	National Institute of Technology Meghalaya An Institute of National Importance	**CURRICULUM**

Programme	**Doctor of Philosophy (Ph.D.)**	Year of Regulation	**2019-20**
Department	**Humanities and Social Sciences (HS)**	Semester	**I/II**

Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
HS 702	**Statistics and Time Series Analysis**	**3**	**0**	**0**	**3**	**50**	**50**	**100**	**200**

Course Objectives	To understand the basic concepts of statistical methods in Social Science Research.	Course Outcomes	**CO1**	Ability to apply Statistical Methods in Social Science Research.
	To understand the survey methodology and survey sampling techniques.		**CO2**	Ability to understand survey methodology and apply survey sampling in research.
	To understand logistic regression and time series analysis.		**CO3**	Ability to apply logistic regression and time series analysis in Social Science Research.

SYLLABUS

No.	Content	Hours	COs
I	**Statistical Methods in Social Science Research**: Statistical Methods in Social Science Research, Introduction to Statistical Software, Randomized Response Techniques, Content Analysis, Scaling Techniques, Data Integration Techniques, Statistical Assessment of Agreement, Meta-Analysis, Cluster and Discriminant Analysis, Principal Component Analysis, Factor Analysis, Multidimensional Scaling, Social and Occupational Mobility, Social Network Analysis	**08**	**CO1**
II	**Survey Methodology and Survey Sampling:** Selecting Samples, Modes of Data Collection, Research Designs, Cross-Sectional Studies, Longitudinal Studies, Questionnaires as Tools, Reliability and Validity of Self-report Measures, Composing a Questionnaire, Guidelines for the Effective Wording of Questions, Order of Questions, Nonresponse Reduction, Interviewer Effects, Nature of Sampling, Probability Sampling, Bias in Probability Sampling, Non-probability Sampling	**10**	**CO2**
III	**Logistics Regression and Probability:** Logistic function, Multiple Explanatory Variables, Model Fitting, Rule of Ten, Maximum Likelihood Estimation, Evaluating Goodness of Fit, Coefficients, Likelihood Ratio Test, Case-control Sampling, Regression Analysis, Regression Lines, Residual Analysis, Standard Error of Estimate, Develop Trend Line, Methods of Assigning Probabilities, Structure of Probability, Marginal, Union, Joint and Conditional Probabilities, Addition and Multiplication Laws, Baye's Theorem, Discrete Distributions - Binomial Distribution, Poisson Distribution, Continuos Distributions, Normal Distribution	**08**	**CO3**
IV	**Time Series Analysis:** Key Concepts, Stochastic Processes, The Phenomenon of Spurious Regression, Tests of Stationarity, The Unit Root Test, Transforming Nonstationary Time Series, Cointegration, Approaches to Economic Forecasting, AR, MA, and ARIMA Modeling of Time Series Data, The Box-Jenkins (BJ) Methodology, Identification, Estimation of the ARIMA Model, Diagnostic Checking, Forecasting, Further Aspects of the BJ Methodology, Vector Autoregression (VAR), Measuring Volatility in Financial Time Series	**10**	**CO3**
Total Hours		**36**	

Essential Readings:

1. Hubert M. Blalock, "Social Statistics", McGraw-Hill, 1979.
2. Alan Agresti and Barbara Finlay, "Statistical Methods for the Social Sciences", Prentice Hall, 3rd Edition, 1997.
3. S. P. Mukherjee, Bikas K. Sinha and AsisChatterjee, "Statistical Methods in Social Science Research", Springer Singapore, 2018.

Supplementary Readings:

1. Jeff Evans, John Irvine Ian Miles, "Demystifying Social Statistics", Pluto Press, 1st Edition, 1979.
2. David S. Moore and George P. McCabe, "Introduction to the Practice of Statistics", W. H. Freman & Company, 5th Edition, 2005.
3. W. S. Torgerson, "Theory and Method of Scaling", Wiley, 1958.
4. Arlene Fink and JaquelineKosecoff, "How to Conduct Surveys: A Step-by-step Guide", Sage Publications, 1998.
5. Seymour Sudman and Norman N. Bradburn, "Asking Questions: A Practical Guide to Questionnaire Design", Jossey-Bass, 1982.
6. William G. Cochran, "Sampling Techniques", Wiley, 3rd Edition, 1977.