Course Framework

Of

Four Year Under Graduate Programme (FYUGP)

Of

B.Sc. (Hons.) Programme in Computer Application and Cyber Security

(W.e.f. from Academic Year 2025-26)

Department Of Cyber Defence
Jharkhand Raksha Shakti University
Meur's Road SKIPA Premises, Ranchi

1. Introduction of the Programme:

Computer Application and Cyber Security is a multidisciplinary field that plays a critical role in safeguarding digital infrastructure, securing data, and maintaining the integrity of information systems. By combining the principles of statistics, mathematics, computer science, information technology, cybersecurity, and data analytics, it effectively addresses the growing challenges of the digital world.

The B.Sc. (Hons.) Programme in Computer Application and Cyber Security (Four-Year) is designed to keep students abreast of the latest developments in the field. The curriculum not only provides a strong theoretical foundation but also offers hands-on training and exposure to the most recent tools and technologies in areas such as Network Security, Operating Systems and System Administration, Programming and Software Development, Database Management, Ethical Hacking and Penetration Testing, Cyber Law and Digital Ethics, Cloud Computing and Virtualization, and Artificial Intelligence and Machine Learning in Cybersecurity.

This comprehensive curriculum prepares graduates to effectively detect, prevent, and respond to cyber threats. With an increasing dependence on digital platforms across various sectors, including finance, healthcare, government, and education, the demand for professionals who can secure and manage digital systems has never been greater. Graduates of this programme are in high demand and well-suited for roles such as Cybersecurity Analyst, Network Administrator, Information Security Officer, Software Developer, IT Consultant, and others.

Career opportunities exist in both public and private sectors, including IT companies, cybersecurity firms, government agencies, defense organizations, and multinational corporations.

A degree in Computer Application and Cyber Security also prepares students for leadership roles by instilling strong analytical, problem-solving, and decision-making skills. As the digital landscape continues to evolve, professionals in this field are essential for creating secure digital environments and ensuring business continuity.

2. Programme Objectives

Programme objectives describe the skills, knowledge, and behaviours that students acquire as they progress through the programme. The following programme objectives are endorsed for the Bachelor's (Hons.) Programme in Computer Application and Cyber Security (FYUGP):

- **Basic and Discipline-specific knowledge**: To apply the knowledge of mathematics, science, computer fundamentals, and core computing concepts to solve complex problems

in Computer Science and Cyber Security, including areas such as software development, system architecture, network security, data analytics, and cyber security, digital forensics, etc.

- **Problem Analysis**: To identify, define, and systematically analyze complex computing problems by applying principles of mathematics, computing science, and critical reasoning, enabling effective problem-solving in diverse areas such as algorithms, system security, data management, and software engineering.

- **Modern tool usage**: To select, adapt, and apply appropriate modern computing tools, platforms, and techniques to model, design, implement, and evaluate solutions in computer applications and cybersecurity, with an informed understanding of their capabilities, practical uses, and limitations in real-world environments.

- **Ethics**: To apply ethical principles and uphold professional integrity in the practice of computing and cybersecurity, with a strong emphasis on data privacy, responsible disclosure, intellectual property rights, and adherence to relevant cyber laws, regulations, and industry standards.

- **Effective Communication**: To communicate technical concepts and solutions effectively through written, oral, and visual forms, including project documentation, technical reports, formal presentations, and digital communication in both academic and professional environments.

- **Societal Impact and Legal Context**: To evaluate the impact of computer applications and cybersecurity on individuals, organizations, and society at large, including its role in law enforcement, digital governance, and the criminal justice system, thereby fostering a sense of civic duty and legal awareness.

- **Individual and team work**: To work efficiently as an individual and as a member or leader in diverse and multidisciplinary teams, demonstrating responsibility, collaboration, adaptability, and leadership in dynamic work environments.

- **Lifelong learning**: To recognise the importance of lifelong learning and actively engage in continuous personal and professional development to remain updated with emerging tools, trends, and technologies in computer applications, cybersecurity, and the broader computing discipline.

- **Design/ Develop Research-based solution**: To design and develop research-based, innovative solutions to problems in computer science and cybersecurity using systematic methodologies, critical thinking, data analysis, and experimental approaches.

