

Programme Name: B.Sc., Digital and Cyber Forensic Science

Program Code: 28A

Graduate attributes:

GA1	Domain Knowledge	Knowledge
GA2	Domain Analysis	
GA3	Design and Development of Solutions	
GA4	Communication Skills	Skills
GA5	Innovative and Entrepreneurial Skills	
GA6	Leadership and Management Skills	
GA7	Individual and Team Work	Attitude
GA8	Ethical and Social Responsibility	
GA9	Life-long Learning	

Programme Educational Objectives (PEOs)

The B.Sc. Digital and Cyber Forensic Science program describe accomplishments that graduates are expected to attain within five to seven years after graduation.

PEO1	Expertise with the knowledge on investigation of cyber offenses and online frauds
PEO2	Exhibit high standards with regard to application of digital cyber forensic techniques in recovery and investigation of material found in digital devices.
PEO3	Proficiency in various techniques to mitigate the complexities associated with threats on data transmission and recovery.

Programme Specific Outcomes (PSOs)	
After the successful completion of B.Sc. Digital and Cyber Forensic Science program the students are expected to	
PSO1	Impart education with domain knowledge effectively and efficiently in par with the expected quality standards for Digital and Cyber Forensic Science professional.
PSO2	Ability to apply the mathematical, technical and critical thinking skills in the discipline of Digital and Cyber Forensic Science to find solutions for complex problems.
PSO3	Ability to engage in life-long learning and adopt fast changing technology to prepare for professional development.
PSO4	Expose the students to learn the important Digital and Cyber Forensic Science such as Cyber Policing, Web Application Security, Malware Analysis and Cyber Threat Intelligence and Mobile and Network forensics so that they can opportunity to be a part of industry 5.0 applications irrespective of domains.
PSO5	Inculcate effective communication skills combined with professional & ethical attitude.

Programme Outcomes (POs)	
On successful completion of the B.Sc. Digital and Cyber Forensic Science	
PO1	Exhibit good domain knowledge and completes the assigned responsibilities effectively and efficiently in par with the expected quality standards.
PO2	Apply analytical and critical thinking to identify, formulate, analyze, and solve complex problems in order to reach authenticated conclusions
PO3	Design and develop research based solutions for complex problems with specified needs through appropriate consideration for the public health, safety, cultural, societal, and environmental concerns.
PO4	Establish the ability to Listen, read, proficiently communicate and articulate complex ideas with respect to the needs and abilities of diverse audiences.
PO5	Deliver innovative ideas to instigate new business ventures and possess the qualities of a good entrepreneur

P06	Acquire the qualities of a good leader and engage in efficient decision making.
P07	Graduates will be able to undertake any responsibility as an individual/member of multidisciplinary teams and have an understanding of team leadership
P08	Function as socially responsible individual with ethical values and accountable to ethically validate any actions or decisions before proceeding and actively contribute to the societal concerns.
P09	Identify and address own educational needs in a changing world in ways sufficient to maintain the competence and to allow them to contribute to the advancement of knowledge
P010	Demonstrate knowledge and understanding of management principles and apply these to one own work to manage projects and in multidisciplinary environment.

COURSE OUTCOME (CO's)

SEMESTER - I

Course Name: Programming in C

#	Course Outcome	
C01	Describe about the about the fundamentals of computers, history and various types of software and hardware devices.	K1
C02	Interpret the concepts of Variables, Constant, Operators and various types of expressions	K2
C03	Apply the concept of Decision making statements and looping constructs for solving basic programs	K3
C04	Use the concepts of files and pointers inside a C program	K3
C05	Develop programs incorporating all the C language constructs	K4
C06	Test the correctness of the programs and identify logical and syntax errors	K5

Course Name: Programming Lab- C

#	Course Outcome	
C01	Apply the various basic programming constructs like decision making statements. Looping statements, functions, structures, pointers and files	K3
C02	Design programs using the concept of files in C and be able to simulate operations	K4
C03	Determine the efficient techniques in programming to solve various scientific problems	K5

