

**JYOTI NIVAS COLLEGE AUTONOMOUS  
SYLLABUS FOR 2018 BATCH AND THEREAFTER**

**Programme: B.C.A**

**Semester: VI**

**CRYPTOGRAPHY AND NETWORK SECURITY**

**Course Code: 18BCAVIE2A**

**No. of Hours: 60**

**COURSE OBJECTIVES:**

- This course is aimed at providing students with a practical and theoretical knowledge of cryptography and network security.
- To develop an understanding of different cryptographic protocols and techniques,
- To understand methods for authentication, access control, intrusion detection and prevention.

**LEARNING OUTCOMES:**

- Understand cryptography and network security concepts and applications.
- Apply security principles to System design.
- Identify and investigate network security threats.

**UNIT - I: Introduction to Network Security**

**12 HRS**

Introduction - Need for Security, Security Approaches, Principles of Security, Security services, Types of Attacks – General View - Technical View, Programs that Attack, Specific Attacks.

**UNIT - II: Basics of Cryptography and Encryption**

**12 HRS**

Introduction to Cryptography, Plain Text and Cipher Text, Symmetric Cipher Model, Cryptography, Cryptanalysis, Brute Force Attacks, Substitution Techniques - Caesar Cipher and Modified Caesar Cipher, Mono Alphabetic cipher, Poly-Alphabetic Cipher, Playfair Cipher, Transposition Techniques- Rail Fence technique, Simple Columnar transposition Technique, Encryption and Decryption-Symmetric and Asymmetric key cryptography, Steganography.

**UNIT - III: Block ciphers and Data encryption standards**

**10 HRS**

Stream ciphers Block ciphers, Data Encryption Standard, a DES example, AES- structure, AES transformation functions.

**UNIT - IV: Public key cryptography and RSA**

**15 HRS**

Principles of public key cryptosystems - public key cryptosystems - applications for public key cryptosystems, RSA algorithm - algorithm and example, Deffie Hellman key exchange algorithm and example.

**Cryptographic Data integrity algorithms** - Cryptographic Hash functions - applications, Message Authentication – Requirements and Functions.

**Digital signatures** – Introduction, Properties, attacks and forgeries, digital signature requirements.

**User Authentication mechanisms**- Authentication basics, Passwords- Introduction- clear text passwords, Password encryption- Problems with passwords, Authentication tokens- introduction

and types, use of smart cards, biometric authentication, Kerberos- introduction and working, Remote user authentication principles, personal identity verification.

**UNIT - V: Applications of network security, Ethical and legal issues. 11 HRS**

**network and internet security** -Cloud computing- Data protection on the cloud, cloud security as a service, Web/Internet security protocols- HTTPS,SSL,SSH, Wireless network security, Mobile device security, Email security-Pretty good privacy, S/MIME.

**Legal and Ethical issues-** Introduction to Cybercrime & computer crime, Intellectual property, Privacy, Ethical issues.

**REFERENCES:**

1. AtulKahate, Cryptography and Network Security, 4th Edition,2019
2. William Stallings, Cryptography and Network Security: Principles and Practices, 7<sup>th</sup> Edition,2019
3. Nina Godbole and SunitBelapure, Cyber Security, 1st edition,2019.

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**Programme: B.C.A**

**Semester: VI**

**SOFTWARE PROJECT MANAGEMENT**

**Course Code: 18BCAVI E2B**

**No. of Hours: 60**

**COURSE OBJECTIVES:**

- To understand the Software Project Planning and Evaluation techniques.
- To learn about the activity planning and risk management principles.
- To manage software projects and control software deliverables.
- To develop skills to manage the various phases involved in project management and people management.

**LEARNING OUTCOMES:**

- To deliver successful software projects that support organization's strategic goals.

**UNIT - I: Project Evaluation and Project Planning**

**12 HRS**

Importance of Software Project Management – Activities Methodologies – Categorization of Software Projects – Setting objectives – Management Principles – Management Control – Project portfolio Management – Cost-benefit evaluation technology – Risk evaluation – Strategic program Management – Stepwise Project Planning

**UNIT - II: Project Life Cycle and Effort Estimation**

**12 HRS**

Software process and Process Models – Choice of Process models – Rapid Application development – Agile methods – Dynamic System Development Method – Extreme Programming – Managing interactive processes – Basics of Software estimation – Effort and Cost estimation techniques – COSMIC Full function points – COCOMO II – a Parametric Productivity Model.

