Re-Accredited 'B++' 2.86 CGPA by NAAC
VEER NARMAD SOUTH GUJARAT UNIVERSITY
University Campus, Udhna-Magdalla Road, SURAT - 395 007, Gujarat, India.
વીર નર્મદ દક્ષિણ ગુજરાત યુનિવર્સિટી
યુનિવર્સિટી કેમ્પસ, ઉધના-મગદલ્લા રોડ, સુરત - ૩૯૫ ૦૦૭, ગુજરાત, ભારત.
Tel : +91 - 261 - 2227141 to 2227146, Toll Free : 1800 2333 011, Digital Helpline No.- 0261 2388888
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-: પરિપત્ર :-

યુનિવર્સિટી સંલગ્ન વિનયન વિદ્યાશાખા હેઠળની તમામ કોલેજોનાં આચાર્યશ્રીઓને જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૫–૨૬ થી અમલમાં આવનાર T.Y.B.A. Statistics Sem.-5 & 6 Minor નો પેટાસમિતિ દ્વારા તૈયાર કરવામાં આવેલ અભ્યાસક્રમ સંદર્ભે આંકડાશાસ્ત્ર વિષયની અભ્યાસ સમિતિની તા.૨૭/૦૩/૨૦૨૫ની સભાના ઠરાવ ક્રમાંકઃ૦૪ થી કરેલ ભલામણ સ્વીકારી વિનયન વિદ્યાશાખાની તા.૨૮/૦૪/૨૦૨૫ની સભાનાં ઠરાવ ક્રમાંકઃ ૧૪ થી કરેલ ભલામણ સ્વીકારી એકેડેમિક કાઉન્સિલની તા.૦૫/૦૫/૨૦૨૫ ની સભાનાં ઠરાવ ક્રમાંકઃ ૫૧ થી મંજુર કરેલ છે. જેનો અમલ કરવા આથી જાણ કરવામાં આવે છે.

બિડાણઃ ઉપર મુજબ

ક્રમાંકઃઓથો./પરિપત્ર/૧૧૮૩૬/૨૦૨૫
તા.૦૯–૦૫–૨૦૨૫

કુલસચિવ

પ્રતિ,
૧) વિનયન વિદ્યાશાખા હેઠળની સંલગ્ન તમામ કોલેજોનાં આચાર્યશ્રીઓ.
.....આપશ્રીની કોલેજના સંબંધિત શિક્ષકોને જાણ કરી અમલ કરવા સારૂ.
૨) ડીનશ્રી, વિનયન વિદ્યાશાખા.
૩) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.
.....તરફ જાણ તેમજ અમલ સારૂ.

Template For Syllabus

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

ProgrammeName :- B.A Statistics

As Per NEP 2020

About programme :- Semester V (Minor)

Teaching & Evaluation Scheme:- As per NEP 2020

Course Category	Course Code	Course Title	Mark sheet title in English	Level of course	Teaching Hours /week (TH)	Teaching Hours /week (PR)	Exam Duration (TH)	Exam Duration (PR)	Credit (TH)	Credit (PR)	Internal Marks (TH)	Internal Marks (PR)	External Marks (TH)	External Marks (PR)	Total (TH)
Minor	MESTA 504	Paper – 4 :Operation Research	Paper – 4 :Operation Research	300	4	-	2	-	4	-	50	-	50	-	100
Minor	MESTA 505	Paper – 5 :Analysis of Statistical Data	Paper – 5 :Analysis of Statistical Data	300	4	-	2	-	4	-	50	-	50	-	100

Course wise Details :-

Template For Syllabus

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

Programme Name :- B.A Statistics

As Per NEP 2020

About programme :- Semester VI (Minor)

Teaching & Evaluation Scheme:- As per NEP 2020

Course Category	Course Code	Course Title	Mark sheet title in English	Level of course	Teaching Hours /week (TH)	Teaching Hours /week (PR)	Exam Duration (TH)	Exam Duration (PR)	Credit (TH)	Credit (PR)	Internal Marks (TH)	Internal Marks (PR)	External Marks (TH)	External Marks (PR)	Total (TH)
Minor	MESTA 606	Paper – 6 : Sampling Techniques & Testing of Hypothesis	Paper – 6 : Sampling Techniques & Testing of Hypothesis	300	4	-	2	-	4	-	50	-	50	-	100

Course wise Details :-

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

T.Y.B.A.-SEM-VSTATISTICS(Minor)

