PART- II

# CURRICULUM OF DIPLOMA PROGRAMME

## ON

## COMPUTER SCIENCE & ENGINEERING (CSE)

## IN

## MULTI POINT ENTRY & CREDIT SYSTEM

## For the State of Nagaland

June 2019

# Curriculum Structure and Sample Path for Computer Science & Engineering

**TERM-III**

| Sl. No. | Code | Course | Pre-requiste | Study Scheme Contact Hours /Week L | T | P | Evaluation Scheme Theory End Exam | Progressive Assignment Class Test | Assign-ment | Attend-ance | Practical End Exam | Progressive Assignment Sessional | Viva | Total Marks | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | G105 | Applied Mathematics | NIL | 3 | 1 | 0 | 75 | 10 | 10 | 5 | 0 | 0 | 0 | 100 | 4 |
| 2 | G302 | Development of Life skill - II | NIL | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 25 | 25 | 50 | 2 |
| 3 | CSE402 | Computer Hardware & Maintenance Workshop | NIL | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 50 | 25 | 25 | 100 | 3 |
| 4 | CSE411 | Digital Circuits | NIL | 3 | 0 | 2 | 75 | 10 | 10 | 5 | 25 | 25 | 0 | 150 | 4 |
| 5 | CSE404 | Computer Architecture & Organization | NIL | 3 | 0 | 0 | 75 | 10 | 10 | 5 | 0 | 0 | 0 | 100 | 3 |
| 6 | CSE409 | Object Oriented Programming in C++ | G206B | 3 | 1 | 2 | 75 | 10 | 10 | 5 | 25 | 25 | 0 | 150 | 5 |
| 7 | CSE403 | Date Structure & Algorithm | G206B | 3 | 0 | 4 | 75 | 10 | 10 | 5 | 25 | 25 | 0 | 150 | 5 |
| 8 | CSE509 | Professional Practices - II | NIL | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 50 | 1 |
| | | Total | | 16 | 3 | 16 | 375 | 50 | 50 | 25 | 125 | 175 | 50 | 850 | 27 |

# Curriculum Structure and Sample Path for Computer Science & Engineering

**TERM-IV**

| Sl. No. | Code | Course | Pre-requiste | Study Scheme Contact Hours /Week L | T | P | Theory End Exam | Class Test | Assign-ment | Attend-ance | Practical End Exam | Sessional | Viva | Total Marks | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | CSE504 | Microprocessor & Interfacing | CSE 411, CSE 404 | 3 | 1 | 2 | 75 | 10 | 10 | 5 | 25 | 25 | 0 | 150 | 5 |
| 2 | CSE 408 | Database Management system | CSE 403 | 3 | 1 | 4 | 75 | 10 | 10 | 5 | 25 | 25 | 0 | 150 | 6 |
| 3 | CSE407 | Network Essentials | NIL | 3 | 0 | 2 | 75 | 10 | 10 | 5 | 25 | 25 | 0 | 150 | 4 |
| 4 | CSE502 | Webpage Design - I | NIL | 2 | 1 | 4 | 75 | 10 | 10 | 5 | 25 | 25 | 0 | 150 | 5 |
| 5 | CSE405 | Operating System | CSE404 | 3 | 0 | 0 | 75 | 10 | 10 | 5 | 0 | 0 | 0 | 100 | 3 |
| 6 | CSE510 | Professional Practices III | NIL | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 50 | 1 |
| 7 | G307 | Softcore - I (Environmental Education - I) | NIL | 3 | 0 | 0 | 75 | 10 | 10 | 5 | 0 | 0 | 0 | 100 | 3 |
| | | Total | | 17 | 3 | 14 | 450 | 60 | 60 | 30 | 100 | 150 | 0 | 850 | 27 |

# Curriculum Structure and Sample Path for Computer Science & Engineering

**TERM-V**

| Sl. No. | Code | Course | Pre-requiste | Study Scheme Contact Hours /Week | | | Evaluation Scheme Theory End Exam | Progressive Assignment | | | Practical End Exam | Progressive Assignment Sessional | Viva | Total Marks | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | Class Test | Assign-ment | Attend-ance | | | | | |
| 1 | CSE 401 | Software Engineering | NIL | 3 | 1 | 0 | 75 | 10 | 10 | 5 | 0 | 0 | 0 | 100 | 4 |
| 2 | CSE 513 | Business Data Processing | NIL | 3 | 1 | 4 | 75 | 10 | 10 | 5 | 25 | 25 | 0 | 150 | 6 |
| 3 | CSE 505 | Object Oriented Programming in Java | CSE 409 | 4 | 1 | 2 | 75 | 10 | 10 | 5 | 25 | 25 | 0 | 150 | 6 |
| 4 | CSE503 | Webpage Design – II | CSE502 | 2 | 1 | 4 | 75 | 10 | 10 | 5 | 25 | 25 | 0 | 150 | 5 |
| 5 | CSE 506 | Internetworking and Web Technology | CSE 407 | 3 | 1 | 3 | 75 | 10 | 10 | 5 | 25 | 25 | 0 | 150 | 5 |
| 6 | CSE 511 | Professional Practices IV | NIL | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 50 | 1 |
| | | Total | | 15 | 5 | 15 | 375 | 50 | 50 | 25 | 100 | 150 | 0 | 750 | 27 |

## Curriculum Structure and Sample Path for Computer Science & Engineering

**TERM-VI**

| Sl. No. | Code | Course | Pre-requiste | Study Scheme Contact Hours /Week | | | Evaluation Scheme Theory | | | | Evaluation Scheme Practical | | | Total Marks | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | End Exam | Class Test | Assign-ment | Attend-ance | End Exam | Sessional | Viva | | |
| 1 | CSE 501 | Multimedia Technology and Applications | NIL | 4 | 0 | 4 | 75 | 10 | 10 | 5 | 50 | 25 | 25 | 200 | 6 |
| 2 | CSE 601 | Elective I | NIL | 3 | 1 | 0 | 75 | 10 | 10 | 5 | 0 | 0 | 0 | 100 | 4 |
| 3 | CSE 602 | Elective II | NIL | 3 | 1 | 0 | 75 | 10 | 10 | 5 | 0 | 0 | 0 | 100 | 4 |
| 4 | CSE406 | Linux Operating System | CSE 405 | 3 | 1 | 4 | 75 | 10 | 10 | 5 | 25 | 25 | 25 | 175 | 6 |
| 5 | CSE507 | Project | NIL | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 100 | 50 | 50 | 200 | 6 |
| 6 | G304 | Softcore - II | NIL | 3 | 0 | 0 | 75 | 10 | 10 | 5 | 0 | 0 | 0 | 100 | 3 |
| 7 | CSE 512 | Professional Practices V | NIL | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 50 | 1 |
| **Total** | | | | **16** | **3** | **22** | **375** | **50** | **50** | **25** | **175** | **150** | **100** | **925** | **30** |

| Sl. No. | Code | Course | Pre-requiste | Study Scheme Contact Hours /Week | | | Evaluation Scheme Theory | | | | Evaluation Scheme Practical | | | Total Marks | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | End Exam | Class Test | Assign-ment | Attend-ance | End Exam | Sessional | Viva | | |
| 1 | CSE 608 | Industrial Training of Two Weeks Duration | NIL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 100 | 0 | 200 | 10 |
| **Total** | | | | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **100** | **100** | **0** | **200** | **10** |

# Curriculum Structure and Sample Path for Computer Science & Engineering

**TERM-VI Elective**

| Sl. No. | Code | Course | Pre-requiste | Study Scheme Contact Hours /Week | | | Evaluation Scheme Theory | | | | Evaluation Scheme Practical | | | Total Marks | Credit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | End Exam | Class Test | Assign-ment | Attend-ance | End Exam | Sessional | Viva | | |
| 1 | CSE 601 | E-commerce | NIL | 3 | 1 | 0 | 75 | 10 | 10 | 5 | 0 | 0 | 0 | 100 | 4 |
| 2 | CSE 601 | Network Security & Cryptography | NIL | 3 | 1 | 0 | 75 | 10 | 10 | 5 | 0 | 0 | 0 | 100 | 4 |
| 3 | CSE 602 | Wireless and Mobile Communication | NIL | 3 | 1 | 0 | 75 | 10 | 10 | 5 | 0 | 0 | 0 | 100 | 4 |
| 4 | CSE 602 | Soft Computing | NIL | 3 | 1 | 0 | 75 | 10 | 10 | 5 | 0 | 0 | 0 | 100 | 4 |
| | | **Total** | | **6** | **2** | **0** | **150** | **20** | **20** | **10** | **0** | **0** | **0** | **200** | **8** |

# TERM - III

| APPLIED MATHEMATICS | |
|---|---|
| **Course code:** G105 | **Semester : Third** |
| **Teaching Scheme** | **Maximum Marks : 100** |
| | **PA and End Examination Scheme** |
| Theory : 3 hrs/week | Class test: 10 Marks Sessional 0 |
| Tutorial: 1 hrs / week | Assignment/Quiz etc./Attendance: 15 Marks |
| Practical : NIL | End Semester Theory Exam: 75 |
| Credit : 4 | End Semester Practical Exam: 0 |

**Rationale / Aim :-**

Mathematics is an important tool to solve wide variety of engineering problems. Most of the technological processes in industry are described effectively by using mathematical framework. Mathematics has played an important role in the development of mechanical, civil, aeronautical and chemical engineering through its contribution to mechanics of rigid bodies, hydrodynamics, aero-dynamics and heat transfer etc. It has become of great interest to electrical engineers through its application to information theory, design of digital computer etc.

