MSC (CA&IT) - Semester: III

(Effective from year 2024-25)

Course Code:	CAIT-306-B (IKS)	**Course Title:**	Nyaya Sastras for Mathematical Logic
Course Credits:	**02**	**Hour of Teaching/Week:**	**02**
Internal Assessment Marks:	**25**	**External Exam Marks:**	**25**
Exam Duration	**1Hr**		

Unit	Contents
1	Overview of Nyaya Shastra and its relevance in the modern context. Propositional Logic: Syntax, semantics, and truth tables - Predicate Logic. Quantifiers, variables, and logical connectives. Inference Rules and Proofs in Mathematical Logic. Introduction to Computer Logic,Boolean Algebra and Logic Gates Combinational Circuits and their applications in Nyaya Shastra. Sequential Circuits and their relevance in Nyaya Shastra methodologies.
2.	Overview of Nyaya Shastra principles and methodologies. Formal analysis of Nyaya Sha syllogisms and reasoning Logical fallacies and error detection in Nyaya Shastra texts Symbolic representation and analysis of Nyaya Shastra arguments. Modal operators: Possibility, necessity, and contingency in Nyaya Shastra Application of Modal Logic in analyzing Nyaya Shastra concepts (1 hour). Formal representation of Nyaya Shastra modal arguments. Comparative study of Nyaya Shastra with Western philosophical logic. Examining the intersections and divergences between Nyaya Shastra and contemporary logic.

References:

1. न्यायसूत्रम्, वात्स्यायनभाष्यसहहतम्– महर्षगौतमः, वात्स्यायनश्च.
2. तत्सवहहन्तामणौपराथाानुमानप्रकरणम्– गंगेशोपाध्यायः
3. Mathematical Logic by Stephen Cole Kleene
4. Introduction to Logic by Irving M. Copi and Carl Cohen
5. A Concise Introduction to Mathematical Logic by Wolfgang Rautenberg
6. Logic in Computer Science: Modelling and Reasoning about Systems by Michael Huth and Mark Ryan
7. Computability and Logic by George S. Boolos, John P. Burgess, and Richard C. Jeffrey
8. Mathematical Logic for Computer Science by Mordechai Ben-Ari
9. Handbook of Practical Logic and Automated Reasoning by John Harrison