3. Programme Outcomes

Programme outcomes are defined by the National Assessment and Accreditation Council (NAAC) to ensure that educational programmes meet specific quality standards. The National Assessment and Accreditation Council (NAAC) designs these outcomes to measure students' achievements at the end of a programme, with a focus on the knowledge, skills, and attitudes they acquire. Outcomes for students include attaining profound expertise in their discipline, acquiring the ability to function in multidisciplinary domains, exercising research intelligence in investigations and innovations, and learning ethical principles.

The POs for B.Sc. (Hons.) Programme in Computer Application and Cyber Security (FYUGP) are as follows:

PO-1	To acquire a thorough understanding of the fundamental and advanced concepts across various domains of computer Science and Cyber Security.
PO-2	To Build a Strong Foundation in Computing Principles
PO-3	To Develop Analytical and Problem-Solving Skills
PO-4	To cultivate evidence-based decision-making abilities by integrating mathematical foundations with computer applications and security.
PO-5	To prepare professionally skilled Computer Application and Cyber Security graduates to serve in various cyber security agencies and society.
PO-6	Design and develop research-based, innovative solutions to address contemporary challenges in the field of Computer Application and Cyber Security

Course Structure

FIRST SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C101	Programming for Problem Solving using C/C++	CORE	3	0	1	25	75	100	4
FYCS - AC102	Digital System Design	AC	3	0	1	25	75	100	4
FYCS - MDC103	Multi-Disciplinary Course (from POOL-1)	MDC	3	0	0	25	50	75	3
FYCS - SEC104	Web Design Fundamentals	SEC	2	0	1	15	60	75	3
FYCS - IKS105	Foundations of Indian Knowledge Systems	IKS	2	0	0	-	50	50	2
FYCS - VAC106	Universal Human Values-I	VAC	2	0	0	-	50	50	2
FYCS - AEC107	Hindi	AEC	2	0	0	-	50	50	2
			Total Credit			Total Marks		**500**	**20**

SECOND SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C201	Data Structure	CORE	3	0	1	25	75	100	4
FYCS – AC202	Operating System	AC	3	0	1	25	75	100	4
FYCS – MDC203	Multi-Disciplinary Course (from POOL-1)	MDC	3	0	0	25	50	75	3
FYCS – SEC204	Cyber Security & Ethical Hacking	SEC	2	0	1	15	60	75	3
FYCS – IKS205	Social Awareness and Civic Responsibility	IKS	2	0	0	-	50	50	2
FYCS – VAC206	Universal Human Values-II	VAC	2	0	0	-	50	50	2
FYCS – AEC207	English Communication and Professional Communication Skills	AEC	2	0	0	-	50	50	2
			Total Credit			Total Marks		**500**	**20**

THIRD SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C301	Data Communication & Computer Network	CORE	3	0	1	25	75	100	4
FYCS-C302	Database Management System	CORE	3	0	1	25	75	100	4
FYCS – ELC303	Elective Course (from POOL-2)	ELC	3	0	1	25	75	100	4
FYCS – MDC304	Multi-Disciplinary Course (from POOL-1)	MDC	3	0	0	25	50	75	3
FYCS – SEC305	Computational Thinking through MATLAB and Python	SEC	2	0	1	15	60	75	3
FYCS – AEC306	Analytical and Decision-Making Skills	AEC	2	0	0	-	50	50	2
			Total Credit			Total Marks		**500**	**20**

FOURTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C401	Information Security and Cyber Law	CORE	3	0	1	25	75	100	4
FYCS-C402	Object Oriented Programming	CORE	3	0	1	25	75	100	4
FYCS – C403	Theory of Computation	CORE	4	0	0	25	75	100	4
FYCS – ELC404	Elective Course (from POOL-2)	ELC	3	0	1	25	75	100	4
FYCS – VAC405	Universal Human Values-III	VAC	2	0	0	-	50	50	2
FYCS – AEC406	Computational Thinking	AEC	2	0	0	-	50	50	2
			Total Credit			Total Marks		**500**	**20**

FIFTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C501	Introduction to Artificial Intelligence	CORE	3	0	1	25	75	100	4
FYCS-C502	Cryptography and Network Security	CORE	3	0	1	25	75	100	4
FYCS-C503	Design and Analysis of Algorithms	CORE	3	0	1	25	75	100	4
FYCS-C504	Machine Learning	CORE	3	0	1	25	75	100	4
FYCS – ELC505	Elective Course (from POOL-2)	ELC	3	0	1	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

SIXTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C601	Software Engineering	CORE	3	0	1	25	75	100	4
FYCS-C602	Information and Coding Theory	CORE	3	0	1	25	75	100	4
FYCS-C603	Cloud Computing	CORE	3	0	1	25	75	100	4
FYCS-C604	Data Mining	CORE	3	0	1	25	75	100	4
FYCS – ELC605	Elective Course (from POOL-2)	ELC	0	0	4	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

L: Lecture; T: Tutorial; P: Practical; MS: Mid-Semester; ES: End-Semester

Pathway 1 – Honours with Research

Specialization I: Cyber Security

SEVENTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C701	Research Methodology	CORE	4	0	0	25	75	100	4
FYCS-C702	Advanced Cryptography and Security Protocols	CORE	3	0	1	25	75	100	4
FYCS-C703	AI and Machine Learning for Cyber Defence	CORE	3	0	1	25	75	100	4
FYCS-ELC704	Elective Course (from POOL-3A)	ELC	3	0	1	25	75	100	4
FYCS-RC705	Research Proposal – Planning and Techniques	RC	4	0	0	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

EIGHTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS- C801	Biometric Security and Authentication Systems	CORE	3	0	1	25	75	100	4
FYCS-C802	Cryptanalysis and Attack Modeling	CORE	3	0	1	25	75	100	4
FYCS-ELC803	Elective Course (from POOL-3A)	ELC	3	0	1	25	75	100	4
FYCS-RC804	Research Project/Dissertation	RC	0	0	8	-	200	200	8
			Total Credit			Total Marks		**500**	**20**

L: Lecture; T: Tutorial; P: Practical; MS: Mid-Semester; ES: End-Semester

Specialization II: Network Security

SEVENTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C701	Research Methodology	CORE	4	0	0	25	75	100	4
FYCS-C702	Advanced Cryptography and Security	CORE	3	0	1	25	75	100	4
FYCS-C703	Advanced Network Protocols and Security	CORE	3	0	1	25	75	100	4
FYCS-ELC704	Elective Course (from POOL-3B)	ELC	3	0	1	25	75	100	4
FYCS-RC705	Research Proposal – Planning and Techniques	RC	4	0	0	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

EIGHTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS- C801	Mobile and Wireless Security	CORE	3	0	1	25	75	100	4
FYCS-C802	Cloud Security	CORE	3	0	1	25	75	100	4
FYCS-ELC803	Elective Course (from POOL-3B)	ELC	3	0	1	25	75	100	4
FYCS-RC804	Research Project/Dissertation	RC	0	0	8	-	200	200	8
			Total Credit			Total Marks		**500**	**20**

L: Lecture; T: Tutorial; P: Practical; MS: Mid-Semester; ES: End-Semester

Specialization III: Machine Learning

SEVENTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C701	Research Methodology	CORE	4	0	0	25	75	100	4
FYCS-C702	Machine Learning for Cybersecurity	CORE	3	0	1	25	75	100	4
FYCS-C703	Natural Language Processing	CORE	3	0	1	25	75	100	4
FYCS-ELC704	Elective Course (from POOL-3C)	ELC	3	0	1	25	75	100	4
FYCS-RC705	Research Proposal – Planning and Techniques	RC	4	0	0	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

EIGHTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS- C801	Computer Vision and Image Intelligence	CORE	3	0	1	25	75	100	4
FYCS-C802	Deep Learning	CORE	3	0	1	25	75	100	4
FYCS-ELC803	Elective Course (from POOL-3C)	ELC	3	0	1	25	75	100	4
FYCS-RC804	Research Project/Dissertation	RC	0	0	8	-	200	200	8
			Total Credit			Total Marks		**500**	**20**