Statistics Paper – 4: **OPERATION RESEARCH TECHNIQUES** (Minor) (4 credits)

As per NEP 2020

To be implemented from the Academic year 2025-'26

Course code	MESTA 504	Weightage	Marks
Course title	PAPER - IV:OPERATION RESEARCH TECHNIQUES		
credit	4		
Teaching per week	4 hours		
Effective from	2025-'26		
Purpose of course	The Purpose of course is to developed theoretical knowledge & practical application of OR techniques in students for the further studies.		
Objective of course	The main objective of this course is to provide fundamental knowledge of Linear programming problem, assignment problem and transportation problem. The purpose is to make students aware about the application of different operations research techniques for real life examples.		
Programme outcomes	**PO-01:** Knowledge & Conceptual Understanding: Develop a strong foundation in principles and concepts across disciplines, fostering interdisciplinary learning, advance knowledge and problem-solving abilities. **PO-02:** Analytical & Critical Thinking: Apply critical thinking and analytical reasoning to evaluate data, hypotheses and real-world problems, leading to evidence-based conclusions. **PO-03:** Research & Inquiry-based Learning: Develop investigative skills through experimentation, data analysis to contribute to research and innovation. **PO-04:** Technical Skills: Gain hands-on experience with instrumentation and computational tools relevant to research and industry applications. **PO-05:** Digital & Computational Literacy: Utilize digital tools, computational techniques and emerging technologies such as AI, statistical modelling to enhance learning and problem-solving. **PO-06:** Environmental & Societal Responsibility: Understand the role of science in addressing environmental, health and societal challenges, promoting sustainability and ethical responsibility. **PO-07:** Effective Communication & Collaboration: Develop proficiency in scientific communication, both written and oral, for effective dissemination of knowledge while collaborating in multidisciplinary teams. **PO-08:** Innovation & Entrepreneurship: Foster an entrepreneurial mind-set by applying knowledge for innovation, technology development, and industry-oriented applications. Develop sustainable solutions to address real-world challenges in research and environmental management. **PO-09:** Lifelong Learning & Professional Growth: Cultivate curiosity and adaptability for continuous learning, equipping students for higher education,		

	research, and professional careers. **PO-10:** Ethical Leadership & Value-based Education: Develop leadership qualities, ethical values, and a sense of responsibility in applying societal progress, aligning with Indian knowledge systems and global perspectives.		
Programme specific outcomes	**PSO1: Understanding Statistical Principles** Graduate Should comprehend the importance and value of statistical principles and be able to convert problem description into testable research hypothesis**.** **PSO2:Professional and Entrepreneurial Skills Development** The program enhances student's professional skills and entrepreneurial capabilities, fostering independent logical and analytical thinking. It also emphasizes teamwork and leadership, preparing students for diverse environments by providing skill enhancement Certificate courses**.** **PSO3:Real-World Problem Solving** Students are trained to investigate, design, and develop practical solutions for real-world challenges, ensuring they can apply theoretical knowledge to practical situations through Experiential Learning and by providing platform for extracurricular activities. **PSO4:Self-Learning and Problem-Solving Skills** Students gain hands-on experience with advanced statistical tools and software, enhancing their ability to tackle real-world problems efficiently. **PSO5:Performing data Analysis** Graduate should be able to apply analytical and statistical methods to analyze data, interpret results, and provide solutions in various settings. **PSO6: Develop Communication Skills** Effectively Communicate Statistical results through clear & informative data visualizations. **PSO7:Commitment to Lifelong Learning and Research** The program focuses not only on imparting core education but also to developing interest in research. **PSO8:Provide Employability** Identify & explore career opportunities in statistics, including roles in industry, government & academia.		
Mapping between POs and PSOs			

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
PO1	✓		✓		✓			
PO2	✓	✓	✓	✓	✓			
PO3	✓		✓				✓	
PO4			✓	✓	✓		✓	
PO5	✓		✓	✓	✓			
PO6	✓		✓		✓			✓
PO7		✓	✓			✓		
PO8	✓	✓						✓
PO9			✓	✓	✓		✓	✓
PO10		✓	✓			✓		

