M.A./ M.Sc. (Two Years Degree Program)	
III Semester	
Subject-Geography	
Code of the Course	GEG9101P
Title of the Course	STATISTICAL DATA ANALYSIS USING SOFTWARE
Qualification Level of the Course	NHEQF Level 6.5
Credit of the course	4
Type of the course	Discipline Specific Elective Practical Course in Geography
Delivery type of the Course	Practical (80+40). The 80 hours for content delivery include hands-on exercises, and 40 hours of diagnostic assessment, formative assessment, and subject/class activity, problem solving.
Pre-requisites	Fundamental understanding of geographical concepts and statistics
Co-requisites	Basic working knowledge of computer.
Objectives of the course	• To develop professional skills of using statistical softwares such as SPSS, MS Excel for quantitative analysis. • To make students learn analysing geographical data using robust statistical tools provided by these softwares. • To develop skills of data handling and manipulation in softwares. • To develop them as professionals capable of working as data analysts across public and private sectors and self-employment as technical consultants.
Learning outcomes	• Student will learn various techniques of data analysis using statistical softwares. • Student will learn to input and edit statistical data using statistical softwares. • Student will learn to prepare various diagrams and graphs using statistical softwares. • Student will learn to compute fundamental descriptive statistics using statistical softwares. • Student will learn to analyzing relationships using statistical data in softwares.
Syllabus **पाठ्यक्रम**	
UNIT - I	Levels of Measurement: Nominal, Ordinal, Scale. Database file formats. Variables and Cases – entering variables, entering data and validating data. मापन के स्तर: नामक, क्रमिक, मापक। डेटाबेस फ़ाइल प्रारूप। चर और केसेस - चर दर्ज करना, आंकड़े दर्ज करना और आंकड़ों को मान्य करना।
UNIT - II	Data In and Out – Importing data files of different formats. Exporting data files to different formats. Data editing – copying and pasting data to other applications, saving data, printing outputs. Data manipulation –

	Creating a new variable and inserting cases to existing database, recoding data. आंकड़े आयात और निर्यात - विभिन्न प्रारूपों की आंकड़ा फ़ाइलों को आयात करना। विभिन्न प्रारूपों में आंकड़ा फ़ाइलों को निर्यात करना। आंकड़ों का संपादन - अन्य अनुप्रयोगों में आंकड़ों की प्रतिलिपि करना और पेस्ट करना, आंकड़ों को सहेजना, परिणाम मुद्रित करना। आंकड़ों का परिवर्तन - नए चर बनाना और मौजूदा डेटाबेस में केसेस को डालना, आंकड़ों को पुनः कोडित करना।
UNIT - III	**Data Representation: Preparation of various graphs and diagrams** Line graphs (Simple Line graph and Multiple Line graph). Bar diagram: Simple, Compound and Multiple bar diagram. Pie-diagram. Histogram. Population Pyramid. **आंकड़ों का प्रतिनिधित्व: विभिन्न ग्राफ और आरेखों का निर्माण** रेखा ग्राफ (सामान्य रेखा ग्राफ और बहु- रेखा ग्राफ)। बार आरेख: सामान्य, मिश्रित और बहु बार आरेख । पाई-आरेख। आयत आरेख। जनसंख्या पिरामिड।
UNIT - IV	**Data Analysis: Computation of Fundamental Descriptive Statistics** Measures of Central Tendency - Mean, Median, Mode. Measures of dispersion – Standard deviation, Z-scores, Boxplots. Measures of symmetry – Skewness. Kurtosis. **आंकड़ों का विश्लेषण: मूल वर्णनात्मक आँकड़ों की गणना** केंद्रीय प्रवृत्ति के माप - माध्य, माध्यिका, बहुलक। विचरण के माप - मानक विचलन, जी-स्कोर, बॉक्स आरेख। सममितता के माप - तिरछापन। कर्टोसिस।
UNIT - V	**Data Analysis and Mapping** Scatter Plot. Correlation – Pearson's and Spearman's. Computation of Regression- single linear regression and multiple linear regression. t-Test. ANOVA. Factor analysis. **आंकड़ों का विश्लेषण और मानचित्रण** बिंदु आरेख। सहचर्य - पियरसन और स्पीयरमैन। प्रतिगमन की गणना - एकल रैखिक प्रतिगमन और बहु रैखिक प्रतिगमन। टी-परीक्षण। एनोवा। कारक विश्लेषण।
Practical Exercises	1. Assign suitable levels of measurements to database. (1 exercise) 2. Entering variables, entering data and validating data. (1 exercise) 3. Importing and Exporting data files. (1 exercise) 4. Data editing – copying, pasting and saving data, printing outputs. (1 exercise) 5. Data manipulation – Creating a new variable and inserting cases, and recoding data. (1 exercise) 6. Constructing line graphs - Simple and Multiple. (1 exercise) 7. Constructing bar diagram: Simple, Compound and Multiple. (1 exercise) 8. Constructing pie-diagram. (1 exercise) 9. Constructing Histogram. (1 exercise) 10. Constructing Population Pyramid. (1 exercise) 11. Computation and interpretation of descriptive statistics - Mean, Median, Mode and Standard deviation, Z-scores, Skewness. Kurtosis. (1 exercise) 12. Constructing Boxplots. (1 exercise) 13. Constructing Scatter Plot. (1 exercise) 14. Computation of Correlation – Pearson's and Spearman's. (1 exercise)

	15. Computation of Regression- single linear regression and multiple linear regression. (1 exercise) 16. Performing t-Test. (1 exercise) 17. ANOVA. (1 exercise) 18. Factor analysis. (1 exercise) Exercises will be done in available statistical softwares: Microsoft Excel and/ or SPSS
	Suggested Readings **सहायक ग्रन्थ / सामग्री**
Text Books	• शर्मा, पी.एम., भूगोल में सांख्यकीय विधियां, राजस्थान हिंदी ग्रन्थ अकादमी • Argyrous, G. (2011). Statistics for Research: With a Guide to SPSS. United Kingdom: SAGE Publications. • Cunningham, J. B., Aldrich, J. O. (2012). Using SPSS: An Interactive Hands-On Approach. United Kingdom: SAGE Publications. • Mahmood, A. Statistical Methods in Geographical Studies: Student Edition, Rajesh Publications, 2020
Reference Books	• Cole, J. P. and C. M. A. King, Quantitative Geography: Techniques and Theories in Geography, John Wiley and Sons Ltd., London, 1970. • Field, A., Discovering Statistics Using SPSS (Introducing Statistical Methods) • Gregory, S., Statistical Methods and the Geographer, Longman Group Ltd. London, 1978. • Hammond, Robert and Patrick McCullagh, Quantitative Techniques in Geography: An Introduction, Oxford University Press, London, 1978 • Hebden, Julia, Statistics for Economists, Heritage Publishers, London, 1990. • Johnston, R. J., Multivariate Statistical Analysis in Geography, Longman Group Ltd. London, 1978. • Silk, J., Statistical Concepts in Geography, George Allen and Unwin, London, 1980. • Wilson, A. H. and M. J. Kirkby, Mathematics for Geographers and Planners, Oxford University Press London 1982.
Suggested E-resources	• https://www.spss-tutorials.com/ • https://support.microsoft.com/en-us/office/excel-video-training