L: Lecture; T: Tutorial; P: Practical; MS: Mid-Semester; ES: End-Semester

Specialization IV: Blockchain Technology

SEVENTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C701	Research Methodology	CORE	4	0	0	25	75	100	4
FYCS-C702	Advanced Cryptography and Security	CORE	3	0	1	25	75	100	4
FYCS-C703	Introduction to Blockchain Technology	CORE	3	0	1	25	75	100	4
FYCS-ELC704	Elective Course (from POOL-3D)	ELC	3	0	1	25	75	100	4
FYCS-RC705	Research Proposal – Planning and Techniques	RC	4	0	0	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

EIGHTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS- C801	Blockchain and Cryptocurrency Technologies	CORE	3	0	1	25	75	100	4
FYCS-C802	Cryptography for Blockchain	CORE	3	0	1	25	75	100	4
FYCS-ELC803	Elective Course (from POOL-3D)	ELC	3	0	1	25	75	100	4
FYCS-RC804	Research Project/Dissertation	RC	0	0	8	-	200	200	8
			Total Credit			Total Marks		**500**	**20**

L: Lecture; T: Tutorial; P: Practical; MS: Mid-Semester; ES: End-Semester

Pathway 2- Honours

Specialization I: Cyber Security

SEVENTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C701	Research Methodology	CORE	4	0	0	25	75	100	4
FYCS-C702	Advanced Cryptography and Security Protocols	CORE	3	0	1	25	75	100	4
FYCS-C703	AI in Cyber Security	CORE	3	0	1	25	75	100	4
FYCS-ELC704	Elective Course (from POOL-4A)	ELC	3	0	1	25	75	100	4
FYCS-RC705	Research Proposal – Planning and Techniques	RC	4	0	0	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

EIGHTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS- C801	Database Security	CORE	3	0	1	25	75	100	4
FYCS-C802	Cloud Security	CORE	3	0	1	25	75	100	4
FYCS-ELC803	Elective Course (from POOL-4A)	ELC	3	0	1	25	75	100	4
FYCS-RC804	Project/Dissertation	RC	0	0	4	25	75	100	4
FYCS- RC805	Ethics in Research	RC	4	0	0	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

L: Lecture; T: Tutorial; P: Practical; MS: Mid-Semester; ES: End-Semester

Specialization II: Network Security

SEVENTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C701	Research Methodology	CORE	4	0	0	25	75	100	4
FYCS-C702	Advanced Cryptography and Security	CORE	3	0	1	25	75	100	4
FYCS-C703	Mobile and Wireless Security	CORE	3	0	1	25	75	100	4
FYCS-ELC704	Elective Course (from POOL-4B)	ELC	3	0	1	25	75	100	4
FYCS-RC705	Research Proposal – Planning and Techniques	RC	4	0	0	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

EIGHTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS- C801	Applied Network Forensic	CORE	3	0	1	25	75	100	4
FYCS-C802	Cloud Security	CORE	3	0	1	25	75	100	4
FYCS-ELC803	Elective Course (from POOL-4B)	ELC	3	0	1	25	75	100	4
FYCS-RC804	Project/Dissertation	RC	0	0	4	25	75	100	4
FYCS- RC805	Ethics in Research	RC	4	0	0	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

Specialization III: Machine Learning

SEVENTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C701	Research Methodology	CORE	4	0	0	25	75	100	4
FYCS-C702	Bigdata Analytics	CORE	3	0	1	25	75	100	4
FYCS-C703	Natural Language Processing	CORE	3	0	1	25	75	100	4
FYCS-ELC704	Elective Course (from POOL-4C)	ELC	3	0	1	25	75	100	4
FYCS-RC705	Research Proposal – Planning and Techniques	RC	4	0	0	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

EIGHTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS- C801	Deep Learning	CORE	3	0	1	25	75	100	4
FYCS-C802	Introduction to Human Computer Interactions	CORE	3	0	1	25	75	100	4
FYCS-ELC803	Elective Course (from POOL-4C)	ELC	3	0	1	25	75	100	4
FYCS-RC804	Project/Dissertation	RC	0	0	4	25	75	100	4
FYCS- RC805	Ethics in Research	RC	4	0	0	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