<table>
<tr><td>Course outcomes</td><td>CO1: Understand the basic concept of operation research, and basic concept of linear programming problem.
CO2: Understand the concept of assignment problem and apply optimal task allocation.
CO3: Understand the concept of transportation problems. Apply the modified distribution (MODI METHOD) for optimality testing in transportation problems.
CO4: Apply the course content for the further study of Statistics and real world and analyse real world transportation logistics and make decisions for efficient resource allocation</td><td></td><td></td></tr>
<tr><td>Mapping between COs with PSOs</td><td>
<table>
<tr><th>CO</th><th>PSO1</th><th>PSO2</th><th>PSO3</th><th>PSO4</th><th>PSO5</th><th>PSO6</th><th>PSO7</th><th>PSO8</th></tr>
<tr><td>CO1</td><td>✓</td><td></td><td></td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>CO2</td><td>✓</td><td></td><td></td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>CO3</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>CO4</td><td>✓</td><td></td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Course content</td><td>Unit-I
❖ Meaning of OR.
❖ Scope of OR.
❖ Phases of OR.
❖ Uses of OR techniques.</td><td>10%</td><td>05</td></tr>
<tr><td></td><td>Unit-II
❖ Meaning of LPP.
❖ Mathematical formulation of LPP.
❖ Definitions of terms: basic solution, Feasible solution, optimum solution
❖ Graphical method for solving LPP (TWO Variables only), Examples</td><td>30%</td><td>25</td></tr>
<tr><td></td><td>Unit-III
❖ Meaning and formulation of TP
❖ Balanced and unbalanced TP
❖ Methods of finding initial BFS of a TP,
North West corner method, Row minima method, Column minima method, Matrix minima method, Vogel’s approximation method, optimality test, examples.</td><td>40%</td><td>10</td></tr>
<tr><td></td><td>Unit-IV
❖ Meaning and mathematical formulation of AP
❖ Difference between AP and TP
❖ Hungarian method for Solving an AP, examples</td><td>20%</td><td>10</td></tr>
<tr><td>References</td><td>1. Paria G. Linear programming, Transportation, Assignment Game Book & Allied PVT. LTD., Calcutta.
2. Grant E.L. (1964) Statistical quality control Mac Graw Hills.
3. Kanti Swarup P.K. Gupta & Man Mohan (1995 & 2007).
4. Sharma S.D. (1998) Operations Research, Kedar Nath & Sons, Meerut.
5. Sharma J.K. (1998) Operations Research Mac Milan pub. New Delhi
Hadley G. (1995) Linear Programming. Narosa Publishing House, New Delhi.</td><td></td><td></td></tr>
</table>

[Subject Code - 2501001205051205]

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

T.Y.B.A.-SEM-VSTATISTICS (Minor)

Statistics Paper – 5: **ANALYSIS OF STATISTICAL DATA**

(Time Series & Vital Statistic) (Minor) (4 credits)

As per NEP 2020

To be implemented from the Academic year 2025-’26

Course code	MESTA 505	Weightage	Marks
Course title	Paper - V: ANALYSIS OF STATISTICAL DATA		
credit	4		
Teaching per week	4 hours		
Effective from	2025-’26		
Purpose of course	The purpose of the course is to develop analytical skills for social science research		
Objective of course	The main objective of this course is to provide fundamental knowledge of various methods to collect the vital statistical data and analyse different types of trends and seasonal variations of time series. The purpose is to make students aware about the application of vital statistics and time series in real life.		
Programme outcomes	**PO-01:** Knowledge & Conceptual Understanding: Develop a strong foundation in principlesand concepts across disciplines, fostering interdisciplinary learning, advance knowledgeand problem-solving abilities. **PO-02:** Analytical & Critical Thinking: Apply critical thinking and analytical reasoning to evaluate data, hypothesesand real-world problems, leading to evidence-based conclusions. **PO-03:** Research & Inquiry-based Learning: Develop investigative skills through experimentation, data analysis to contribute to research and innovation. **PO-04:** Technical Skills: Gain hands-on experience with instrumentation and computational tools relevant to research and industry applications. **PO-05:** Digital & Computational Literacy: Utilize digital tools, computational techniques and emerging technologies such as AI, statistical modelling to enhance learning and problem-solving. **PO-06:** Environmental & Societal Responsibility: Understand the role of science in addressing environmental, health and societal challenges, promoting sustainability and ethical responsibility. **PO-07:** Effective Communication & Collaboration: Develop proficiency in scientific communication, both written and oral, for effective dissemination of knowledge while collaborating in multidisciplinary teams. **PO-08:** Innovation & Entrepreneurship: Foster an entrepreneurial mind-set by applying knowledge for innovation, technology development, and industry-oriented applications. Develop sustainable solutions to address real-world challenges in research and environmental management. **PO-09:** Lifelong Learning & Professional Growth: Cultivate curiosity and adaptability for continuous learning, equipping students for higher education,		

