

**H.N.G. University, Patan**  
**M.Sc.(C.A. & I.T.) SEMESTER - VIII**  
**801 : Networking - II**

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**Unit : 1** **[10%]**

**Review of Basic Concepts** - Standards, Internet, History, OSI model, Protocol suite, Addressing, Transmission media, Local Area and Wide Area Networks, Switching, Connecting devices, IP addressing, Subnetting, Supernetting, IPv6.

**Unit : 2** **[25%]**

**Internet Protocol** - Delivery and Forwarding of IP packets - Forwarding, Routing Table, Datagram, Fragmentation, Checksum, IP Design, ARP, RARP, Internet control message protocol, Internet group management protocol.

**Unit : 3** **[25%]**

**Transmission Control Protocol** - User Datagram protocol - UDP operation, Use, UDP design, TCP services - Flow control, Error control, TCP, connection, Transition diagram, Congestion control.

**Unit : 4** **[20%]**

**Application Layer and Client Server Model** - DHCP, Domain name system - Name space, Distribution Resolution, Messages, Telnet( Rlogin), Network Virtual Terminal - Character Set, Controlling the server, File Transfer Protocol - Connections, Communication, Simple Mail Transfer Protocol, Simple Network Management Protocol, Mobile IP.

**Unit : 5** **[20%]**

**Telecommunications Management Network**: Why TMN? **Broadband Network Management**: ATM Networks-Broadband Network and Services-ATM Technology-Virtual Path - Virtual Circuit. ATM Packet Size- Role of SNMP and ILMI in ATM Management - ATM Digital Exchange Interface Management

**Text Books :**

1. Behrouz Forouzan , TCP/IP Protocol Suite, 3rd and 4th edition, Tata McGraw Hill
2. Behrouz Forouzan ,Data communication & Networking, 4th edition, Tata McGraw Hill
3. Mani Subramanian, "Network Management: Principles and Practice", Addison -Wesley
4. Online Help

**Reference Book :**

1. Andrew S Tanenbaum , Computer Networks, Fourth Edition, Prentice Hall

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**M.Sc.(C.A. & I.T.) SEMESTER - VIII**  
**802 : Personality Development and Aptitude Test**

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<b>Unit : 1</b>	<b>[20%]</b>
Aspects of communication skills	
<b>Unit : 2</b>	<b>[20%]</b>
Writing Skills:	
1. Revision of Grammar	
2. Writing Essays	
3. Comprehension or Precis Writing	
<b>Unit : 3</b>	<b>[20%]</b>
Business Communication [Written Communication]	
1. Minutes	
2. Memo	
3. Bio-data	
4. Memorandum	
5. Notice	
6. E-mail writing	
7. Agenda	
8. Proposal etc.	
<b>Unit : 4</b>	<b>[20%]</b>
Aptitude Test preparation	
<b>Unit : 5</b>	<b>[20%]</b>
<b>[Practical Aspects of the course ]</b>	
Mock Interview, Group discussion, class-room teaching (Junior Classes), attitude building, team leadership and development of emotional and social intelligence etc.	

**Reference Books:**

1. Developing Communication Skills  
Krishna Mohan & Meena Banerji (Mac Millan)
2. A Practical English Grammar  
A.J. Thomsen & A.V. Martinet (Oxford India)
3. Comprehension, Precis and Paragraph Writing  
By Dr. Shakti Batra (M B D International)
4. A Communicative Grammar of English  
Geoffrey Leech & Jan Svartvik (Pearson Education)
5. English Conversation Practice  
Grant Taylor (Tata McGraw-Hill)
6. Handbook of Practical Communication Skills  
Chrissie Wright (Jaico Publishing House )
7. Communicating for Results  
Fruehling R.R. & Lacombe J. M. (AITBS Publishers : New Delhi)
8. Advanced Business Communication  
J.M.Penrose, R.W.Rossberry & R.J.Myers(Ed.Thomson,South-Western:Singapore)
9. Business Ethics and Managerial Values  
S.K. Bhatiya (Deep & Deep Publication : New Delhi)
10. Living English Structure Standard  
Allen (Longman)
11. A Comprehensive English Language Course  
Chandak Chattarji (Orient Longman Ltd)
12. A Modern Approach To Verbal & Non-Verbal Reasoning  
R.S. Aggarwal (S.Chand & Company Ltd.)
13. Your Interview  
K.L. Kumar(S.Chand & Company Ltd.)

