



KARNATAK UNIVERSITY, DHARWAD
ACADEMIC (S&T) SECTION
ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಧಾರವಾಡ
ವಿದ್ಯಾಮಂಡಳ (ಎಸ್&ಟಿ) ವಿಭಾಗ



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NAAC Accredited
'A' Grade 2014

website: kud.ac.in

No. KU/Aca(S&T)/SSL-394A/2022-23/1055

Date: 23 SEP 2022

ಅಧಿಸೂಚನೆ

ವಿಷಯ: 2022-23ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿನಿಂದ ಎಲ್ಲ ಸ್ನಾತಕ ಕೋರ್ಸುಗಳಿಗೆ 3 ಮತ್ತು 4ನೇ ಸೆಮೆಸ್ಟರ್
NEP-2020 ಮಾದರಿಯ ಪಠ್ಯಕ್ರಮವನ್ನು ಅಳವಡಿಸಿರುವ ಕುರಿತು.

- ಉಲ್ಲೇಖ: 1. ಸರ್ಕಾರದ ಅಧೀನ ಕಾರ್ಯದರ್ಶಿಗಳು(ವಿಶ್ವವಿದ್ಯಾಲಯ 1) ಉನ್ನತ ಶಿಕ್ಷಣ ಇಲಾಖೆ ಇವರ
ಆದೇಶ ಸಂಖ್ಯೆ: ಇಡಿ 260 ಯುಎನ್ಇ 2019(ಭಾಗ-1), ದಿ:7.8.2021.
2. ಸಮಾಜವಿಜ್ಞಾನ ನಿಖಾಯ ಸಭೆಯ ಠರಾವುಗಳ ದಿನಾಂಕ: 12.09.2022
3. ವಿಶೇಷ ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ನಿರ್ಣಯ ಸಂ. 04, ದಿನಾಂಕ: 17.09.2022
4. ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಆದೇಶ ದಿನಾಂಕ: 22-09-2022

ಮೇಲ್ಕಾಣಿಸಿದ ವಿಷಯ ಹಾಗೂ ಉಲ್ಲೇಖಗಳನ್ವಯ ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಆದೇಶದ ಮೇರೆಗೆ, 2022-23ನೇ
ಶೈಕ್ಷಣಿಕ ಸಾಲಿನಿಂದ ಅನ್ವಯವಾಗುವಂತೆ, ಸಮಾಜವಿಜ್ಞಾನ ನಿಖಾಯದ ಎಲ್ಲ ಸ್ನಾತಕ ಕೋರ್ಸುಗಳ ರಾಷ್ಟ್ರೀಯ ಶಿಕ್ಷಣ ನೀತಿ
(NEP)-2020 ರಂತೆ 3 ಮತ್ತು 4ನೇ ಸೆಮೆಸ್ಟರ್‌ಗಳಿಗಾಗಿ ವಿಶೇಷ ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ಅನುಮೋದಿತ
ಪಠ್ಯಕ್ರಮಗಳನ್ನು ಪ್ರಕಟಪಡಿಸಿದ್ದು, ಸದರ ಪಠ್ಯಕ್ರಮಗಳನ್ನು ಕ.ವಿ.ವಿ. www.kud.ac.in ಅಂತರ್ಜಾಲದಿಂದ ಡೌನ್‌ಲೋಡ್
ಮಾಡಿಕೊಳ್ಳಲು ಸೂಚಿಸುತ್ತಾ, ವಿದ್ಯಾರ್ಥಿಗಳು ಹಾಗೂ ಸಂಬಂಧಿಸಿದ ಎಲ್ಲ ಬೋಧಕರ ಗಮನಕ್ಕೆ ತಂದು ಅದರಂತೆ
ಕಾರ್ಯಪ್ರವೃತ್ತರಾಗಲು ಕವಿವಿ ಅಧೀನದ / ಸಂಲಗ್ನ ಮಹಾವಿದ್ಯಾಲಯಗಳ ಪ್ರಾಚಾರ್ಯರುಗಳಿಗೆ ಸೂಚಿಸಲಾಗಿದೆ.

