



Shri Vaishnav Vidyapeeth Vishwavidyalaya

Master of Technology (Information Security)

Choice Based Credit System (CBCS)

SEMESTER II

COURSE CODE	CATEGORY	COURSE NAME	EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHERS ASSESSMENT*	END SEM UNIVERSITY EXAM	TEACHERS ASSESSMENTS*				
MTIS 201		ADVANCED DATABASE AND SECURITY	60	20	20	30	20	3	1	6	7

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P Practical; C - Credit; Q/A – Quiz/ Assignment/ Attendance, MST mid Semester Test.

***Teacher Assessment** shall be based following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:-

1. Enumerate and explain the use of the Query Language. & How to use them.
2. Demonstrate the different features of Spatial databases & use of it in a Real World Problem

Course Outcomes:-

1. Master in Query Language.
2. Master in XML.
3. Master in Temporal Database.
4. Master in Spatial databases.
5. Master in Spatio-Temporal Queries.
6. Master in Data Management on Cloud.

Syllabus:

UNIT I

Modeling data; Recap: ER Model, UML, semantic networks, logic; XML databases; Object relational databases;

UNIT II

Temporal databases; Queries and relational operators; Temporal indexes: persistent B-trees;

UNIT III

Spatial databases and spatio-temporal databases; Representing space / spatial entities; Queries and relational operators; Recap: Spatial indexes: B+ trees, kd trees, R-trees; Spatial Database Management Systems (SDBMS);

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UNIT IV

Spatio-temporal queries; map reduce /cloud; Data management on cloud; Defining and combining heterogeneous databases, schemas and ontology's;

UNIT V

Case study: Multi line Insurance Company. Smart Card based Information Security, Smart card operating system-fundamentals, design and implantation principles, memory organization, smart card files, file management, atomic operation, smart card data transmission.

Reference Books:

1. Role Based Access Control David F. Ferraiolo , D. Richard Kuhn , RamaswamyChandramouli.
2. A reading list of research papers relevant to above topics may be given to students.
3. Database System Concepts, AviSilberschatz, Hank Korth, and S.Sudarshan. 6th Ed. McGraw Hill, 2010.
4. Principles of Data and Knowledge Base Systems, Volume 1, J.D. Ullman, Computer Science Press.
5. Spatial Database Systems: Design, Implementation and Project Management; edited by Albert K. W. Yeung, George Brent Hall.

List of Practical's:

1. Different query operations.
2. Case studies.

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MTIS 202		SECURE E-COMMERCE	60	20	20	-	-	3	1	-	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST mid Semester Test.

***Teacher Assessment** shall be based following components: Quiz/Assignment/Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:-

1. To introduce the main concepts related to secure electronic commerce, focusing on how security techniques can be used to protect e-commerce transactions. The careful discussion of examples and techniques, and your application of them to real-life situations build up your critical analysis capabilities.
2. To introduce some standard protocols and security provisions commonly used in industry and government organizations. This builds up your knowledge, and enhances your ability to apply it to new situations.
3. To induce students to reflect and speculate about security threats and their solution. You will be required to consider real life situations and will be asked to discuss a security issue. You will be given significant freedom of choice with respect to strategies and techniques, thus promoting creativity.
4. To teach you to follow proper standards when tackling problems and proposing and documenting solutions, thus ensuring that they can be understood and enforced. This helps to promote responsibility and a professional attitude.

Course Outcomes:-

At the successful conclusion of this course, Students should be able to:

1. describe the various forms of electronic commerce;
2. explain the range of threats to e-commerce security;
3. identify the different areas susceptible to malicious activity;
4. conduct an analysis of the risks associated with the use a particular e-commerce technology;
5. describe different cryptographic techniques and their technical characteristics;
6. explain how cryptography can be, and is, used to achieve security;

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7. describe the different standards in use for secure electronic commerce, such as certificates, MACs, etc;
8. describe the different protocols in use for secure electronic commerce, such as SSL, TLS and S/MIME;
9. analyse e-commerce systems currently in operation, such as electronic payment systems.
10. describe and analyse standard security mechanisms, such as filters, proxies and firewalls.