L: Lecture; T: Tutorial; P: Practical; MS: Mid-Semester; ES: End-Semester

Specialization IV: Blockchain Technology

SEVENTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C701	Research Methodology	CORE	4	0	0	25	75	100	4
FYCS-C702	Advanced Cryptography and Security	CORE	3	0	1	25	75	100	4
FYCS-C703	Introduction to Blockchain Technology	CORE	3	0	1	25	75	100	4
FYCS-ELC704	Elective Course (from POOL-4D)	ELC	3	0	1	25	75	100	4
FYCS-RC705	Research Proposal – Planning and Techniques	RC	4	0	0	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

EIGHTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS- C801	Blockchain for IoT and Edge Computing	CORE	3	0	1	25	75	100	4
FYCS-C802	Blockchain and Cryptocurrency Technologies	CORE	3	0	1	25	75	100	4
FYCS-ELC803	Elective Course (from POOL-4D)	ELC	3	0	1	25	75	100	4
FYCS-RC804	Project/Dissertation	RC	0	0	4	25	75	100	4
FYCS- RC805	Ethics in Research	RC	4	0	0	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

Pathway 3 Post Graduate Diploma

Specialization I: Cyber Security

SEVENTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C701	Research Methodology	CORE	4	0	0	25	75	100	4
FYCS-C702	Advance Cryptography and Security	CORE	3	0	1	25	75	100	4
FYCS-C703	Mobile and Wireless Security	CORE	3	0	1	25	75	100	4
FYCS-ELC704	Elective Course (from POOL-5A)	ELC	3	0	1	25	75	100	4
FYCS-JOC705	Advance Web Development	JOC	3	0	1	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

EIGHTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS- C801	Biometric Security	CORE	3	0	1	25	75	100	4
FYCS-C802	Database Security	CORE	3	0	1	25	75	100	4
FYCS-ELC803	Elective Course (from POOL-5A)	ELC	3	0	1	25	75	100	4
FYCS-JOC804	AI in Cybersecurity	JOC	3	0	1	25	75	100	4
FYCS- JOC805	Project/ Dissertation	JOC	0	0	4	-	100	100	4
			Total Credit			Total Marks		**500**	**20**

L: Lecture; T: Tutorial; P: Practical; MS: Mid-Semester; ES: End-Semester

Specialization II: Network Security

SEVENTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C701	Research Methodology	CORE	4	0	0	25	75	100	4
FYCS-C702	Advance Cryptography and Security	CORE	3	0	1	25	75	100	4
FYCS-C703	Wireless sensor network	CORE	3	0	1	25	75	100	4
FYCS-ELC704	Elective Course (from POOL-5B)	ELC	3	0	1	25	75	100	4
FYCS-JOC705	Advance Network Protocols	JOC	3	0	1	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

EIGHTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS- C801	Cloud Security	CORE	3	0	1	25	75	100	4
FYCS-C802	Database Security	CORE	3	0	1	25	75	100	4
FYCS-ELC803	Elective Course (from POOL-5B)	ELC	3	0	1	25	75	100	4
FYCS-JOC804	Anomaly Detection in Network Traffic	JOC	3	0	1	25	75	100	4
FYCS- JOC805	Project/ Dissertation	JOC	0	0	4	-	100	100	4
			Total Credit			Total Marks		**500**	**20**

Specialization III: Machine Learning

SEVENTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C701	Research Methodology	CORE	4	0	0	25	75	100	4
FYCS-C702	Advance Cryptography and Security	CORE	3	0	1	25	75	100	4
FYCS-C703	Data Science	CORE	3	0	1	25	75	100	4
FYCS-ELC704	Elective Course (from POOL-5C)	ELC	3	0	1	25	75	100	4
FYCS-JOC705	Introduction to Big Data	JOC	3	0	1	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

EIGHTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS- C801	Natural Language Processing	CORE	3	0	1	25	75	100	4
FYCS-C802	Deep Learning	CORE	3	0	1	25	75	100	4
FYCS-ELC803	Elective Course (from POOL-5C)	ELC	3	0	1	25	75	100	4
FYCS-JOC804	Data Analytics	JOC	3	0	1	25	75	100	4
FYCS- JOC805	Project/ Dissertation	JOC	0	0	4	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

