Scheme of Instruction & Syllabi
of
Bachelor of Technology
(Cloud Computing)

(With effective from academic session 2023-24)

(Dr. Gaurav Agarwal)
HOD CSE

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Dean Engineering &Technology

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STUDY AND EVALUATION SCHEME
(With effective from academic session 2023-2024)
BTech. in Cloud Computing
YEAR III, SEMESTER V

Sl. No.	Category	Course Code	Course Title/ Subjects	Hours per week			Evaluation Scheme		Total	Credits
				L	T	P	CA	EE		
THEORY										
1	Professional Core	BCSI501	Theory of Computation	3	1	0	30	70	100	4
2	Professional Core	BCSICT501	Cloud Computing	3	0	0	25	50	75	3
3	Professional Core	BCSICT502	Network Security	3	0	0	25	50	75	3
4	Professional Core	BCSICT503	Principles of Virtualization	1	0	0	10	15	25	1
5	HSM	BCSICT504	Humanities II	3	1	0	30	70	100	4
6	Professional Elective		Elective-I	3	0	0	25	50	75	3
7	Engineering Science Course	IIOT5	Deep Learning	4	0	0	30	70	100	4
PRACTICALS AND PROJECTS										
7	Professional Core	BCSICT508	Network Security Lab	0	0	2	10	15	25	1
8	Professional Core	BCSICT509	Principle of Virtualization Lab	0	0	2	20	30	50	2
9	Summer Training	BCSI502	Summer Project Seminar-II	0	0	2	20	30	50	2
			TOTAL	20	2	6	225	450	625	27

L-Lecture, **T**- Tutorial , **P**- Practical ,**CA**- Continuous Assessment, **EE**- End Semester Examination

Cloud Computing

L*-Lecture* , T*-Tutorial, P*-Practical

COURSE CODE	Elective - I
BCSICT505	Security Architecture
BCSICT506	Database Security

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STUDY AND EVALUATION SCHEME
(With effective from academic session 2023-2024)
B.Tech. in Cloud Computing
YEAR III, SEMESTER VI

Sl. No.	Category	Course Code	Course Title/ Subjects	Hours per week			Evaluation Scheme		Total	Credits
				L	T	P	CA	EE		
THEORY										
1	Professional Core	BCSI601	Artificial Intelligence	3	0	0	25	50	75	3
2	Professional Core	BCSICT601	Linux Administration	1	0	0	10	15	25	1
3	Professional Core	BCSICT602	Ethical Hacking	3	1	0	30	70	100	4
4	Professional Core		Elective -II	3	1	0	30	70	100	4
5	Professional Core	BCSICT608	Incident Response Management	2	0	0	15	35	50	2
6	Open Elective		Open Elective-I	3	0	0	25	50	75	3
7	Engineering Science Course	IIOT6	Advanced Artificial Intelligence	4	0	0	30	70	100	4
PRACTICALS AND PROJECTS										
7	Professional Core	BCSICT612	Exploring Software as a Service (SaaS) Lab	0	0	2	20	30	50	2
8	Professional Core	SICT615	Linux administration Lab	0	0	2	20	30	50	2
9	Professional Core	SICT616	Ethical Hacking Lab	0	0	2	10	15	25	1
10	Project	BCSICT617	Project-I			4				
			TOTAL	19	2	12	215	435	650	26

L-Lecture, **T**- Tutorial , **P**- Practical ,**CA**- Continuous Assessment, **EE**- End Semester Examination

Course code	Open Elective - I
BCSICT609	UI/UX Fundamentals
SICT610	Mobile Application Development
BCSICT611	Business Intelligence

Course code	Elective – II lab
BCSICT612	Exploring Software as a Service (SaaS) Lab
BCSICT613	Cloud Migration Lab
BCSICT614	Cloud Scripting using PaaS Lab

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BCSI501 Theory of Computation

L	T	P	C
3	1	0	4

MODULE -I

Regular languages : Introduction; Alphabets, Strings and Languages; Automata and Grammars, Deterministic finite Automata (DFA), State transition graph, Transition table, Language of DFA, Nondeterministic finite Automata (NFA), NFA with epsilon transition, Equivalence of NFA and DFA, Minimization of Finite Automata, Regular expression (RE): Definition, Operators of regular expression and their precedence, Algebraic laws for Regular expressions, Kleen's Theorem, Regular expression to FA, DFA to Regular expression, Arden Theorem, Non Regular Languages, Pumping Lemma for regular Languages. Application of Pumping Lemma, Closure properties of Regular Languages, Decision properties of Regular Languages, FA with output: Moore and Mealy machine, Equivalence of Moore and Mealy Machine

MODULE- II

Context free grammar (CFG) and Context Free Languages (CFL): Definition, Derivation, Derivation trees, Ambiguity in Grammar, Inherent ambiguity, Ambiguous to Unambiguous CFG, Useless symbols, Simplification of CFGs, Normal forms for CFGs: CNF and GNF, Closure proper ties of CFLs, Decision Properties of CFLs: Emptiness, Finiteness and Membership, Pumping lemma for CFLs.. Push Down Automata (PDA): Description and definition, Instantaneous Description, Language of PDA, Acceptance by Final state, Acceptance by empty stack, Deterministic PDA, Equivalence of PDA and CFG, CFG to PDA and PDA to CFG, Two stack PDA

MODULE -III

Turing machines (TM): Basic model, definition and representation, Instantaneous Description, Language acceptance by TM, Variants of Turing Machine, TM as Computer of Integer functions, Universal TM, Universal Turing machine and undecidable problems , Rice's theorems for RE sets , Linear bounded automata and context sensitive languages Church's Thesis, Recursive and recursively enumerable languages, Halting problem, Introduction to Undecidablity, Undecidable problems about TMs. Universal Turing machine and undecidable problems, Post correspondence problem (PCP), Modified PCP,Introduction to recursive function theory.