Course Name: Data Structures

#	Course Outcome	
C01	Define the concept of Data structure and list the various classifications of data structures.	K1
C02	Demonstrate how arrays, stacks, queues, linked lists, trees, heaps, Graphs and Hash Tables are represented in the main memory and various operations are performed on those data structures.	K2
C03	Illustrate the various file organizations like Sequential, Random and Linked organizations.	K2
C04	Discover the real time applications of the various data structures	K3
C05	Design algorithms for various sorting and searching techniques	K4

Course Name: Introduction to Linear Algebra

#	Course Outcome	
C01	Explain the concept/theory in linear algebra, to develop dynamic and graphical views to the related issues of the chosen topics as outlined in “course content,” and to formally prove theorems	K2
C02	Recognize the basic applications of the chosen topics and their importance in the modern science	K3
C03	Develop simple mathematical models, and apply basic linear algebra techniques learned from the chosen topics to solve simple problems	K3
C04	Report and communicate effectively with others and present mathematical results in a logical and coherent fashion	K4
C05	Appraise the power and beauty of mathematics, and solve problems independently and collaboratively as part of a team	K5

SEMESTER - II

Course Name: Programming in C++

#	Course Outcome	
C01	Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects	K1
C02	Demonstrate the various basic programming constructs like decision making statements. Looping statements and functions	K2
C03	Explain the object oriented concepts like overloading, inheritance, polymorphism, virtual functions , constructors and destructors	K3
C04	Explain the various file stream classes; file types, usage of templates and exception handling mechanisms.	K3
C05	Compare the pros and cons of procedure oriented language with the concepts of object oriented language	K5
C06	Develop programs incorporating the programming constructs of object oriented programming concepts	K5

Course Name: Programming Lab C++

#	Course Outcome	
C01	Apply the various basic programming constructs like decision making statements. Looping statements, functions, concepts like overloading, inheritance, polymorphism, virtual functions , constructors and destructors	K3
C02	Illustrate the concept of Virtual Classes, inline functions and friend functions	K4
C03	Compare the various file stream classes; file types, usage of templates and exception handling mechanisms.	K5
C04	Compare the pros and cons of procedure oriented language with the concepts of object oriented language	K5

Course Name: Internet Basics Lab

#	Course Outcome	
C01	Apply the predefined procedures to create Gmail account, check and receive messages	K3
C02	Apply the predefined procedures to perform various basic operations on internet	K3
C03	Utilize various google applications like docs, google classroom, google drive, google forms, google meet and slides	K3

Course Name: Discrete Mathematics

#	Course Outcome	
C01	Understand discrete mathematical preliminaries and apply discrete mathematics in formal representation of various computing constructs	K2
C02	Demonstrate an understanding of relations ,functions, Combinatorics and lattices	K2
C03	Apply the techniques of discrete structures and logical reasoning to solve a variety of problems and write an argument using logical notation	K3
C04	Analyze and construct mathematical arguments that relate to the study of discrete structures	K4
C05	Develop and model problems with the concepts and techniques of discrete mathematics.	K4

SEMESTER - III

Course Name: Python Programming

#	Course Outcome	
C01	Apply the various basic programming constructs like operators, expressions, decision making statements and Looping statements	K2
C02	Summarize the concept of lists, tuples , functions and error handling	K2
C03	Apply the concept of Decision making statements, looping constructs , functions for solving basic programs	K3
C04	Analyze the concepts of Lists, tuples and error handling mechanisms	K4
C05	Evaluate a program incorporating all the python language constructs	K5

Course Name: Python Programming Lab

#	Course Outcome	
C01	Apply the concept of Decision making statements, looping constructs , functions for solving basic programs	K3
C02	Analyze the concepts of Lists, tuples and error handling mechanisms	K4
C03	Evaluate a program incorporating all the python language constructs	K5

Course Name: Introduction to Cyber Crime

#	Course Outcome	
C01	Understand the concept of cybercrime and emerging crime threats and attacks in cyberspace	K2
C02	Classify the main typologies, characteristics, activities, actors and forms of cybercrime, including the definitional, technical and social aspects.	K3
C03	Evaluate behavioral aspects of the various type of attacks in cyberspace.	K4
C04	Analyze the impact of cybercrime crime on businesses and individuals and discuss the impact of cybercrime on society	K4

