits   : 4

OPERATIONS RESEARCH – II

Objective:

To impart knowledge of various optimization techniques that make use of statistical concepts abundantly. The Optimization techniques which do not involve Statistical concepts are included in OR-I . On the other hand, in this paper those optimization techniques involving the Statistical concepts, especially the probability principles are taught.

UNIT – I   Theory of Games

Game theory Optimal solution of Two-person Zero-sum Games-Mixed strategies-Graphical solutions of (2 x n) and (m x 2) Games-Solution of m x n games by LPP.

UNIT – II   PERT – CPM

Arrow (Network) Diagram representations-determination of critical path-Determination of the floates - Probability considerations in project scheduling.

UNIT – III   Inventory models

Advantages of keeping inventories – Deterministic models with and without shortages – finite and infinite rate of replinishment – equal and unequal production runs probabilistic models without setup costs.

UNIT – IV   Queueing Theory

Basic elements of the queueing model. Role of the Poisson and Exponential distribution: Arrival process-Departure processes - Detailed study of (M/M/1) / (?/FIFO) models.

UNIT – V   Simulation

Scope of simulation applications-Types of simulation-Role and generation of random numbers-The unifom distribution and its importance to simulation –Generation of random numbers by the multiplicative congruential method. Techniques for generating random deviates: Inverse transformation method(exponential weibull, Geometric distributions)-Rejection techniques(Beta and Gamma distributions). The convolution method (Poisson, Erlange and Binomial) concepts – no problem.

TEXT BOOKS:

1.   Hamdy,A. and Taha : Operations Research, 6the ed., PHI, 1998.UNIT 1 : chapter 11 UNIT 2 : Chapter 12   UNIT 3 : Chapter 13 exclude 13.34,13.3.5 & 13.4.3.UNIT 4 : Chapter 15 Article (excluding 15.1,15.2 & 15.3), 15.3.3, 15.3.6 & 15.37.Chapter 16 Article 16.2 & 16.3

2.   Philips,D.T., Ravindran,A and Solberg,J.J: Operations Research Principles and Practice. UNIT 5 : Chapter 9 Relevant article

REFERENCE BOOKS:

1.   Kanti Swarup, Gupta,P.K. and Man Mohan : Operations Research, Sultan Chand & Co, 3rd ed., 1984.

SEMESTER – VI	**Hours/week : 4**
11UST630303A	**Credits : 4**

ELECTIVE – III : STATISTICAL PACKAGES THEORY AND PRACTICAL – SPSS

Objective:

To train the students in using good statistical packages for solving a variety of statistical problems.

1. Formation of discrete and continous frequency distributions-descriptive statistics.

2. Graphs and diagrams: Pie, bar, line and scatter diagrams-Histogram and Normal probability plot

3. Correlation coefficient rank correlation, partial and multiple correlations.

4. Regression : Simple and multiple linear regression.

5. Curve estimation.

6. Compare means: Independent sample test and paired t- test.

7. Cross tabulation and χ^2 – test.

8. One way and two way ANOVA – Factorial designs.

9. Non parametric test: Binomial tests, run test, sign test, Median test, Mann-whitney test, Kruskal-Wallis, Kendall's and Fried man tests.

SEMESTER – VI	**Hours/week : 4**
11UST630303B	**Credits : 4**

ELECTIVE – III : STATISTICAL PACKAGES THEORY AND PRACTICAL – SAS

Objective:

To train the students in using good statistical packages for solving a variety of statistical problems.

1. Formation of discrete and continous frequency distributions-descriptive statistics.

2. Graphs and diagrams: Pie, bar, line and scatter diagrams-Histogram and Normal probability plot

3. Correlation coefficient rank correlation, partial and multiple correlations.

4. Regression : Simple and multiple linear regression.

5. Curve estimation.

6. Compare means: Independent sample test and paired t- test.

7. Cross tabulation and χ^2 – test.

8. One way and two way ANOVA – Factorial designs.

9. Non parametric test: Binomial tests, run test, sign test, Median test, Mann-whitney test, Kruskal-Wallis, Kendall's and Fried man tests.

