

SVKM's NarseeMonjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. (Information Technology)				Semester: VI AY 2020 - 21	
Course/Module: Introduction to Cybersecurity				Module Code: BTIT06010	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
3	2	0	4	Marks Scaled to 50	Marks Scaled to 50
Prerequisite: Basic Knowledge of Computer Network, Operating Systems and programming					
Objectives: This course is an introduction to the field of Cybersecurity. This course introduces various aspects of cybersecurity to the students. Students will learn about various security threats and countermeasures.					
Outcomes: After completion of this course, students would be able to					
<ol style="list-style-type: none"> 1. Analyze various cybersecurity threats and countermeasures 2. Understand various security technologies and mechanisms 3. Develop risk and Incident Management plan 4. Understand various professional, ethical and legal issues related to cybersecurity 					
Detailed Syllabus:					
Week	Description				Duration
1	Introduction: Basic Components of Cybersecurity, Characteristics of Information, vulnerabilities, threats , Attacks and controls ,goals of security, NSTISSC security model, Security System development life cycle, cybercrimes and criminals, professional, legal and ethical issues.				6
2	Design Principles: Various Security threats and attacks, method of defence, Design Principles, Security policies, types of security policies, Case Study				5
3	Cryptography: Cryptography basics, transposition ciphers, substitution ciphers, mathematics for symmetric and asymmetric- key cryptography, cryptographic algorithms (AES and RSA), stream and block ciphers, key management, digital signature, hash functions, Attacks on cryptosystems, cryptanalysis.				10
4	Program Security: Secure programs, Non malicious Program Errors, Viruses and other malicious code, countermeasures.				4
5	Identity and access management(IAM): Authentication basics, Passwords, authentication tokens, certificate based and biometric authentication, Kerberos, SSO approaches, Multi-Factor Authentication, attacks on authentication schemes, Access control principles, DAC, MAC, and Role based Access Control, Access control				6

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Mukesh Patel School of Technology Management & Engineering

	models, identity and access provisioning lifecycle	
6	Security Technologies: Firewalls, Kinds of Firewalls, Filtering Services, DMZ, Implementing policies (Default allow, Default Deny) on proxy, NAT, Intrusion Detection and Prevention Systems, types of IDPS, Virtual Private Network, SSH, Security information and event management (SIEM)	6
7	Risk and Incidents Management: overview of risk management, risk identification and assessment, risk control strategies, selecting risk control strategy, continuity strategies (Business continuity planning, Incident response planning, Disaster Recovery planning)	4
8	Human Aspect in cybersecurity: security and usability, security culture	2
9	Contemporary issues related to cybersecurity	2
	Total	45

Text Books:

1. C. Pfleeger, S. L. Pfleeger and J. Margulies, Security in Computing, 5th Edition, Pearson Education, 2018.
2. M. Whitman and H. Mattford, Principles of Information Security with MindTap, 6th Edition, Cengage, 2018.

Reference Books:

1. B. Forouzan, D. Mukhopadhyaya, "Cryptography and Network Security", 4th Edition, McGraw Hill, 2019.
2. W. Stallings, "Cryptography and Network Security: Principles and Practice", 7th Edition, Pearson Education, 2017.
3. D. Shah, "Mark Stamp's Information Security: Principles and Practice", Wiley India, 2012.

Any other information :

Details of Internal Continuous Assessment (ICA)

Test Marks :20

Term Work Marks:30

Details of Term work:Tutorials/Quiz/Presentation/Viva/Assignments etc.

Signature
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SVKM's NarseeMonjee Institute of Management Studies
 Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. (Information Technology)				Semester: VI AY 2020 -21	
Course/Module : Cloud Computing				Module Code: BTIT06011	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
3	2	0	4	Marks Scaled to 50	Marks Scaled to 50
Prerequisite: Computer Networks					
Objectives: The course is designed to enable students to understand state-of-the-art cloud computing technologies and applications. This course covers basic models, architecture, virtualisation. It also delves into concepts, processes and best practices needed to secure cloud information. It emphasises on business models, risk management and service management aspects of cloud.					
Outcomes: After completion of this course, students would be able to					
<ol style="list-style-type: none"> 5. Assess the need for migrating to cloud based on importance and benefits of cloud computing 6. Classify the layers of cloud reference model based on their significance 7. Evaluating existing infrastructure and identify components, interface and protocols for cloud transformation. 8. Compare the business continuity options, address security concerns and the service management activities in cloud environment 					
Detailed Syllabus: (per session plan)					
Week	Description				Duration
1	Introduction: Essential Characteristics of Cloud, Benefits of Cloud, Applications of Cloud, Cloud Service Models and Cloud Service Brokerage, Cloud Deployment Models				3
2	Reference Model: Cloud Reference model, Considerations for building cloud infrastructure – Strategic impact, Risk impact, Financial impact				3
3	Infrastructure as a Service: Compute System, Storage System architecture, Network connectivity				3
4	Platform as a Service: Web Application Frameworks, Web Hosting Services, Google App Engine, Microsoft Windows Azure, Force.com				3
5	Software as a Service: Customer Relationship Management, Human Resources Financial, Collaboration, Backup and Recovery, Industry Solutions				3