ಅಡಕ: ಮೇಲಿನಂತೆ

[Signature]
ಕುಲಸಚಿವರು.

ಗೆ,

ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವ್ಯಾಪ್ತಿಯಲ್ಲಿ ಬರುವ ಎಲ್ಲ ಅಧೀನ ಹಾಗೂ ಸಂಲಗ್ನ ಮಹಾವಿದ್ಯಾಲಯಗಳ
ಪ್ರಾಚಾರ್ಯರುಗಳಿಗೆ. (ಕ.ವಿ.ವಿ. ಅಂತರ್ಜಾಲ ಹಾಗೂ ಮಿಂಚಂಚೆ ಮೂಲಕ ಬಿತ್ತರಿಸಲಾಗುವುದು)

ಪ್ರತಿ:

1. ಕುಲಪತಿಗಳ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
2. ಕುಲಸಚಿವರ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
3. ಕುಲಸಚಿವರು (ಮೌಲ್ಯಮಾಪನ) ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
4. ಅಧೀಕ್ಷಕರು, ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆ / ಗೌಪ್ಯ / ಜಿ.ಎ.ಡಿ. / ವಿದ್ಯಾಂಡಳ (ಪಿ.ಜಿ.ಪಿ.ಎಚ್.ಡಿ) ವಿಭಾಗ, ಸಂಬಂಧಿಸಿದ
ಕೋರ್ಸುಗಳ ವಿಭಾಗಗಳು ಪರೀಕ್ಷಾ ವಿಭಾಗ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
5. ನಿರ್ದೇಶಕರು, ಕಾಲೇಜು ಅಭಿವೃದ್ಧಿ / ವಿದ್ಯಾರ್ಥಿ ಕಲ್ಯಾಣ ವಿಭಾಗ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.



KARNATAK UNIVERSITY, DHARWAD

04 - Year B.A. (Hons.) Program

SYLLABUS

Subject: APPLIED STATISTICS

[With effect from 2022-23]

DISCIPLINE SPECIFIC CORE COURSE (DSCC) FOR SEM III & IV

OPEN ELECTIVE COURSE (OEC) FOR SEM III & IV

AS PER N E P - 2020

Karnatak University, Dharwad
Four Years Under Graduate Program for B.A. (Hons.)
With effect from 2022-23
APPLIED STATISTICS (As Minor subject)

Sem	Type of Course	Theory/ Practical	Instruction hour per week	Total hours of Syllabus / Sem	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks	Credits
III	DSCC-5 013AST011	Theory	03 hrs	42	02 hrs	40	60	100	03
	DSCC-6 013AST012	Theory	03 hrs	42	02 hrs	40	60	100	03
	OEC-3 003AST051	Theory	03 hrs	42	02 hrs	40	60	100	03
IV	DSCC-7 014AST011	Theory	03 hrs	42	02 hrs	40	60	100	03
	DSCC-8 014AST012	Theory	03 hrs	42	02 hrs	40	60	100	03
	OEC-4 004AST051	Theory	03 hrs	42	02 hrs	40	60	100	03
	Details of the other Semesters will be given later								

B.A. Semester – III

Subject: APPLIED STATISTICS Discipline Specific Course (DSC)

The course APPLIED STATISTICS in III semester has two papers (Paper I & II) for 06 credits: Each paper has 03 credits. Both the papers are compulsory. Details of the courses are as under.