Text Books:

1. K.L.P. Mishra and N.Chandrasekaran, "Theory of Computer Science: Automata, Languages and Computation", PHI
2. Hopcroft, Ullman, "Introduction to Automata Theory, Languages and Computation", Pearson Education
3. Peter Linz "An Introduction to Formal Languages and Automata" Narosa Publishing House Fourth Edition

Reference Books:

1. Y.N.Singh "Mathematical Foundation of Computer Science", New Age International.

2. Papadimitriou, C. and Lewis, C.L., “Elements of the Theory of Computation”, PHI Learning Private Limited, Delhi India.
3. K.Krithivasan and R.Rama; Introduction to Formal Languages, Automata Theory and Computation; Pearson Education.
4. Harry R. Lewis and Christos H. Papadimitriou, Elements of the theory of Computation, Second Edition, Prentice-Hall of India Pvt. Ltd.
5. Micheal Sipper, “Introduction of the Theory and Computation”, Thomson Learning

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BCSICT501 Cloud Computing

L T P C
3 0 0 3

MODULE-I

Introduction to Cloud Computing–Definition of Cloud, Evolution of Cloud computing, Underlying Principles of Parallel and Distributed Computing ,Cloud Characteristics , Elasticity in Cloud, On-demand Provisioning. Service Oriented Architecture, REST and Systems of Systems Web Services, Publish-Subscribe Model, Basics of Virtualization, Types of Virtualization Implementation Levels of Virtualization, Virtualization Structures Tools And Mechanisms, Virtualization of CPU, Memory I/O Devices, Virtualization Support and Disaster Recovery

MODULE-II

Layered Cloud Architecture Design – NIST Cloud Computing Reference Architecture – Public, Private and Hybrid Clouds laaS, PaaS, SaaS, Architectural Design Challenges, Cloud Storage Storages-a-Service, Advantages of Cloud Storage ,Cloud Storage ProvidersS3.Need for Virtualization Pros and cons of Virtualization Types of Virtualization –System VM, Process VM, Virtual Machine monitor – Virtual machine properties - Interpretation and binary translation, HLL VM - supervisors Xen, KVM, VMware, Virtual Box, Hyper-V, Major Players in Cloud Computing issues in Clouds - Eucalyptus - Nimbus - Open Nebula, CloudSim

MODULE-III

Security Standards. Security, Standards and Applications: Security in Clouds: Cloud security challenges – Software as a Service Security, Common Standards: The Open Cloud Consortium – The Distributed management Task Force – Standards for application Developers – Standards for Messaging – Standards for Security, End user access to cloud computing, Mobile Internet devices and the cloud. Service providers- Google, Amazon, Microsoft Azure, IBM, Sales force

Text Books:

1. Kai Hwang, Geoffrey C. Fox, Jack G. Dongarra, "Distributed and Cloud Computing, From Parallel Processing to the Internet of Things", Morgan Kaufmann Publishers, 2012.
2. Rittinghouse, John W., and James F. Ransome, ―Cloud Computing: Implementation, Management and Security, CRC Press, 2017.
3. Rajkumar Buyya, Christian Vecchiola, S. ThamaraiSelvi, ―Mastering Cloud Computing, Tata Mcgraw Hill, 2013.
4. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing – A Practical Approach, Tata Mcgraw Hill, 2009.
5. George Reese, "Cloud Application Architectures: Building Applications and Infrastructure in the Cloud: Transactional Systems for EC2 and Beyond (Theory in Practice), O'Reilly, 2009.

BCSICT 502 - Network Security

L T P C
3 0 0 3

MODULE-I

Computer Network System Security Introduction: Introduction, What is computer Network security, Sample Attacks Computer Network, The Marketplace for vulnerabilities, Error 404 Hacking, Security Policies and Security Handshake Pitfalls, What is security policy, high and low level policy, Protocol problems, assumptions, shared secret protocols, public key protocols, mutual authentication, reflection attacks, use of timestamps, nonce and sequence numbers, session Keys, one-and two-way public key based authentication, Authentication of People: Verification techniques, passwords, length of passwords, password distribution, smart cards, and biometrics

MODULE-II

IP Security: IP Security Overview, IP Security Policy, Encapsulating Security Payload, Combining Security Associations, Internet Key Exchange (IKE).Transport-Level Security: Web Security Considerations, Secure Sockets Layer, Transport Layer Security, HTTPS standard, Secure Shell (SSH) application. Malicious Software: Viruses, Worms, System Corruption, Attack Agents, Information Theft Key loggers, Phishing, Spyware Payload Stealthing, Backdoors, Rootkits, Distributed Denial of Service Attacks, Major web server threats ,Cross site request forgery ,Cross site scripting ,Defenses and protections against XSS , Finding vulnerabilities ,Secure development.