Through this syllabus we aim to give students a strong foundation in Matrix and Vector with their applications. We also aim to give detail idea of Numerical Integration, Numerical solution of Non-Linear Equation, Gauss Elimination method and Differential Equations with application problems.

| UNIT | TOPIC/SUB-TOPIC | Contact Hrs. | Total Marks. |
|---|---|---|---|
| 1.0 | **Numerical Analysis**<br><br>**1.1 Interpolation.**<br><br>(i) introduction to interpolation.<br>(ii) Lagrange's interpolation formula.<br>(iii) The operators $\Delta$, $\nabla$ and $E$ .Relation between them.<br>(iv) Difference Table.<br>(v) Newton's forward and backward interpolation formula.<br>(vi) Concept of extrapolation.<br><br>**1.2 Numerical Differentiation and Integration.**<br><br>(i) Newton's forward and backward difference formula for differentiation $\left( \dfrac{dy}{dx}, \dfrac{d^2 y}{dx^2} \right)$ at any point at $x = x_0 \ or \ x = x_n$<br><br>**1.3 Numerical Integration**.<br><br>(i) Trapezoidal rule and Simpson's $\dfrac{1}{3}$ rd rule.<br><br>**1.4 Numerical Solution of Ordinary Differential Equation** | **15** | |

| | | | | |
|---|---|---|---|---|
| | (i)      Introduction.<br>(ii)    Runge Kutta's $2^{nd}$ and $4^{th}$ order methods. | | | |
| **2.0** | **Differential Equations (ordinary)**<br>    (i)     Introduction.<br><br>    (ii) Order and degree of a differential equation.<br><br>    (iii)    Formation of Differential Equations.<br><br>    (iv)    Solution of a Differential Equation.<br><br>    (v) Differential equation of the first order and first degree.<br><br>    (vi)    Variables separable.<br><br>    (vii)    Homogeneous Differential Equations.<br><br>    (viii)    Linear Differential Equations.<br><br>    (ix)    Equations reducible to linear form.<br><br>    (x) Exact differential Equations.<br><br>    (xi)    Equations reducible to the exact form.<br><br>    (xii)    Linear Differential Equations of second order with constant coefficients.<br><br>    (xiii)    Complete solution = Complementary Function + Particular Integral. | 15 | |
| **4.0** |     (xiv)    Method of finding Particular Integral.<br><br>    (xv)    Applications of differential equations to electrical circuit<br><br>    (xvi)    problems.<br><br>    (xvii)    Problems related to other physical systems.<br><br> **Graph Theory**<br>    (i)     Introduction.<br><br>    (ii) Basic Terminology.<br><br>    (iii)    Simple Graph, Multigraph and Pseudo graph.<br><br>    (iv)    Degree of a Vertex.<br><br>    (v) Types of Graphs.<br><br>    (vi)    Subgraphs and Isomorphic Graphs.<br><br>    (vii)    Operations of Graphs.<br><br>    (viii)    Paths, Cycles and Connectivity. | 20 | |

| | | | | |
|---|---|---|---|---|
| | (ix)   Eulerian and Hamiltonian Graph. | | | |
| | (x) Shortest Path Problems using known Algorithm | | | |
| | (xi)   Representation of Graphs. | | | |
| | (xii)   Planar Graph. | | | |
| | (xiii)   Graph Colouring. | | | |
| **5.0** | **Discrete Mathematics**<br>5.1 The principle of Inclusion and Exclusion with examples.<br>5.2 Generating Functions.<br>   (i)   Introductory examples.<br>   (ii)   Definition and examples of Calculation Techniques.<br>   (iii)   Partition of integers with problems.<br>   (iv)   Exponential Generating function with problems.<br>5.3 Recurrence Relations.<br>   (i)   First order linear recurrence relations<br>   (ii)   Second order linear homogeneous recurrence relations with constant coefficients.<br>   (iii)   Non-homogeneous recurrence relations.<br>   (iv)   (iv)Method of generating functions<br>   (v)   (v) Problems on all  the above topics.. | 10 | |
| | Total   hours | 60 | |

**Reference Books.**

(1)   Integral Calculus by B.C.Das and B.N.Mukherjee.
(2)   Diploma Engineering Mathematics (Volume-II) by B.K.Pal.
(3)   Applied Mathematics-I by Dr.J.S.Bindra and K.S.Gill.
(4)   Applied Mathematics-II by Dr.J.S.Bindra and K.S.Gill.
(5)   Applied Mathematics-III by Dr.J.S.Bindra.
(6)   Engineering Mathematics (Volume-I, Volume-II & Volume-III)
      By S.Arumugam, A.Thangapandi Issac and A.Somsundaram.
(7)   Discrete and Combinatorial Mathematics by Ralph P.Grimaldi.
(8)   A TEXT BOOK OF DISCRETE MATHEMATICS by Swapan Kumar Sarkar.
(9)   Mathematics for Polytechnic by S.P.Deshpande.
(10)   Higher Engineering Mathematics by B.S.Grewal.
(11)   Introductory Method of Numerical Analysis by S.S.Sastry.
(12)   Calculus of Finite Difference and Numerical Analysis by Gupta-Malik.

## COMPUTER HARDWARE & MAINTENANCE WORKSHOP

| | |
|---|---|
| **Course code: CSE402** | **Semester : Third** |
| **Teaching Scheme** | **Maximum Marks : 100** |
| | **PA and End Examination Scheme** |
| Theory : 0 hrs/ week | Class test: 0 Marks Sessional: 50 |
| Tutorial: 1 hrs/ week | Assignment/Quiz etc./Attendance: 0 Marks |
| Practical : 4 hrs / week | End Semester Theory Exam: 0 |
| Credit : 3 | End Semester Practical Exam: 50 |

**Rationale / Aim :-**

The aim of this course is train the student in PC hardware maintenance. This includes hands-on-training on PC and its related peripherals. The course provide opportunity for the student to install, repair, and maintain PC and related peripherals. The trouble-shooting involves Virus attack and clearing, Installation of OS and device drivers, Installation of Applications, etc.

**Maintenance and troubleshooting of PC, hand held devices, Networking Devices and Peripherals.**

5.1 Introductory Concepts.

5.2 Steps for Working, Setup of Peripherals and troubleshooting.

| | Suggested List of Laboratory Experiments :- | |
|---|---|---|
| Expt No | **Laboratory Experiments to perform** | **Hrs** |
| 1 | Installation maintenance and troubleshooting of hardware devices such as various components in mother board, interfacing cards, etc. | |
| 2 | Installation of Windows and Linux operating system | |
| 3 | Installation of various Networking equipment such as switches. | |
| 4 | Fixing of passive network components such as IO boxes, etc. | |
| 5 | Trouble-shooting of elementary problems related to PC such as virus infection, network connection troubleshooting, etc. | |
| 6 | Installation of various application software, patches, devices drivers, peripherals, and upgrades related to OS and system software. | |

| DIGITAL CIRCUITS | |
|---|---|
| **Course code:** CSE411 | **Semester : Third** |
| **Teaching Scheme** | **Maximum Marks : 150** |
| | **PA and End Examination Scheme** |
| Theory : 3 hrs/week | Class test: 10 Marks Sessional 25 |
| Tutorial: NIL | Assignment/Quiz etc./Attendance: 15 Marks |
| Practical : 2 hrs / week | End Semester Theory Exam: 75 |
| Credit : 4 | End Semester Practical Exam: 25 |
| **Rationale / Aim :-** | |
| This course deals with digital electronic components and circuits. It focuses on elementary topics like number systems, Boolean algebra, logic gates, various digitals circuits using logics gate like combinational circuits, flip-flops, shift registers. It also covers memory devices, data convertors and display and display drives. | |

| UNIT | TOPIC/SUB-TOPIC | TOTAL HRS. |
|---|---|---|
| 1. | **Number System:** Number Systems and Codes : Decimal, Binary, Octal, Hexadecimal number system and conversion from one number system to another, Arithmetic operations using these number systems, Representation of negative number in the different number systems, Complements and complement subtraction, Different codes (8421, Ex~3, 2421, Gray, Alphanumeric, BCD, Seven segment codes etc) and code conversions. | 6 |
| 2.0 | **Boolean Algebra and Logic Gates:** Postulates and different theorems. SOP and POS forms of expression and their conversion. Simplification : using Boolean theorems and k-map (up to 4 variables) Basic logic gates - their symbols, truth table and logic ' expression for the output simple circuit realization using the logic gates. Realization of any expression either using all NAND or NOR gates | 6 |
| 3.0 | **Combinational Logic Circuits :** Arithmetic circuit (Adder/ Subtractor), Multiplexers and their uses, Decoder/demultiplexers and their uses, code converter, Encoder, parity generator/checkers. | 8 |
| 4.0 | **Families of Logic Circuit :** TTL and CMOS family, open collector and tri-state logic gates. | 3 |

5.0 **Storage Devices & Sequential Circuits :**　　　　　　06+04+02
Latches and Flip-flops, Timing diagrams of latches and flip flops,　　　=12
conversion of one flipflop to another, Counters - Binary ripple counters,
Asynchronous module counters, UP/Down counter, Synchronous counters
(binary, different modulo and UP/Down), Timing diagram of all types of
counters.  Brief introduction to a few commercially available counter ICs
(asynchronous and synchronous).

5.1 Shift-registers-Different types of shift registers and their functional details,
A few applications of shift-registers.

5.2 Memory -Memory types and terminology, Memory organization,
Semiconductor memory, reading and writing, RAM, ROM, PROM cells
and circuits, EPROM (Programming and erasing), Dynamic RAM, Memory
expansion, PLA.

6.0 **Data Converters :**　　　　　　　　　　　　　　　　　6
Digital-to-Analog Conversion - Weighted resistor, R-2R ladder, DAC
performance and their characteristics.
Analog-to-Digital Conversion - Counter type ADC, dual slope type,
successive approximation type, tracking type and flash type, ADC
performance and their characteristics.

7.0 **Display and Display Drives  :**　　　　　　　　　　　　4
Introduction to LED, LCD, 7-segment displays, Bar graph display and
Dot matrix displays.  Decoder drivers for 7-segment display, Bar graph
display and LCD.  Multiplexing of display.