Course No.-5 (Paper No. I): 013AST011

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/ Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course-05	DSCC-5	Theory	03	03	42 hrs	2hrs	40	60	100

Course No.5 (Paper-I): Title of the Course (Paper-I): **013AST011: EXACT SAMPLING DISTRIBUTIONS AND STATISTICAL INFERENCE**

Course Outcome (CO):

After completion of this course, students will be able to:

CO 1 : Apply different methods of estimations to real life data sets

CO 2 : Understand basic concepts involved in Tests of Significance and Testing of Hypothesis

CO 3 : Formulate null and alternative hypotheses and apply small, large sample and parametric tests in real life problems

CO 4 : Perform large sample and small sample tests of hypotheses

CO 5 : Apply Chi-square, t and F tests in real life problems

Syllabus- Course 5: 013AST011 : Title- EXACT SAMPLING DISTRIBUTIONS AND STATISTICAL INFERENCE	Total Hrs: 42
UNIT-I Sampling distribution and Estimation	14 hrs
Definition of basic concepts: population, sample, parameter and statistic. Definition of a Random Sample, Sampling distribution of a Statistic along with examples, Definition of standard error, Standard error of mean, standard deviation, proportion, difference of means and difference of proportions. Uses of standard error and simple problems. Definition of the terms – Estimate, Estimation, Point estimation and interval estimation.	

UNIT-II Testing of Hypothesis and confidence intervals	14 hrs
<p>Explanation of terms – Statistical hypothesis, Null hypothesis, Alternative hypothesis, Level of significance, critical region, size of the test, power of the test with examples. Definition of type-I and type-II errors. Large sample tests- Test of significance of population mean, test of significance of equality of means of two populations, test of significance of population proportion and test of significance of equality proportion of two populations.</p> <p>Meaning of confidence interval, confidence limits and confidence coefficient with examples. Construction of 95% and 99% confidence intervals - mean, difference of means, proportion and difference of proportions for large samples only and their numerical problems on the construction of 95% and 99% confidence limits.</p>	
Unit-III Chi-Square, t - test and F-test Distributions	14 hrs
<p>Introduction to Chi-square distribution, definition of Chi-square variate. Properties of Chi-square distribution. Applications of Chi-square distribution. Chi-square test of goodness of fit. Problems on Chi-square test of Goodness of fit and independence of attributes.</p> <p>Definition, assumption and properties of t-test. t-test for testing population mean, equality of sample means and paired t-test. Applications of t-test. Simple problems.</p> <p>Definition, assumption and properties of F-statistic. F-test for equality of variances and its applications. Numerical problems.</p>	

Books recommended.

1. Ramchandran, K.M. and Tsokos C. P. (2009). Mathematical Statistics with Applications, Academic Press.
2. Gupta S. P. (2021). Statistical Methods, Sultan Chand and Sons, New Delhi, 46th edition.
3. Mukhopadhyaya, P. (2011). Applied Statistics, Books and Allied Ltd.
4. Gupta, S C. and V. K. Kapoor. (2018). Fundamentals of Mathematical Statistics, Sultan Chand, New Delhi, 11th Edition.
5. Gani S. G.(2003). Sankhyshastra and Ganakayantra, Udaya Ravi Publications, Bijapur.

B.A. Semester – III**Subject: APPLIED STATISTICS
Discipline Specific Course (DSC)****Course No.-6 (Paper No. II): 013AST012**

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/ Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course-06	DSCC-6	Theory	03	03	42 hrs	2hrs	40	60	100

**Course No.6 (Paper-II): Title of the Course (Paper-II) : 013AST012 : SAMPLING
TECHNIQUES**

Course Outcome (CO):

After successful completion of this course, students will be able to:

CO 1 : Know the concept of Population, Sample, Sampling unit, sampling design, sampling frame, sampling scheme, need for sampling.

CO 2 : Apply different sampling methods for designing and selecting a sample from a population.

CO 3 : Design good questionnaire relevant to a survey for a specific investigation.

CO 4 : Explain sampling and non-sampling errors.