	research, and professional careers. **PO-10:** Ethical Leadership & Value-based Education: Develop leadership qualities, ethical values, and a sense of responsibility in applying societal progress, aligning with Indian knowledge systems and global perspectives.		
Programme specific outcomes	**PSO1: Understanding Statistical Principles** Graduate Should comprehend the importance and value of statistical principles and be able to convert problem description into testable research hypothesis**.** **PSO2:Professional and Entrepreneurial Skills Development** The program enhances student's professional skills and entrepreneurial capabilities, fostering independent logical and analytical thinking. It also emphasizes teamwork and leadership, preparing students for diverse environments by providing skill enhancement Certificate courses**.** **PSO3:Real-World Problem Solving** Students are trained to investigate, design, and develop practical solutions for real-world challenges, ensuring they can apply theoretical knowledge to practical situations through Experiential Learning and by providing platform for extracurricular activities. **PSO4:Self-Learning and Problem-Solving Skills** Students gain hands-on experience with advanced statistical tools and software, enhancing their ability to tackle real-world problems efficiently. **PSO5:Performing data Analysis** Graduate should be able to apply analytical and statistical methods to analyze data, interpret results, and provide solutions in various settings. **PSO6: Develop Communication Skills** Effectively Communicate Statistical results through clear & informative data visualizations. **PSO7:Commitment to Lifelong Learning and Research** The program focuses not only on imparting core education but also to developing interest in research. **PSO8:Provide Employability** Identify & explore career opportunities in statistics, including roles in industry, government & academia.		
Mapping between POs and PSOs			
Course outcomes	**CO1**:Understand the basic concept of time series. **CO2**:Understand the concept vital statistics. **CO3**: Apply the course content for the further study of Statistics.		

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
PO1	✓		✓		✓			
PO2	✓	✓	✓	✓	✓			
PO3	✓		✓				✓	
PO4			✓	✓	✓		✓	
PO5	✓		✓	✓	✓			
PO6	✓		✓		✓			✓
PO7		✓	✓			✓		
PO8	✓	✓						✓
PO9			✓	✓	✓		✓	✓
PO10		✓	✓			✓		

<table>
<tr><td></td><td>CO4:Develop analytical skill to differentiate between trends & seasonal variations and analyse the difference types of seasonal variations.</td><td></td><td></td></tr>
<tr><td>Mapping between COs with PSOs</td><td>
<table>
<tr><th>CO</th><th>PSO1</th><th>PSO2</th><th>PSO3</th><th>PSO4</th><th>PSO5</th><th>PSO6</th><th>PSO7</th><th>PSO8</th></tr>
<tr><td>CO1</td><td>✓</td><td></td><td></td><td>✓</td><td>✓</td><td></td><td>✓</td><td></td></tr>
<tr><td>CO2</td><td>✓</td><td></td><td></td><td>✓</td><td>✓</td><td></td><td>✓</td><td></td></tr>
<tr><td>CO3</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>CO4</td><td>✓</td><td></td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Course content</td><td>Unit-I – Time Series
❖ Concept of Time series – causes of variations in time series data – components of time series.
❖ Determination of trends –
Moving average methods
Least square method (Linear and Parabolic).</td><td>40%</td><td>20</td></tr>
<tr><td></td><td>Unit-II – Seasonal Variations
❖ Seasonal variations of time series
- computations of seasonal indices by simple average method and moving average method (3, 4 & 5 Years).</td><td>20%</td><td>10</td></tr>
<tr><td></td><td>Unit-III – Vital Statistics
❖ Introduction
❖ Method to collect the vital statistical data.
❖ Limitations of vital statistical data and suggestions to prevent (Remove) it.
❖ Birth rates, Death rates, Fertility rates and Reproduction rates, Its examples.</td><td>20%</td><td>10</td></tr>
<tr><td></td><td>Unit-IV -Indian official statistics:
• Central Statistical Organization on (CSO) National Sample Survey (NSS)
• National Council of Applied Economics and Research
• Department of Commercial Intelligence and Statistics (D.C.I.S)
• Indian Statistical Institution (I.S.I)
Principal Publications containing data on the topics such as population, agriculture and industry.</td><td>20%</td><td>10</td></tr>
<tr><td>References</td><td>1.Barkley G.W. (1958) Techniques of population analysis “John Wiley & sons Inc First Ed
2. Pathak K.B. and F. Ram (1998) “Techniques of Demographic Analysis” 2nd Ed, Himalaya Publishing House.
3. Cox P.R. “Demography” Cambridge University Press.
4. D.C. Sanchaeti and V.K. Kapoor Statistic (Theory, Method and Application) Sultan Chand & Son
5. Goon A.M. Gupta, M.K. and Dasgupta B. (2008) Fundamentals of statistic, Vol II, Edition World press.
6. Kendall M.G. (1976) Time series, Charles Griffin.
7. M.C. Shukla, S.S. Gutshan Statistics theory and practice.
8. એમ. સી. જયસ્વાલ (1974): અર્થ વિષયક આંકડાશાસ્ત્ર, યુનિ. ગ્રંથ નિર્માણ બોર્ડ, અમદાવાદ</td><td></td><td></td></tr>
</table>