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Mukesh Patel School of Technology Management & Engineering

6	Virtual Layer: Functions of virtual layer, Types of Virtualisation, Virtualisation Software, Resource pool, Virtual resources.	3
7	Control Layer: Functions of control layer, Control software, Software defined approach, Resource optimization	3
8	Security layer: Threats, Security mechanisms, Infrastructure Security: The Network Level, The Host Level, The Application Level, Data Security and Storage, Aspects of Data Security, Data Security Mitigation Provider Data and Its Security	3
9	Identity and Access Management (IAM): Trust boundaries and IAM, IAM Challenges, IAM standards and protocols for cloud services, IAM practices in cloud, Cloud Authorization Management.	3
10	Audit and Compliance: Internal Policy Compliance, Governance, Risk and Compliance (GRC), External Compliance, Cloud Security Alliance, Cloud Audit, Security as a Service.	3
11	Business Continuity: Business process models and business continuity, Service availability, Fault Tolerance mechanisms	3
12	Cloud Backup and Replication: Backup and Replication in Cloud, Cloud Application Resiliency	3
13	Service and Orchestration Layer: Functions of service layer, Cloud portal, Cloud interface standards, Protocols for accessing cloud services.	3
14	Service and Orchestration Layer: Service Orchestration, Cloud Service Lifecycle	3
15	Service Management: Service Portfolio Management, Service operation Management	3
	Total	45

Text Books:

- John Rhoton, "Cloud Computing Explained: Implementation Handbook for Enterprises", Recursive Limited, 2013 Edition.
- Tim Mather, "Cloud Security and Privacy: An Enterprise Perspective on Risks and Compliance (Theory in Practice)", 1st edition, O'Reilly Media, 1st October 2011.

Reference Books:

- Rajkumar Buyya, James Broberg, Andrzej Goscinski, "Cloud Computing: Principles and Paradigms", Wiley India, 2013.
- Barry Sosinsky, "Cloud Computing Bible", Wiley India, 2011.
- A.Srinivasan, J. Suresh, "Cloud Computing A Practical approach for learning and implementation",

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Mukesh Patel School of Technology Management & Engineering

Pearson India, Jan 2014

7. Anthony T. Velte, "Cloud Computing: A Practical Approach", McGraw Hill, July 2017
8. Gautam Shroff, "Enterprise Cloud Computing", Cambridge University Press, 2010.

Any other information:

Details of Internal Continuous Assessment (ICA)

Test Marks :20

Term Work Marks: 30

Details of Term work : Tutorials/Quiz/Presentation/Viva

Signature
(Prepared by Concerned Faculty/HOD)

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Mukesh Patel School of Technology Management & Engineering

Program: B.Tech. (Information Technology)				Semester: VI AY 2020 -21	
Course/Module : Mobile Application Development				Module Code: BTIT06012	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
0	4	0	2	50	-
Prerequisite: Programming for Problem Solving					
Objectives:					
<ul style="list-style-type: none"> • To understand Mobile Application Development as a process by which application software would be developed for low-power handheld devices, such as mobile devices. • The course would focus more on lab work to teach mobile application development through “Eclipse integrated development environment (IDE) with J2SE, Java Standard Edition, and the Android Development Kit (ADK)”. 					
Outcomes:					
After completion of this course, students would be able to					
<ol style="list-style-type: none"> 1. Demonstrate the capability to use a range of software tools in support of the development of a software application. 2. Apply Application Design for a given scenario with graphical user interface concepts. 3. Understand the code necessary to create several simple applications to demonstrate capabilities on emulator/hand-held device. 4. Design applications with ability to connect to backend database or external files. 					
Detailed Syllabus: (per session plan)					
Week	Description				Duration
1	Configuration of Development Platform. Starting an Android Application project: Installing Eclipse and Java, Installing the Android Development Kit.				1
2	Application Design: Screen Layout, Simple Controls, Creating and Configuring an Android Emulator, Communicating with the Emulator.				2
3	Controls and the User Interface: Check Boxes, Radio Buttons, Spinner, DatePicker.				2
4	Basic Graphics by Extending the View Class: Touch Listener, Graphics.				2
5	Find a Location with Google Maps				1
6	Multiscreen Applications: Stretching the Screen, Pop-up Dialog Boxes and Toasts, Menus.				2
7	Working with Images: Displaying Images, Using Images stored on the Android Device.				2