MODULE-III

Basic cryptography: Public key cryptography ,RSA public key crypto ,Digital signature Hash functions ,Public key distribution ,Real world protocols ,Basic terminologies ,Email security certificates ,Transport Layer security TLS ,IP security , DNS security. Basic security problems, Routing security, DNS revisited, Summary of weaknesses of internet security, .Link layer connectivity and TCP IP connectivity, Packet filtering firewall, Intrusion detection.

Text books:

1. William Stallings, Network Security Essentials: Applications and Standards, Prentice Hall, 4th edition, 2010.
2. Michael T. Goodrich and Roberto Tamassia, Introduction to Computer Security, Addison Wesley, 2011.
3. William Stallings, Network Security Essentials: Applications and Standards, Prentice Hall, 4th edition, 2010.
4. Alfred J. Menezes, Paul C. van Oorschot and Scott A. Vanstone, Handbook of Applied Cryptography, CRC Press, 2001

BCSICT503 - Principles of Virtualization

L T P C

1 0 0 1

Course Objective:

This course gives students an insight into the basics of cloud computing along with virtualization, Cloud computing is one of the fastest growing domain from a while now. It will provide the students Basic understanding about cloud and virtualization along with it how one can migrate over it

MODULE-I

Introduction to Virtualization: Virtualization and cloud computing - Need of virtualization – cost, administration, fast deployment, reduce infrastructure cost – limitations Types of hardware virtualization: Full virtualization - partial virtualization - Para virtualization
Desktop virtualization: Software virtualization – Memory virtualization - Storage virtualization – Data virtualization – Network virtualization)

MODULE-II

Hypervisors and Virtual machines Server Virtualization: Understanding Server Virtualization, types of server virtualization, Virtual machine basics, types of virtual machines, hypervisor concepts and types Virtualization Solutions Understanding Microsoft's Virtualization solutions: Microsoft's Infrastructure Optimization Model, Virtualization and the Infrastructure Optimization Model, Benefits of Virtualization, Achieving the Benefits of Datacenter Virtualization, Achieving the Benefits of Client Virtualization, Achieving the Benefits of Cloud Virtualization

MODULE-III

Migrating into a Cloud Introduction, Challenges while migrating to Cloud, Broad approaches to migrating into the cloud why migrate -deciding on cloud migration, the Seven-step model of migration into a cloud, Migration Risks and Mitigation, Enterprise cloud computing paradigm, relevant Deployment Models for Enterprise Cloud Computing, Adoption and Consumption Strategies, issues for enterprise applications on the cloud

Text & References:

Text:

1. David Marshall, Wade A. Reynolds, Advanced Server Virtualization: VMware an Microsoft Platform in the Virtual Data Center, Acerbic
2. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online - Michael Miller - Que 2008
3. Cloud Computing (Principles and Paradigms), Edited by Rajkumar Buyya, James Broberg Andrzej Goscinski, John Wiley & Sons, Inc. 2011
4. Cloud computing a practical approach - Anthony T.Velte, Toby J. Velte Robert Elsenpeter, TATA McGraw- Hill , New Delhi – 2010

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BCSICT504 – Humanities II Engineering & Managerial Economics

MODULE-I

Introduction: Meaning, Nature and Scope of Economics, Meaning of Science, Engineering and Technology. Managerial Economics and its scope in engineering perspective.

MODULE-II

Basic Concepts Demand Analysis, Law of Demand, Determinates of Demand, Elasticity of Demand-Price, Income and cross Elasticity. Uses of concept of elasticity of demand in managerial decision

MODULE-III

Demand forecasting Meaning, significance and methods of demand forecasting, production function, Laws of returns to scale & Law of Diminishing returns scale. An overview of Short and Long run cost curves – fixed cost, variable cost, average cost, marginal cost, Opportunity cost

MODULE-IV

Market Structure Perfect Competition, Imperfect competition – Monopolistic, Oligopoly, duopoly sorbent features of price determination and various market conditions.

MODULE-V

National Income, Inflation and Business Cycles Concept of N.I. and Measurement. Meaning of Inflation, Type causes & prevention methods, Phases of business cycle

Reference Books:-

1. Koutsoyiannis A: Modern Microeconomics, ELBS.
2. Managerial Economics for Engineering: Prof. D.N. Kakkar
3. Managerial Economics: D.N. Dwivedi
4: Managerial Economics: Maheshwari.

