VAC Courses for Semester 3 and 4

Subject: Computer Science

IKS (VAC) – Semester 3

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. तत्सवहहन्तामणौपराथा◌ानुमानप्रकरणम्– 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

VAC for Semester - 4

Course Code:	CAIT-406-A	Course Title:	Digital Enhancement
Course Credits:	02	Hour of Teaching/Week:	02
Internal Assessment Marks:	25	External Exam Marks:	25
Exam Duration	1Hr		

Unit	Contents
1.	Digital Inclusion and Digital Empowerment Needs and Challenges, Vision of Digital India : Digilocker, E-hospitals, E-pathshala, BHIM, Swayam Portal, e-Kranti (Electronic Delivery of Services), e-health Campaign, Digital Signature. Public utility portals of Govt. of India such as RTI, Health, Finance, Education, SSI-ID. Communication and Collaboration in Cyber Space: Electronic Communication: e-mail, blogs, social media tools Collaborative Digital Platforms, Tools and platform for online learning. Collaboration using file sharing, messaging, video conferencing
2.	Digital Safety Measurement Tools: Online Security and privacy, Threats to the cyber world, various forms of viruses, Data breach and cyber attacks.Overview of block chain technology Security initiatives by government of India. Ethical Issues in Digital World: Misuse of Personal Information, Mis-Information and Deep fakes, Lack of oversight and responsibility. Uses and misuses of Artificial Intelligence

References:

1. Understanding digital literacy's: A Practical Introduction by Rodney Jones and Christofer Hafner
2. https:/digitalindia.gov.in
3. https:/digilocker.gov.in
4. https:/cybercrime.gov.in
5. https:/cybersafeindia.gov.in
1. https:/meity.gov.in and other online resourses

VAC for Semester - 4

Course Code:	CAIT-406-B	Course Title:	Cyber Security
Course Credits:	02	Hour of Teaching/Week:	02
Internal Assessment Marks:	25	External Exam Marks:	25
Exam Duration	1Hr		

Unit	Contents
1.	Defining Cyberspace and Overview of Computer and Web-technology, Architecture of cyberspace, Communication and web technology, Internet, World wide web, Advent of internet, Internet infrastructure for data transfer and governance, Internet Society, Regulation of cyberspace, Concept of cyber security, Issues and challenges of cyber security.Classification of cyber crimes, Common cyber crimes- cyber crime targeting computers and mobiles, cyber crime against women and children, financial frauds, social engineering attacks, malware and ransomware attacks, zero day and zero click attacks. Legal perspective of cyber crime, IT Act 2000 and its amendments.
2.	Introduction to Social networks. Types of Social media, Social media platforms Security , issues related to social media, Flagging and reporting of inappropriate content, Laws regarding posting of inappropriate content, Best practices for the use of Social media. Introduction to digital payments, Components of digital payment and stake holders, Modes of digital payments- Banking Cards, Unified Payment Interface (UPI), e-Wallets, Unstructured Supplementary Service Data (USSD), Aadhar enabled payments, Digital payments related common frauds and preventive measures. RBI guidelines on digital payments and customer protection in unauthorized banking transactions

References:

1. Cyber Crime Impact in the New Millennium, by R. C Mishra , Auther Press. Edition 2010.
2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure and Nina Godbole, Wiley India Pvt. Ltd. (First Edition, 2011)
3. Security in the Digital Age: Social Media Security Threats and Vulnerabilities by Henry A. Oliver, Create Space Independent Publishing Platform. (Pearson , 13th November, 2001)
4. Electronic Commerce by Elias M. Awad, Prentice Hall of India Pvt Ltd.
5. Cyber Laws: Intellectual Property & E-Commerce Security by Kumar K, Dominant Publishers.
6. Network Security Bible, Eric Cole, Ronald Krutz, James W. Conley, 2nd Edition, Wiley India Pvt. Ltd.