Syllabus-Course 6: 013AST012: Title- SAMPLING TECHNIQUES	Total Hrs: 42
Unit-I Basic Concepts of Sampling	14 hrs
Meaning of population, population size, finite population, infinite population, sample, sample size, sampling, sampling technique, sampling unit, sampling frame, census and sample survey, advantages of sampling. Examples of sampling. Types of errors in sample survey-Sampling errors and non-sampling errors, non response errors, response errors and tabulation errors. Advantages of sampling over complete census. Limitation of sampling. Planning of sample survey and its execution.	
Unit-II Simple Random Sampling and Systematic sampling	14 hrs
Introduction and definition of Simple Random Sampling (SRS), Notations and formulae for estimating population mean, total and variance. Methods of obtaining simple random sample-Lottery method and Random numbers table method. Merits and demerits of Simple Random Sampling. Simple problems on simple random sampling method.	

Definition of systematic random sampling. Explanation of methods of obtaining systematic random samples. Examples of systematic random sample. Formulae for estimating population mean, total and variance. Applications of systematic random sampling method. Merits and demerits of systematic random sampling method. Simple problems on systematic random sampling method.	
Unit-III Stratified Sampling	14 hrs
Need for stratification, stratifying factors, improvement of method over SRS, Definition of strata, stratification, and stratified random sampling. Notations and formulae for estimating population mean, total and variance. Methods of allocation and sample size in different strata-Equal allocation, Proportional allocation and Optimal allocation. Determination of Bowley's formulae for proportional allocation and Neyman's formula for optimal allocation. Advantages and disadvantages of stratified random sampling method. Simple problems on stratified random sampling method, Proportional and Optimal allocation.	

Books recommended.

1. Parimal Mukhopadhyay (2008). Theory and methods of Survey Sampling, PHI publications.
2. Gupta S. P. (2021). Statistical Methods, Sultan Chand and Sons, New Delhi, 46th edition.
3. Gupta S. C. and V. K. Kapoor (2018). Fundamentals of Applied Statistics, Sultan Chand, New Delhi
4. Gani S. G.(2003). Sankhyshastra and Ganakayantra. Udaya Ravi Publications, Bijapur.

B.A. Semester – III
Subject: APPLIED STATISTICS

Title of the Course: OEC-3: 003AST051: DATA ANALYSIS WITH SPSS

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/ Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
OEC	OEC-3	Theory	03	03	42 hrs	2hrs	40	60	100

Course No.OEC-3: Title of the Course (OEC-3) : **003AST051: DATA ANALYSIS WITH SPSS**

Course Outcome (CO):

After the completion of this course, students will be able to:

CO 1 : Use SPSS software for cleaning and presentation of data.

CO 2 : Present the data in the form of diagrams and graphs.

CO 3 : Analyze univariate, bivariate and multivariate data.

Syllabus-Course OEC-3 : 003AST051: Title- DATA ANALYSIS WITH SPSS	Total Hrs: 42
Unit-I Introduction	14 hrs
Need of SPSS, preparation of coding sheet of the questionnaire, defining the type of variable and data, constructing the database – defining variable name, type of variable, width of variable name, labeling, assigning the numeric value to the characteristic, declare measurement of scale of data. Data Editing in SPSS: Enter the data based on type of data case wise for different variables, defining the grouping of variable for repeated measures. Replacing the missing value, transforming the data into same variable and different variable, use of commands –Compute variables using different operators and functions and saving of the data.	
Unit-II Tabulation and Graphical representation	14 hrs
Formation of frequency distribution, representation of frequency distribution by graphs, construction cross table, P-P plots and Q-Q Plots.	
Unit-III Univariate, Bivariate and multivariate Data analysis	14 hrs
Calculation of Measures of central tendency, Dispersion, Karl-Pearson's correlation, Regression, fitting different curves, testing of hypothesis- t-test for single mean, difference of means for independent samples, paired sample and one-way ANOVA.	

Note: Various techniques studied in the paper has to be demonstrated using SPSS software.

Books recommended.