Course Name: Allied: 3 Software Security

#	Course Outcome	
C01	Explain the various types of security attacks and its implications	K2
C02	Illustrate the concepts of security risk management and security testing	K2
C03	Apply the various testing methodologies to evaluate the risks associated.	K3
C04	Compare and contrast the implications of good and bad software design	K4
C05	Classify the various tools for penetration testing	K4

Course Name: Skill Based Subject : 1: Cyber Law

#	Course Outcome	
C01	Explain the various types of cybercrimes	K2
C02	Demonstrate the various types of cyber laws and their applicability	K2
C03	Classification of civil, criminal cases and Essential elements of criminal law	K4
C04	Determine the sections of Indian Evidence act	K5

SEMESTER - IV

Course Name: Digital Forensics

#	Course Outcome	
C01	Explain the principles of network ,mobile and cyber forensic science	K2
C02	Illustrate the cyber-crime investigation procedures	K2
C03	Apply the cyber-crime techniques to data acquisition and evidence collection	K3
C04	Analyzing the digital evidences and arriving at conclusions	K4
C05	Examine the Volatile and Non-volatile Digital Evidence	K4

Course Name: Cyber security

#	Course Outcome	
C01	Outline the concepts of various security aspects like threats, attacks and authentication procedures	K2
C02	Compare the various type security attacks by inspecting their characteristics	K2
C03	Analyze security issues in network and computer systems	K4
C04	Evaluate and Communicate the human role in security systems	K5
C05	Interpret and forensically investigate security incidents	K5

Course Name: Forensics Lab

#	Course Outcome	
C01	Will learn the Police science its role in criminal investigation and Prevention of crime	K2
C02	Will help to know about the working and functioning of Forensic science laboratories.	K3
C03	The detail study will help to understand about the basics and different branches of Forensic Sciences.	K3

Course Name:Skill Based Subject2: Capstone Project Work Phase I

#	Course Outcome	
C01	Illustrate a real-world problem and identify the list of project requirements	K3
C02	Compare existing system with the proposed system and extract the innovative ideas	K4
C03	Judge the features of the project including forms, databases and reports	K5

Course Name: Allied 4: Intellectual Property Rights and Privacy Laws

#	Course Outcome	
C01	Define that various laws associated with intellectual property rights	K2
C02	Explain the concept of commercialization of IPR be licensing	K2
C0 3	Outline the concepts of copyrights and international protection of copyrights	K2
C04	Recall the history and perspective of privacy laws.	K2
C05	Classify the compare the various types of privacy laws	K4

SEMESTER - V**Course Name: Linux System Administration**

#	Course Outcome	
C01	Illustrate the various directory and file commands in LINUX	K2
C02	Explain the methods of securing files in Linux	K2
C03	Explain the various kernel components of Linux	K2
C04	Apply the various commands of Linux to perform several operations	K3
C05	Solve various network administrative issues by writing Linux shell scripts	K3

Course Name: Linux System Administration Lab

#	Course Outcome	
C01	To create the directory, how to change and remove the directory.	K1
C0 2	To evaluate the concept of shell scripting programs by using an AWK and SED commands	K2
C03	To demonstrate the basic knowledge of Linux commands and file handling utilities by using Linux shell environment.	K3

Course Name: Skill Based Subject 3 : Capstone Project Work Phase II

#	Course Outcome	
C01	Select appropriate input, output, form and table design	K3
C02	Design code to meet the input requirements and to achieve the required output	K6
C03	Compose a project report incorporating the features of the project	K6

Course Name: Elective 1: Network Security and Management

#	Course Outcome	
C01	Explain about the qualities of good network and various network security policies	K2
C02	Understand the various types of security like software/ hardware security and database security	K2
C03	Apply the concepts of intrusion detection in network	K3
C04	Determine the network management and security management standards	K5

