SCHOOL OF ENGINEERING & TECHNOLOGY

COURSE FILE

Program: CSE
Course Code: CSE4708
Course Title: Cyber Forensics
Module Semester: 5th Aug 2024 - 6th Dec 2024
Session: 7th Sem

Index

S. No.	Topics
1.	Course Details: Course-Code; Course Title; Semester/Term/Module; Year
2.	Vision, Mission of the University
3.	Graduate Attributes of the BMU Students
4.	Vision, Mission of the School
5.	PEOs and POs & PSOs of the Program
6	Course Description and its objectives
7	Course Outcomes and CO-PO Mapping
8	Course Syllabus: (including Course Content with Module-wise teaching hours allocated; Readings, Activities, Teaching Strategy, and Module mapped to COs, Text Book(s), Reference Books, Other learning resources)
9	Detailed Session wise Plan
10	Weekly Timetable
11	Registered Students List
12	Details of Internal Assessments; weightages, due dates, mapping to CO
13	Mid Semester Question papers with sample solutions
14	Sample Evaluated Internal Submissions and Identification of weak students.
15	Reflections from the Mid-term semester feedback received, and interventions made to enhance the student learning and continuous improvement in teaching and learning strategies.

16	Interventions made for slow performers and advanced learners, highlighting initiatives taken for student improvements (retest, resubmissions etc.)
17	End Semester Question papers with sample solutions
18	Detail of Marks in all components up to the End Semester
19	Attendance Report
20	Final record of Results (including the grades)
21	Analyzing Direct Feedback received on Course Outcomes
22	CO Attainment Measurement Analysis
23	Interventions made for slow performers and advanced learners, highlighting initiatives taken for student improvements (retest, resubmissions etc.)
24	End Semester Question papers with sample solutions
25	Feedback (class committee or otherwise) and corrective actions (if any)
26	Faculty Course Review (if any, like Use of Innovative Pedagogies; Technology; Experiential Learning; Integration with the Vision and Mission of the University; Feedback; Course Outcome attainment for the next run of the course)
27	Any other additional information

1. Course Details

- Course Code: CSE4708
- Course Title: Cyber Forensics
- **Module/Semester: 5th Aug 2024 - 6th Dec 2024**
- Session: 7th Sem

2. Vision, Mission of the University

Vision

BML Munjal University seeks to nurture ethical leaders who are skilled, knowledgeable and have the life skills required for leading their organizations to success. The university shall seek the advancement and dissemination of practically oriented knowledge benchmarked with the best global standards.

Mission

BML Munjal University aims to be a leading university for the quality and impact of its teaching, research and linkages with major stakeholders. The focus of the university is to find creative solutions to problems through application of knowledge. The university aims to create a talented community of students and faculty who excel in teaching, learning and research, in a creative and stimulating environment. The university will collaborate with other institutions for development of science, technology and arts in the global context.

3. Graduate Attributes

- Acquire and apply practical understanding of discipline knowledge.

- Demonstrate a sense of ethics and display excellence in both personal and professional life.

- Exhibit problem solving, critical thinking skills and investigative capability to address real world problems.

- Manifest leadership qualities and work effectively in teams across globally diverse environments.

- Be a lifelong learner with an entrepreneurial mindset to innovate in the constantly changing global scenario.

- Possess a strong sense of inquiry and design innovative solutions for positive societal impact.

- Be effective communicators and possess an empathetic outlook.

4. Vision, Mission of the School

Vision of School:

To be amongst the leading engineering schools of the country recognized globally for excellence in teaching and research with focus on experiential learning, innovation and entrepreneurship.

Mission of School:

* Providing high-quality learning experience to our students, preparing them to be global leaders, and contributing to the development of society through research, innovation, and entrepreneurship.
* Creating an inclusive and diverse learning environment that fosters creativity, critical thinking, and ethical values.

* Collaborating with industry, government, and other institutions to address complex societal challenges and promote sustainable development.

5. PEOs and POs & PSOs of the Program

Program Educational Objectives (PEO):
a) PEO 1: Identify real-life problems and develop creative and innovative hardware/software-based solutions.
b) PEO 2: Achieve professional development through self-learning to adapt to the technological changes in the ever changing field of computing.
c) PEO 3: Engage in life-long learning of computer engineering technologies, critical thinking and continuous ingenuity and apply them in real-life applications.
d) PEO 4: Accomplish leadership roles by imbibing ethics and professionalism with emphasis on sustainable development of the society.