1. Robert V. Hogg, Joseph W. McKean and Allen T. Craig (2007). Introduction to Mathematical Statistics, Pearson Education, Asia.
2. Irwin Miller and Marylees Miller, John E. Freunds (2006). Mathematical Statistics with Applications, 7th Ed., Pearson Education, Asia.
3. Sheldon Ross (2007). Introduction to Probability Models, 9th Ed., Academic Press, Indian Reprint.
4. Gardener, M (2012). Beginning R: The Statistical Programming Language, Wiley Publications.
5. Cunningham, B.J (2012). Using SPSS: An Interactive Hands-on approach.

Details of Formative assessment (IA) for DSCC/OEC/SEC: 40% weightage for total marks

Type of Assessment	Weightage	Duration	Commencement
Written test-1	10%	1 hr	8 th Week
Written test-2	10%	1 hr	12 th Week
Seminar	10%	10 minutes	--
Case study / Assignment / Field work / Project work/ Activity	10%	-----	--
Total	40% of the maximum marks allotted for the paper		

**Faculty of Social Science
04 - Year UG Honors programme:2021-22**

**GENERAL PATTERN OF THEORY QUESTION PAPER FOR DSCC/ OEC
(60 marks for semester end Examination with 2 hrs duration)**

Part-A

1. Question number 1-06 carries 2 marks each. Answer any 05 questions : 10marks

Part-B

2. Question number 07- 11 carries 05Marks each. Answer any 04 questions : 20 marks

Part-C

3. Question number 12-15 carries 10 Marks each. Answer any 03 questions : 30 marks
(Minimum 1 question from each unit and 10 marks question may have sub questions for 7+3 or 6+4 or 5+5 if necessary)

Total: 60 Marks

Note: Proportionate weightage shall be given to each unit based on number of hours prescribed.



B.A. Semester – IV
Subject: APPLIED STATISTICS
Discipline Specific Course (DSC)

The course STATISTICS in IV semester has two papers (Paper I & II) for 06 credits: Each paper has 03 credits. Both the papers are compulsory. Details of the courses are as under.

Course No.-7 (Paper No. I): 014AST011

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/ Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course-07	DSCC-7	Theory	03	03	42 hrs	2hrs	40	60	100

Course No.7 (Paper-I): Title of the Course (Paper-I): **014AST011: Title of Paper:**

ANALYSIS OF VARIANCE AND DESIGN OF EXPERIMENTS

Course Outcome (CO):

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

- CO 1** : Develop strategic plans for experimentation in scientific research projects.
- CO 2** : Apply the principles of Design of Experiment to generate experimental designs.
- CO 3** : Develop problem solving skills for the application of Design of experiments to Agriculture and controlled laboratory experiments.

Syllabus-Course 7: 014AST011: Title- ANALYSIS OF VARIANCE AND DESIGN OF EXPERIMENTS	Total Hrs: 42
Unit-I Analysis of Variance: One-Way and Two-way Classification	14 hrs
Definition of analysis of variance and its basic assumptions. Meaning of assignable and chance variations. ANOVA for one-way classified data-definition, linear mathematical model, assumptions, statement of hypothesis, splitting up of total sum of squares into various component sum of squares, degrees of freedom and ANOVA table. Simple numerical problems one-way classified data. Analysis of variance for two-way classification – definition, linear mathematical model, assumptions, statement of hypothesis, splitting up of total sum of squares into various component sum of squares. Degrees of freedom and ANOVA table. Simple numerical problems on two way classified data.	
Unit-II Design of Experiments: Completely Randomized Design	14 hrs
Definition of terms - Experiment, treatment, experimental unit, experimental material, yield, block, precision, experimental error, uniformity trials, and efficiency. Basic principles of design of experiments – Replication, Randomization and Local control. Completely Randomized Design (CRD) -definition, layout, linear mathematical model, assumptions, hypothesis, splitting up of sum of squares into various component sum of squares, degrees of freedom and ANOVA table. Merits, demerits and applications of CRD. Simple numerical problems.	