L: Lecture; T: Tutorial; P: Practical; MS: Mid-Semester; ES: End-Semester

Specialization IV: Blockchain Technology

SEVENTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS-C701	Research Methodology	CORE	4	0	0	25	75	100	4
FYCS-C702	Advanced Cryptography and Security	CORE	3	0	1	25	75	100	4
FYCS-C703	Introduction to Blockchain	CORE	3	0	1	25	75	100	4
FYCS-ELC704	Elective Course (from POOL-5D)	ELC	3	0	1	25	75	100	4
FYCS-JOC705	Blockchain Protocols	JOC	3	0	1	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

EIGHTH SEMESTER

Course Code	Course Title	Nature of Course	Teaching Scheme			Examination Scheme			
			L	T	P	MS	ES	Total Marks	Total Credits
FYCS- C801	Blockchain and Cryptocurrency	CORE	3	0	1	25	75	100	4
FYCS-C802	Cryptography for Blockchain	CORE	3	0	1	25	75	100	4
FYCS-ELC803	Elective Course (from POOL-5D)	ELC	3	0	1	25	75	100	4
FYCS-JOC804	Blockchain with Python and Web3.py	JOC	3	0	1	25	75	100	4
FYCS- JOC805	Project/ Dissertation	JOC	0	0	4	25	75	100	4
			Total Credit			Total Marks		**500**	**20**

➢ LIST OF MULTIDISCIPLINARY COURSES (MDC)- (POOL-1)

S.No.	Course Nature and Code	Course Name	Theory/ Practical	Credit
1	MDC - 1	Mathematics	T	3
2	MDC - 2	Mathematical Foundations of Probability and Statistics	T	3
3	MDC - 3	Discrete Mathematics	T	3
4	MDC - 4	Statistical Methods for Data Science	T	3

➢ LIST OF ELECTIVE COURSES FOR SECOND AND THIRD YEAR(AEC)

(POOL-2)

S.No.	Course Nature and Code	Course Name	Theory/ Practical	Credit
1	MDC - 1	Computer Architecture	T+PR (3+1)	4
2	MDC - 2	Introduction to Digital Forensic	T+PR (3+1)	4
3	MDC - 3	Internet of Things	T+PR (3+1)	4
4	MDC - 4	Software Testing	T+PR (3+1)	4
5	MDC - 5	Project/ Dissertation*	PR (4)	4

*** - Compulsory in 6th Semester**

➢ LIST OF ELECTIVE COURSES FOR FOURTH YEAR (ELC)

❖ POOL-3A

S.No.	Course Nature and Code	Course Name	Theory/ Practical	Credit
1	ELC - 1	Natural Language Processing for Threat Intelligence	T+PR (3+1)	4
2	ELC - 2	Mobile and Wireless Security	T+PR (3+1)	4
3	ELC - 3	Swayam Course	T+PR (3+1)	4

❖ POOL-3B

S.No.	Course Nature and Code	Course Name	Theory/ Practical	Credit
1	ELC - 1	Database Security	T+PR (3+1)	4
2	ELC - 2	Applied Network Forensics	T+PR (3+1)	4
3	ELC - 3	Swayam Course	T+PR (3+1)	4

❖ POOL-3C

S.No.	Course Nature and Code	Course Name	Theory/ Practical	Credit
1	ELC - 1	Data Science	T+PR (3+1)	4
2	ELC - 2	ML for Healthcare and Biomedical Data	T+PR (3+1)	4
3	ELC - 3	Swayam Course	T+PR (3+1)	4

❖ POOL-3D

S.No.	Course Nature and Code	Course Name	Theory/ Practical	Credit
1	ELC - 1	Consensus Algorithms in Blockchain	T+PR (3+1)	4
2	ELC - 2	Blockchain Security and Attack Vectors	T+PR (3+1)	4
3	ELC - 3	Swayam Course	T+PR (3+1)	4