Syllabus:

UNIT I

Introduction to E-Commerce – Network and E-Commerce – Types of E-Commerce – Ecommerce Business Models: B2C, B2B, C2C, P2P and M-commerce business models – Ecommerce Payment systems: Types of payment system – Credit card E-Commerce transactions – B2C E-Commerce Digital payment systems – B2B payment system.

UNIT II

Security and Encryption: E-Commerce Security Environment – Security threats in E-Commerce environment – Policies, Procedures and Laws.

UNIT III

Inter-organizational trust in E-Commerce: Need – Trading partner trust – Perceived benefits and risks of E-Commerce – Technology trust mechanism in E-Commerce – Perspectives of organizational, economic and political theories of inter-organizational trust – Conceptual model of inter-organizational trust in E-Commerce participation.

UNIT IV

Introduction to trusted computing platform: Overview – Usage Scenarios – Key components of trusted platform – Trust mechanisms in a trusted platform.

UNIT V

Trusted platforms for organizations and individuals – Trust models and the E-Commerce domain.

Reference Books:

1. Kenneth C. Laudon and Carol Guercio Trave, “E-Commerce Business Technology Society”, Pearson Education, 2005.
2. Pauline Ratnasingam, “Inter-Organizational Trust for Business-to-Business E-Commerce”, IRM Press, 2005.
3. Siani Pearson, et al, “Trusted Computing Platforms: TCPA Technology in Context”, Prentice Hall PTR, 2002.

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MTIS 203		OPERATING SYSTEM DESIGN	60	20	20	30	20	3	1	6	7

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/ Assignment/Attendance, MST Mid Semester Test.

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Course Objectives:-

1. Enumerate and explain the use of the Operating System.& Different Type of System
2. Demonstrate the different Functions of Operating system.
3. Explain the different issues related with operating system security.

Course Outcomes:-

1. Master in Operating System Functions..
2. Master in Scheduling.
3. Master in Synchronization.
4. Master in Deadlock & memory Management.
5. Master in Security issues.
6. Master in I/O & File Handling.

Syllabus:

UNIT I

Computer system and operating system overview, Operating system functions and design issues, Design approaches, Types of advanced operating systems, Process abstraction, Process management, system calls, Threads, Symmetric multiprocessing and microkernels.

UNIT II

Scheduling: Uniprocessor, Multiprocessor and Real time systems, concurrency, classical problems, Mechanisms for synchronization: semaphores, monitors.

UNIT III

Process deadlock and deadlock handling strategies, Memory management, virtual memory concept, virtual machines, I/O management, File and disk management, Operating system security.

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SEMESTER II

UNIT IV

Distributed Operating system: architecture, Design issues, Distributed mutual exclusion, distributed deadlock detection, shared memory, Distributed scheduling.

UNIT V

Multiprocessor operating systems: architecture, operating system design issues, threads, process synchronization, process scheduling, memory management, reliability and fault tolerance.

Reference Books:

1. Advanced concept in operating system: M. Singhal, N.G Shivratri
2. Operating system internal and design principles: William Stallings
3. Operating system concepts: Avi Silberschatz · Peter Baer Galvin · Greg Gagne. John Wiley & Sons, Inc.

List of Practical's:

1. Program for scheduling.
2. Program for deadlock
3. program for semaphore
4. Program for memory management.
5. Program for mutual exclusion.

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MTIS 211		SOCIAL NETWORK ANALYSIS	60	20	20	-	-	3	1	-	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/ Assignment/Attendance, MST Mid Semester Test.

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:-

1. Enumerate and explain the use of the Programming Language.& Different Syntax of Programming& How to use them in Programming Editor.
2. Demonstrate the different features of Programming & use of it in a Real World Problem

Course Outcomes:-

1. Classify social networks
2. Analyze social media and networking data
3. Apply Social networks Visualization tools
4. Analyze the social data using graph theoretic computing approach
5. Identify application driven virtual communities from social networks
6. Apply sentiment mining

Syllabus:

UNIT I

Introduction to social network analysis, Vertex or node, edge, neighbors, degree, shortest path, cycle, tree, complete graph, bipartite graphs, directed graphs, weighted graphs, adjacency matrix, connected components.

UNIT II

Games on networks, game theory strategies, dominant strategies, dominated strategies, pure strategies and mixed strategies, Nash equilibrium, multiple equilibria- coordination games, multiple equilibria- the Hawk-Dove game, mixed strategies, Modeling ,network traffic using game theory.



