Department of Computer Science
(Prof. Rajendra Singh (Rajju Bhaiya) University, Prayagraj)

(2024-2025 onwards)

COURSE STRUCTURE WITH CREDITS DISTRIBUTION

VAC Course: DIGITAL AND TECHNOLOGICAL SOLUTIONS

Programme: Undergraduate	Year: 2	Semester: IIIRD
Offered by : Department of Computer Science		
Course Code: S030301T	Course: DIGITAL AND TECHNOLOGICAL SOLUTIONS	
Credit: 2	Value Added Course (Elective Course)	

Course Outcome: after completion of the course, student will be able to:
CO1: Gain importance of digital paradigm and digital technology.
CO2: Gain knowledge of communication and computer networking methods
CO3: Have familiarization with e-governance and Digital India initiatives.
CO4: Understand latest advanced technology.
CO5: Build basic knowledge of artificial intelligence and machine learning.

Unit	Course Contents
1	**Introduction to Digital Systems:** History of computer, evolution and significance of digital technology, components and applications, software and its types, operating system, Problem Solving: Algorithms and Flowcharts, benefits and challenges, role of technology for the sustainable environment.
2	**Communication and Networking**: Internet, WWW, E-mail, Web browser, Search engine, social networking, Transmission media, Types of area networks: LAN, MAN, WAN, Protocols.
3	**Application Suite:** MS office: MS Word, MS PowerPoint, MS Excel, Libre office: Word processing, Presentation, Spreadsheets.
4	**Digital India and E-governance:** Initiatives and infrastructure, E-commerce & Digital Marketing basic Concepts, Digital financial tools: Unified Payment Interface, Aadhaar Enabled Payment System, USSD, Credit / Debit Cards, e-Wallets, OTP, NEFT, RTGS, IMPS. Importance Portals: Digilocker, NAD, ABC, E-Samarth,
5	**Cyber Security:** Need and Goal of Cyber Security, Securing PC, Securing Email and Social Media Accounts, IT Act 2000, Malwares, Firewall, Software license, Netiquettes, Hacking.
6	**Artificial Intelligence:** History of Artificial Intelligence, Goals and Ethics of AI, Advantages and disadvantages, application and types of AI, Future impact of AI in different sectors, machine learning, Neural networks.
7	**Advanced Technology:** Internet of Things (IoT), Big Data Analytics, Cloud Computing: IaaS, PaaS, SaaS, Virtual Reality, Blockchain Technology, 3D Printing.
8	**Robotics:** Process Automation, Application of Robots in various fields, Sensors and controllers, Robotics Components: Micro-controller and microprocessors (Arduino, Raspberry Pi), Humanoid robots, Flying robots: Drone technology, application of drones.

Suggested Books:
- R. Thareja, "Computer Fundamentals and Programming in C," New Delhi, India: Oxford University Press, 2021.
- R. P. Jain and S. K. Jain, "Introduction to Information Technology," New Delhi, India: Firewall Media, 2015.
- K. D. Tripathi, "Social Media: Concepts, Practices and Trends," New Delhi, India: PHI Learning Pvt. Ltd., 2020.
- N. K. Venkateswaran, "Cyber Security and Digital Forensics: A Practical Approach," Boca Raton, FL: CRC Press, 2018.
- S. Gandhi and R. Sharma, "Digital Privacy and Security," New Delhi, India: Springer Nature Singapore Pte Ltd, 2021.
- P. N. Thomas and A. Raghuramaraju, "Digital India: Understanding Information, Communication and Social Change," New Delhi, India: Sage Publications India Pvt Ltd, 2017.
- Blockchain Basics: A Non-technical Introduction in 25 steps, by Daniel Drescher, 1st Edition.
- Essentials of Cloud Computing by K. Chandrashekaran, CRC press, 2014
- Introduction to Robotics: Mechanics and Control by John J Craig
- Basics of Unmanned Aerial Vehicles by Garvit Pandya