Evaluation for M.Tech (CSE Part time)

Sl. No.	Subject Codes	Subject	Periods			Evaluation Scheme				End Semester		Total	Credit
			L	T	P	CT	TA	Total	PS	TE	PE		
1	WCS-400	Mathematical Foundation of Computer Science	3	0	0	20	10	30		70		100	3
2	WCS-043	Digital Forensics	3	0	0	20	10	30		70		100	3
3	WCS-410	Digital Forensics Lab	0	0	4				25		25	50	2
4	WCS-421	Mini Project	0	0	4				50		50	100	2
		Total										350	10

SEMESTER-IV

Course Code	WCS-400		
Course Name	Mathematical Foundation of Computer Science		
Credits	3	Total No. of lecture	48

COURSE OBJECTIVE
☐ To understand the mathematical fundamentals that is prerequisites for a variety of courses like Data mining, Network protocols, analysis of Web traffic, Computer security, Software engineering, Computer architecture, operating systems, distributed systems, Bioinformatics, Machine learning.
☐ To develop the understanding of the mathematical and logical basis to many modern techniques in information technology like machine learning, programming language design, and concurrency.
☐ To study various sampling and classification problems.

Unit 1 Probability mass, density, and cumulative distribution functions, Parametric families of distributions, Expected value, variance, conditional expectation, Applications of the univariate and multivariate Central Limit Theorem, Probabilistic inequalities, Markov chains	7
Unit 2 Random samples, sampling distributions of estimators, Methods of Moments and Maximum Likelihood,	7
Unit 3 Statistical inference, Introduction to multivariate statistical models: regression and classification problems, principal components analysis, The problem of over fitting model assessment.	8
Unit 4 Graph Theory: Isomorphism, Planar graphs, graph colouring, Hamilton circuits and Euler cycles. Permutations and Combinations with and without repetition. Specialized techniques to solve combinatorial enumeration problems	11
Unit 5 Computer science and engineering applications Data mining, Network protocols, analysis of Web traffic, Computer security, Software engineering, Computer architecture, operating systems, distributed systems, Bioinformatics, Machine learning.	10

Unit 6	5
Recent Trands in various distribution functions in mathematical field of computer science for varying fields like bioinformatics, soft computing, and computer vision.	

COURSE OUTCOMES
After completion of course, students would be able to:
☐ To understand the basic notions of discrete and continuous probability.
☐ To understand the methods of statistical inference, and the role that sampling distributions play in those methods.
☐ To be able to perform correct and meaningful statistical analyses of simple to moderate complexity.

References

1. John Vince, Foundation Mathematics for Computer Science, Springer.

2. K. Trivedi.Probability and Statistics with Reliability, Queuing, and Computer Science Applications. Wiley.

3. M. Mitzenmacher and E. Upfal.Probability and Computing: Randomized Algorithms and Probabilistic Analysis.

4. Alan Tucker, Applied Combinatory, Wiley

Course Code	WCS-043
Course Name	Digital Forensics
Credits	3
Pre-Requisites	Cybercrime and Information Warfare, Computer Networks

Total Number of Lectures: 48

COURSE OBJECTIVE
• Provides an in-depth study of the rapidly changing and fascinating field of computer

LECTURE WITH BREAKUP	NO. OF LECTURES
Unit 1: **Digital Forensics Science:** Forensics science, computer forensics, and digital forensics. **Computer Crime:** Criminalistics as it relates to the investigative process, analysis of cyber-criminalistics area, holistic approach to cyber-forensics	9
Unit 2: **Cyber Crime Scene Analysis:** Discuss the various court orders etc., methods to search and seizure electronic evidence, retrieved and un-retrieved communications, Discuss the importance of understanding what court documents would be required for a criminal investigation.	8
Unit 3: **Evidence Management & Presentation:** Create and manage shared folders using operating system, importance of the forensic mindset, define the workload of law enforcement, Explain what the normal case would look like, Define who should be notified of a crime, parts of gathering evidence, Define and apply probable cause.	9
Unit 4: **Computer Forensics:** Prepare a case, Begin an investigation, Understand computer forensics workstations and software, Conduct an investigation, Complete a case, Critique a case, **Network Forensics:** open-source security tools for network forensic analysis, requirements for preservation of network data.	10
Unit 5: **Mobile Forensics:** mobile forensics techniques, mobile forensics tools. **Legal Aspects of Digital Forensics:** IT Act 2000, amendment of IT Act 2008.	8
Unit 6: Recent trends in mobile forensic technique and methods to search and seizure electronic evidence	4

COURSE OUTCOMES
After completion of course, students would be able to:
• Understand relevant legislation and codes of ethics
• Computer forensics and digital detective and various processes, policies and procedures
• E-discovery, guidelines and standards, E-evidence, tools and environment.
• Email and web forensics and network forensics

References:

1. John Sammons, The Basics of Digital Forensics, Elsevier

2. John Vacca, Computer Forensics: Computer Crime Scene Investigation, Laxmi Publications