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UNIT III

Technological networks (Internet, telephone network, power grids, transportation networks), social networks (face-book, movie collaboration, paper collaboration), information networks (web), biological networks (neural networks, ecological networks).

UNIT IV

Random models of networks, Erdos-Renyi model of random graph, models of the small world, decentralized search in small-world , random graphs with general degree distributions, models of network formation,

UNIT V

Spread of influence through a network, influence maximization in networks, spread of disease on networks, Information networks, structure of the web, link analysis and web search, page rank, spectral analysis of page rank and hubs and authorities, random walks, auctions and matching markets, sponsored search markets

Reference Books:

1. David Easley and Jon Kleinberg, Networks, Crowds, and Markets: Reasoning About a
2. Highly Connected World. Cambridge University Press, 2010.
3. Mark Newman, Networks: An Introduction, Oxford University Press, 2010.
4. Hansen, Derek, Ben Sheiderman, Marc Smith., Analyzing Social Media Networks with
5. NodeXL: Insights from a Connected World, Morgan Kaufmann, 2011.
6. AvinashKaushik., Web Analytics 2.0: The Art of Online Accounta-bility, Sybex, 2009.

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			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHERS ASSESSMENT*	END SEM UNIVERSITY EXAM	TEACHERS ASSESSMENTS*				
MTIS212		SECURE SOFTWARE ENGINEERING	60	20	20	-	-	3	1	-	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/ Assignment/Attendance, MST Mid Semester Test.

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Course Objectives:-

1. The objective is to plan, manage, document, and communicate all phases of a secure software development cycle.
2. To understand the security requirements, secure software life development cycle, UML for security.

Course Outcomes:-

1. Analyze the various problems related with product & process.
2. Master in preparing test cases.
3. Apply Social networks Visualization tools
4. Apply the various executing test for failures.
5. Identify the applications
6. Master in UML for security.

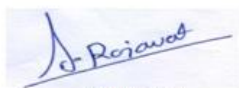
Syllabus:

UNIT I

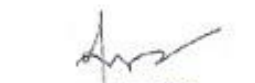
Problem, Process, and Product - Problems of software practitioners – approach through software reliability engineering- experience with SRE – SRE process – defining the product – Testing acquired software – reliability concepts- software and hardware reliability. Implementing Operational Profiles - Developing, identifying, crating, reviewing the operation – concurrence rate – occurrence probabilities-applying operation profiles.

UNIT II

Engineering “Just Right” Reliability - Defining “failure” for the product - Choosing a common measure for all associated systems. - Setting system failure intensity objectives –Determining user



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needs for reliability and availability. Overall reliability and availability objectives, common failure intensity objective., developed softw

are failure intensity objectives. – Engineering software reliability strategies. Preparing for Test - Preparing test cases. - Planning number of new test cases for current release. - Allocating new test cases. - Distributing new test cases among new operations - Detailing test cases. - Preparing test procedures.

UNIT III

Executing Test - Planning and allocating test time for the current release. - Invoking test-identifying identifying failures - Analyzing test output for deviations. – Determining which deviations are failures. Establishing when failures occurred. Guiding Test - Tracking reliability growth - Estimating failure intensity. - Using failure intensity patterns to guide test – Certifying reliability. Deploying SRE - Core material - Persuading your boss, your coworkers, and stakeholders. - Executing the deployment - Using a consultant.

UNIT IV

Using UML for Security - UML diagrams for security requirement -security business process-physical security - security critical interaction - security state. Analyzing Model - Notation - formal semantics - security analysis - important security opportunities. Model based security engineering with UML - UML sec profile- Design principles for secure systems – Applying security patterns.

UNIT V

Applications - Secure channel - Developing Secure Java program- more case studies. Tool support for UML Sec - Extending UML CASE TOOLS with analysis tools - Automated tools for UML SEC. Formal Foundations - UML machines - Rely guarantee specifications- reasoning about security properties.

Reference Books:

1. John Musa D, “Software Reliability Engineering”, 2 nd Edition, Tata McGraw-Hill, 2005 (Units I, II and III)
2. Jan Jürjens, “Secure Systems Development with UML”, Springer; 2004 (Unit IV and V)

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			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHERS ASSESSMENT*	END SEM UNIVERSITY EXAM	TEACHERS ASSESSMENTS*				
MTIS 213		ETHICAL HACKING	60	20	20	-	-	3	1	-	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/ Assignment/Attendance, MST Mid Semester Test.

