Course Type	Course Code	Name of the Course	L	T	P	Credits
OE	HSO 402	**Computational Psychology**	3	0	0	9

Course Objective
Equip students with the knowledge and skills to utilize computational methods for understanding and modeling psychological processes
Learning Outcomes
1. Understand fundamental concepts and methods in computational psychology, including modeling techniques and data analysis approaches.
2. Apply computational tools and techniques to analyze psychological phenomena.
3. Critically evaluate the strengths and limitations of computational approaches in explaining and predicting human behavior and cognition.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	*Foundations* Introduction to modeling in Psychology, Nature of Psychological Data, Issues of Measurement	6	Understand role of modeling in psychology, nature of psychological and understand principles of measurement
2	*Statistical Modeling* Simple linear regression, Multiple linear regression, Logistic regression	9	Understanding and application of various statistical modeling techniques used in psychology
3	*Parameter Estimation* Discrepancy function, Ordinary Least Squares (OLS), Maximum Likelihood Estimation (MLE). Methods of model selection.	9	Understanding the workings of common parameter estimation techniques – OLS and MLE along with application and methods to choose best model
4	*Bayesian Methods* Concepts in Bayesian Inference, Analytical Methods, Markov Chain Monte Carlo (MCMC) methods, Applications and Model evaluation	9	Awareness about Bayesian Inference principles, analyze data using analytical methods and MCMC, and infer with discrete and continuous distributions and model evaluation
5	*Models in Psychology* Neural Networks, Response Time Modeling, Modeling of cognitive processes	9	Appreciate application of computation models in common psychological processes
	Total Lecture Hours	42	

Text Books:

1. Farrell, S. & Lewandowsky, S. (2018). *Computational Modeling of Cognition and Behavior*. Cambridge: CUP

2. Cohen, M.X. (2023). *Modern Statistics: Intuition, Math, Python, R*. SincXpress.

Reference Books:
1. Lee. M. & Wagenmakers, E-J. (2014). *Bayesian Cognitive Modeling*. CUP
2. Sun, R. (Ed.) (2008). *The Cambridge Handbook of Computational Psychology*. CUP
3. Anderson, B. (2014). *Computational Neuroscience and Cognitive Modelling*. SAGE