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45

**Practical**
1. Verification of truth tables of different basic logic gates.
2. Realisation of logic expressions using different basic logic gates.
3. Realisation of logic expressions using either all NAND or all NOR gates.
4. Adder circuits (Half, Full-adder) design.
5. Design of a multiplexer using logic gates (4 to 1 Multiplexer)
6. Use of commercially available multiplexer ICs to realise two logic functions.
7. Design of a decoder using logic gates (2 to 4 decoder)
8. Use of commercially available decoder ICs to realise two logic functions.
9. Design of RS, JK, D latches using logic gates.
10. Design of master/slave JK flip-flop.
11. To study the functional behaviour of some commercially available flip-flop ICs (JK and D)
12. Counter design (modulo 6 and 10 asynchronous and synchronous counters) using flip-flop and
to display the counts on 7-segment display units.
13. To study the performance of some commercially available counter ICs (asynchronous and
synchronous), cascading of counter ICs, Different modulo (MOD-6 and MOD-10) counter design
using counter ICs.
14. To design a shift register using flip-flops and to study its behaviour.
15. To study the different functional features of shift register ICs.

**REFERENCE BOOKS :**

1. Digital Systems – by Ronald J. Tocci, PHI
2. Digital Design – by Mano, PHI
3. Digital Logic & Comp. Design – by Mano, PHI

LIST OF EQUIPMENT

1. Digital Trainer Kit
2. Powered Project board containing
   i) Solderless breadboard with
   ii) Power supply
   iii) Power lead and connector plate

3. Logic Trainer lab with
i) DC power supply (+5V, 1A, 5V at 500 mA +/- 15V at 500 mA)
ii) Logic Switches (slide)
iii) Pulse generator  1Hz, 10Hz & 100 Hz sq. wave
iv) Logic gates (30 built in logic gates comprising dual input for each of AND, OR, NAND, NOR, XOR & NOT gates)
v) Power supply

4. Flip-flop trainer kit

5. Counter trainer kit

| COMPUTER ARCHITECTURE & ORGANIZATION | |
|---|---|
| **Course code: CSE404** | **Semester : Third** |
| **Teaching Scheme** | **Maximum Marks : 100** |
| | **PA and End Examination Scheme** |
| Theory : 3 hrs/week | Class test: 10 Marks Sessional: 0 |
| Tutorial: NIL | Assignment/Quiz etc./Attendance: 15 Marks |
| Practical : NIL | End Semester Theory Exam: 75 |
| Credit : 3 | End Semester Practical Exam: 0 |
| **Rationale / Aim :-** | |
| This course deals with evolution of computers, and numbers representation. Various block components like CPU, Memory, I/O devices and peripherals are covered in details. This course helps in building concept of a student that will further help in better understanding of subjects like microprocessor, operating system, etc. | |

UNIT    TOPIC/SUB-TOPIC                                               TOTAL HRS.

1.    **Evolution of Computers :**                                                    5
Brief history of development; Babbage's machines, Von Neumann Concept,
Difference between calculators and computers, Generations of Computer -SSI, LSI, VLSI,
Classification - micro, mini, main frames and supercomputers.
        PC's and portable systems.

2.    **Number Representation :**                                                   5
Signed numbers, Signed - magnitude 1's complement, 2's complement
and excess notations, numbers, Fixed and floating point numbers and
operations, Booth's Algorithm, Common errors in arithmetic truncation
errors, round of  errors.
        Codes : weighted and non-weighted, BCD, ASCII, EBCDIC

3.    **Central Processing Unit :**                                                8
Components of Arithmetic Logic Unit (in block diagram only), Different
types of instructions, Instruction format, addressing modes, different CPU
registers - Accumulator, Flag, Program Counter, Instruction Register and
General Purpose registers.  Hardware control unit - its different functions

4.    **Microprocessor :**                                                         7
Intel 8085 architecture and simple assembly language programming
concept, Brief introduction to  Intel 8086/8088 and Pentium processor
(relative study), Brief introduction to RISC processor

5.    **Memory :**                                                                 6

Concept of bits, bytes and words; Storage of numbers and characters,
RAM, ROM, EPROM; Concept of cache memory - its role in
performance improvement, memory hierarchy

6.      **I/O Devices :**                                                    10
Printers - Dot Matrix, Ink Jet, Line, Laser; Visual display unit –
alphanumeric and graphic, Keyboard, Graphics devices - mouse, joy-stick, Scanners and
digitizers, Auxiliary storage devices - floppy and Hard disk : Sectors, tracks and cylinders,
accessing mechanisms (brief idea) Magnetic tapes - description and accessing mechanisms, CD
ROM
7.      **PC Architecture**                                                   4
                                                                        ------
                                                                          45


**REFERENCE BOOKS :**

1.      Computer Organization & Architecture – by Stallings, PHI
2.      Computer Organization – by V. C. Hamacher, Z. G. Vranesic & S. G. Zaki, MGH
3.      Computer Architecture & Organization – by J. P. Hayes, MGH
4.      Computer Organization & Design – by Pal Chaudhuri, PHI
5.      Computer System Architecture – by Mano, PHI

| OBJECT ORIENTED PROGRAMMING IN C++ | |
|---|---|
| **Course code: CSE409** | **Semester : Third** |
| **Teaching Scheme** | **Maximum Marks : 150** |
| | **PA and End Examination Scheme** |
| Theory : 3 hrs/week | Class test: 10 Marks Sessional 25 |
| Tutorial: 1 hrs/week | Assignment/Quiz etc./Attendance: 15 Marks |
| Practical : 2 hrs / week | End Semester Theory Exam: 75 |
| Credit : 5 | End Semester Practical Exam: 25 |
| **Rationale / Aim :-** | |
| Object oriented programming usind C++ is a course in the area of Computer Science and Informational Technology that will help the student to develop concept like, Objects and classes, function overloading, virtual functions, etc. Further, this will help the learners to understand the concepts of data encapsulation, inheritance and polymorphism in the area of coding using C++ as a programming language. | |

| UNIT | TOPIC/SUB-TOPIC | TOTA HRS. |
|---|---|---|
| 1. | **Introduction To Object Oriented Programming** <br> Introduction to object oriented approach <br> Need of object oriented programming <br> Identifying objects <br> Characteristics of object oriented Programming language <br> Basic concepts of OOPs objects, classes, data encapsulation, inheritance, <br> Polymorphism and overloading <br> Comparison of object oriented language and procedure oriented language | 5 |
| 2. | **Object Oriented Language C++ Features** <br> Common statement <br> Basic data types <br> Operators <br> Arithmetic, relational, logical operators <br> Manipulators, assignment and conditional operators <br> New and delete operators <br> Control structure <br> FOR loop <br> WHILE loop <br> If-else statement <br> Switch statement <br> Break and continue statement | 6 |

| 3. | **Arrays and Pointers** | 5 |
|---|---|---|

Defining an array and accessing it's elements
Array as class member data
Array of objects
Addresses and pointers
Pointers and functions

| 4. | **Structure and Functions** | 4 |
|---|---|---|

Specifying the structure
Defining a structure variable
Accessing the members of a structure
Enumerated data types
Function definition and declaration

| 5. | **Objects and Classes** | 6 |
|---|---|---|

Definition and declaration
Access specifier: Private, public and protected
Constructor, destructor
Structures and classes

| 6. | **Operator Overloading** | 4 |
|---|---|---|

Basic concepts of overloading
Overloading unary operators
Overloading binary operators
Advantages of operator overloading

| 7. | **Inheritance** | 5 |
|---|---|---|

Definition of inheritance
Basic concepts of `Base class' and `derived class'
Derived class constructor
Public and private inheritance
Types of inheritance:
Single, Multiple & multilevel inheritance , Hierarchical, and Hybrid inheritance,

| 8. | **Polymorphism** | |
|---|---|---|

Introduction to Polymorphism in programming languages    4
Types of polymorphism
Polymorphic variables

| 9. | **Virtual Functions** | 3 |
|---|---|---|

Definition of virtual function
Friend function and friend classes
Use of `this' pointer

| 10. | **Templates** | 3 |
|---|---|---|

Introduction to templates

Class templates
Member function template

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**45**

**C++ Lab – 30 hrs.**

Problems on :-
Objects and classes
Declaring and creating objects
Constructors
Modifiers
Passing objects to methods
Instance variables and class variables
Instance method & class method
Scope of variables interface and packages
Introductory Problems on Class Inheritance Super classes and sub class
Calling super class constructors
Calling super class methods
Object class
Number class
Processing date and time
Class Templates and Exceptional handling

**REFERENCE BOOKS :**
1.      Object Oriented Programming – by E. Balaguruswamy, TMH
2.      Software Engineering – by Roger S. Pressman, PHI
3.      Object Oriented Modeling & Design – by James Rumbaugh, Michael Blaha, William
Premerlani,  Frederick Eddy, William Lorensen, PHI
4.      Visual Basic Developers Guide – BPB Publication
5.      Mastering Visual Basic – BPB Publication

**LIST OF EQUIPMENT**

Hardware :      Stand alone PC
                (for detail, please refer Annex – I)

Software :      C++ Compiler / Visual Studio.

| PROFESSIONAL PRACTICES - II | |
|---|---|
| **Course code:** CSE509 | **Semester :  Third** |
| **Teaching Scheme** | **Maximum Marks :  50** |
| | **PA and End Examination Scheme** |
| Theory :      0 hrs / week | Class test:  0  Marks   Sessional 50 |
| Tutorial:      0 hrs / week | Assignment/Quiz etc./Attendance: 0 Marks |
| Practical :    2 hrs / week | End Semester Theory Exam:  0 |
| Credit :    1 | End Semester Practical Exam: 0 |
| **Rationale / Aim :-** | |
| Interact with industry is essential for proper understanding about implementation procedure of the theoretical knowledge gained during course of study. The course content of professional practice-III is designed to develop interpersonal skill and adoptability to the industry so that the student will be benefited in their professional carrier. | |

**Aim :-** The course aims to equip students with basic knowledge and skills about Basic concept of PC assembly and installation of operating system software