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Mukesh Patel School of Technology Management & Engineering

8	Text Files, Data Tables, and XML: Working Text files, Data Tables using SQLite, XML for Data Exchange.	2
9	Client-Server Applications and Publishing your Application	1
	Total	15
Text Books:		
5. "Android Application Development for Java Programmers", James C. Sheusi, Cengage Learning, 2013.		
Reference Books:		
9. "Head First Android Development", Jonathan Simon, O'Reilly Media, 2012.		
Any other information :		
Details of Internal Continuous Assessment (ICA)		
Test Marks : 20		
Term Work Marks : 30		
Details of Term work : Tutorials/Quiz/Presentation/Viva/Project		

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SVKM's NarseeMonjee Institute of Management Studies
 Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. (Information Technology)				Semester: VI AY 2020 - 21	
Course/Module: Ethics for IT Users & IT Organizations				Module Code: BTIT06018	
Teaching Scheme			Evaluation Scheme		
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
0	0	2	2	Marks Scaled to 50	-
Prerequisite: NIL					
Objectives: This course gives an introduction to Ethics in Information Technology. It covers ethics related to IT users and ethics applicable in an IT organization's context.					
Outcomes: After completion of this course, students would be able to <ol style="list-style-type: none"> 1. Describe various approaches to ethical decision making 2. Understand ethical issues that arise at workplace and illustrate the key ethical issues of an IT organization 3. Understand copyrights, patents and laws needed in IT organizations 4. Highlight the ethical concerns w.r.t online communities and emerging technologies 					
Detailed Syllabus:					
Unit	Description				Duration
1.	An Overview of Ethics: Brief introduction to ethical theories – consequence based, duty based. Definition of ethics, the importance of integrity, the difference between morals, ethics and laws, ethics in the business world: forecasting business ethics, improving corporate ethics, creating an ethical work environment (prevention of sexual harassment act), decision making, ethics in information technology.				6
2.	Ethics for IT Workers and IT Users: IT professionals: professional business industry, managing professional relationships, professional code of ethics, professional organizations, certification, government licensing, IT professional malpractice. IT users: common ethical issues, ethical practice of IT users.				6
3.	Intellectual Property: Intellectual property, copyrights, patents, trade secrets and its laws, employees and trade secret, key intellectual property issues, plagiarism, reverse engineering, open source code, competitive intelligence, trademark infringement, cyber-squatting.				6

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Mukesh Patel School of Technology Management & Engineering

4.	Ethics of IT Organization: Key ethical issues for organizations, ethics in IT outsourcing, whistle blowing, green computing, ICT industry code of conduct.	6
5.	Ethical aspect of Online communities, Emerging and Converging Technologies: Ethical concerns in online communities, Ubiquitous computing, Intelligent user interfaces and other emerging technologies.	6
Total		30

Textbooks:

1. "Ethics in Information Technology", 4th Edition, George Reynolds Strayer University, 2012.
2. "Ethics and Technology: Controversies, Questions, and Strategies for Ethical Computing", 3rd Edition, Herman T. Tavani, John Wiley & Sons, 2011.

Reference Books:

1. "Ethics in IT outsourcing", Gold T. Taylor & Francis, 2012.
2. "Contemporary Issues in Ethics and Information Technology", Robert A. Schultz, Idea Group Inc (IGI), 2006.

Any other information:

Details of Internal Continuous Assessment (ICA)