Program Outcomes (PO):
e) PO1: Apply the foundational concepts of mathematics, science and computer engineering to find novel solutions for complex real-life engineering problems.
f) PO2: Identify, formulate, review literature and analyze complex computer engineering problems reaching substantiated conclusions and derive a coherent logic that can be implemented by computers.
g) PO3: Design analytical and computational models for solving complex engineering problems giving due consideration to issues related to public health and safety, cultural and societal constraints, and environmental concerns.
h) PO4: Use research-based knowledge, methods, tools and techniques for data collection, designing digital computing systems, analyzing and interpreting the results to provide substantiated conclusions.
i) PO5: Use appropriate tools to model complex computer engineering problems through identification of the limitations and creating solutions to predict the real-world phenomena.
j) PO6: Use appropriate contextual knowledge of computer engineering to review and assess societal, health, legal, cultural, safety and contemporary issues and rationalize the ensuing responsibilities towards the society.
k) PO7: Adopt computer engineering practices in congruence with societal need, understand the working practices and its impact on natural resources for sustainable development.
l) PO8: Use ethical principles to pursue excellence in developing computer engineering systems and behave appropriately to develop a reliable and trustworthy relationship with others.
m) PO9: Function effectively as a reliable and responsible individual, and as a member or leader in diverse computer engineering teams, and in multidisciplinary settings, thereby placing team goals ahead of individual interests.
n) PO10: Communicate effectively by capturing the desirable computer system requirements for preparation of specification documents, write clear and concise report such as laboratory files, research papers, thesis, and presentation materials.
o) PO11: Demonstrate knowledge of computer engineering and management principles for the completion of individual or group projects in multidisciplinary environments.
p) PO12: Recognize the evolving technological changes and engage as an independent and life-long learner in both computing and non-computing fields.

Program Specific Outcomes (PSO):
q) PSO1: Identify applicable tools and techniques related to data science practice such as data

8

collection, cleaning, analysis, modelling, evaluation and result interpretation and apply them for deriving hidden and meaningful patterns for appropriate actionable insights.

r) PSO2: Develop intelligent systems for various real-life domains like healthcare, transportation, finance etc. using Artificial Intelligence methodologies.

s) PSO3: Understand the foundational concepts and techniques to protect computing systems against constantly evolving cybersecurity threats and analyze security breaches and violations of cyber systems and networks to provide appropriate solutions.

t) PSO4: Design effective security systems to mitigate risks, threats and vulnerabilities for protecting the organizations against cyber threats.

6. Course Description and its objectives

Cyber Forensics is a core elective course in computer science and engineering and computer science undergraduate program. This course focuses on to understand Computer Forensics, Computing Investigations, Enforcement Agency Investigations. This course will provide overview of types of computer forensics, data recovery, electronic evidence, threats, surveillance.

7. Course Outcomes and CO-PO Mapping

Course Outcomes:

CO1: Understand a brief overview of Computer Forensics Fundamentals

CO2: Identify the features of Data Recovery

CO3: Understanding of Reconstructing Past Events

CO4: Work with cyber forensics tools

8. Course Syllabus

Sr. No.	Content	CO	Sessions
1	Computer Forensics Fundamentals	1	3
2	Types of Computer Forensics Technology	1	3
3	Types of Vendor and Computer Forensics Services	1	0
4	Data Recovery	2	2
5	Evidence Collection and Data Seizure	2	3
6	Duplication and Preservation of Digital Evidence	3	2
7	Computer Image Verification and Authentication	2	2
8	Discover of Electronic Evidence	3	2
9	Identification of Data	3	3
10	Reconstructing Past Events	3	2
11	Networks	2	1
12	Fighting against Macro Threats	3	2
13	Information Warfare Arsenal	3	2
14	Tactics of the Military	4	2
15	Tactics of Terrorist and Rogues	3	2
16	Tactics of Private Companies	4	2
17	The Future \u2013 Arsenal	4	2
18	Surveillance Tools	4	1
19	Victims and Refugees	4	2
20	Advanced Computer Forensics	4	2
21	Payload, Key Management	4	0

9. Learning Resources

Text Books:

    ✓ Computer Forensics by John R. Vacca

    ✓ Windows Forensics by Chad Steel

    ✓ Cybercrime and Society by Majid Yar

    ✓ Software Forensics by Robert M Slade

Reference Links:

10. Weekly Timetable

Time	Monday	Tuesday	Wednesday	Thursday	Friday
9:15-10:10	Cyber Forensics (CSE4708)				
10:15-11:10		Cyber Forensics (CSE4708)			
11:15-12:10			Cyber Forensics (CSE4708)		
12:15-13:10				Cyber Forensics (CSE4708)	
13:15-14:10					Cyber Forensics (CSE4708)
14:15-15:10				Cyber Forensics (CSE4708)	
15:15-16:10			Cyber Forensics (CSE4708)		
16:15-17:10		Cyber Forensics (CSE4708)			
17:15-18:10	Cyber Forensics (CSE4708)				

11. Student List

uniqueId	studentName
210C2030002	Aayush Dubey
210C2030004	Pelleti Sujith Reddy
210C2030007	Malladi Sai Prabhas
210C2030010	Subhransh Behura
210C2030014	Abhimanyu Gulati

11. Student List

12. Internal Assessment Data

Component	Duration	Weightage	Evaluationweek	Remarks
Mid Term		20		
Quiz 1		10	2	
Assignment 1		10	2	
End Term		40		