**Objective: -** On completion of this course, the Student will be able to:

- Assembly different PC system

- Install various kind of operating system

**Suggested List of activities to be done:**

- Assemble of PC System with 3 to 4 types of motherboard

- Installation of more than 3 to 4 types of operating system (Linux, different types of Window OS, Ubuntu & etc)

**SUGGESTED LEARNING RESOURCES**

1.   Hardware and Software of Personal Computers – by S.K. Bose, New Age International

| DATA STRUCTURE & ALGORITHM | |
|---|---|
| **Course code:** CSE403 | **Semester :** Third |
| **Teaching Scheme** | **Maximum Marks :** 150 |
| | **PA and End Examination Scheme** |
| Theory : 3 hrs/week | Class test: 10 Marks Sessional 25 |
| Tutorial: NIL | Assignment/Quiz etc./Attendance: 15 Marks |
| Practical : 4 hrs / week | End Semester Theory Exam: 75 |
| Credit : 5 | End Semester Practical Exam: 25 |
| **Rationale / Aim :-** | |
| This subject is essential for diploma students for Computer Science to have fundamental idea on related topics like string processing, arrays, records, linked list, tree, stacks, recursion, etc. and applications of them. | |

| UNIT | TOPIC/SUB-TOPIC | TOTAL HRS. |
|---|---|---|
| 1. | **Introduction and Overview** | 2 |
| | 1.1 Introduction | |
| | 1.2 Basic Terminology | |
| | 1.3 Elementary Data Organization | |
| | 1.4 Data Structures | |
| | 1.5 Data Structure Operation | |
| | 1.6 Algorithms; Complexity; Time- space Tradeoff | |
| 2. | **Preliminaries** | 3 |
| | 2.1 Introduction | |
| | 2.2 Mathematical notation and Functions | |
| | 2.3 Algorithmic Notation | |
| | 2.4 Control Structures | |
| | 2.5 Complexity of Algorithms | |
| | 2.6 Sub algorithms | |
| | 2.7 Variables | |
| | 2.8 Data Types | |
| 3. | **String Processing** | 5 |

Sequential, Index-Sequential and Direct file Organization

---------
45

## Practical

Program Related to
1.   Creation of singly & doubly linked list
2.   Insertion, deletion and updation of (1) above
3.   Creation of stack, queue and incertion/deletion operation on Stack/Queue
4.   Conversion amongst infix, prefix & postfix expressions
5.   Creation of tree and insertion/deletion of a node
6.   Tree traversal problem
7.   Graph search algorithms
8.   Searching & Sorting Algorithm

REFERENCE BOOKS:
1.   Data Structures - by Seymolur Lipschutz (Schaum Series)
2.   Fundamentals of Computer Algorithms – by Horowitz,E & Sahani, S – Galgotia Pub.
3.   Data Structures Theory Applications - by Trembly & Sorenson, TMH

LIST OF EQUIPMENT
Hardware :      Stand alone PC]
                (for detail, please refer Annex – I)


Software :      C / C++ Compiler

| DEVELOPMENT OF LIFE SKILL- II | |
|---|---|
| **SUBJECT CODE: G302** | **Semester : Thirth** |
| **Teaching Scheme** | **Maximum Marks :   50** |
| | **PA and End Examination Scheme** |
| Theory :      1    hrs/week | Class test: 0 Marks |
| Tutorial:      0   hrs/week | Assignment / Quiz etc.:  0 Marks <br> Attendance :0 Marks <br> Sessional: 25marks |
| Practical :    2   hrs/week | End Semester Theory Exam: <br> End Semester PA Exam: 25 Marks |
| Credit :       2 | |
| **Rationale:** | |

The nature of organizations is changing at very rapid speed in this competitive world. In this situation the responsibility of diploma holder is not unique. He will be a part of a team in the organization. As such the individual skills are not sufficient to work at his best.

This subject will develop the student as an effective member of the team. It will develop the abilities and skills to perform at highest degree of quality as an individual as well as a member of core group or team.

Such skills will enhance his capabilities in the field of searching, assimilating information, managing the given task, handling people effectively, solving challenging problems.

The subject is classified under Human Science.

**Module/Unit**     After completion of the course, students will be able to:

1.     Apply task management techniques for given projects

2.     Enhance leadership traits

3.     Resolve conflict by appropriate method

4     Apply problem solving skills for a given situation

5     Apply techniques of effective time management

6     Face the interview without fear

7     Convince people to avoid frustration

8     Follow moral and ethics

# TERM -IV

| MICROPROCESSOR & INTERFACING | |
|---|---|
| **Course code:** CSE504 | **Semester : Fourth** |
| **Teaching Scheme** | **Maximum Marks :  150** |
| | **PA and End Examination Scheme** |
| Theory :      3  hrs/week | Class test:  10  Marks   Sessional 25 |
| Tutorial:     1 hrs / week | Assignment/Quiz etc./Attendance: 15 Marks |
| Practical :    2 hrs /week | End Semester Theory Exam:  75 |
| Credit :    5 | End Semester Practical Exam: 25 |
| **Rationale / Aim :-** | |

The course Microprocessor and Interfacing is designed to explain the concept of single chip computer with minimum hardware peripherals attached to execute programs. The students will undersigned the configuration of the Intel 8085 and 8086 microprocessors. The student will also learn how to do assembly level programming using these microprocessor including memory and I/O interface.

| UNIT-1 | Introduction to Microprocessor - Evolution of Microprocessors,Specific features of Microprocessors, Application in our daily life (a few examples) | 2 | |
|---|---|---|---|
| Unit -2 | Internal architecture of a microprocessor (using block diagram); Explanation of each block in brief, Concept of bus structure, Register-to-register transfer, Communication with I/O and memory (This part can be explained using the specific microprocessors like 8085 or 8086/8088). Pin details of 8085 and 8086/8088 CPU and their functions in brief | 6 | |
| Unit -3 | Addressing modes in general (may be limited to 8085 and 8086/8088 CPU), Instruction cycles, Instruction set, timing diagram (may be limited to 8085 and 8086/8088 CPU). Concept of assemblers and compilers | 3 | |
| UNIT-4 | Interfacing of Memory and I/O devices : Concept of address space, address/data bus demultiplexing, address and data bus buffering, address decoding, I/O concepts, memory interfacing concept of I/O mapped I/O and memory mapped I/O. Interrupts - Types of interrupts, Hardware and software data transfer schemes - Synchronous, asynchronous and interrupt | 5 | |

| | | | | |
|---|---|---|---|---|
| | driven. | | | |
| **UNIT-5** | Assembly Language Programming : <br><br> (This part may be limited to the use assembly language of 8085 or 8086/8088 CPU) i) Example for register to register, register to memory, memory to register, block of data movement from one area of memory to another, merging of two blocks of data, data block exchange. ii) Examples of arithmetic addition, subtraction, multiplication and division iii) Examples of searching and sorting (simple) iv) Examples using of look up tables v) Use subroutines and delay programme. | 10 | |
| **UNIT-6** | Peripheral chips and their Interfacing : <br><br> Functional description of 8255, 8253, 8251, 8257, 8237 and 8259. Interfacing of these chips with some standard CPU. Simple assembly language programme to explain the function of these chips. | 6 | |
| **UNIT-7** | Special Purpose Interfacing Devices and their Interfacing : Keyboard interfacing, 7 segment and dot matrix display interfacing, A/D and D/A interfacing, Stepper motor interfacing | 4 | |
| **UNIT-8** | Recent standard μp : Intel family, HP family and Motorola family. <br><br> Concepts of embedded μp. | 4 | |
| **UNIT-9** | PC Interfacing : Simple interfacing of Input/Output peripherals like LED, 7 segment LED display modules, steppes motor, relays through digital I/O card or through the parallel port. Serial link between microprocessor trainer kit and PC serial port, EPROM programming using PC port. | 5 | |
| | **Total** | 45 | |

| Suggested List of Laboratory Experiments :- | | |
|---|---|---|
| Expt No | **Laboratory  Experiments to perform** | **Hrs** |
| 1 | Acquaintance with the microprocessor trainer kit hardware and the user's commands (Dynalog/Vinyties/ALS) | |
| 2 | Assembly language programme development : Data transfer programme - Register to Register, Register to Memory and Vice-Versa <br><br> Arithmetic Operation - 8 bit addition and subtraction, multi-byte addition and | |

| | | |
|---|---|---|
| | subtraction, BCD addition and subtraction, multiplication using repeated addition, multiplication using shift-add process, signed multiplication, Binary division, BCD division | |
| 3 | Array processing - Adding one entry to an array, checking of an ordered list, replacing of one or more entries in a list, sorting and searching, block movement, block exchange and data insertion | |
| 4 | Look-up table - finding squares, cubes etc., of a number using look-up table, code conversion using look-up table | |
| 5 | Delay program, use of subroutine (use the above programme as a subroutine in a main programme | |
| 6 | Data Input/Output - Programming 8255 with the basic I/O modes, programming 8253, interfacing 7-segment display, bar graph display, multiplexed display, programming 8253, in different modes, waveshape generation using 8253, Interfacing of ADC and DAC with microprocessors/microcontroller, keyboard interfacing (using interrupts or polling) to microprocessor/microcontroller, relay interfacing, stepper motor interfacing. | |
| 7 | PC Interfacing : Experiments on ADC/DAC interfacing, to stepper motor interfacing and display interfacing, Other interfacing problems may be repeated using PC interfacing and run by using any High level language. | |

| Name of Authors | Titles of the Book | Name of the Publisher |
|---|---|---|
| A.P. Mathur | Introduction to Microprocessor - by, | TMH |
| Ramesh S. Gaonkar | Microprocessor | PHI |
| D.Hall, | Microprocessor | MGH |
| Govindara jalu, | IBM PC & Clones | TMH |
| William Stalings | Computer Organization & Architecture | PHI |

| NETWORK ESSENTIALS | |
|---|---|
| **Course code:** CSE407 | **Semester : Fourth** |
| **Teaching Scheme** | **Maximum Marks :  150** |
| | **PA and End Examination Scheme** |
| Theory :      3  hrs/week | Class test:  10  Marks   Sessional 25 |
| Tutorial:      0 hrs/ week | Assignment/Quiz etc./Attendance: 15 Marks |
| Practical :    2 hrs / week | End Semester Theory Exam:  75 |
| Credit :    4 | End Semester Practical Exam: 25 |
| **Rationale / Aim :-** | |