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Course Objectives:-

1. This module introduces the concepts of Ethical Hacking and gives the students the opportunity to learn about different tools and techniques in Ethical hacking and security and practically apply some of the tools.

Course Outcomes:-

1. At the end of the course the student will be able to:
2. Identify and analyse the stages an ethical hacker requires to take in order to compromise a target system.
3. Identify tools and techniques to carry out a penetration testing.
4. Critically evaluate security techniques used to protect system and user data.
5. Demonstrate systematic understanding of the concepts of security at the level of policy and strategy in a computer system.

Syllabus:

UNIT I

Casing the Establishment - What is footprinting- Internet Footprinting. -Scanning-Enumeration -basic banner grabbing, Enumerating Common Network services. Case study- Network Security Monitoring

UNIT II

Securing permission - Securing file and folder permission.Using the encrypting file system.Securing registry permissions.Securing service- Managing service permission. Default services in windows 2000 and windows XP. Unix - The Quest for Root. Remote Access vs Local access.Remote access.Local access.After hacking root.

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UNIT III

Dial-up ,PBX, Voicemail, and VPN hacking - Preparing to dial up. War-Dialing.Brude-Force Scripting PBX hacking. Voice mail hacking . VPN hacking. Network Devices – Discovery, Autonomous System Lookup.Public Newsgroups.Service Detection.Network Vulnerability.Detecting Layer 2 Media.

UNIT IV

Wireless Hacking - Wireless Footprinting. Wireless Scanning and Enumeration.Gaining Access.Tools that exploiting WEP Weakness.Denial of Services Attacks. Firewalls- Firewalls landscape- Firewall Identification-Scanning Through firewalls- packet Filtering- Application Proxy Vulnerabilities .Denial of Service Attacks - Motivation of Dos Attackers.Types of DoS attacks.Generic Dos Attacks.Unix and Windows DoS

UNIT V

Remote Control Insecurities - Discovering Remote Control Software.Connection.Weakness.VNC .Microsoft Terminal Server and Citrix ICA .Advanced Techniques Session Hijacking.Back Doors.Trojans.Cryptography .Subverting the systems Environment.Social Engineering.Web Hacking. Web server hacking web application hacking. Hacking the internet User - Malicious Mobile code, SSL fraud, E-mail Hacking, IRC hacking, Global countermeasures to Internet User Hacking.

Reference Books:

1. Stuart McClure, Joel Scambray and Goerge Kurtz, “Hacking Exposed Network Security Secrets & Solutions”, Tata Mcgrawhill Publishers, 2010.
2. Bensmith, and Brian Komer, “Microsoft Windows Security Resource Kit”, Prentice Hall of India, 2010.

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MTIS 221		MOBILE WIRELESS SECURITY	60	20	20	-	-	3	1	-	4

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Course Objectives:-

Provide students a comprehensive wireless and mobile security overview including the design, planning, installation, and maintenance of wireless network security infrastructures. Emphasis is placed on information warfare countermeasures relative to government, military, terrorist and rogue, and private enterprise demographics

Course Outcomes:-

At the end of the course the student will be able to:

1. Diagnose distributed denial-of-service attacks and specify mitigation techniques.
2. Explain the vulnerabilities introduced into an infrastructure by wireless and cellular technologies.
3. Recommend security hardening techniques for wireless or mobile technologies.
4. Compare and contrast the needs of law-enforcement versus individual right-to-privacy in wireless in-frastructures.
5. Prepare a group presentation or individual written assignment on a relevant wireless or mobile security topic.
6. Produce a relevant wireless or mobile security team project.

Syllabus:

UNIT I

Wireless Fundamentals: Wireless Hardware- Wireless Network Protocols- Wireless Programming WEP Security. Wireless Cellular Technologies – concepts – Wireless reality –Security essentials – Informa-tion classification standards - Wireless Threats: Cracking WEP -Hacking Techniques- Wireless Attacks– Airborne Viruses.