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**803 : Advance Algorithms**

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**Unit : 1** **[25%]**

**Linked Storage Algorithms**

**Linked List Algorithms:** Single, Double, Circular and Sorted Linked list.

**Unit : 2** **[25%]**

**Tree & Graph Algorithms**

**Tree Algorithms:** Types of Tree, Traversing Binary Tree, BST with Header Node, Threaded BST

**Graph Algorithms:** Representation of Graphs, Breadth First Search, Depth First Search, Topological Sort, Strongly Connected Components, Algorithm for Kruskal's and Prim's for finding Minimum cost Spanning Trees.

**Unit : 3** **[25%]**

**Divide and Conquer approach, Dynamic Programming and Greedy algorithms:**

**Divide and Conquer Approach:** Merge Sort, Quick sort, Medians and Order statistics, Strassen's algorithm for Matrix Multiplications

**Dynamic Programming:** Elements of Dynamic Programming, Matrix Chain Multiplication, Longest common subsequence and optimal binary search trees problems.

**Greedy Algorithms:** Elements of Greedy strategy, An activity selection problem, Huffman Codes, A task scheduling problem.

**Unit : 4** **[25%]**

**String matching and NP-Complete Problem**

**String matching:** The naïve String Matching algorithm, The Rabin -Karp Algorithm, String Matching with finite automata, The Knuth -Morris Pratt algorithm.

**NP-Complete Problem:** Polynomial-time verification, NP-Completeness and Reducibility, NP-Completeness Proof, NP-Complete problems.

**Text Books :**

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education Asia, 2003.
2. A.V.Aho, J.E. Hopcroft and J.D.Ullman, "The Design and Analysis Of Computer Algorithms", Pearson Education Asia, 2003.

**Reference Books :**

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", PHI Pvt. Ltd., 2001
2. An Introduction to Data Structures with Application By Tremblay & Sorenson McGraw -Hill 1984

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**804 : Computer Security**

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**Unit : 1** **[25%]**

**Introduction:** What Does "Secure" Mean?, Attacks, The Meaning of Computer Security, Computer Criminals, Methods of Defense.

**Cyber Security:** Making a Business Case, Quantifying Security, Modeling Cyber -security, Current Research and Future Directions

**Unit : 2** **[25%]**

**System Security**

- Intruders
  - Intruders, Intruders detection, Password management.
- Malicious Software
  - Viruses and Related Threats
- Firewalls
  - Firewalls Design principle, established systems .

**Unit : 3** **[25%]**

**Cryptography**

- Foundations of cryptography and computer security
    - Mathematical foundations, Randomness
  - Symmetric key cryptography
    - Classical Encryption Techniques
    - Block Ciphers and The Data Encryption Standard
    - Advance Encryption Standard
    - Confidentiality Using Symmetric Encryption
  - Public key cryptography
    - Public Key Cryptography And RSA
- Message Authentication and Hash Function

**Unit : 4** **[25%]**

**Network Security**

- Protocols: Digital Signature standards
- Electronics Mail Security - PGP (Pretty Good Privacy) MIME, data Compression technique
- IP Security: Architecture, Authentication Leader, Encapsulating security Payload – Key management
- Web security: -Secure Socket Layer & Transport Layer security, secure electronics transactions

**Text Books:**

1. Security in Computing, Fourth Edition By Charles P. Pfleeger, Shari Lawrence Pfleeger  
Publisher: Prentice Hall.
2. Cryptography and Network Security (2nd edition) William Stallings(Pearson Education).