This course provides the detail knowledge and skill set to the student regarding data communication and networking. It provides an in-depth knowledge regarding design and implementation of network. It also enhances the psychomotor skill set related to passive network component installations. Moreover it provides an introductory knowledge about the information security

| UNIT | TOPIC/SUB-TOPIC | TOTAL HRS. |
|---|---|---|
| 1 | **Introduction to Computer Networking and Internetworking** <br> 1.1 Concept of data and information <br><br> 1.1.1    Data Representation: various codes <br><br> 1.1.2    Concept of Bit, Byte, Word, <br><br> 1.1.3    Basic of communication-simplex, Half Duplex Full Duplex <br><br> 1.1.4    Channel Allocation, Switching Circuit and Packet <br><br> 1.1.5    Data Transfer Rate / Bandwidth. <br><br> 1.1.6    Multiplexing | 6 |
| 2 | **Network Topology** <br> Network Topology for LAN-bus, ring, star <br> Network Topology for WLAN- Adhoc and infrastructure <br> Network Topology for MAN and WAN – hierarchical, mesh, peer-to-peer. | 5 |
| 3 | **OSI Reference Model** <br> The seven layer Architecture – Physical Layer, Medium Access Sub layer, Data Link Layer, Network Layer, Transport Layer, Session Layer, Presentation Layer and Application Layer | 8 |

| | | |
|---|---|---|
| **4** | **Concept of LAN and VLAN** | 6 |
| | LAN Architecture, Topologies, Protocols | |
| | Concept of VLAN, VLAN Routing | |
| | Concept of Switching. | |
| **5** | **TCP/IP** | 12 |
| | Overview of TCP/IP | |
| | TCP/IP Stack and OSI Reference Model | |
| | The four Layer TCP/IP Architecture | |
| | Internet Protocol | |
| | IP Addressing IPv4, IPv6, CIDR, Subnetting and Supernetting | |
| | Internet Routing Protocols – RIP, OSPF, BGP (conceptual level) | |
| **6** | **Information Security** | 5 |
| | Basic concept of information security | |
| | Data confidentiality, Data integrity, Data availability and Non-Repudiation. | |
| | Authentication and encryption techniques. | |
| | Firewall, Proxy and Tunneling | |
| | Virtual Private Network (VPN) | |
| **7** | Concepts of internet and www , Domain Name Space (DNS), HTML and XML. | 3 |
| | **Total** | 45 |

**Suggested List of Laboratory Experiments :-**

| Expt No | **Laboratory  Experiments to perform** |
|---|---|
| 1 | Study and describe the differences between centralised distributed and collaborative computing. (Students may be told to identify from given specification of system). |
| 2 | Case studies of LAN, MAN, WAN |
| 3 | Study and describe client, server, peers (identify from given specification) |
| 4 | Study network services - remote login, telnet, ftp (Either from internet or a network being made available) |
| 5 | Determine how a specific network service is affected given a network architecture (centralised and distributed). |
| 6 | Demonstrate different transmission media<br>Twisted pair, Co-axial cables, Wireless, Identify advantages and disadvantages |
| 7 | Identify, describe - Network connectivity devices like Media connector, Interface boards,<br>Modems, Repeaters, Hubs, Switch, Bridges, Multiplexer, Routers |
| 8 | Study main protocols through Windows 95/98/NT (any two in details)<br>(TCP/IP, SLIP, PPP, FDDI, X.25, ISDN, ATM) |

| 9 | Laboratory setting-up of Ethernet, installation of Ethernet card and testing |
|---|---|
| 10 | Design LAN and VLAN |
| 11 | Configure Network Server<br>Windows NT, Server installation, network printing, network application, client server |
| 12 | Configure Network Clients |
| 13 | Preventing Problems in a Network<br>Physical, electrical, virus, warm security |
| 14 | Troubleshooting<br>Isolating a problem, recovery from disaster, study of Tools, terminators, cable protocol analysers |
| 15 | Network Administration |

**Text /Reference Books:**

| Name of Authors | Titles of the Book | Name of the Publisher |
|---|---|---|
| A. S. Tanenbaum | 1. Computer Network – by | PHI |
| W. Stallings | 2. Data Communication & Computer Networks | PHI |
| Charles M. Kozierok | TCP/IP Guide | No Starch Press |

| WEBPAGE DESIGN - I | |
|---|---|
| **Course code: CSE502** | **Semester : Fourth** |
| **Teaching Scheme** | **Maximum Marks : 150** |
| | **PA and End Examination Scheme** |
| Theory : 2 hrs/week | Class test: 10 Marks Sessional 25 |
| Tutorial: 1 hrs/week | Assignment/Quiz etc./Attendance: 15 Marks |
| Practical : 4 hrs / week | End Semester Theory Exam: 75 |
| Credit : 5 | End Semester Practical Exam: 25 |
| **Rationale / Aim :-** | |
| The aim of this course is to train the student in the design, development, and deployment of the Web based applications. The course will develop soft and technical skills in student related to design of the web based application related to e-commerce, e-governance, e-learning and related areas. | |

**THEORY**

| UNIT | TOPIC/SUB-TOPIC | TOTA HRS. |
|---|---|---|
| 1 | **Basic anatomy of HMTL documents**<br>Basic HTML tags, Basic Structure, Paragraph, Style Formatting, Hyperlinks, Heading, Images, List, Frames, Forms, Tables. | 10 |
| 2 | **XML**<br>Basic XML Document, Document type Definition, XSLT, Well formed Documents. | 8 |
| 3 | **Cascaded Style Sheet:**<br>Introduction to CSS, CSS Syntax, CSS Borders, Margin and Padding, CSS Box Model, Height/Width, CSS text, Font Color changing, CSS List and Tables | 4 |
| 4 | **Javascript:**<br>Introduction to Javascript, Javascript Data Types, variables, operator, functions and Object. | 8 |

------------

**Total** 15

**Laboratory  Experiments to perform**

Create a HTML document as a static web page

Create XML document for data handling, Use DTD, and CSS

Document formatting using CSS.

Use Javascript to create forms, and connect to data bases

| Text /Reference Books: | | | |
|---|---|---|---|
| Name of Authors | Titles of the Book | Edition | Name of the Publisher |
| C. Musciano and B. Kennedy | HTML: The Definative Guide | 3rd | O'Reilly |
| R. Lerdorf, K. Tatroe, P. MacIntyre | Programming PHP | 3rd | O'Reilly |
| E.R. Harold, W.S. Means | XML in a Nutshell | 3rd | O'Reilly |
| H. Williamson | XML: the complete reference | 11th reprint | TMH |
| P. Hanna | JSP 2.0 The complete Reference | 18th reprint | TMH |

**LIST OF EQUIPMENT**

Hardware :    Stand alone PC
              (for detail, please refer Annex – I)

Software :    Notepad and Browser.

| OPERATING SYSTEM | |
|---|---|
| **Course code:** CSE405 | **Semester :  Fourth** |
| **Teaching Scheme** | **Maximum Marks :   100** |
| | **PA and End Examination Scheme** |
| Theory :      3 hrs/week | Class test:  10  Marks   Sessional 0 |
| Tutorial:     NIL | Assignment/Quiz etc./Attendance: 15 Marks |
| Practical :    NIL | End Semester Theory Exam:   75 |
| Credit :    3 | End Semester Practical Exam: 0 |

**Rationale / Aim :-**

The aim of this course is to provide an overall concept regarding the operating system. The student will interact with various management techniques that are very crucial for the management of the various hardware and software computing resources. Techniques related to resource management and algorithm will be discussed at length for better knowledge and skill-sets.

| Unit | Topic | Total Hrs |
|---|---|---|
| **Unit -1** | **Introduction**<br>1.1 Definition of O.S.<br>1.2 History of O.S.<br>1.3 Concepts<br>1.3 Structure | 3 |
| **Unit -2** | **Processes**<br>2.1 Definition of process and threads.<br>2.2 Interprocess communication.<br>2.3 Classical IPC problems.<br>2.4 Process scheduling. | 4 |
| **Unit -3** | **Process Scheduling Algorithm**<br>3.1 Resident Monitor(Single user)<br>3.2 Multi user system<br>3.3 Time sharing system<br>3.4 FIFS<br>3.5 Round Robin Fashion/Time quantum. Concept.<br>3.6 Multiple queues<br>3.7 Priority queues<br>3.8 Shortest job first | 7 |

| UNIT-4 | **Memory Management** | |
|---|---|---|
| | 4.1 Resident Monitor | 8 |
| | 4.2 Multiple Partition | |
| | 4.3 Garbage collection and compaction | |
| | 4.4 Paged memory management | |
| | 4.5 Page Replacement Algorithms | |
| | 4.6 Swapping | |
| | 4.7 Segmentation | |
| | 4.8 Segmented paged memory management | |
| | 4.9 Demand paged memory management | |
| | 4.10 Virtual Memory | |
| UNIT-5 | **File Systems** | |
| | 5.1 Concept of Files & Directories | 4 |
| | 5.2 File System Implementation | |
| | 5.3 Security Issues in Files | |
| | 5.4 Protection Mechanisms | |
| | 5.5 Case studies of Unix file system | |
| UNIT-6 | **Input/Output** | |
| | 6.1 Principles of I/O Hardware | 3 |
| | 6.2 Principles of I/O Software | |
| | 6.3 Disk 10.4 Clocks | |
| | 6.5 Serial and Parallel port access | |
| | 6.6 Terminal Access | |
| UNIT-7 | **Device Management** | |
| | 7.1 Techniques for Device Management – Dedicated, shared, virtual | 4 |
| | 7.2 Device allocation considerations I/O traffic control &     I/O Schedule, I/O Device handlers | |
| | 7.3 SPOOLing | |
| UNIT-8 | **Dead Locks** | |
| | 8.1 Concept of deadlock | 5 |
| | 8.2 Resources | |
| | 8.3 Deadlock Prevention :    Banker Algorithm & Safety Algorithm | |
| | 8.4 The Ostrich Algorithm | |
| | 8.5 Deadlock Detection and Recovery | |
| | 8.6 Deadlock Prevention | |
| UNIT-9 | **Distributed O.S** | |
| | 9.1 Definition | 4 |
| | 9.2 Types of Distributed O.S | |
| | 9.3 Workstation server model | |
| | 9.4 The processor pool model | |
| | 9.5 The hybrid model | |
| | 9.6 Case study SUN NFS File Server | |