Test Marks:30

Term Work Marks: 20

Details of Term work: Quiz/Presentation/Discussion

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Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. (Information Technology)				Semester: VI AY 2020 - 21	
Course/Module : Research Methodology				Module Code: BTIT06019	
Teaching Scheme			Evaluation Scheme		
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
0	2	0	1	Marks Scaled to 50	-
Prerequisite: --					
Objectives: The aim of this course is to introduce students to the approach to do research in the computing domain					
Outcomes: After completion of this course, students would be able to					
<ul style="list-style-type: none"> 9. Produce a review report related to the research conducted 10. Identify and use print and electronic library resources effectively and appropriately 11. Adhere to ethical guidelines for writing reports and collecting information 12. Create a research proposal based on the review findings 					
Detailed Syllabus: (per session plan)					
Week	Description				Duration
1-3	<ul style="list-style-type: none"> - Identify and use print and electronic library resources effectively and appropriately - Literature search and review 				6
4-10	<ul style="list-style-type: none"> - Literature search and review - Referencing style, plagiarism basics and checks - Writing a review report 				14
11-15	<ul style="list-style-type: none"> - Writing a review report - Drafting a research proposal 				10
	Total				30
Text Books / Reference books: --					
Any other information : Details of Internal Continuous Assessment (ICA)					
Test Marks : --					
Term Work Marks : 50					
Details of Term work : Assignment/Presentation/Viva					

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Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. (Information Technology)				Semester : VI AY 2020 - 21	
Course : Software Testing				Code : BTIT06020	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
2	2	0	3	Scaled to 50 marks	Scaled to 50 marks
Pre-requisite: Software Engineering ,Programming for Problem Solving					
Objectives: This is an introductory course on software testing.The objective of this course is to familiarizewith testing fundamentals andtesting phases. Also, the different software testing methodologies and toolsare discussed .					
Outcomes: After successfully completion of this course, students would be able to <ol style="list-style-type: none"> 1. Understand softwaretesting processto find software bugs. 2. Analysethe different software testing methodologies. 3. Understand the concept of test management and testing tools. 4. Apply software testing techniques to various application scenarios 					
Detailed Syllabus:					
Unit	Description				Duration
1	Fundamentals of Testing: Introduction to Testing, Error, Defect and bug terminology,General Principles of Testing,Psychology of Testing, Test Metrics.				3
2	Testing Phases: Software Testing Life Cycle, Agile Methodology and its Impact on testing,Test Levels - Unit, Component, Module, Integration, System, Acceptance and Generic Testing.				4
3	Static Testing: Structured Group Examinations,Static Analysis, Control flow and Data flow, Determining Metrics.				5
4	Dynamic Testing - Black Box TestingTechniques -Equivalence Class Partitioning, Boundary				7

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	Value Analysis, State Transition Test, Cause Effect Graphing and Decision Table Technique, Use Case Testing, Functional Testing, Non-functional testing-performance, load, security testing. White Box Testing Techniques: Statement, Branch, Path Coverage, Test of conditions. Gray Box Testing, Intuitive and Experience Based Testing	
5	Test Management: Test Organization, Test Planning, Cost and economy Aspects, Test Strategies, Test Activity and Incident Management, Configuration Management, Performance and Security Testing	4
6	Testing Tools: Types of test Tools, Tool Selection Criteria, Cost Effectiveness of Tool.	4
7	Testing of Object Oriented Systems- Introduction to OO testing concepts with case study.	3
	Total	30
Text Books:		
<ol style="list-style-type: none"> 1. Software Testing Foundations, Andreas Spillner, Tilo Linz, Hans Schaefer, Shoff Publishers and Distributors, fourth edition, 2014. 2. Software Testing: Principles and Practices by Srinivasan D and Gopalswamy R, Pearson Education. 		
Reference Books:		
<ol style="list-style-type: none"> 1. Foundations of Software Testing by Aditya P. Mathur – Pearson Education, 2013. 2. Testing Object Oriented Systems: models, patterns and tools, Robert V Binder, Addison Wesley. 3. The art of software testing by GJ Myers, Wiley Publication, 2011. 4. Software Testing Principles, Techniques and Tools, M.G. Limaye, Tata McGraw-Hill Education, TMH, 2009. 		
Term Work: As per department and Institute norms for termwork.		

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SVKM's NarseeMonjee Institute of Management Studies
 Mukesh Patel School of Technology Management & Engineering