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UNIT II

Standards and Policy Solutions – Network Solutions – Software Solutions – Physical Hardware Security- Wireless Security – Securing WLAN – Virtual Private Networks – Intrusion Detection System – Wireless Public Key infrastructure. Tools – Auditing tools – Pocket PC hacking –wireless hack walk-through.

UNIT III

Security Principles – Authentication – Access control and Authorization – Non-repudiation privacy and Confidentiality – Integrity and Auditing –Security analysis process. Privacy in Wireless World – Legislation and Policy – Identify targets and roles analysis – Attacks and vulnerabilities – Analyze mitigations and protection.

UNIT IV

WLAN Configuration – IEEE 802.11 – Physical layer – media access frame format – systematic exploitation of 802.11b WLAN – WEP – WEP Decryption script – overview of WEP attack – Implementation - Analyses of WEP attacks.

UNIT V

Global Mobile Satellite Systems; case studies of the IRIDIUM and GLOBALSTAR systems. Wireless Enterprise Networks: Introduction to Virtual Networks, Blue tooth technology, Blue tooth Protocols. Server-side programming in Java, Pervasive web application architecture, Device independent example application.

Reference Books:

1. Russel Dean Vines, “Wireless Security Essentials: Defending Mobile from Data Piracy”, John Wiley & Sons, 1st Edition, 2002.
2. Cyrus, Peikari and Seth Fogie, “Maximum Wireless Security”, SAMS Publishing 2002.
3. Yi-Bing Lin and ImrichChlamtac, “Wireless and Mobile Networks Architectures”, John Wiley & Sons, 2001.
4. Raj Pandya, “Mobile and Personal Communication systems and services”, Prentice Hall of India, 2001.
5. Tara M. Swaminathan and Charles R. Eldon, “Wireless Security and Privacy- Best Practices and Design Techniques”, Addison Wesley, 2002.
6. Bruce Potter and Bob Fleck, “802.11 Securities”, O’Reilly Publications, 2002.
7. Burkhardt, “Pervasive Computing”, Pearson Education, India Edition, 2007.
8. J. Schiller, “Mobile Communication”, Pearson Education, India Edition, 2002.

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			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHERS ASSESSMENT*	END SEM UNIVERSITY EXAM	TEACHERS ASSESSMENTS*				
MTIS 222		INFORMATION THEORY & CODING	60	20	20	-	-	3	1	-	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/ Assignment/Attendance, MST Mid Semester Test.

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:-

1. To introduce information theory, the fundamentals of error control coding techniques and their applications.
2. Basic concepts of information theory, leading to the channel capacity theorem, error control coding techniques and applications.
3. The basic concepts of cryptography will be introduced.

Course Outcomes:-

1. Students will be introduced to the basic notions of information and channel capacity.
2. Students will be introduced to convolution and block codes, decoding techniques, and automatic repeat request (ARQ) schemes.
3. Students will be understood how error control coding techniques are applied in communication systems.
4. Students will understand the basic concepts of cryptography.

Syllabus:

UNIT I

Source Coding - Introduction to information theory, uncertainty and information, average mutual information and entropy, source coding theorem, Shannon-fano coding, Huffman coding, Arithmetic coding, Lempel-Ziv algorithm, run-length encoding and rate distortion function.

UNIT II

Channel capacity and coding - channel models, channel capacity, channel coding, information capacity theorem, random selection of codes. Error control coding: linear block codes and their properties, decoding of linear block code, perfect codes, hamming codes, optimal linear codes and MDS codes.

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UNIT III

Cyclic codes - polynomials, division algorithm for polynomials, a method for generating cyclic codes, matrix description of cyclic codes, burst error correction, fire codes, golay codes, CRC codes, circuit implementation of cyclic codes. BCH codes: minimal polynomials, generator polynomial for BCH codes, decoding of BCH codes, Reed-Solomon codes and nested codes.

UNIT IV

Convolutional codes - tree codes and trellis codes, polynomial description of convolutional codes, distance notions for convolutional codes, generation function, matrix description of convolutional codes, viterbi decoding of convolutional codes, distance bounds for convolutional codes, turbo codes and turbo decoding.

UNIT V

Trellis Coded Modulation - concept of coded modulation, mapping by set partitioning, ungerboeck's TCM design rules, TCM decoder, Performance evaluation for Additive White Gaussian Noise (AWGN) channel, TCM for fading channels.