| UNIT-10 | Case Studies<br>10.1 UNIX & LINUX O.S<br>10.2 MS-DOS & WINDOWS XP<br>10.3 WINDOWS -NT | 3 |
|---|---|---|
| | **Total** | 45 |

| Name of Authors | Titles of the Book | Name of the Publisher |
|---|---|---|
| John Donovan | System Programming | TMH |
| D. M. Dhamdhare | Introduction to System Software | TMH |
| Madnick and Donovan | Operating System | |
| A. Silberschatz and P. Galvin | Operating System Concepts | ADP |
| Kernighan & Pike | The UNIX Programming Environment | PHI |
| Sumitabha Das | UNIX – Concepts & Application | TMH |

| SOFTCORE – I | |
|---|---|
| ENVIRONMENTAL EDUCATION | |
| **Course code:** G307 | Semester **: Fourth** |
| **Teaching Scheme** | **Maximum Marks : 100** |
| | **PA and End Examination Scheme** |
| Theory :     3  hrs/week | Class test:  10  Marks   Sessional 0 |
| Tutorial:     0 hrs/week | Assignment/Quiz etc./Attendance: 15 Marks |
| Practical :    0 hrs/week | End Semester Theory Exam:  75 |
| Credit :    3 | End Semester Practical Exam: 0 |

## RATIONALE

Management of Environmental Degradation as also its control using innovative technologies is of prime importance in the times we are living in. Since the days of the famed Rio Summit (1992) awareness about degradation of environment we live in an its management through participation of one and all has literally blossomed into a full-fledged movement of universal importance. Technically qualified people, such as the Diploma Engineers, should not only be aware about new technologies to combat environmental degradation at their disposal but also various aspects of environment, ecology, bio-diversity, management, and legislation so that they can perform their jobs with a wider perspective and informed citizens. This course can be taken by all diploma students irrespective of their specializations.

**DETAILED COURSE CONTENT**

**THEORY:**

| UNIT TOPIC / SUB-TOPIC | Lecture Hrs. |
|---|---|

**1.0     INTRODUCTION                                                         2**

1.1 Introduction

1.2 Environment and its components

1.3 Environment in India

1.4 Public Awareness

**2.0    ECOLOGICAL ASPECTS OF ENVIRONMENT                                    8**

2.1 Ecology

- Eco-system

- Factors affecting Eco-system

2.2 Bio-geochemical cycles

- Hydrological cycle

- Carbon cycle

- Oxygen cycle

- Nitrogen cycle

- Phosphorous cycle

- Sulphur cycle

2.3 Bio-diversity

2.4 Bio-diversity Index

**3.0    NATURAL RESOURCES                                                    5**

3.1  Definition of Natural Resources

3.2  Types of Natural Resources

3.3  Quality of life

3.4  Population & Environment

3.5  Water Resources

- Sources of Water

3.6  Water Demand

3.7  Forest as Natural Resource

- Forest and Environment

- Deforestation

- Afforestation

- Forest Conservation, its methods

3.8 Land

- Uses and abuses of waste and wet land

**4.0     GLOBAL ENVIRONMENTAL ISSUES                                     9**

4.1 Introduction

4.2 Major Global Environmental Problems

4.3 Acid Rain

- Effects of Acid Rain

4.4   Depletion of Ozone Layer

- Effects of Ozone Layer Depletion

4.5 Measures against Global Warming

4.6 Green House Effect

**5.0     ENVIRONMENTAL POLLUTION                                        9**

5.1 Introduction

5.2 Water Pollution

- Characteristics of domestic waste water

- Principles of water treatment

- Water treatment plant (for few industries only- unit operations & unit processes - names only)

5.3 Air Pollution

- Types of air pollutants

- Sources of  Air Pollution

- Effects of Air Pollutants

5.4 Noise Pollution

- Places of noise pollution

- Effect of noise pollution

**6.0 CLEAN TECHNOLOGY**      **6**

6.1 Introduction to Clean Technologies

6.2 Types of Energy Sources

- Conventional Energy sources
- Non-conventional sources of Energy

6.3 Types of Pesticides

6.4 Integrated Pest Management

**7.0 ENVIRONMENTAL LEGISLATION**      **3**

7.1 Introduction to Environmental Legislation

7.2 Introduction to Environmental Laws

**8.0 ENVIRONMENTAL IMPACT ASSESSMENT**      **3**

8.1 Introduction to Environmental Impact Assessment

8.2 Environmental Management (elements of ISO 14001)

8.3 Environmental ethics

**SUGGESTED IMPLEMENTATION STRATEGIES:**

The teachers are expected to teach the students as per the prescribed subject content. This subject does not have any practical but will have only demonstration and field visit as stated. The students will have to prepare report of the site visit.

**SUGGESTED LEARNING RESOURCES:**

(a) Reference Books:

| S. No. | Title | Author, Publisher, Edition & Year |
|---|---|---|
| 1. | Environmental Engineering | Pandya & Carny, Tata McGraw Hill, New Delhi |
| 2. | Introduction to Environmental Engineering and Science | Gilbert M. Masters Tata McGraw Hill, New Delhi |
| 3. | Waste Water Engineering – Treatment, Disposal & Reuse | Metcalf & Eddy Tata McGraw Hill, New Delhi |
| 4. | Environmental Engineering | Peavy, TMH International New York |
| 5. | Study / training materials, references, reports etc. developed by Central Pollution Control Board, New Delhi as also State Pollution Control Boards | Central Pollution Control Board Postal Address: Parivesh Bhawan, CBD-cum-Office Complex East Arjun Nagar, DELHI - 110 032, INDIA Tel.: 91-11-22307233 Fax: 91-11-22304948 e-mail: ccb.cpcb@nic.in |
| 6. | Environmental Science | Aluwalia & Malhotra, Ane Books Pvt. Ltd, New Delhi |
| 7. | Text Book of Environment & Ecology | Sing, Sing & Malaviya, Acme Learning, New Delhi |
| 8. | Environmental Science & Ethics | Sing, Malaviya &Sing , Acme Learning, New Delhi |
| 9. | Environmental Chemistry | Samir K. Banerji, Prentice Hall of India, New Delhi |

(b)     Others:

1.     Text book mentioned in the references

2.     Lab Manuals

3.     OHP Transparencies

4.   Video film on Environment

**SUGGESTED LIST OF DEMONSTRATIONS/FIELD VISIT**

- pH value of water sample.

- Hardness of water

- Calcium hardness

- Total Hardness

- Residual Chlorine to a given sample of water

- Turbidity

- B.O.D.

- C.O.D.

**Visits:** **Following visits shall be arranged by the teachers during the semester:**

- Water Treatment Plant

- Sewage Treatment Plant

- Maintenance work of water supply mains and sewage    system

# DATABASE MANAGEMENT SYSTEM

*L*      *T*      *P*                              **Curri. Ref. No.: CSE408**

3      1      4

| | | |
|---|---|---|
| **Total Contact hrs.: 120** | **Total marks: 150** | ***Theory: 100*** |
| *Theory: 45* | | *End Term Exam: 75* |
| *Tutorial: 15* | | *P.A.: 25* |
| *Practical: 60* | | ***Practical: 50*** |
| **Pre requisite: CSE403,** | | *End Term Exam: 25* |
| **Credit: 6** | | *P.A : 25* |

## Theory

Total Period   : 45
Period          : 3 P/W

| UNIT | TOPIC/SUB-TOPIC | TOTAL HRS. |
|---|---|---|
| **1.0** | **Introduction to Database Management System** | **5** |
| | 1.1 Database System environment | |
| | 1.2 File oriented Approach | |
| | 1.3 Database Approach | |
| | 1.4 Users of DBMS | |
| | 1.5 Intended use of DBMS | |
| | 1.6 Benefit of using database approach | |
| | 1.7 Concepts of Client Server Architecture and distributed system | |
| **2.0** | **Database System Concept and Application** | **5** |
| | 2.1 Date Models, Schemes and instances | |
| | 2.2 DBMS architecture and Independence | |
| | 2.3 Database Languages and Interfaces | |
| | 2.4 The database system environment | |
| | 2.5 Classification of DBMS | |
| **3.0** | **E-R diagram** | **2** |
| | 3.1 Defining relations, Entity Set | |
| | 3.2 E-R Model concept with examples | |
| **4.0** | **SQL** | **12** |
| | 4.1 Data definition in SQL | |
| | 4.2 Queries in SQL | |
| | 4.3 Create, Update, Insert statements in SQL | |
| | 4.4 Views in SQL | |
| | 4.5 Specifying additional constraints as assertions | |
| | 4.6 Specifying indexes | |
| **5.0** | **Functional Dependencies and Normalization for Relational Database** | **4** |