Program: B.Tech. (Information Technology)				Semester: VI AY 2020 -21	
Course/Module : Elective-II (Artificial Intelligence and Robotics)				Module Code: BTIT06013	
Teaching Scheme			Evaluation Scheme		
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
2	2	0	3	Marks Scaled to 50	Marks Scaled to 50
Prerequisite: Engineering Mathematics , Programming in Python , Data Structures					
Objectives:					
<ul style="list-style-type: none"> • Formulate scientific questions and solve problems with the aid of abstraction and modeling. • Understand and implement the game playing strategies & develop basic AI systems. • Impart knowledge about industrial robots for their control and design. 					
Outcomes:					
After completion of this course, students would be able to					
13. Build intelligent agents for search and games					
14. Solve AI problems through programming with Python					
15. Perform kinematic and dynamic analyses with simulation.					
16. Design control laws for a robot & Integrate mechanical and electrical hardware for a real prototype of robotic device					
Detailed Syllabus: (per session plan)					
Week	Description				Duration
1	Introduction: Concept of AI, history, current status, scope, agents, environments, Problem Formulations, Review of tree and graph structures, State space representation, Search graph and Search tree.				3
2	Search Algorithms: Random search, Search with closed and open list, Depth first and Breadth first search, Heuristic search, Best first search, A* algorithm, AND-OR Graphs, AO* algorithm.				6
3	Domain of a game, different ways to improve search strategies, plausible move generate, static evaluation function, different static evaluation functions, minimax search procedure, and alpha-beta cutoff.				6
4	Introduction to Robotics : Types and components of a robot, Classification of robots, closed-loop and open loop control systems., Kinematics systems; Definition of mechanisms and manipulators, Social issues and safety				3

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Mukesh Patel School of Technology Management & Engineering

5	Robot Kinematics and Dynamics: Kinematic Modelling: Translation and Rotation Representation, Coordinate transformation, DH parameters, Jacobian, Singularity, and Statics, Dynamic Modelling: Equations of motion: Euler-Lagrange formulation	6
6	Sensors and Vision System: Sensor: Contact and Proximity, Position, Velocity, Force, Tactile etc	6
	Total	30

Text Books:

1. Stuart Russell and Peter Norvig, "Artificial Intelligence: A Modern Approach" , 3rd Edition, Prentice Hall ,2018
2. Elaine Rich and Kevin Knight, "Artificial Intelligence", Tata McGraw Hill, 3 edition , 2017
3. Saha, S.K., "Introduction to Robotics, 2nd Edition, McGraw-Hill Higher Education, New Delhi, 2014.

Reference Books:

1. Trivedi, M.C., "A Classical Approach to Artificial Intelligence", Khanna Publishing House, Delhi. 4., 2009
2. Saroj Kaushik, "Artificial Intelligence", Cengage Learning India, 2011
3. Mittal R.K. and Nagrath I.J., "Robotics and Control", Tata McGraw Hill, 2003
4. . Ghosal, A., "Robotics", Oxford, New Delhi, 2nd edition, 2006.
5. Craig, J.J., "Introduction to Robotics: Mechanics and Control", Pearson, New Delhi, 2009

Any other information :

Details of Internal Continuous Assessment (ICA)

Test Marks :20

Term Work Marks : 30

Details of Term work : Tutorials/Quiz/Presentation/Viva

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Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. (Information Technology)				Semester : VI AY 2020 -21	
Course/Module : Elective-II (Advanced Computer Networks)				Module Code : BTIT06014	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
2	2	0	3	Marks Scaled to 50	Marks Scaled to 50

Prerequisite: Computer networks (BTIT04009)

Objectives:

The objective of this course is to familiarize students with the working of internetworks. This course addresses various protocols used in the internet and how they interact to provide user services. It also introduces students to advanced topics in computer networking.

Outcomes:

After completion of this course, students would be able to

1. Understand medium access layer protocols
2. Design IP addressing scheme, analyze packet forwarding, and compare different routing protocols
3. Compare and analyze transport protocols and other key protocols essential for networking
4. Understand various multimedia protocols, internet security concepts and future networks

Detailed Syllabus:

Unit	Description	Duration
1.	Medium access layer: Channel allocation problem, hidden node and exposed node problem FDM, TDM, CDMA, MACA	3
2.	Internet protocol: IPv4, compare IPv4 and IPv6, IPv6 - (address, special address, transition from IPv4 to IPv6; subnetting classless addressing)	5
3.	Network Layer: Routing tables and forwarding, Routing protocols - Open Shortest Path First and Border Gateway Protocol, DHCP, Mobile IP, AODV	6
4.	Transport layer: Transmission Control Protocol - Reno, SCTP, I-TCP, Snoop TCP and Mobile TCP	6
5.	Multimedia in the internet: SIP, QoS (flow classes, flow control to improve QoS - FIFO, Priority and WFQ)	3
6.	Network security: Introduction to Internet security - application layer security, transport layer security (SSL and TLS), IPSec, VPN, Firewall, WPA2, WPA3	5
7.	Introduction to Internet of Things and applications, software defined networks and 5G.	2
	Total	30

Text Book:

1. Behrouz A. Forouzan, Firouz Mosharraf, "Computer Networks: A Top-down Approach", McGraw-Hill, 2012.

SVKM's NarseeMonjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

2. Jochen Schiller, "Mobile communication", 2nd edition, Pearson education, 2008.

Reference Books:

1. Behrouz A. Forouzan, "TCP/IP Protocol suite", 4th Edition, TMH, 2010.
2. James F. Kurose, Keith W. Ross, "Computer Networking: A Top Down Approach", 6th Edition, Pearson Education, 2012.
3. Feit S, "TCP/IP: Architecture, Protocols and Implementation with IPv6 and IP Security", 2nd Edition, TMH, 2008.
4. Comer D., "Internetworking with TCP/IP Volume-I", 5th Edition, PHI, 2010.
5. W.Richard Stevens, Kevin Fall, "TCP/IP Illustrated Volume-I: The Protocols", 2nd Edition, Pearson Education, 2012.
6. Jonathan Rodriguez, "Fundamentals of 5G Mobile Networks", 1st edition, Wiley, 2015.

Any other information :

Details of Internal Continuous Assessment (ICA)

Test Marks :20

Term Work Marks : 30

Details of Term work : Tutorials/Quiz/Presentation/Viva

Signature
(Prepared by Concerned Faculty/HOD)

SVKM's NarseeMonjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. (Information Technology)				Semester: VI AY 2020 - 21	
Course/Module : Elective-II (Advance Image Processing)				Module Code: BTIT06015	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
2	2	0	3	Marks Scaled to 50	Marks Scaled to 50
Prerequisite: Image processing, Signal and System , Engineering maths					
Objectives: <ol style="list-style-type: none"> 1. To explore the various Image Analysis and it's Interpretation techniques. 2. To learn different methods of Feature generation and it's Interpretation. 3. To analyze& Interpret Images in terms of various applications. 					
Outcomes: After completion of this course, students would be able to <ol style="list-style-type: none"> 1. Understand Image representation and modelling. 2. Analyze various methods of Image Analysis. 3. Learn Motion analysis for video. 4. Construct 3D Image visualization. 					
Detailed Syllabus:					
Units	Description				Duration
1	Introduction: Digital image fundamentals Fundamental steps in digital image processing, Components of digital image processing system, elements of visual perception, Structure of the human eye, Image formation in the eye.				2
2	Image Modelling: Sampling, Quantization and Representing Digital Images. Image. Pre-processing.Enhancement: Power Law Transformation, Contrast Stretching and Histogram Equalization.Spatial domain Filters: Smoothing, Sharpening				4
3	Brightness adaptation and discrimination, light, Image sensing and acquisition, Image formation model, definition and some properties of two dimensional system. Discrete 2D convolution, 2D discrete Fourier transform and its properties, optical and modulation transfer function, Spectral density function.				4

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Mukesh Patel School of Technology Management & Engineering

4	Feature Extraction: Basis Vectors and Images , K-L transformation , Singular Value Decomposition , Independent Component Analysis , Non–Negative Matrix Factorization , Non- linear Dimension Reduction , Haar Transform , Multi resolution Interpretation	5
5	Image Representation and Description: Boundary Representation, Region Representation, Moments Representation, Structure Representation, Shape Representation, Texture Representation.	5
6	Motion analysis: Background subtraction and modelling, Optical Flow, KLT, Spatio-Temporal Analysis, Dynamic Stereo, Motion parameter Estimation.	4
7	3D Image Visualization: Sources of 3D Data sets, Slicing the Data set, Arbitrary section planes, The use of colour.	3
8	Application: Remote Sensing Images • Medical Images • Image Forensics: Finger print classification • Digital Watermarking for Images• Biometric systems	3
	Total	30

Text Books:

1. R.C.Gonsales ,R.E.Woods, “Digital Image Processing”, fourth Edition, Pearson Education,2018
2. Anil K. Jain, “Fundamentals of Image Processing”, PHI Second edition.2007
3. Digital Image Processing, S Jayaraman, S Esakkirajan, T Veerakumar,Tata McGraw-Hill Education Private Limited, 2015.

Reference Books:

1. William Pratt, “*Digital Image Processing*”, John Wiley, fourth edition,2007
2. N Ahmed & K.R. Rao, “*Orthogonal Transforms for Digital Signal Processing*” Springer ,2012
3. B. Chanda, D. Dutta Majumder, “*Digital Image Processing and Analysis*”, PHI,2011
4. Image Processing, Analysis, and Machine Vision, Milan Sonka Vaclav Hlavac Roger Boyle. 2015
Digital Image Processing an Algorithm Approach, Madhuri A. Joshi, PHI 2018.