SEMESTER – VI   Hours/week : 2
11UST640602   Credits   : 2

SKILL BASED ELECTIVE – II : STATISTICS FOR MANAGEMENT

Objective:

Statistical skills are imparted for taking beter managerial decisions

UNIT – I

Statistics meaning and its uses, Measures of central tendency mean, median, mode.

UNIT – II

Dispersion – study about, range, Standard Deviation and coefficient of variation, Skewness, and Kurtosis.

UNIT – III

Relationship between two variables: the scatter diagram; correlation, rank correlation and the regression lines– The coefficient of determination– Theory of attributes.

UNIT – IV

Probability – concepts of probability –Definititon and properties of Binomial – Poisson and Normal probability distributions (No derivations,Simple problems only).

UNIT – V

Time series analysis: The components of time series analysis – The additive and multiplicative models – Measurement of trend by the method of Least squares & moving averages; measurement of seasonal variation by simple average method & Link relative method. (Problems only).

TEXT BOOKS:

Boot and Cox: Statistical Analysis for Managerial Decisions (Relevant chapters).

SEMESTER – VI   Hours/Week : 5
11UST630304   Credit   : 3

GROUP PROJECT

Objective:

To enable the students to apply the statistical techniques for solving real-life problems.

A good project goes a long way in providing practical training to the students. They get an opportunity through the project to apply some of the vital theoretical concepts and techniques that had learnt in the previous Semesters.

On most of the occasions, socio-economic survey and market research surveys are periodically conducted by government agencies, NGO's and private organizations. So, it is proposed to offer good project topics to the students in these practical areas. The students will be thoroughly trained through the project not only in scientific selection of sample for data collection, but also in identifying and applying approximate statistical techniques in their projects.

The board evaluation strategy of the project will entitle the allocation of appropriate marks to the project report preparation and the remaining marks to the project viva-voce, as indicated below:

                                                          MARKS
1)   Project report evaluation   -   60 Marks
2)   Project Viva   -   40 Marks

SKILL BASED ELECTIVES

BOTANY
11UBO540601	Mushroom Culture
11UBO640602	Herbal Technology

BUSINESS ADMINISTRATION
11UBU540601	Personality Development
11UBU640602	Managerial Skills

CHEMISTRY
11UCH540601	Food and Nutrition
11UCH640602	Everyday Chemistry

COMMERCE
11UCO540601A	Accounting for Executives
11UCO540601B	Soft Skills for Managers
11UCO640602A	Total Quality Management
11UCO640602B	Fundamentals of Accounting Packages

COMMERCE (CA)
11UCC540601	Soft Skills
11UCC640602	Basics of Accounting

COMPUTER APPLICATIONS (Dept of IT)
11UBC540601A	Fundamentals of IT
11UBC540601B	Internet Concepts
11UBC640602A	Visual Programming
11UBC640602B	Flash

COMPUTER SCIENCE
11UCS540601A	Office Automation
11UCS540601B	Internet Concepts
11UCS640602A	Fundamentals of Computer Networks
11UCS640602B	E-Commerce

ECONOMICS
11UEC540601	Security Analysis
11UEC640602	Economics of Insurance

ELECTRONICS
11UEL540601	DVD Troubleshooting and Assembling
11UEL640602	PC Assembling

ENGLISH LITERATURE
11UEN540601	Business English Writing
11UEN640602	Media Skills

HISTORY
11UHS540601	Indian History for Competitive Exams
11UHS640602	Tourism and Travel Management

MATHEMATICS
11UMA540601	Mathematics for Competitive Exams
11UMA640602	MATLAB

PHYSICS
11UPH540601	Cell Phone Servicing
11UPH640602A	Electrical Wiring
11UPH640602B	Videography

STATISTICS
11UST540601	Data Analysis for Competitive Exams
11UST640602	Statistics for Management

TAMIL
11UTA540601	தமிழ் இலக்கியத்தில் மனித உரிமைகள்
11UTA640602	மைய அரசுப் பணித் தேர்வுத்தமிழ்