5.1 Functional dependencies

5.2 Normal forms based on primary keys

5.3 General definitions of second and third normal forms

5.4 Boye Codd normal form

**6.0   Transaction Processing Concepts**                                    **3**

6.1 Introduction to transaction processing

6.2 Transaction and System concept

6.3 Desirable properties of transactions

6.4 Schedules and recover ability

**7.0   Concurrency Control Techniques**                                     **3**

7.1 Basic Concepts; Concepts of Locks : live lock, dead lock;
Serializability

**8.0   Security and Integrity**                                             **5**

8.1 Security and integrity violation

8.2 Authorization

8.3 Authorization and Views

8.4 Granting of Privileges

8.5 Security specification in SQL

8.6 Encryption

**9.0   Distributed Databases**                                             **6**

Principles of distributed database; data fragmentations,
transparency, integrity, allocation of fragments, translation of global
query to fragment query; concurrency control – elementary ideas          --------

                                                                          **45**

**Practical**

Total Period    : 60
Period          : 4 P/W

**1     Oracle**

1.1 Introduction to Oracle

1.2 Datatypes and attributes constraints, primary key, unique, foreign key, check, not null

**2     Introduction to Structured Query Language (SQL)**

2.1 Data definition language (DDL) - Create, alter, drop table

2.2 Data manipulation language (DML) - Select, insert, update, delete

2.3 Data control language - Grant, revoke

2.4 Creating and deleting views, index

**3     Introduction to PL/SQL**

3.1 Block structure, variable and types, looping constructs, expression and operators,
functions

3.2 Cursors variable, cursor fetch, loops

3.3 procedure, functions, triggers

3.4 Error handling and exceptions 3.5 Composite datatypes

4. **Developer 2000/IDS**

4.1 Oracle forms - Form modules, blocks, items, windows, canvas views, triggers, master detail forms, menu, alert, LOV

4.2 Oracle reports – report generation with parameters

5. **Visual Basic**

5.1 Windows programming. Creation of forms, menus, etc

5.2 Basic Programming Constructs of Visual Basic-Array handling Common controls of Visual Basic-Creation of Label control, command button, textbox, checkbox, option button, frame, list box, combo box, scroll bars, timer, shape, line.

5.3 File System Control - Dirlist box, dDrivelist box, filelist box, and synchronization of above controls Common Dialog Controls, Connectivity with Databases (with RDBMS like Oracle), Ideas on implementing ODBC Object Orientation in Visual Basic, Creation of Active X Control using Visual Basic

6. **DBA function :**

5.1 Installation of Oracle & D2K

5.2 Creation of a database

5.3 Routine maintenance of database

5.4 Backup & Recovery of database

5.5 Concept of inet.ora

**REFERENCE BOOKS**

1. Fundamentals of Database System - by Elmasri and Navathe - Addison-Wesley
2. An Introduction to Database Systems – by C.J. Date – Addison-Wesley
3. Principles of Database Systems – by John E. Hopcroft & Jeffrey D. Ullman – Galgotia Pub.
4. Developing personal oracle7 applications – by David Lockman – Sams Pub.
5. Oracle8 DBA handbook – by Kevin Loney – TMH

**LIST OF EQUIPMENT**

Hardware : Unix/Windows based Client-Server environment (for detail, please refer Annex – I)

Software : Oracle & D2K/IDS (Latest Version)

| PROFESSIONAL PRACTICES - III | |
|---|---|
| **Course code:** CSE510 | **Semester : Fourth** |
| **Teaching Scheme** | **Maximum Marks :  50** |
| | **PA and End Examination Scheme** |
| Theory :     NIL | Class test:  0  Marks   Sessional 50 |
| Tutorial:    NIL | Assignment/Quiz etc./Attendance: 0 Marks |
| Practical :   2 hrs / week | End Semester Theory Exam:  0 |
| Credit :    1 | End Semester Practical Exam: 0 |

**Rationale / Aim :-**

Interact with industry is essential for proper understanding about implementation procedure of the theoretical knowledge gained during course of study. The course content of professional practice-III is designed to develop interpersonal skill and adoptability to the industry so that the student will be benefited in their professional carrier.

| | **Contents (Theory)** | **Hrs** |
|---|---|---|
| UNIT - I | 1.0 Industrial Visits<br>Structured industrial visits be arranged and report of the same should be submitted by the individual student, to form a part of the term work.<br>Industrial visits may be arranged in the relevant areas/industries | |
| UNIT-II | 2.0 Lectures by Professional / Industrial Experts be organized from ANY ONE of the following areas:<br>• Networking<br><br>• Web Designing  / PC Assembling | |
| | Total | |

# TERM - V

# SOFTWARE ENGINEERING

| L | T | P | | Curri. Ref. No.: CSE401 |
|---|---|---|---|---|
| 3 | 1 | 0 | | |

| Total Contact hrs.: 60 | Total marks: 100 | Theory: 100 |
|---|---|---|
| Theory: 45 | | End Term Exam: 75 |
| Tutorial: 15 | | P.A.: 25 |
| Practical: 0 | | Practical: 0 |
| **Pre requisite: NIL** | | End Term Exam: 0 |
| **Credit: 4** | | P.A : 0 |

**Theory**

Total Period   : 45
Period          : 3 P/W

| UNIT | TOPIC/SUB-TOPIC | TOTAL HRS. |
|---|---|---|
| **1.0** | **Introduction to Software Engineering** | 4 |
| | 1.1 The evolving role of software | |
| | 1.2 Software crisis-problems and causes | |
| | 1.3 Software engineering paradigms | |
| | 1.4 Classic life cycle | |
| | 1.5 Prototyping | |
| | 1.6 Spiral Model | |
| | 1.7 Generic view of software engineering | |
| | | |
| **2.0** | **Software Requirement Analysis** | 6 |
| | 2.1 Requirement analysis fundamentals | |
| | 2.2 Structured analysis : Basic notation and its extension, object oriented analysis and data modeling, process modeling | |
| | | |
| **3.0** | **Software Design** | 5 |
| | 3.1 Evolution of software design | |
| | 3.2 Design fundamentals: Abstraction, refinement, modularity, software architecture | |
| | 3.3 Flow oriented design and object-oriented design | |
| | | |
| **4.0** | **Quality Assurance** | 5 |
| | 4.1 Software quality factor | |
| | 4.2 Software quality Assurance (SQA) | |
| | 4.3 SQA activities | |
| | 4.4 Software reliability, errors and faults | |
| | 4.5 Software reliability models | |

| 5.0 | **Verification and Validation** | 4 |
|---|---|---|

5.1 Software testing strategies & techniques
5.2 Elementary ideas of black box & white box testing

| 6.0 | **Software Evaluation** | 2 |
|---|---|---|

| 7.0 | **Software Documentation** | 4 |
|---|---|---|

7.1 Types of Documentation
7.2 User Documentation
7.3 Operations documentation

| 8.0 | **Software Project Management** | 15 |
|---|---|---|

8.1 Basic concepts of software project management process
objectives, scope, estimation, COCOMO model
8.2 Project planning
8.3 Project scheduling, Gantt chart, pert chart
8.4 Managing people, project staffing, group working, working
environment
8.5 Project monitoring, milestone, methods of project monitoring
8.6 Risk analysis, tracking and control, version management

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45

**REFERENCE BOOKS**
1. Software Engineering Beginners Approach – by Pressman – TMH
2. Software Engineering – by Pankaj Jalote – Narosa Pub. House
3. Fundamentals of Software Engg- Carlo Ghezzi, Mehdi Jazayeri, & Dino Mandrioli – PHI.
4. Software Engineering – by Sommerville – Addison-Wesley

| | WEBPAGE DESIGN - II | |
|---|---|---|
| **Course code:** CSE503 | **Semester : Fifth** | |
| **Teaching Scheme** | **Maximum Marks :  150** | |
| | **PA and End Examination Scheme** | |
| Theory :       2  hrs/week | Class test:  10  Marks   Sessional 25 | |
| Tutorial:     1 hrs/ week | Assignment/Quiz etc./Attendance: 15 Marks | |
| Practical :    4 hrs / week | End Semester Theory Exam:  75 | |
| Credit :    5 | End Semester Practical Exam: 25 | |

**Rationale / Aim :-**

The aim of this course is to train the student in the design, development, and deployment of the Web based applications. The course will develop soft and technical skills in student related to design of the web based application related to e-commerce, e-governance, e-learning and related areas. The student will learn about connectivity of front end programming tools with back-end data-base connectivity.

| UNIT | TOPIC/SUB-TOPIC | TOTAL HRS. |
|---|---|---|
| 1 | **Introduction:** <br> Introduction to PHP, PHP syntax, PHP variables, PHP data types, PHP strings, PHP operators, Branching and looping statements in PHP. | 8 |
| 2 | **Functions and arrays:** <br> PHP functions, and <br> PHP arrays | 2 |
| 3 | **PHP Forms:** <br> PHP Form Handling, PHP Form Validation, PHP Form Required, PHP Form URL/E-mail, PHP Form Complete, PHP GET and POST. | 5 |
| 4 | **MySQL Database:** <br> MySQL Database <br> MySQL Connect <br> MySQL Create DB <br> MySQL Create Table <br> MySQL Insert Data <br> MySQL Get Last ID <br> MySQL Insert Multiple <br> MySQL Prepared <br> MySQL Select Data <br> MySQL Delete Data | 6 |

|   |   |   |
|---|---|---|
| | MySQL Update Data | |
| | MySQL Limit Data | |
| 5 | **Connectivity of PHP with MySQL.** | **4** |
| 6 | **Elementary concept of setting up of a Web server based on Apache/XAMP/LAMP/ etc** | **5** |

**Paractical: 60 hrs**

**4 hrs/Wk**

1. Elementary Program related to PHP and MySQL (At-least 10 Nos).

2. Setting up of Web server using Apache/XAMP / LAMP / etc.

# BUSINESS DATA PROCESSING

| L | T | P | | Curri. Ref. No.: CSE513 |
|---|---|---|---|---|
| 3 | 1 | 4 | | |

| | | |
|---|---|---|
| **Total Contact Hrs: 120** | **Total marks: 150** | **Theory: 100** |
| *Theory: 45* | | *End Term Exam: 75* |
| *Tutorial:15* | | *P.A.: 25* |
| *Practical: 60* | | **Practical: 50** |
| **Pre requisite:** | | *End Term Exam: 25* |
| **Credit: 6** | | *P.A : 25* |