Any other information :

Details of Internal Continuous Assessment (ICA)

Test Marks :20

Term Work Marks : 30

Details of Term work : Tutorials/Quiz/Presentation/Viva

SVKM's NarseeMonjee Institute of Management Studies
Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. (Information Technology)				Semester:VI AY - 2020 -21	
Course/Module : Elective-II (Distributed Systems)				Module Code:BTIT06016	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
2	2	0	3	Marks Scaled to 50	Marks Scaled to 50
Prerequisite:					
Objectives: The student should be made to: <ul style="list-style-type: none"> 1. Understand foundations of Distributed Systems. 2. Introduce the idea of peer to peer services and file system. 3. Understand in detail the system level and support required for distributed system. 4. Understand the issues involved in studying process and resource management. 					
Outcomes: After completion of this course, students would be able to <ul style="list-style-type: none"> 1. Discuss trends in Distributed Systems. 2. Apply network virtualization. 3. Apply remote method invocation and objects. 4. Design process and resource management systems. 					
Detailed Syllabus: (per session plan)					
Unit	Description				Duration
1	UNIT – IINTRODUCTION Examples of Distributed Systems–Trends in Distributed Systems Focus on resource sharing – Challenges. Case study: World Wide Web				2
2	UNIT - II COMMUNICATION IN DISTRIBUTED SYSTEM System Model – Inter process Communication The API for internet protocols – External data representation and Multicast communication. Network virtualization: Overlay networks. Case study: MPI Remote Method Invocation And Objects: Remote Invocation – Introduction – Request-reply protocols – Remote procedure call – Remote method invocation. Case study: Java RMI – Group communication – Publish-subscribe systems – Message queues – Shared memory approaches – Distributed objects – Case study: Enterprise Java Beans -from objects to components				6

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Mukesh Patel School of Technology Management & Engineering

3	<p>UNIT - III PEER TO PEER SERVICES AND FILE SYSTEM 10-8</p> <p>Peer-to-peer Systems – Introduction</p> <p>Napster and its legacy – Peer-to-peer – Middleware – Routing overlays.</p> <p>Overlay case studies: Pastry, Tapestry- Distributed File Systems –Introduction</p> <p>File service architecture – Andrew File system.</p> <p>File System: Features-File model -File accessing models File sharing semantics</p> <p>Naming: Identifiers, Addresses, Name Resolution – Name Space Implementation – Name Caches – LDAP.</p>	7
4	<p>UNIT - IV- SYNCHRONIZATION AND REPLICATION 9-9</p> <p>Introduction – Clocks, events and process states</p> <p>Synchronizing physical clocks- Logical time and logical clocks – Global states – Coordination and Agreement – Introduction – Distributed mutual exclusion – Elections – Transactions and Concurrency Control– Transactions - Nested transactions – Locks – Optimistic concurrency control – Timestamp ordering – Atomic Commit protocols - Distributed deadlocks – Replication – Case study – Coda.</p>	8
5	<p>UNIT - V PROCESS & RESOURCE MANAGEMENT5</p> <p>Process Management: Process Migration: Features, Mechanism, Threads: Models, Issues, Implementation.</p> <p>Resource Management: Introduction- Features of Scheduling Algorithms – Task Assignment Approach – Load Balancing Approach – Load Sharing Approach.</p>	7
Total		30

Text Books:

1. George Coulouris, Jean Dollimore and Tim Kindberg, “Distributed Systems Concepts and Design”, Fifth Edition, Pearson Education, 2017.
2. Andrew S. Tanenbaum, Maarten Van Steen, “Distributed Systems: Principles and Paradigms, Createspace Independent Publishing Platform, 2016.
3. Maurice Herlihy, Dmitry Kozlov, Sergio Rajsbaum, “Distributed Computing Through Combinatorial Topology”, Morgan Kaufmann Elsevier- 2013.

Reference Books:

1. Michel Raynal, “Distributed Algorithms for Message-Passing Systems” Springer-Verlag Berlin Heidelberg, 2013
2. Brendan Burns, “Designing Distributed Systems: Patterns and Paradigms for Scalable, Reliable Services” , O'Reilly Media, Inc, 2018.