Elective-I

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BCSICT505 Security Architecture

MODULE-I

Introduction to Cloud Computing and Security: Understanding Cloud Computing - The IT Foundation for Cloud- overview of Security Architecture, Cloud Computing Architecture: loud Reference Architecture-Control over Security in the Cloud Model- Cloud Deployment & Services Models- Key Examples

MODULE-II

Cloud Computing: Security Concerns- Risk Tolerance- Legal and Regulatory Issues, Security Requirements for the Architecture-Security Patterns and Architectural Elements- Cloud Security Architecture-Key Strategies for Secure Operation

MODULE-III

Overview of Data Security in Cloud Computing-Common Risks with Cloud Data Security- Data Encryption: Applications and Limits- Errors with Data Encryption- Cloud Data Security: Sensitive Data Categorization, Cloud Data Storage-Roach Motel Syndrome, Overall Strategy: Effectively Managing Risk, Overview of Security Controls, Overview of Security Controls, The Limits of Security Controls,
Best Practices, Security Monitoring

MODULE-IV

Private Clouds: Motivation and Overview-Security Implications: Shared versus Dedicated Resources, Security Criteria for Ensuring a Private Cloud - Network Considerations- Data Center Considerations- Operational Security Considerations- Regulation, Selecting a CSP: Overview of Assurance, Overview of Risks, and Security Criteria- Revisiting Defense-in-depth- Additional Security relevant Criteria.

MODULE-V

Evaluating Cloud Security, Checklists for Evaluating Cloud Security- Foundational Security- Business Considerations- Defense-in-depth- Operational Security, Operating a Cloud: From Architecture to Efficient and Secure Operations, Bootstrapping Secure Operations, Security Operations Activities- Business Continuity, Backup, and Recovery- Managing Changes in Operational Environments - Information Security Management - Vulnerability and Penetration Testing, Security Monitoring and Response

TEXT BOOKS

Vic (J.R.) Winkler, “Securing the Cloud: Cloud Computer Security Techniques and Tactics”, Elsevier,2011.

REFERENCE BOOKS

1. Sushil Jajodia, Krishna Kant, “Secure Cloud Computing”, Elsevier,2014. 2. Curtis Franklin, Jr. ,Brian J. S. Chee, “Securing the Cloud: Security Strategies for the Ubiquitous Data Center”, CRC Press, 2019.

EBOOk

1. https://solutionsreview.com/cloud-platforms/free-cloud-computing-ebooks/

MOOC

1 https://www.coursera.org/learn/cloud-computing-security

Elective-I

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BCSICT506 Database Security

MODULE-I

Introduction to Databases Security Problems in Databases Security Controls Conclusions Security Models - Introduction Access Matrix Model Take-Grant Model Acten Model PN Model Hartson and Hsiao's Model Fernandez's Model Bussolati and Martella's Model for Distributed databases

MODULE-II

Security Models - Bell and LaPadula's Model Biba's Model Dion's Model Sea View Model Jajodia and Sandhu's Model the Lattice Model for the Flow Control conclusion Security Mechanisms Introduction User Identification/Authentication Memory Protection Resource Protection Control Flow Mechanisms Isolation Security Functionalities in Some Operating Systems Trusted Computer System Evaluation

MODULE-III

Security Software Design Introduction A Methodological Approach to Security Software Design Secure Operating System Design Secure DBMS Design Security Packages Database Security Design Statistical Database Protection & Intrusion Detection Systems Introduction Statistics Concepts and Definitions Types of Attacks Inference Controls evaluation Criteria for Control Comparison .Introduction IDES System RETISS System ASES System Discovery

MODULE-IV

Private Clouds: Motivation and Overview-Security Implications: Shared versus Dedicated Resources, Security Criteria for Ensuring a Private Cloud - Network Considerations- Data Center Considerations- Operational Security Considerations- Regulation, Selecting a CSP: Overview of Assurance, Overview of Risks, and Security Criteria- Revisiting Defense-in-depth- Additional Security relevant Criteria.

MODULE-V

Models For The Protection Of New Generation Database Systems -1 Introduction A Model for the Protection of Frame Based Systems A Model for the Protection of Object Oriented Systems SORION Model for the Protection of Object-Oriented Databases

BOOKS AND REFERENCES

TEXT BOOKS:

1. Database Security and Auditing, Hassan A. Anyone, India Edition, CENGAGE Learning, 2009.
2. Database Security, Castagno, Second edition, Pearson Education.

REFERENCE BOOK:

1. Database security by Alfred baste, Melissa goal, CENGAGE learning

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BCSICT508 PC Network Security Lab

LIST OF EXPERIMENTS:

1 Create type 2 virtualization in VMWARE. Allocate memory and storage space as per requirement. Install Guest OS on that VMWARE.

2 Adding a New Virtual Disk to a Virtual Machine. Convert basic disc to dynamic disc and vice versa

3 a. Shrink and extend virtual disk

b.Create, Manage, Configure and schedule snapshots

c. Create Spanned, Mirrored and Striped volume

4 Sharing and data transfer between the virtual machines

5 a. Desktop Virtualization using VNC

B.Desktop Virtualization using Chrome Remote Desktop

6 Create type 2 virtualization on ESXI 6.5 server

7 Access ESXI server from another VM and create multiple OS on top of ESXI 6.5 server

8 Create ESXI servers as Bare metal OS

9 Create a VLAN in CISCO packet tracer

10 Install KVM in Linux

11 Create a VPN from one virtual machine to another virtual and pass data secure way

12Create Nested Virtual Machine (VM under another VM)

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BCSI601 PC Artificial Intelligence

MODULE-I

Introduction: Introduction to Artificial Intelligence, Foundations and History of Artificial Intelligence, Applications of Artificial Intelligence, Intelligent Agents, Structure of Intelligent Agents. Computer vision, Natural Language Possessing.

