Course Code	STA1MN109 (P)				
Course Title	Elementary statistics				
Type of Course	Minor				
Semester	I				
Academic Level	100 - 199				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours
	4	3	-	2	75

Course Summary	To equip students with the fundamental principles of statistical analysis and their application in geographical contexts, enabling them to effectively analyze, interpret, and communicate spatial data.

Course Outcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Recognize the importance of statistical methods in geographical research and analysis.	U	C	Instructor-created exams / Quiz
CO2	Evaluate different types of data used in geography, including qualitative and quantitative variables, and analyze data to help entrepreneurial decisions using critical thinking skills.	Ap	F	Practical Assignment / Observation of Practical Skills/ Instructor-created exams
CO3	Calculate and interpret measures of central tendency, such as mean, median, and mode, and measures of dispersion, including range, variance, and standard deviation, in the context of geographical data analysis.	Ap	F	Seminar Presentation / Group Tutorial Work/ Instructor-created exams
CO4	Analyze higher-order moments or other numerical measures of the characteristics of distributions, such as skewness and kurtosis, and interpret their implications for spatial patterns and trends and critically evaluate ethical implications of statistical methods aligning with human values.	U	C	Instructor-created exams / Home Assignments
CO5	Introduce the concepts of correlation and regression analysis and their applications in geography, including assessing the strength and direction of relationships between variables and making predictions based on statistical models.	U	C	One Minute Reflection Writing assignments/ Instructor-created exams
CO6	Demonstrate measures of central	Ap	P	Viva Voce/ Instructor-creat

		tendency using spreadsheet.			ed exams

* - Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C)
\# - Factual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)

COURSE CONTENT

Module	Unit	Content	Hours (45 +30)	Marks (70)
		STATISTICS AND GEOGRAPHY	**10**	**15**
	1	Statistical Analysis and Geography	1	
	2	Data, sources of data, internal data, external data, primary and secondary data, meta data	2	
	3	Data collection, characteristics of data sets	2	
	4	Quantitative and qualitative data sets	1	
	5	Measurement Evaluation: Validity, accuracy, precision	2	
	6	Data and Information	1	
1	**Sections from References:** Unit 1: 1, 1.1 [Ref 1] Unit 2: 1.2 [Ref 1] Unit 3: 1.2 [Ref 1] Unit 4: 1.2 [Ref 1] Unit 5: 1.3 [Ref 1] Unit 6: 1.4 [Ref 1]			
		DISPLAYING AND INTERPRETING DATA	**12**	**15**
2	7	Organization of data	2	
	8	Classification	2	
	9	Frequency distribution	2	

	10	Basic principles for forming a groupes frequency distribution	2	
	11	Cumulative and bivariate frequency distribution	2	
	12	Tabulation, requisites of a good table	2	
	Sections from References: Unit 7: 3.1 [Ref 2] Unit 8: 3.2 [Ref 2] Unit 9: 3.3, 3.3.1, 3.3.2, 3.3.3, 3.3.4 [Ref 2] Unit 10: 3.4, 3.4.1, 3.4.2, 3.4.3, 3.4.4 [Ref 2] Unit 11: 3.5, 3.5.1, 3.5.2, 3.6 [Ref 2] Unit 12: 3.7, 3.7.2 [Ref 2]				
3	**REPRESENTATIONS OF DATA**		**14**	**25**
	13	Types of diagrams	1	
	14	Graphical representation of data	3	
	15	Limitations of diagrams and graphs	1	
	16	Measures of Central Tendency:	4	
	17	Selection and limitations of an average	2	
	18	Measures of Dispersion	3	
	Sections from References: Unit 13: 4.3.2, 4.3.3, 4.3.44.3.6, 4.3.7 [Ref 2] Unit 14: 4.4.2, 4.4.3, 4.4.4 [Ref 2] Unit 15: 4.5 [Ref 2] Unit 16: 5.4,5.6, 5.7, 5.8, 5.9, 5.10 [Ref 2] Unit 17: 5.12, 5.13 [Ref 2] Unit 18: 6.5, 6.6, 6.9 [Ref 2]				
4	**CORRELATION AND REGRESSION**		**10**	**15**
	19	Correlation	2	
	20	Correlation coefficient	2	

	21	Regression	3	
	22	Lines of regression	3	

Sections from References:

Unit 19: 8.1, 8.1.1, 8.1.2, 8.3 [Ref 2]

Unit 20: 8.4 [Ref 2]

Unit 21: 9.2 [Ref 2]

Unit 22: 9.3, 9.3.1, 9.3.2, 9.3.4 [Ref 2]

		PRACTICUM		
5			30	
		Do practice problems in spreadsheet from any 5 units of the given list and one additional problem decided by the teacher-in-charge, related to the content of the course. Other units listed here may be used as demonstrations of the concepts taught in the course.		
	1	Types of data		
	2	Introduction to spreadsheet		
	3	Frequency distributions for organizing and summarizing data		
	4	Histograms		
	5	Graphs that enlighten and graphs that deceive		
	6	Measures of central tendency		
	7	Measures of dispersion		
	8	Measures of Relative Standing and Boxplots		

Sections from References:
Unit 1: 1.2 Ref [5]
Unit 2: 1.4 Ref [5]
Unit 3: 2.1 Ref [5]
Unit 4: 2.2 Ref [5]
Unit 5: 2.3 Ref [5]
Unit 6: 3.1 Ref [5]
Unit 7: 3.2 Ref [5]
Unit 8: 3.3 Ref [5]

Books and References:

1. James E. Burt_ Gerald M. Barber_ David L. Rigby - Elementary Statistics for Geographers-The Guilford Press (2009)
2. Gupta, S. C.. (2015). Fundamentals of Statistics,

Himalaya Publishing House.
3. J. Chapman McGrew Jr., Arthur J. Lembo Jr., Charles B. Monroe - An Introduction to Statistical Problem Solving in Geography, Third Edition-Waveland Press, Inc. (2014)
4. Mario F Triola, Elementary Statistics using Excel.

Mapping of COs with PSOs and POs :

	PSO 1	PSO 2	PSO 3	PSO4	PSO 5	PSO6	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	2	3	-	-	-	-	3	-	-	-	-	-
CO 2	-	2	-	-	-	-	-	-	-	-	2	-
CO 3	-	-	-	-	-	3	-	3	-	-	-	-
CO 4	1	-	-	-	2	-	-	-	-	-	-	3
CO 5	-	2	3	1	-	-	-	-	2	1	-	-
CO 6	-	-	3	-	-	2	-	-	-	2	3	-

Correlation Levels:

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate / Medium
3	Substantial /
	High

Assessment Rubrics:

- Quiz / Assignment/ Quiz/ Discussion / Seminar
- Midterm Exam
- Programming Assignments (20%)
- Final Exam (70%)

Mapping of COs to Assessment Rubrics :

	Internal Exam	Assignment	Project Evaluation	End Semester Examinations
CO 1	✓	✓		✓
CO 2	✓	✓		✓
CO 3	✓			✓
CO 4		✓		✓
CO 5		✓		✓
CO 6	✓			