❖ POOL-4A

S.No.	Course Nature and Code	Course Name	Theory/ Practical	Credit
1	ELC - 1	Cyber Threat Intelligence and Incident Response	T+PR (3+1)	4
2	ELC - 2	Predictive Cyber Risk Analysis	T+PR (3+1)	4
3	ELC - 3	Swayam Course	T+PR (3+1)	4

❖ POOL-4B

S.No.	Course Nature and Code	Course Name	Theory/ Practical	Credit
1	ELC - 1	Network Traffic Analytics	T+PR (3+1)	4
2	ELC - 2	Database Security	T+PR (3+1)	4
3	ELC - 3	Swayam Course	T+PR (3+1)	4

❖ POOL-4C

S.No.	Course Nature and Code	Course Name	Theory/ Practical	Credit
1	ELC - 1	Data Science	T+PR (3+1)	4
2	ELC - 2	Optimization Techniques for Machine Learning	T+PR (3+1)	4
3	ELC - 3	Swayam Course	T+PR (3+1)	4

❖ POOL-4D

S.No.	Course Nature and Code	Course Name	Theory/ Practical	Credit
1	ELC - 1	Advance Network Security	T+PR (3+1)	4
2	ELC - 2	Blockchain Security and Attack Vectors	T+PR (3+1)	4
3	ELC - 3	Swayam Course	T+PR (3+1)	4

❖ POOL-5A

S.No.	Course Nature and Code	Course Name	Theory/ Practical	Credit
1	ELC – 1	Cyber Security and Risk Management and Competence	T+PR (3+1)	4
2	ELC – 2	Cloud Security	T+PR (3+1)	4
3	ELC – 3	Swayam Course	T+PR (3+1)	4

❖ POOL-5B

S.No.	Course Nature and Code	Course Name	Theory/ Practical	Credit
1	ELC – 1	Secure Network Design	T+PR (3+1)	4
2	ELC – 2	Applied Network Forensic	T+PR (3+1)	4
3	ELC – 3	Swayam Course	T+PR (3+1)	4

❖ POOL-5C

S.No.	Course Nature and Code	Course Name	Theory/ Practical	Credit
1	ELC – 1	Machine Learning for Cyber Security	T+PR (3+1)	4
2	ELC – 2	Machine Learning for Health Care and Biomedical Data	T+PR (3+1)	4
3	ELC - 3	Swayam Course	T+PR (3+1)	4

❖ POOL-5D

S.No.	Course Nature and Code	Course Name	Theory/ Practical	Credit
1	ELC - 1	Consensus Algorithms in Blockchain	T+PR (3+1)	4
2	ELC - 2	Blockchain Security and Attack Vectors	T+PR (3+1)	4
3	ELC - 3	Swayam Course	T+PR (3+1)	4

Marks Distribution Scheme

Course	Credits	FM	MS		ES	
			T	P	T	P
ELC	4	100	15	10	50	25
AEC	2	50	-	-	50	-
VAC	2	50	-	-	50	-
SEC	3	75	15	-	50	10
MDC	3	75	25	-	50	-
CORE (WITH PRACTICAL)	4	100	15	10	50	25
CORE (WITHOUT PRACTICAL)	4	100	25	-	75	-
Internship	4	100	-		**Grade Point awarded and validated by concerned authorities**	
Research						
i. Research Methodology	4	100	25		75	
ii. Research Proposal	4	100	25		75	
iii. Thesis/Dissertation/Project	4	200	-		200	

T: Theory; P: Practical; MS: Mid Semester; ES: End Semester; FM: Full Marks

ABBREVIATION

AEC: Ability Enhancement Courses

VAC: Value Added Courses

SEC: Skill Enhancement Courses

MDC: Multidisciplinary Courses

MJ: Major Course

MN: Minor Course

CC: Core Course

JOC: Job Oriented Courses

AEC: Ability Enhancement Courses

AC: Associated Core

SEC: Skill Enhancement Courses

VAC: Value Added Courses

IKS: Indian Knowledge System

ELC: Elective Courses

RC: Research Course

RM: Research Methodology

FM: Full Marks

MS: Mid-Semester

ES: End-Semester

T: Theory

PR: Practical