Reference Books:

1. Ranjan Bose, "Information theory, coding and cryptography", Tata McGraw Hill, 2002.
2. Viterbi, "Information theory and coding", McGraw Hill, 1982.
3. John G. Proakis, "Digital Communications", 2 nd Edition, McGraw Hill

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COURSE CODE	CATEGORY	COURSE NAME	EVALUATION SCHEME								
			THEORY			PRACTICAL		Th	T	P	CREDITS
			END SEM UNIVERSITY EXAM	TWO TERM EXAM	TEACHERS ASSESSMENT*	END SEM UNIVERSITY EXAM	TEACHERS ASSESSMENTS*				
MTIS 223		CLOUD SECURITY	60	20	20	-	-	3	1	-	4

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit; Q/A – Quiz/Assignment/Attendance, MST Mid Semester Test

***Teacher Assessment** shall be based following components: Quiz/Assignment/ Project/Participation in Class, given that no component shall exceed more than 10 marks.

Course Objectives:-

1. Cloud security introduces the basic concepts of security systems and cryptographic protocols, which are widely used in the design of cloud security.
2. The issues related multi tenancy operation, virtualized infrastructure security and methods to improve virtualization security

Course Outcomes:-

1. Compare modern security concepts as they are applied to cloud computing.
2. Assess the security of virtual systems.
3. Evaluate the security issues related to multi-tenancy.
4. Appraise compliance issues that arise from cloud computing.

Syllabus:

UNIT I

Security Concepts: Confidentiality, privacy, integrity, authentication, non-repudiation, availability, access control, defence in depth, least privilege, how these concepts apply in the cloud, what these concepts mean and their importance in PaaS, IaaS and SaaS. e.g. User authentication in the cloud; Cryptographic Systems: Symmetric cryptography, stream ciphers, block ciphers, modes of operation, public-key cryptography, hashing, digital signatures, public-key infrastructures, key management, X.509 certificates, OpenSSL.

UNIT II

Multi-tenancy Issues: Isolation of users/VMs from each other. How the cloud provider can provide this; Virtualization System Security Issues: e.g. ESX and ESXi Security, ESX file system security, storage considerations, backup and recovery; Virtualization System Vulnerabilities: Management console vulnerabilities, management server vulnerabilities, administrative VM vulnerabilities, guest VM



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vulnerabilities, hypervisor vulnerabilities, hypervisor escape vulnerabilities, configuration issues, malware (botnets etc).

UNIT III

Virtualization System-Specific Attacks: Guest hopping, attacks on the VM (delete the VM, attack on the control of the VM, code or file injection into the virtualized file structure), VM migration attack, hyperjacking.

UNIT IV

Technologies for Virtualization-Based Security Enhancement: IBM security virtual server protection, virtualization-based sandboxing; Storage Security: HIDPS, log management, Data Loss Prevention. Location of the Perimeter

UNIT V

Legal and Compliance Issues: Responsibility, ownership of data, right to penetration test, local law where data is held, examination of modern Security Standards (eg PCIDSS), how standards deal with cloud services and virtualization, compliance for the cloud provider vs. compliance for the customer.

Reference Books:

1. Tim Mather, SubraKumaraswamy, ShahedLatif, Cloud Security and Privacy: An
2. Enterprise Perspective on Risks and Compliance[ISBN: 0596802765]
3. Ronald L. Krutz, Russell Dean Vines, Cloud Security[ISBN: 0470589876]
4. John Rittinghouse, James Ransome, Cloud Computing[ISBN: 1439806802]
5. J.R. ("Vic") Winkler, Securing the Cloud[ISBN: 1597495921]
6. Cloud Security Alliance 2009, Security Guidance for Critical Areas of Focus in Cloud Computing
7. vmwareVMware Security Hardening Guide
8. Cloud Security Alliance 2010, Top Threats to Cloud Computing
9. NIST Guidelines on Security and Privacy in Public Cloud Computing
10. NIST Guide to Security for Full Virtualization Technologies
11. William Hau, Rudolph Araujo et al How Virtualization Affects PCI DSS
www.mcafee.com/us/resources/.../wp-how-virt-affect-pci-dss-part-1.pdf
12. Chenxi Wang Compliance with Clouds: Caveat Emptor.

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