VEER NARMAD SOUTH GUJARAT UNIVERSITY, SURAT

T.Y.B.A.-SEM-VISTATISTICS(Minor)

Statistics Paper – 6: **SAMPLING TECHNIQUES &TESTING OF HYPOTHESIS**

(Minor) (4 credits)

As per NEP 2020

To be implemented from the Academic year 2025-'26

Course code	MESTA 606	Weightage	Marks
Course title	Paper - VI:SAMPLING TECHNIQUES &TESTING OF HYPOTHESIS		
credit	4		
Teaching per week	4 hours		
Effective from	2025-'26		
Purpose of course	The purpose of the course is to provide students with a deep understanding of sampling & testing of hypothesis for the further studies in statistics & real life.		
Objective of course	The main objective of this course to provide fundamental knowledge of sampling, simple random sampling, stratified sampling, systematic sampling and testing of hypothesis. The purpose is to make students aware about the application of sampling and testing of hypothesis in research.		
Programme outcomes	**PO-01:** Knowledge & Conceptual Understanding: Develop a strong foundation in principlesand concepts across disciplines, fostering interdisciplinary learning, advance knowledgeand problem-solving abilities. **PO-02:** Analytical & Critical Thinking: Apply critical thinking and analytical reasoning to evaluate data, hypothesesand real-world problems, leading to evidence-based conclusions. **PO-03:** Research & Inquiry-based Learning: Develop investigative skills through experimentation, data analysis to contribute to research and innovation. **PO-04:** Technical Skills: Gain hands-on experience with instrumentation and computational tools relevant to research and industry applications. **PO-05:** Digital & Computational Literacy: Utilize digital tools, computational techniques and emerging technologies such as AI, statistical modelling to enhance learning and problem-solving. **PO-06:** Environmental & Societal Responsibility: Understand the role of science in addressing environmental, health and societal challenges, promoting sustainability and ethical responsibility. **PO-07:** Effective Communication & Collaboration: Develop proficiency in scientific communication, both written and oral, for effective dissemination of knowledge while collaborating in multidisciplinary teams. **PO-08:** Innovation & Entrepreneurship: Foster an entrepreneurial mind-set by applying knowledge for innovation, technology development, and industry-oriented applications. Develop sustainable solutions to address real-world challenges in research and environmental management.		

PO-09: Lifelong Learning & Professional Growth: Cultivate curiosity and adaptability for continuous learning, equipping students for higher education, research, and professional careers.

PO-10: Ethical Leadership & Value-based Education: Develop leadership qualities, ethical values, and a sense of responsibility in applying societal progress, aligning with Indian knowledge systems and global perspectives.

Programme specific outcomes

PSO1: Understanding Statistical Principles

Graduate Should comprehend the importance and value of statistical principles and be able to convert problem description into testable research hypothesis**.**

PSO2:Professional and Entrepreneurial Skills Development

The program enhances student's professional skills and entrepreneurial capabilities, fostering independent logical and analytical thinking. It also emphasizes teamwork and leadership, preparing students for diverse environments by providing skill enhancement Certificate courses**.**

PSO3:Real-World Problem Solving

Students are trained to investigate, design, and develop practical solutions for real-world challenges, ensuring they can apply theoretical knowledge to practical situations through Experiential Learning and by providing platform for extracurricular activities.