**Reference Books:**

1. Computer Security Basics by Debby Russell, G.T. Gangemi (Orielly)
2. Network Security Private Communication in a Public World by Charlie Kamfman, Radia Parolman, Mike Speciner

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**805 : XML & Web Services**

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**Unit : 1**

**[20%]**

XML Introduction, XML Pros and Cons, How to use, XML Tree, XML Syntax of, XML Elements, XML Attributes, XML Validation, XML Validator, XML, A valid XML Document, viewing, XML CSS, XML XSLT, XML HTTP Request, XML Parser, XML DOM, XML to HTML, XML Applications, XML Namespaces, XML Cdata, XML Encoding, XML Technologies, Extracting and Displaying data

**XML DOM:**

DOM Introduction, DOM Document, DOM Nodes, and Types, DOM Node Tree, DOM Load Function, DOM Methods, DOM Accessing, DOM Node Info, DOM Node List, DOM traversing, DOM Document Type, DOM Cdata

**Manipulating Nodes:**

DOM get values, DOM Create Nodes, DOM Replace Nodes, DOM Remove Nodes, DOM Add Nodes, and DOM clone Nodes

**Unit : 2**

**[35%]**

**DTD:** Introduction to DTD, Purpose of DTD, DTD Building Blocks, DTD Elements, DTD Attributes, DTD Elements Vs Attributes, DTD Entities, DTD Validation

**XSLT:** Introduction to XSLT, XSLT Languages, XSLT Browsers, XSLT Transform, XSLT <Template>, XSLT <value-of>, XSLT <for-each>, XSLT <sort>, XSLT <if>, XSLT <choose>, XSLT Apply, XSLT on the Client, XSLT on the server, XSLT Edit XML

**XPATH:** Introduction to XPATH, XPATH nodes, XPATH syntax, XPATH Axes, XPATH Operators, XPATH Functions

**XQUERY:** Introduction to XQUERY, XQUERY Flower, XQUERY HTML, XQUERY terms, XQUERY syntax, XQUERY Add, XQUERY select, XQUERY Functions

**Unit : 3**

**[35%]**

**XLINK:** Introduction to XLINK, XLINK syntax, XLINK Example, XLINK reference

**XPOINTER:** Introduction to XPOINTER, XPOINTER syntax, XPOINTER Example

**XSD:** Introduction to XSD, XSD<schema>, simple types (XSD elements, XSD attributes), Complex Types (XSD elements, XSD elements only, XSD empty, XSD text only, XSD mixed, XSD indicators, XSD <any>, XSD <any Attribute>), Data Types (XSD string, XSD date, XSD numeric, XSD misc)

**XSLFO:** Introduction to XSLFO, XSLFO Documents, XSLFO Area, XSLFO Output, XSLFO flow, XSLFO pages, XSLFO block, XSLFO lists, XSLFO tables

**Unit : 4**

**[10%]**

**SOAP:** Overview Of SOAP, SOAP: Protocol - Message Structure

**Web Services:** Overview - Architecture - Key Technologies - UDDI - WSDL - SOAP And Web Services In E-Com - Overview Of .NET.

**Text/Reference Books:**

1. Beginning XML, 4th Edition, David Hunter, Jeff Rafter, Joe Fawcett, Eric van der Vlist, Danny Ayers, Jon Duckett, Andrew Watt, Linda McKinnon, Wrox Publication
2. Frank. P. Coyle, XML, Web Services And The Data Revolution, Pearson Education, 2002
3. Xml and Web services Unleashed, Ron Schmelzer, Travis Vandersypen, Madhu Siddalingaiah, Diane Kennedy, Pearson Edition,
4. Foundations of the Semantic Web: XML, RDF & Ontology by Rajendra Akerkar

5. An Introduction to XML and Web Technologies by Anders Moller, Michael Schwartzbach, Pearson Edition