MODULE-II

Introduction to Search : Searching for solutions, Uniformed search strategies, Informed search strategies, Local search algorithms and optimistic problems, Adversarial Search, Search for games, Alpha - Beta pruning

MODULE-III

Knowledge Representation & Reasoning: Propositional logic, Theory of first order logic, Inference in First order logic, Forward & Backward chaining, Resolution, Probabilistic reasoning, Utility theory, Hidden Markov Models (HMM), Bayesian Networks.

MODULE-IV

Machine Learning : Supervised and unsupervised learning, Decision trees, Statistical learning models, Learning with complete data - Naive Bayes models, Learning with hidden data - EM algorithm, Reinforcement learning,.

MODULE-V

Pattern Recognition : Introduction, Design principles of pattern recognition system, Statistical Pattern recognition, Parameter estimation methods - Principle Component Analysis (PCA) and Linear Discriminant Analysis (LDA), Classification Techniques – Nearest Neighbor (NN) Rule, Bayes Classifier, Support Vector Machine (SVM), K – means clustering

Reference Books:-

Text books:
1. Stuart Russell, Peter Norvig, “Artificial Intelligence – A Modern Approach”, Pearson Education
2. Elaine Rich and Kevin Knight, “Artificial Intelligence”, McGraw-Hill
3. E Charniak and D McDermott, “Introduction to Artificial Intelligence”, Pearson Education
4. Dan W. Patterson, “Artificial Intelligence and Expert Systems”, Prentice Hall of India.

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BCSICT601 PC Linux Administration

MODULE-I

Introduction to Linux The Linux File system, The Shell, The Linux Utilities Using the Command Line Working as root, working with the Shell, Using Bash to Best Effect, Managing Bash with Key Sequences, Performing Basic File System Management Tasks, Working with Directories, Working with Files, Viewing the Content of Text Files, Finding Files That Contain Specific Text , Creating Empty Files, Piping and Redirection, Piping, Redirection, Finding Files, Working with Vi Editor: Vi Modes, Saving and Quitting, Cut, Copy, and Paste, Deleting Text. Getting Help: Using man to Get Help, Getting Information on Installed Packages.

MODULE-II

System Administration Software Management, Software Repositories and Package Databases, Package Management Utilities, Using apt, Installing Software from Tarballs, Configuring a Graphical User Interface, Creating Backups, Making File Backups with tar, Making Device Backups Using dd, Configuring Logging, Configuring syslog

MODULE-III

File System Management Mounting Disks, Using the mount Command, Unmounting Devices, Automating Mounts with /etc/fstab, Checking File System Integrity, Working with Links: Working with Symbolic Links, Working with Hard Links. Configuring Storage, Comparing File Systems, Creating File Systems, Working with Logical Volumes

MODULE-IV

Configuring Server for Security Setting Up User Accounts, Commands for User Management, Managing Passwords, Modifying and Deleting User Accounts, Configuration Files, Creating Groups, Commands for Group Management, /etc/group, Using Group Passwords, Managing the User's Shell Environment, Configuring Permissions, Read, Write, and Execute: The Three Basic Linux Permissions, Permissions and the Concept of Ownership

MODULE-V

Working with Advanced Linux Permissions, Setting Permissions, Using unmask to Set Default Permissions for New Files, Working with Access Control Lists, Preparing the File System for ACLs, ACL Limitations, Applying File Attributes, Apply Quota to Allow a Maximum Amount of Files, Installing the Quota Software, Preparing the File System for Quota, Initializing Quota, Setting Quota for Users and Groups, Configuring Administrator Tasks

Reference Books:-

1– Linux For Beginners by Jason Cannon.

2 – The Linux Command Line : A Complete Introduction by William Shotts.

3 – Linux Pocket Guide : Essential Commands by Daniel J. .

4 – Linux Network Administration Guide by Tony Bautts.

5 – How Linux Works, 2nd Edition by Brian Ward....

6 – Linux Bible by Christopher Negus.

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BCSICT602 PC Ethical Hacking

MODULE-I

Cyber Ethical Hacking ,What is Cyber Attack,Types of Cyber Attack,Phase of hacking,Information Gathering,Scanning,Google Hacking Database,type of Virus,type of Worms ,Virus ,Trojans and Backdoors,Sniffers and keyloggers,Social Engineering,Email, DNS, IP spoofing ,System Hacking and Security,HoneyPots

MODULE-II

Footprinting and Reconnaissance ,Scanning Networks,Enumeration,System Hacking,Malware Threats,Sniffing,Social Engineering, Denial of Service, Session Hijacking Hacking Web Servers, Hacking Web Applications,SQL Injection ,Hacking Wireless Networks, Hacking Mobile Platforms, Evading IDS, Firewalls and Honey pot

MODULE-III

Ethical Hacking Cloud Computing, Ethical Hacking Cryptography, Denial of Service, Hacking Mobile Platforms, Hacking Web Servers, Session Hijacking, Scanning Networks, Social Engineering, Malware Threats,Footprinting and Reconnaissance,SQL Injection, Evading IDS, Firewalls and Honey pots Enumeration,IoT and OT Hacking

Reference Books:-

1. Hands-on Ethical Hacking and Network Defense.
2. The Basics of Hacking and Penetration Testing - Patrick Engebretson.
3. The Web Application Hacker's Handbook: Finding and Exploiting Security Flaws.
4. Black Hat Python: Python Programming for Hackers and Pentesters.
5. Hacking: The Art of Exploitation by Jon Erickson.