**UNIT - III: Activity Planning and Risk Management**

**12 HRS**

Objectives of Activity planning – Project schedules – Activities – Sequencing and scheduling – Network Planning models – Formulating Network Model – Forward Pass & Backward Pass techniques – Critical path (CRM) method – Risk identification – Assessment – Risk Planning – Risk Management – PERT technique – Monte Carlo simulation – Resource Allocation – Creation of critical paths – Cost schedules.

**UNIT - IV: Project Management and Control**

**12 HRS**

Framework for Management and control – Collection of data Project termination – Visualizing progress – Cost monitoring – Earned Value Analysis- Project tracking – Change control- Software Configuration Management – Managing contracts – Contract Management.

**UNIT - V: Staffing in Software Projects****12 HRS**

Managing people – Organizational behavior – Best methods of staff selection – Motivation – The Oldham-Hackman job characteristic model – Ethical and Programmed concerns – Working in teams – Decision making – Team structures – Virtual teams – Communications genres – Communication plans.

**REFERENCES:**

1. Bob Hughes, Mike Cotterell and Rajib Mall: Software Project Management – Fifth Edition, Tata McGraw Hill, New Delhi, 2012.
2. Gopaldaswamy Ramesh, “Managing Global Software Projects” – McGraw Hill Education (India), Fourteenth Reprint 2013.
3. Robert K. Wysocki “Effective Software Project Management” – Wiley Publication, 2011.
4. Walker Royce: “Software Project Management”- Addison-Wesley, 1998.

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**Programme: B.C.A**

**Semester: VI**

**DATA STORAGE TECHNOLOGIES**

**Course Code: 18BCAVI E2C**

**No. of Hours: 60**

**COURSE OBJECTIVES:**

- To introduce the concepts of Data storage and related technologies,
- Storage Area Networks, their characteristics and components and to become familiar with the SAN vendors and their products.
- To understand concepts about Network Storage

**LEARNING OUTCOMES:**

The successful completion of this course, the students will have knowledge on:

- Various Storage Technologies.
- Storage systems architecture.
- Network storage technologies.
- Securing Storage and Storage Virtualization.

**UNIT - I: Introduction to Storage Technologies**

**10 HRS**

Introduction to Information storage -Data, Types of data, Big data, Information storage. Evolution of storage architecture, Data center Infrastructure, Virtualization and cloud computing. Data center environment-Applications. Database management system, Host, connectivity, Storage, Disk drive components, Disk drive performance, Host access to data, Direct attached storage, Storage design based on application, Disk native command queuing, Introduction to flash drives.

**UNIT - II: Data protection and Intelligent storage systems**

**10 HRS**

RAID: Implementation methods, RAID array components, RAID techniques, RAID levels: RAID 0, RAID 2, Nested RAID, RAID 3, RAID 4, RAID 5, RAID 6, RAID impact on Disk performance, RAID comparison, Hot spans.  
Intelligent Storage Systems: Components of an Intelligent storage system, Front end, cache, Backend, Physical disk, Storage provisioning- Traditional, Virtual, LUN masking, Types of Intelligent storage systems.

**UNIT - III:Storage networking technologies.**

**15 HRS**

Fiber channel storage area networks: Fiber channel overview, The SAN and its evolution, Components of FC SAN, FC connectivity, Switched Fabric ports, Fiber channel architecture, Fiber channel addressing, worldwide names, FC Frame, Flow Control, Fabric services, Switched fabric login types, Zoning, FC SAN Topologies, Virtualization in SAN. IP SAN.

**UNIT - IV: Network attached storage****15 HRS**

General purpose servers versus NAS devices Benefits of NAS, File systems and network file Sharing, Components of NAS, NAS I/O operation, NAS Implementation, AS file sharing Protocols, Factors affection NAS performance, File level virtualization.

**UNIT - V: Introduction to Information availability****10 HRS**

Business Continuity and disaster recovery basics, Local business continuity techniques, Remote business continuity techniques, Disaster Recovery principles and techniques , Managing & Monitoring Management philosophies (holistic vs. system & component), Standard Framework Applications, Key management metrics (thresholds, availability, capacity, security, performance).

**REFERENCES:**

1. Information Storage and Management, Wiley Publications by *EMC*<sup>2</sup>.
2. Marc Farley Osborne, Building Storage Networks, Tata Mcgraw Hill, 2006
3. Robert Spalding, Storage Networks: The complete Reference, Tata Mcgraw Hill,2002
4. Meeta Gupta, Storage Area Network Fundamentals, Pearson Education Limited, 2006
5. Gerald J Kowalski/ Mark T Maybury, Information Storage & Retrieval Systems Theory & Implementation, BS Publications, 2006