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Any other information :

Details of Internal Continuous Assessment (ICA)

Test Marks :50

Term Work Marks : 50

Details of Term work : Tutorials/Quiz/Presentation/Viva

Signature
(Prepared by Concerned Faculty/HOD)

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Mukesh Patel School of Technology Management & Engineering

Program: B. Tech. (Information Technology)				Semester: VI AY 2020 - 21	
Course/Module : Elective-II (Advanced Database Management Systems)				Module Code: BTIT06017	
Teaching Scheme				Evaluation Scheme	
Lecture (Hours per week)	Practical (Hours per week)	Tutorial (Hours per week)	Credit	Internal Continuous Assessment (ICA) (Marks - 50)	Term End Examinations (TEE) (Marks- 100 in Question Paper)
2	2	0	3	Marks Scaled to 50	Marks Scaled to 50
Prerequisite: Database Management Systems					
Objectives: Expand the knowledge gained in Database Management Systems in several directions like Non-Relational data models, deductive (Intelligent) database systems, Distributed systems, web based systems and object oriented systems etc.					
Outcomes: After successful completion of this course, the students would be able to					
<ol style="list-style-type: none"> 1. Analyse different database modelling and management techniques. 2. Evaluate measures of query cost, processing and optimization techniques 3. Create programs to execute on XML and relational database systems 4. Understand advance database application and database administration 					
Detailed Syllabus: (per session plan)					
Week	Description				Duration
1	The Extended Entity Relationship Model and Object Model: The ER model revisited, Motivation for complex data types, User defined abstract data types and structured types				2
	The Extended Entity Relationship Model and Object Model: Subclasses, super classes, Inheritance, Specialization and Generalization, Constraints and characteristics of specialization and generalization.				2
2	Procedural Language/Structured Query language (PL/SQL): Introduction to PL/SQL, Disadvantages of SQL and advantages of PL/SQL				2
	Procedural Language/Structured Query language (PL/SQL): PL/SQL block structure, block data types, block variable declaration, exception handling, Cursors, types of cursors, functions, procedures, triggers.				2
3	Object Oriented Databases: Overview of object oriented concepts, object identity, object structure and type constructions, Encapsulation of operations, Method and persistence,				2

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	Object Oriented Databases: Type hierarchies and Inheritance, Type extents and queries, Complex objects; Database schema design for OODBMS; OQL, Persistent programming language; OODBMS architecture and storage issues; Transaction and Concurrency control, example of ODBMS.	2
4	Parallel and Distributed Databases and Client-Server Architecture: Architectures for parallel database, Parallel query evaluation, Parallelizing individual operations, Sorting, Joins, Distributed Database Concepts, Data Fragmentation, Replication, and allocation techniques for distributed database design;	2
	Parallel and Distributed Databases and Client-Server Architecture: Query processing in distributed databases; Concurrency control and Recovery in distributed databases.	2
5	Databases on the web and Semi-Structured Data: Web interfaces of the web. Overview of XML; data XML applications;	2
	Databases on the web and Semi-Structured Data: The semi structured data model, Implementation issues, Indexes for data.	2
6	Enhanced data models for Advanced applications: Active database concepts, Temporal database concepts, Spatial database concepts and architecture, Deductive databases and Query processing,	2
	Enhanced data models for Advanced applications: Mobile databases, Geographic information systems.	2
7	NoSQL Database: Overview, and History of NoSQL Databases Definition of the Four Types of NoSQL Database.Comparison of relational databases to new NoSQL stores, MongoDB,, Challenges of NoSQL approach	2
	NoSQL Database: NoSQL Key/Value databases using MongoDB, Document Databases, Features, Query Features, Scaling, Suitable Use Cases, Event Logging, Content Management Systems, Blogging Platforms, Web Analytics or Real-Time Analytics, E-Commerce Applications, When Not to Use	2
8	Case Study: Based on distributed database, GIS , Mobile databases.	2
	Total	30
Text Books:		
6. Hennery Korth and Abraham Silberschatz, "Database System Concepts", McGraw Hill, 6th Edition, 2011		

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7. Elmarsi and Navathe, "Fundamentals of Database Design", Addison Wesley 6th Edition, 2010
8. Coronel Morris Rob, "Database Principles Fundamentals of Design Implementation and Management", Cengage Learning, 9th Edition, 2012

Reference Books:

1. Bipin Desai, "An introduction to Database System", Galgotia Publication Ltd, 1st Edition, 2013
2. C.J. Date, Database Systems, Addison Wesley, Eight Edition, 2006
3. DB2 11 for z/OS Database Administration :Certificate Study guide, Paperback July 2016
4. R. Ramakrishnan, "Database Management System", McGraw Hill, 3rd Edition, 2014

Any other information :

Details of Internal Continuous Assessment (ICA)

1. Minimum: Practical based on 10 Experiments
2. Minimum Two class tests.
3. Minimum two assignments

Test Marks :20

Term Work Marks : 30

Details of Term work : Tutorials/Quiz/Presentation/Viva

Signature
(Prepared by Concerned Faculty/HOD)