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BCSICT605 Cloud Scripting using PaaS

COURSE DESCRIPTION

This course provides a hands-on comprehensive study of Cloud concepts and capabilities across the various Cloud service models including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), and Business Process as a Service (BPaaS). IaaS topics start with a detailed study the evolution of infrastructure migration approaches from VMWare/Xen/ KVM virtualization, to adaptive virtualization, and on-demand resources provisioning. PaaS topics cover a broad range of Cloud vendor platforms including Google App Engine, Microsoft Azure, OpenStack and others as well as a detailed study of related platform services such as storage services that leverage Google Storage, Amazon S3, Amazon Dynamo, or other services meant to provide Cloud resources management and monitoring capabilities. The SaaS and PaaS topics covered in the course will familiarize students with the use of vendor-maintained applications and processes available on the Cloud on a metered on-demand basis in multi-tenant environments. The course also covers the Cloud security model and associated challenges and delves into the implementation and support of High Performance Computing and Big Data support capabilities on the Cloud. Through hands-on assignments and projects, students will learn how to configure and program IaaS services.

COURSE OBJECTIVES

learn cloud computing delivery model IaaS
learn cloud computing delivery model PaaS
learn cloud computing delivery model SaaS.

COURSE OUTCOMES

On completion of this course, the students will be able to
understand Cloud delivery models in details
understand briefly Cloud Computing Reference Architecture.

MODULE-I

Introduction of delivery models in Cloud Computing: Introduction to cloud delivery models, List various cloud delivery models, Advantages of delivery models in cloud, trade-off in cost to install versus flexibility, Cloud service model architecture.

MODULE-II

Infrastructure as a Service (IaaS): Introduction to Infrastructure as a Service delivery model, characteristics of IaaS, Architecture, examples of IaaS, Applicability of IaaS in the industry.

MODULE-III

Platform as a Service (PaaS):Introduction to Platform as a Service delivery model, characteristics of PaaS, patterns, architecture and examples of PaaS, Applicability of PaaS in the industry

MODULE-IV

Software as a Service (SaaS):Introduction to Software as a Service delivery model, characteristics of SaaS, Architecture, examples of SaaS, Applicability of SaaS in the industry..

MODULE-V

Cloud computing Reference Architecture (CCRA): Introduction to Cloud computing reference architecture (CCRA), benefits of CCRA, Architecture overview, versions and application of CCRA for developing clouds, Type causes & prevention methods, Phases of business cycle.

TEXT BOOKS

Cloud Computing Architecture (IBM ICE)

REFERENCE BOOKS

1: Cloud computing for Dummies (November 2009) Judith Hurwitz, Robin Bloor, Marcia Kaufman, Fern Helper
2: IBM Cloud computing http://www.ibm.com/cloud-computing/us/en/
3: Wikipedia page on Cloud Computing http://en.wikipedia.org/wiki/Cloud_computing.

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BCSICT608 Incident Response Management(Cyber Security)

MODULE-I

Need for CSIRM Differences between an event, incident and disaster, what are cyber security incidents, need for CSIRM, policy, plan and procedure, importance of communication protocol, key internal and external stakeholders, law enforcement, role of media, team structure and roles – important considerations.

MODULE-II

Handling a Cyber Security Incident Incident response lifecycle, incident handling infrastructure and facilities requirements, detection and analysis, process, tools and techniques, attack vectors, recognizing signs of an incident, precursors, indicators and historical organization data, incident correlation, review of logs and vital system parameters, incident handling checklist, documentation and reporting

MODULE-III

Recovering from Cyber Security Incidents Nature of incidents and the type of resources it affects, assessment of an incident's impact on business, IT operations and information, determining the amount of time and resources needed in recovering from an incident, prioritization, incident notification structure, containment, eradication and recovery – choosing a containment strategy, evidence gathering and handling, identifying the attack hosts, eradication and recovery, post-incident analysis, evidence retention and lessons learned

MODULE-IV

Preventing Cyber Security Incidents Incident analytics as input to proactive security measures to prevent incidents, risk assessment, host security, network security, malware prevention, user awareness and training, analysis of cost of control versus cost of incident impact, best practices.