12. Internal Assessment Data

13. Weak Students Data

uniqueId	studentName	totalMarks	grade
210C2030010	Subhransh Behura	87	A+
210C2030014	Abhimanyu Gulati	47	R

13. Weak Students Data

14. Actions taken for weak students

-

15. Marks Details

uniqueId	studentName	totalMarks	grade
210C2030002	Aayush Dubey	83	A+
210C2030004	Pelleti Sujith Reddy	78.5	B
210C2030007	Malladi Sai Prabhas	81.5	B+
210C2030010	Subhransh Behura	87	A+
210C2030014	Abhimanyu Gulati	47	R

15. Marks Details

17. Attendance Report

uniqueId	studentName	attendance
210C2030002	Aayush Dubey	88
210C2030004	Pelleti Sujith Reddy	90
210C2030007	Malladi Sai Prabhas	78
210C2030010	Subhransh Behura	82
210C2030014	Abhimanyu Gulati	68

PRATYUT

Plot Number 15, Shanti Nagar, P.O. Sarojini Nagar, Lucknow, Uttar Pradesh - 226008

📞 9695570887 ✉ pratyut987@gmail.com 🔗 linkedin.com/in/pratyut-/ 🔗 github.com/PratyutCS

Education

BML Munjal University, Gurgaon   **November 2021 − September 2025**
Bachelor of Technology in Computer Science And Engineering   *Current CGPA: 7.44/10*

Relevant Coursework

- Attack and Defence
- Data Structures
- Computer Networks
- Database Management
- Security Audit
- OOP using C++
- Blockchain
- Operating System

Experience

BML Munjal University   **July 2023 − July 2024**
Software Developer   *Kapriwas, Haryana*

- Spearheaded the development of a comprehensive database management system using **Embedded Javascript** as front-end, **Node** with **Express** as back-end and **MongoDB for session management** as well as user data storage, ensuring efficient storage and maintenance of legacy and restructured communication flow among 11 departments cutting down paperwork by 28%.
- Designed and implemented a **streamlined solution** for event report creation and submission using **flutter** as front-end, **Node.js and Express.js** as back-end technology **MongoDB user data storage and JWT for authorization** , achieving a 95% reduction in report generation time and a 75% decrease in data collection time.
- Collaborated with cross-functional teams to gather requirements, troubleshoot issues, and enhanced system functionality by 10%, contributing to overall institutional efficiency.

Arcdata   **December 2023 − January 2024**
Web Developer   *Remote*

- Spearheaded the development of a static web-page for Arcdata using **Agile Software Development Life Cycle** resulting in 40% faster development and 100% of user satisfaction, a data collection and AI startup, serving as the primary online presence for the company.
- Utilized technologies including **HTML, CSS, SCSS, and JavaScript** to create a visually appealing site with hybrid scrolling functionality, enhancing user experience, resulting in a 47% increase in user engagement and significantly improving the company's online reach.

BML Munjal University   **December 2022 − March 2023**
Full Stack Developer   *Kapriwas, Haryana*

- Collaborated with the Internal Quality Assurance Cell (IQAC) to spearhead develop a **full-stack webpage** that **streamlined database management and indexing**, reducing file search and manual upload time by 86%.
- Implemented data quality assurance measures, leading to a 60% reduction in workload while ensuring high standards of data integrity by identifying discrepancies and proposing effective solutions.
- Fostered a **positive team environment**, motivating colleagues and contributing to the successful achievement of a **NAAC Grade A for the university**.

Projects

Blockchain | *Python*   **Github**

- Developed a fully **decentralized blockchain** implementation for cryptocurrencies from scratch, utilizing the **latest cryptography protocols**.
- Employed **peer-to-peer technology** and networks to enhance communication efficiency, achieving a 4% improvement in mining time through **multi-threading on the CPU**.
- Developed applied robust error handling mechanisms, enabling automatic transitions.

Invisible Image Watermarking | *NODE.JS, HTML, CSS, EJS, PYTHON, JAVASCRIPT*   **Github**

- Developed a full-stack web-page using **Node.js, Express.js, HTML, CSS, EJS, Python, and JavaScript** to implement spatial and DCT watermarking for videos and images.
- Used **system commands** for execution of **Python scripts** for LSB and DCT watermarking through JavaScript, achieving a 67% increase in code efficiency and a 27% reduction in embedding time with automated client-side updates.
- Integrated protective measures against common state-of-the-art attacks increasing watermark integrity by 30% using a unique methodology devised during the project.

Technical Skills

Languages: Python, Java, C++, HTML/CSS, JavaScript, Embedded C, Rust, GoLang, Dart, Bash
Developer Tools: VS Code, Excel, Android Studio, Git, VMWare, AWS, Azure, MongoDB, Postman
Technologies/Frameworks: Linux, Jenkins, GitHub, Flutter, Matplotlib, Seaborn, Numpy, Pandas, React, Express, puppeteer, FFmpeg, OpenCV, Nmap, Metasploit