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| <p style="text-align: center;">SavitribaiPhule Pune University T.Y.B.Sc. (Computer Science) Sem - V Course Code: DSEC - I Course Code : CS - 352 Course Title :Computer Networks - II</p> | | |
| Teaching Scheme 03 Lect/ week | No. of Credits 2 | Examination Scheme IE :15 marks UE: 35 marks |
| Prerequisites: Prerequisites: Basic knowledge of Networking and ISO/OSI model | | |
| Course Objectives <ul style="list-style-type: none"> To understand different protocols of application layer. To understand concepts of multimedia. Explore the different methods used for Network/INTERNET security. | | |
| Course Outcomes On completion of the course, student will be able to– <ul style="list-style-type: none"> Student will understand the different protocols of Application layer. Develop understanding of technical aspect of Multimedia Systems Develop various Multimedia Systems applicable in real time. Identify information security goals. Understand, compare and apply cryptographic techniques for data security. | | |
| Course Contents | | |
| Chapter 1 | Application Layer | 10 Lect |
| Domain Name System <ul style="list-style-type: none"> Name space-Flat name space, Hierarchical name space Domain Name Space -Label ,Domain name, FQDN,PQDN Distribution of Domain Name Space-Hierarchy of name servers, zone, Root server, Primary and secondary servers. DNS in the Internet: Generic domains, Country domains,inverse domain Resolution-Resolver,mapping names to address,mapping addresses to names,recursive resolution,iterative resolution,caching Electronic Mail- <ul style="list-style-type: none"> Architecture-First scenario, second scenario, Third scenario, Fourth scenario User agent-services of user agent, types of UA Format of e-mail MIME-MIME header Message transfer agent-SMTP Message Access Agent: POP and IMAP File Transfer FTP-Communication over data control connection,File type,data structure,Transmission mode,anonymous FTP | | |
| Chapter 2 | Multimedia | 08 Lect |
| Digitizing audio and video, Audio and Video compression Streaming Stored audio/video <ul style="list-style-type: none"> First approach Second approach Third approach Fourth approach Streaming live audio/video | | |

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| Real time interactive audio/video- Characteristics, Time relationship, timestamp, Playback buffer, ordering multicasting, translation RTP-Packet format RTCP-Message types Voice over IP-SIP,SIP sessionH.323-Architecture, Protocols | | |
| Chapter 3 | Cryptography and Network Security | 09 Lect |
| Terminology: Cryptography, plain text and cipher text, cipher key, categories of cryptography-Symmetric key, asymmetric key Encryption model Symmetric key cryptography <ul style="list-style-type: none"> • Traditional ciphers – substitution cipher, shift cipher, Transposition cipher • Simple Modern ciphers-XOR, Rotation cipher, s-box,p-box • Modern round ciphers-DES • Mode of operation-ECB,CBC,CFB,OFB Asymmetric key cryptography-RSA Security Services <ul style="list-style-type: none"> • Message confidentiality-With Symmetric key cryptography, with asymmetric key cryptography • Message integrity-Document and fingerprint, message and message digest • Message authentication-MAC,HMAC • Digital signature • Entity Authentication-Passwords, Fixed passwords challenge-response | | |
| Chapter 4 | Security in the Internet | 09 Lect |
| IPSecurity(IPSec) <ul style="list-style-type: none"> • Two modes • Two security protocols • Services provided by IPSec • Security association • Internet key exchange • Virtual private network SSL/TLS <ul style="list-style-type: none"> • SSL services • Security parameters • Sessions and connections • Four protocols • Transport layer security PGP <ul style="list-style-type: none"> • Security parameters • Services • PGP algorithms • Key rings • PGP certificates Firewalls <ul style="list-style-type: none"> • Packet filter firewall • Proxy firewall | | |

Reference Books:

1. Data communications and networking by Behrouz Forouzan 4th/5th edition, McGraw Hill Pvt Ltd.
2. Computer Networks by Andrew S Tanenbaum, 4th/5th edition, Pearson Education
3. Cryptography and Network Security: Principles and Practice, William Stallings, 7th edition, Pearson Education
4. Network Security Essentials: Applications and Standards (For VTU), William Stallings, 3rd edition, Pearson Education

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| <p align="center"> Savitribai Phule Pune University T.Y.B.Sc. (Computer Science) - Sem – VI Course Type: DSEC - IV Course Code: CS - 362 Course Title : Software Testing </p> | | |
| Teaching Scheme: 3 Lect / week | No. of Credits: 2 | Examination Scheme: IE : 15 marks UE: 35 marks |
| Prerequisites: <ul style="list-style-type: none"> • Basic knowledge of algorithms, problem solving, expected inputs/outputs • Knowledge of C and java Programming Language, compilation, debugging. | | |
| Course Objectives: <ul style="list-style-type: none"> • To provide the knowledge of software testing techniques • To understand how testing methods can be used as an effective tools in quality assurance of software. • To provide skills to design test case plan for testing software. • To provide knowledge of latest testing methods | | |
| Course Outcomes: <ul style="list-style-type: none"> • To understand various software testing methods and strategies. • To understand a variety of software metrics, and identify defects and managing those defects for improvement in quality for given software. • To design test cases and test plans, review reports of testing for qualitative software. • 4. To understand latest testing methods used in the software industries. | | |
| Course Contents | | |
| Chapter 1 | Introduction to Software Testing | 5 lectures |
| Basics of Software Testing – faults, errors and failures Testing objectives Principles of testing Testing and debugging Testing metrics and measurements Verification and Validation Testing Life Cycle | | |
| Chapter 2 | Software Testing Strategies & Techniques | 10 lectures |
| Testability - Characteristics lead to testable software. Test characteristics Test Case Design for Desktop, Mobile, Web application using Excel White Box Testing - Basis path testing, Control Structure Testing. Black Box Testing- Boundary Value Analysis, Equivalence partitioning. Differences between BBT & WBT | | |
| Chapter 3 | Levels of Testing | 10 lectures |
| A Strategic Approach to Software Testing Test strategies for conventional Software Unit testing Integration testing – Top-Down, Bottom-up integration System Testing – Acceptance, performance, regression, Load/Stress testing, Security testing, Internationalization testing. Alpha, Beta Testing | | |

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| Usability and accessibility testing Configuration, compatibility testing | | |
| Chapter 4 | Testing Web Applications | 6 lectures |
| Dimension of Quality, Error within a WebApp Environment Testing Strategy for WebApp Test Planning The Testing Process –an overview | | |
| Chapter 5 | Agile Testing | 5 lectures |
| Agile Testing, Difference between Traditional and Agile testing, Agile principles and values, Agile Testing Quadrants, Automated Tests. | | |
| Reference Books: | | |
| <ol style="list-style-type: none"> 1. Software Engineering – A Practitioners Approach, Roger S. Pressman, 7th Edition, Tata McGraw Hill, 20 2. Effective Methods of Software Testing, William E Perry, 3rd Edition, Wiley Publishing Inc 3. Managing the Testing Process: Practical Tools and Techniques for Managing Hardware and Software Testing, Rex Black, Microsoft Press, 1999 4. Agile Testing: A Practical Guide for Testers and Agile Teams, Lisa Crispin and Janet Gregory, 1st Edition, Addison-Wesley Professional, 2008 5. Software Testing Principles and Practices By Srinivasan Desikan, Gopalaswamy Ramesh, Pearson | | |