MODULE-V

Cyber Security Incidents Analysis through Scenarios Flow chart of scenario questions, scenarios – DoS attack on DNS server, worm and DDoS agent infestation, military-classified documents stolen by an insider, compromised database server, unauthorized access to payroll records, identities and credentials stolen by hackers, antisocial propaganda in media through compromised home wifi network, personal files stored in Cloud are compromised, remote hacking of smart home network, malware infection in home and office network simultaneously, large scale of citizens' biometric data stolen by cyber war groups

Reference Books:-

Reference Books:

1. NIST SP 800-61r2 – Computer Security Incident Handling Guide
2. Computer Incident Response and Product Security (Networking Technology: Security) by DamirRajnovic 1st, Kindle Edition
3. Intelligence-Driven Incident Response: Outwitting the Adversary 1st Kindle Edition
4. The Computer Incident Response Planning Handbook: Executable Plans for Protecting Information at Risk by N.K. Mccarthy, Matthew Todd, Jeff Klaben, McGraw-Hill Education, 2012
5. Tools and Techniques for Fighting Malicious Code: Malware Analyst's Cookbook by Michael Hale Ligh, Steven Adair, Blake Hartstein, Matthew Richard, Wiley, 2010
6. Incident Response: A Strategic Guide to Handling System and Network Security Breaches by E. Eugene Schultz, Russell Shumway, Sams, 2001
7. The Effective Incident Response Team by Julie Lucas, Brian Moeller, Addison Wesley, 2003
8. Information Security: Incident Response and Disaster Recovery by Michael E. Whitman, Herbert Mattford,

Cengage Learning India Pvt Ltd, 2009
9. Crafting the InfoSec Playbook: Security Monitoring and Incident Response Master Plan 1st Kindle Edition by Jeff Bollinger, Brandon Enright, Matthew Valites, 2015
10. Incident Management and Response Guide: Tools, Techniques, Planning, and Templates Kindle Edition by Tom Olzak, Erudio Security, 2017
11. Cyber Security by Nina Godbole, SunitBelapure, Wiley, 2011
12. Incident Response & Computer Forensics by Jason T. Luttgens, Matthew Pepe, Kevin Mandia, McGraw-Hill Education; 3rd edition, 2014
13. Principles of Incident Response and Disaster Recovery by Michael Whitman, Herbert MattordDelmar Cengage Learning; 2nd Revised edition, 2013
14. Computer Incident Response and Forensics Team Management: Conducting a Successful Incident Response by Leighton Johnson, Syngress, 2013
15. Cyber Incident Response: Bridging the Gap Between Cybersecurity and Emergency Management by Response, and Communications and the Subcommittee on Cybersecurity, Infrastructure Protection, and Security Technologies of the Committee on Homeland Security House of Representatives Subcommittee on Emergency Preparedness, CreateSpace Independent Publishing Platform (8 May 2014)

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Open Elective-I

BCSICT609 UI/UX Fundamentals

Course Description: The increasing possibilities with interactive technology as opened to virtual classrooms for teaching and educating the students. Research has proven that interactive teaching using such visual technologies is much more effective than the traditional methods which help students understand and gain knowledge better. Virtual reality is used in many training scenarios as it consists of a wide range of benefits for academia and industrial needs. Course Objectives: Students will get to know about various techniques of Graphic Design and UI/UX and will develop skills to become a professional designer. They will be taught to enhance their knowledge and master tools producing good industry standard designs. Students will be able to work on advertisements, website, and app designs.

Course Outcomes (COs): At the end of this course students will be able to:
CO 1. Create Graphic Design artworks of your own.
CO 2. Explain the functionality of different design related software
CO 3. Use learned skills to solve problems of various layouts
CO 4. Test own's skill and knowledge for a better workflow
CO 5. Select best output and what works for a particular given project
CO 6. Develop ideas and various app designs and website pages..

MODULE-I

Unit 1: Computer Fundamentals & Digital Illustration, Introduction to Graphic Design and Its Uses, Raster & Vector Graphics, Drawing Vector Shapes and Illustrations, Art & Sketching, Drawing Techniques, Conceptual Thinking in Creativity, Developing a Personal Illustration Style, Color Modes, Schemes, Design, Image Retouching and Color Balancing, Using Filters Corporate Identity Design Designing Brochures & Catalogues Layouts for Newspapers, Designing Magazines, Visual Design Principles

MODULE-II

UI design fundamentals, Evolution of user interfaces, Interaction with physical components, Flat design, Role of UI in UX,Laws of digital interface design, Understand user experience,VIMM model, Know your user, user research, Difference between design and art, emotional design, designing for mental models, Importance of presentation, content, interactions, screen elements, accessibility, and global standards

MODULE-III

Typography, Types of typefaces, Typography Terminology, Guidelines for proper type selection, Typography design, Analyzing Aesthetics as per laws of Design principles, Alignment, Spacing, Lighting & Shadows, Grids,Consistency

MODULE-IV

Design Language & Rapid Prototyping • In-depth study of Design languages for different Google material platforms • Style guides and its importance • Apple Human centered Design guidelines measurements of UI components • Design for platforms: Mobile, Web, Tablet, Responsive, Smart Watch • Mood boards • UX design principles and laws • Introduction to Adobe XD • Creating low and high-fidelity prototypes

MODULE-V

UX & its elements of design • What is User Interaction • What is Cognitive Model • What is Mental Model • UX design laws and its uses • Elements used in User Experience Design • How it works together • What is Big Picture? • What is Persona in UX Design