PSO4:Self-Learning and Problem-Solving Skills

Students gain hands-on experience with advanced statistical tools and software, enhancing their ability to tackle real-world problems efficiently.

PSO5:Performing data Analysis

Graduate should be able to apply analytical and statistical methods to analyze data, interpret results, and provide solutions in various settings.

PSO6: Develop Communication Skills

Effectively Communicate Statistical results through clear & informative data visualizations.

PSO7:Commitment to Lifelong Learning and Research

The program focuses not only on imparting core education but also to developing interest in research.

PSO8:Provide Employability

Identify & explore career opportunities in statistics, including roles in industry, government & academia.

Mapping between POs and PSOs

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8
PO1	✓		✓		✓			
PO2	✓	✓	✓	✓	✓			
PO3	✓		✓				✓	
PO4			✓	✓	✓		✓	
PO5	✓		✓	✓	✓			
PO6	✓		✓		✓			✓
PO7		✓	✓			✓		
PO8	✓	✓						✓
PO9			✓	✓	✓		✓	✓
PO10		✓	✓			✓		

<table>
<tr><td>Course outcomes</td><td>CO1:Understand the basic concept of hypothesis and its testing and applications in various fields.
CO2:Identify the components of testing of hypothesis.
CO3: Perform various large sample test and utilize statistical testing methods & sampling methods in different field.
CO4: Understand the basic concept of sampling, simple random sampling for with & without replacement cases, stratified sampling & systematic sampling and apply the course content for the further study of statistics.</td><td></td><td></td></tr>
<tr><td>Mapping between COs with PSOs</td><td>
<table>
<tr><th>CO</th><th>PSO1</th><th>PSO2</th><th>PSO3</th><th>PSO4</th><th>PSO5</th><th>PSO6</th><th>PSO7</th><th>PSO8</th></tr>
<tr><td>CO1</td><td>✓</td><td>✓</td><td>✓</td><td></td><td></td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>CO2</td><td>✓</td><td>✓</td><td></td><td>✓</td><td></td><td></td><td>✓</td><td></td></tr>
<tr><td>CO3</td><td>✓</td><td>✓</td><td>✓</td><td></td><td>✓</td><td>✓</td><td></td><td></td></tr>
<tr><td>CO4</td><td>✓</td><td>✓</td><td>✓</td><td></td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
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<tr><td>Course content</td><td>Unit-I – Introduction to Sampling Theory
❖ Meaning of population and sample
❖ Basic rules of sampling techniques
❖ Comparison of population and sample investigation
❖ Errors in sampling
❖ Simple Random Sampling – with and without replacement, selection of SRS
❖ Estimation of population mean, standard error and variations of statistics (Without Proof), examples</td><td>40%</td><td>20</td></tr>
<tr><td></td><td>Unit-II – Stratified Random Sampling
❖ Meaning – estimation of a mean, variance (without Proof), examples</td><td>20%</td><td>10</td></tr>
<tr><td></td><td>Unit-III – Testing of Hypothesis
❖ Test of significance, types of hypotheses, statistical hypothesis, Null and alternative hypothesis
❖ Standard error and uses of each
❖ Confidence limits
❖ Process of testing of hypothesis, two types of errors
❖ Large sample test
❖ Testing the significance of single mean, difference between two means, difference between two standard deviations, correlation coefficient, single proportion, difference between two proportion.</td><td>30%</td><td>15</td></tr>
<tr><td></td><td>Unit-IV – National Income
❖ National Income concepts & its Uses, NSO</td><td>10%</td><td>05</td></tr>
<tr><td>References</td><td>1.Goon A.M., Gupta M.K. & Dasgupta (1986), Fundamentals of Statistics Vol - 11, World Press Calcutta.
2. Gupta S.C. & Kapoor V.K. Fundamentals of Mathematical Statistical. Sultan Chand & Sons.
3. Murthy M.N. (1967), Sampling Theory and Methods, Statistical Publishing Society, Calcutta.
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7. Yates F. (1960) Sampling Methods in censuses and surveys ED-III Charles Griffin & Co. Ltd. London</td><td></td><td></td></tr>
</table>

	8. Haansen M.H.et al (1993) Sample survey Methods and Theory. Willey Blackwell: Volume I edition. 9. એસ. એમ શાહ (1976): નિદર્શન પદ્ધતિઓ અને પ્રાયોગિક અભિકલ્પનાઓ, યુનિ. ગ્રંથ નિર્માણ બોર્ડ, અમદાવાદ		