Unit-III Randomized Block Design	14 hrs
Introduction and definition of Randomized Block Design (RBD), layout, linear mathematical model, assumptions, statistical hypothesis, splitting up of total sum of squares into various component sum of squares, degree of freedom, and ANOVA table. Merits and demerits of RBD. Applications of RBD. Comparison between CRD and RBD. Simple problems.	

Books recommended.

1. Das, M.N. and Giri, N.C. (1986). Design and Analysis of Experiments, II Edition Wiley Eastern Ltd., New Delhi
2. Goon, A.M., Gupta, M.K. and Dasgupta, B. (1998). Fundamentals of Statistics, Vol. II, The world Press Pvt. Ltd. Kolkatta.
3. Gupta S. P. (2021). Statistical Methods, Sultan Chand and Sons, New Delhi, 46th edition.
4. Gupta S. C. and V. K. Kapoor (2018). Fundamentals of Applied Statistics, Sultan Chand, New Delhi.
5. Mukhopadhaya, P. (2011). Applied Statistics, Books and Allied Ltd.
6. Gani S. G.(2003). Sankhyshastra and Ganakayantra. Udaya Ravi Publications, Bijapur.

B.A. Semester – IV
Subject: APPLIED STATISTICS
Discipline Specific Course (DSC)

Course No.-8 (Paper No. II): 014AST012

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/ Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
Course-08	DSCC-8	Theory	03	03	42 hrs	2hrs	40	60	100

Course No.8(Paper-II):Title of the Course(Paper-II): **014AST012: REGRESSION ANALYSIS AND ECONOMETRICS**

Course Outcome (CO):

After completion of the course, students will be able to:

- CO 1 :** Provide a wider and deeper exposure to the econometric techniques and their application to the discipline of Economics.
- CO 2 :** Gain an understanding of how to solve problems using econometrics that are common to economic modeling.
- CO 3 :** Develop ability to accurately translate complex economic problems into models and so as to solve them by applying econometric techniques.

Syllabus-Course 8: 014AST012: Title- REGRESSION ANALYSIS AND ECONOMETRICS	Total Hrs: 42
Unit-I: Introduction to Econometrics and Simple Regression Analysis	14 hrs
Econometrics – definitions – scope – methodology – types. Quantification of hypothetical linear relationship using appropriate data. Two variable regression model, assumptions, method of least squares properties. An optimality property of OLS: Gauss-Markov theorem, R-square, maximum likelihood method, testing of hypotheses using point and interval estimates, forecasting solving problems using SPSS.	
Unit-II : Multiple Regression Analysis	14 hrs
Nonlinear relationships – transformation of variables – functional forms – three variable regression model – applications using SPSS. General linear model (matrix approach) – specification – OLS estimators – The properties of the estimated regression coefficients, hypothesis testing and the construction of confidence intervals of the regression model, problems and application using SPSS.	

Unit-III: Problems in regression analysis	14 hrs
Violation of classical assumptions – multicollinearity – autocorrelation – heteroscedasticity – problems – causes – consequences – remedial measures – model specification and diagnostic testing.	

Books recommended.

1. Damodar N. Gujarathi (2009). Basic Econometrics, New Delhi: Tata McGraw Hill
2. Companies Johnston, J. (1972). Econometric Methods, 2nd Edition, McGraw Hill International.
3. Koutsoyiannis, A. (2004). Theory of Econometrics, 2nd Edition, , Palgrave Macmillan Limited
4. Maddala, G.S. and Lahiri, K. (2009). Introduction to Econometrics, 4th Edition, John Wiley & Sons
5. G.M.K. Madanani (1980). Introduction to Econometrics, second edition, Oxford & IBH Publishing company, New Delhi.
6. Gupta, S.C. and Kapoor, V. K. (2020). Fundamentals of Applied Statistics, Sultan Chand & Sons, New Delhi.