Course Name: Elective 1: Artificial Neural Network and Fuzzy Systems

#	Course Outcome	
C01	Explain the concepts of neural networks and , fuzzy logic	K2
C02	Understanding of the basic mathematical elements of the theory of fuzzy sets.	K2
C03	Understanding the differences and similarities between fuzzy sets and classical sets theories	K2
C04	Solve problems that are appropriately solved by neural networks and fuzzy logic	K3

Course Name: Elective 1: Software Agent

#	Course Outcome	
C01	Understanding the fundamentals of agents and agent programming paradigms.	K2
C02	Discussing the basics of java agents.	K2
C03	Learning the concepts of multivalent systems.	K2
C04	Understanding the concepts of intelligent software agents.	K2
C05	Understanding the agents and security.	K2

SEMESTER - VI**Course Name: Cryptography and Network Security**

#	Course Outcome	
C01	Explain the various security aspects and its importance	K2
C02	Outline the several types of security attacks and various cryptographic algorithms	K2
C03	Summarize about message authentication and security practices.	K2
C04	Apply symmetric key and public key cryptographic algorithms to perform the process of cryptography.	K3
C05	Analyze the various cryptographic algorithms and apply them accordingly	K4

Course Name: Cryptography and Network Security - Lab

#	Course Outcome	
C01	Develop encryption, decryption using the substitution techniques	K3
C02	Apply DES and AES algorithms for various practical applications	K3
C03	Applut RSA and Diffie- Hellman algorithms	K3

Course Name: Project Work Lab

#	Course Outcome	
C01	Formulate a real world problem and develop its requirements develop a design solution for a set of requirements	K3
C02	Test and validate the conformance of the developed prototype against the original requirements of the problem	K5
C03	Work as a responsible member and possibly a leader of a team in developing software solutions	K3
C04	Express technical ideas, strategies and methodologies in written form. Self-learn new tools, algorithms and techniques that contribute to the software solution of the project	K1-K4
C05	Generate alternative solutions, compare them and select the optimum one	K6

Course Name: Elective 2: Cyber Policing

#	Course Outcome	
C01	Explain about the history of Indian police	K2
C02	Illustrate the organizational structure and routine activities of a police station	K2
C03	Analyze the public perception of police	K3
C04	List the measures to improvise the public perception of police	K4

Course Name: Elective 2: Web Application Security

#	Course Outcome	
C01	Illustrate about the concept of HTML,DHTML, CSS and Java Script	K2
C02	Explain the history, characteristics, technologies, concepts, usage in web2.0 and web 3.0	K2
C03	Apply the core concepts of web applications to create web pages	K3
C04	Apply the concepts of servers side programming	K3

Course Name: Elective 2: Malware Analysis and Cyber Threat Intelligence

#	Course Outcome	
C01	Explain about the lifecycle of malware and virus nomenclature	K2
C02	Understand the working principle of viruses and worms	K2
C03	Choose the virus and malware designs to perform case studies	K3
C04	Analyze the various types of worms and viruses	K3

Course Name: Elective 3: Client Server Computing

#	Course Outcome	
C01	Explain about the various components of client server computing	K2
C02	Understand the roles of client and server in a network	K2
C03	Analyze the components of Client Server computing in terms of connectivity, hardware/software and service and support	K3
C04	Analyze the various types of worms and viruses	K3

Course Name: Elective 3: Open Source Software

#	Course Outcome	
C01	Explain about the need and importance of open source software	K2
C02	Demonstrate the concepts of open source softwares	K2
C03	Apply the programming constructs of MYSQL, PHP, Python and PERL to create programs	K3
C04	Develop small programs using open source softwares	K3

Course Name: Elective 3: Principles of Secure Coding

#	Course Outcome	
C01	Explain about the secure software development life cycle	K2
C02	Understand the secure coding techniques	K2
C03	Demonstrate the threat modeling process and benefits	K2
C04	Explain about the database and web specific issues	K2

Course Name: Skill Based Subject 4: Ethical Hacking

#	Course Outcome	
C01	Explain the importance of security and various types of attacks	K2
C02	Understand the concepts of scanning and system hacking	K2
C03	Explain about penetration testing and its methodology	K2
C04	Identify the various programming languages used by security professional	K4