Textbook & References:

1. Weathers David. (2021). "UX/UI Design 2021 For Beginners: A Simple Approach to UX/UI Design for Intuitive Designers" (ISBN-13:979-8719605470)
2. Branson Steven (June 2020) "UX / UI Design: Introduction Guide To Intuitive Design And User-Friendly Experience" (ISBN-13:979-8653877315)
3.Anderson Gail. (2016). "The Typography Idea Book: Inspiration from 50 Masters" (ISBN10 :1780678495,ISBN-13:978-1780678498)
4.Slade-Brooking Catharine (2016). "Creating a Brand Identity: A Guide for Designers: (Graphic Design Books, Logo Design, Marketing".(ISBN-10:1780675623, ISBN-13:978-1780675626)

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BCSICT611 Business Intelligence

Purpose

This subject will be exploring concepts onWave Analytic basics, Wave Desktop Exploration, Wave App Basics, Sales Wave App, and Service Wave App.

Objective

After completing this subject the student will gain the knowledge of Business Intelligence using which they can convert raw data into pictorial format and analyse it to predict the future business.

MODULE-I

Wave Analytic basics ? Exploring Wave Analytics, Setup Wave analytics,Creating wave analytic App

MODULE-II

Wave Desktop Exploration- Data Explorer, Analyse Data Explorer, Compare Table. Wave Mobile Exploration: Mobile Data Explorer, Mobile Exploration interface

MODULE-III

Wave App Basics: Creating Wave App basics, setting up Wave app Licenses and Permissions , Sales Wave app ? Creating and Analysing Sales wave using Wizard, Sales wave on Mobiles

MODULE-IV

Service Wave App ? Creating Service Wave using wizard, Service wave to Manage Service Load, Basic Wave Dashboard Customization..

References Book:

Introduction to Salesforce Analytics - Building Reports and Dashboards: Class Slides & Workbook for Sprd-101 by Steve Wasula (Author)

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BCSICT610 Mobile ApplicationDevelopment

MODULE-I

Introduction to Android: The Android Platform, Android SDK, Eclipse Installation, Android Installation, Building you First Android application, Understanding Anatomy of Android Application, Android Manifest file..

MODULE-II

Android Application Design Essentials: Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Permissions.

MODULE-III

Android User Interface Design Essentials: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation.

MODULE-IV

Testing Android applications, Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources. UNIT - V Using Common Android APIs: Using Android Data and Storage APIs, Managing data using Sqlite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World..

TEXT BOOKS: 1.

T1. Lauren Darcey and Shane Conder, “Android Wireless Application Development”, Pearson Education, 2nd ed. (2011)

REFERENCE BOOKS:

R1. Reto Meier, “Professional Android 2 Application Development”, Wiley India Pvt Ltd
R2. Mark L Murphy, “Beginning Android”, Wiley India Pvt Ltd
R3. Android Application Development All in one for Dummies by Barry Burd, Edition: I

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BCSICT615 PC Linux Administration Lab

1.Installation of Red HAT Linux operating system.
a. Partitioning drives
b. Configuring boot loader (GRUB/LILO)
c. Network configuration
d. Setting time zones
e. Creating password and user accounts
f. Shutting down

2.Software selection and installation

3.Basic Commands of linux and unix

4.Do the following changes in Grub file
a. Write the path where the grub file is located.
b. Change the timeout and title of the system.

5.Setting up Samba Server

6.Configuring dhcp server and client

7.Configure a DNS Server with a domain name of your choice.

8.Configure a Linux server and transfer files to a windows client .
(Setting up NFS File Server)

9.Connecting to the internet
a. Setting up linux as a proxy server
b. Configuring mozilla or firefox to use as a proxy.

10.Configuring Mail Server.

11.Configure FTP on Linux Server. Transfer files to demonstrate the working of the same.

12.Using gcc compiler (Programming using C).

13.Using gcc ++ compiler (Programming using C++).

14.Configuring Apache Web Server.

15.Linux system administration
a. Becoming super user
b. Temporarily changing user identity with su command
c. Using graphical administrative tools
d. Administrative commands
e. Administrative configuration files

16. Using java compiler

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BCSICT616 PC Ethical Hacking Lab

Course Objectives:

Introduces the concepts of Ethical Hacking

Gives the students the opportunity to learn about different tools and techniques in Ethical hacking and security Practically apply Ethical hacking tools to perform various activities.

Course Outcomes:

After completion of course, students would be able to:

Understand the core concepts related to vulnerabilities and their causes

Understand ethics behind hacking and vulnerability disclosure

Appreciate the impact of hacking

Perform the lab Experiments based on the following facts.(Develop your own set of lab experiments)

1 Google Hacking

2 Scanning

- Locating Open Ports
- Network mapping
- OS Fingerprinting

3 Gaining and Maintaining Access
4 Passwords hacking
5 Password Cracking Methods
6 Password Cracking Software
7 Man-in-the-Middle
8 Backdoors
9 Denial of Service
10 Covering tracks
11 Intrusion Detection Systems
12 Intrusion Prevention Systems
13 Anti-viruses
14 Malware
15 Viruses