B.A. Semester – IV**Subject: APPLIED STATISTICS****Title of the Course: OEC-4: 004AST051: Quantitative Analysis Techniques**

Course No.	Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/ Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative Assessment Marks	Total Marks
OEC	OEC-4	Theory	03	03	42 hrs	2hrs	40	60	100

Course No.OEC-4: Title of the Course (OEC-4) : **004AST051: Quantitative Analysis Techniques**

Course Outcome (CO):

After the completion of this course, students will be able to:

CO 1 : Carryout correlation and regression analysis

CO 2 : Formulate and solve linear programming problems

CO 3 : Formulate and solve transportation and assignment problems

Syllabus-Course OEC-4 : 004AST051: Title- Quantitative Analysis Techniques	Total Hrs: 42
Unit-I Correlation and regression analysis	14 hrs
<p>Correlation- Definition, Types - Simple, multiple, partial. Causation - Spurious, positive, negative, perfect and no correlation, explanation with examples. Importance of correlation analysis. Measurement of correlation- scatter diagram, Karl Pearson's coefficient of correlation, Properties of coefficient of correlation, interpretation. Spearman's coefficient of rank correlation – with and without ties, interpretation. Coefficient of determination and its interpretation.</p> <p>Regression-Definition, regression lines/equations of X on Y and Y on X. Properties of regression coefficients and regression lines/equations. Principle of least squares and fitting of linear, quadratic and exponential curves. Uses of regression analysis. Comparison between correlation and regression.</p>	
Unit-II Linear programming problem (LPP)	14 hrs
<p>Definition and scope of Operations Research (OR). Modeling and solution. Linear Programming Problem (L.P.P): Definition, Standard forms. Formulation of LPP. Basic Solutions, degenerate and non-degenerate solutions. Graphical method of solving LPP. Criteria for unbounded, Multiple and infeasible solutions.</p>	

Unit-III Transportation problem and Assignment Problem	14 hrs
<p>Transportation problem: Mathematical formulation. Existence of feasible solution. Finding initial basic feasible solution: North West Corner Rule, matrix minima method and Vogel's method. Unbalanced transportation problem.</p> <p>Assignment Problem: Mathematical Formulation and Hungarian algorithm. Unbalanced assignment problem.</p>	

Books recommended.

References

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2. Ross, S.M. (2014). Introduction to Probability and Statistics for Engineers and Scientists, 5th Edition, Academic Press.
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4. Mustafi, C.K.(2006). Operations Research Methods and Practice, 3/e.NewAge Publication.
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6. Sharma, J K.(2013). Operations Research: Theory and Applications (5/e). New Delhi: Laxmi Publications.

Details of Formative assessment (IA) for DSCC/OEC/SEC: 40% weight age for total marks

Type of Assessment	Weight age	Duration	Commencement
Written test-1	10%	1 hr	8 th Week
Written test-2	10%	1 hr	12 th Week
Seminar	10%	10 minutes	--
Case study / Assignment / Field work / Project work/ Activity	10%	-----	--
Total	40% of the maximum marks allotted for the paper		

Faculty of Social Science
04 - Year UG Honors programme:2021-22

GENERAL PATTERN OF THEORY QUESTION PAPER FOR DSCC/ OEC
(60 marks for semester end Examination with 2 hrs duration)

Part-A

1. Question number 1-06 carries 2 marks each. Answer any 05 questions : 10marks

Part-B

2. Question number 07- 11 carries 05Marks each. Answer any 04 questions : 20 marks

Part-C

3. Question number 12-15 carries 10 Marks each. Answer any 03 questions : 30 marks

(Minimum 1 question from each unit and 10 marks question may have sub questions for 7+3 or 6+4 or 5+5 if necessary)

Total: 60 Marks

Note: Proportionate weightage shall be given to each unit based on number of hours prescribed.