**Theory**
Total Period     : 45
Period               : 3 P/W

| UNIT | TOPIC/SUB-TOPIC | TOTAL HRS. |
|---|---|---|
| 1 | **INTRODUCTION**<br>1.1 Introduction to Information - Time, Relevant, Precision | 2 |
| 2 | **INFORMATION SYSTEMS AND BUSINESS CONTEXT**<br>2.1 Organisation,<br>2.2 Technology,<br>2.3 Management | 3 |
| 3 | **INFORMATION SYSTEMS IN MANAGEMENT**<br>3.1 Types of information systems - Transaction processing system, Management information system, Decision support system, Executive information system, Office information system/knowledge work system | 10 |
| 4 | **CATEGORIES OF INFORMATION SYSTEMS ON THE BASIS OF PROCESSING**<br>4.1 Batch processing,<br>4.2 On-line processing,<br>4.3 Real-time processing. | 3 |
| 5 | **DATA AND FILE CONCEPTS**<br>5.1 File structures and data access - Sequential access, Direct access, Indexed sequential access | 3 |
| 6 | **DATA MANAGEMENT**<br>6.1 The requirement - Data redundancy, Maintaining consistency within the data collection,<br>6.2 Program-data interdependence, Flexibility in use of data and sharing data,<br>6.3 Data management trends | 6 |

| 7 | **APPLICATIONS OF IS** | 12 |

7.1 Inventory management,
7.2 Sales management,
7.3 Personnel management

| 8 | **MANAGEMENT INFORMATION SYSTEM** | 6 |

8.1 MIS services - Routine performance reports, Excepting reports, On-demand reports, Predictive reports
8.2 Implementing an MIS

------
45

**Practical**

Total Period   : 60
Period          : 4 P/W

1) Study of the Management Information System in real environment.

2) Study & understanding of the business process activities.

3) Mapping of domain knowledge to Information system design

4) Feasibility study

5) Requirement analysis

6) Application of Object Oriented Modelling of Business Data Processing

7) Use of UML in design of system – use case diagram, activity diagram start chart, etc.

8) Implementation of USE case diagram in system design and development.

**REFERENCE BOOKS**

1. Management Information System – by S. Sadagopan – PHI
2. Management Information System – by S. Shajahan & R. Priyadarshini – New Age International
3. Management Information System – by R.K. Wadhwa – Kanishka Publishers

**LIST OF EQUIPMENT**
1. Hardware : Unix/Windows based PC (for detail, please refer Annex – I)
2. Software : Rational Rose /  Open source UML Programming Package

# OBJECT ORIENTED PROGRAMMING IN JAVA

| | | | |
|---|---|---|---|
| *L* | *T* | *P* | **Curri. Ref. No.: CSE505** |
| 4 | 1 | 2 | |

**Total Contact hrs: 105**      **Total marks: 150**      *Theory: 100*
*Theory: 60*                                                       *End Term Exam: 75*
*Tutorial: 15*      *P.A.: 25*
*Practical: 30*      ***Practical: 50***
**Pre requisite: CSE409**      *End Term Exam: 25*
***Credit: 6***      *P.A : 25*

**Theory**
Total Periods     : 60
Periods : 4 P/W

| UNIT | TOPIC/SUB-TOPIC | TOTAL HRS. |
|---|---|---|
| **1.0** | **INTRODUCTION TO JAVA** | **3** |
| **1.1** | A brief History of Java. | |
| **1.2** | Why Java is popular for Internet. | |
| **1.3** | Java Applets and Applications | |
| **1.4** | Security | |
| **1.5** | Portability | |
| **1.6** | Java components | |
| | 1.6.1   The byte code | |
| | 1.6.2   Java Development kit ( JDK ) | |
| **1.7** | Java Virtual Machine (JVM) | |
| | | |
| **2.0** | **JAVA LANGUAGE FEATURES** | **5** |
| **2.1** | Java Control structure | |
| **2.2** | Character set, Constants, Variables, Data types, Operators (Arithmetic, Relational, Logical, Conditional, Bit-wise, Special) Expressions (Arithmetic, Logical) | |
| **2.3** | Branching statements | |
| | 2.3.1   Simple if statement | |
| | 2.3.2   If-else statement | |
| | 2.3.3   Switch – case statement | |
| **2.4** | Looping | |
| | 2.4.1   While loop | |
| | 2.4.2   Do – while loop | |
| | 2.4.3   For loop | |
| **2.5** | Jump statement | |
| | 2.5.1   Break & Continue | |
| **3.0** | **INTRODUCING CLASSES** | **7** |

**3.1**    Class fundamentals

        3.1.1   The general form of a class

        3.1.2   A simple class

**3.2**    Declaring Objects

**3.3**    Introducing Methods

        3.3.1   Adding a method that takes parameters

        3.3.2   Returning a value

**3.4**    Constructors

        3.4.1   Parameterized constructors

**3.5**    The this keyword

        3.5.1   Instance variable Hiding.

**3.6**    Garbage collectors.
**3.7**    The finalize( ) method.
**3.8**    Overloading Methods, constructors
**3.9**    Using objects as parameters.
**3.10**    Concept of Nested and Inner classes
**3.11**    Access control parameters such as public, protected and private.

**4.0**    **WRAPPER CLASSES OF JAVA**        **5**

    **4.1**    Type casting wrapper classes

        4.1.1  Boolean, Character, Double, Float, Integer and Long

    **4.2**    Study of string classes and methods

        4.1.2  Type conversion (toUppercase, toLowercase), Replace( ), Equals( ), Length( ), CharAt( ) and CompareTo( )

**5.0**    **INHERITANCE**        **8**

    **5.1**    Inheritance Basics
    **5.2**    Member Access and Inheritance
    **5.3**    A super class variable can reference a subclass object.
    **5.4**    Using this and super for member and constructor references.
    **5.5**    Creating a multilevel hierarchy.
    **5.6**    Method overloading
    **5.7**    Using final with Inheritance.
    **5.8**    Multiple Inheritance using Interfaces.

        5.8.1   Using Java Interfaces.

        5.8.2   Defining Interfaces.

        5.8.3   Implementing Interfaces.

        5.8.4   Applying Interfaces.

        5.8.5   Variable in Interfaces.

5.8.6 Interface to implement call back functions.

**6.0** EXCEPTION HANDLING                                          **8**
    **6.1** Fundamentals.
    **6.2** Types of exception handling.
    **6.3** Why use exception handling.
    **6.4** Hierarchy
    **6.5** Exception handling constructs
    **6.6** Try-Cache-Finally
    **6.7** Throw statements
    **6.8** Throws clause
    **6.9** Creating your own exception class.

**7.0** **MULTITHREADED PROGRAMMING**                               **8**

    **7.1** **What are threads?**
    **7.2** Why use thread.
    **7.3** Creating and running thread.
    **7.4** Implementing Run able.
    **7.5** Extending thread.
    **7.6** Synchronization.
         - Synchronization Methods and statements.
    **7.7** Creating multiple Threads
        7.7.1 Thread synchronization.

        7.7.2 Inter thread communication

        7.7.3 Priorities and scheduling.

        7.7.4 Thread local variables

**8.0** **JAVA APPLETES**                                          **8**
    **8.1** Applet Basics
        8.1.1 The Applet class

        8.1.2 Applet architecture.

    **8.2** An Applet skeleton
        8.2.1 Applet Initialization and termination

    **8.3** Simple Applet Display Methods.
        8.3.1 Requesting repainting

        8.3.2 Using the status window

        8.3.3 HTML APPLET tag

        8.3.4 Passing parameters to Applet

8.3.5 get DocumnetBase() and get CodeBase() , showDocument ()

**9.0  EVENT HANDLING AND AWT**                                                    **8**

**9.1**    Layout control
**9.2**    Delegation Event Model:
Events., Event sources, Event Listeners.
**9.3**    Event classes and Event Listener Interfaces.
9.3.1  Action Event, Adjustment Event, Component Event, Container Event, Focus Event, Input Event, Item Event, Key Event, Mouse Event, Text Event, Window Event, and Menu Event

**9.4**    AWT controls
9.4.1  Control Fundamentals

9.4.2  Adding and removing controls

9.4.3  Responding to controls

**9.5**    Auto Tools Buttons
9.5.1  Creating and using Buttons

9.5.2  Labels

9.5.3  Checkboxes and Radio Buttons.

9.5.4  Choices

9.5.5  Creating and using Choices.

9.5.6  Lists.

9.5.7  Creating and using lists.

9.5.7  Scrollbars.

9.5.8  Creating and scrollbars.

9.5.9  Text field and Text Area.

9.5.10  Creating Text field and Text Area.

9.5.11  Using Text field and Text Area.

-----------
                                                                                   **60**


**Practical**

Total Periods     : 30
Periods : 2 P/W
## List of Practicals

- Program based on Basics. (At least 5)

- Program using if, Nested if, Switch, loops & breaking loop statements.

- Program that define classes, create objects, add methods.

- Develop a program for each

  - Type caste

  - Wrapper

  - String

  - Vector class.

- Programs to design and inheriant and interface.

- Program to handle an exception by using by Try-Catch-Finally

- Program to generate own exception class

- Programs by using multi-threading concept ( At least 2 )

- Program using Applet tag in HTML file.

- Writing simple programs on Applet.

  - Design a form using AWT tool.

  - Write a program on applet using buttons.

### REFERENCE BOOKS
1. Java 3e 2007   E Balagrusawmy, Tata McGraw Hills Publishing Co.l Ltd. N. Delhi
2. OOP through Java 2007 ISRD, Group Tata McGraw Hills Publishing Co.l Ltd. N. Delhi.
3. The Complete Reference - Java 23rd edition Herbet Schildt Tata McGraw Hills Publishing Co.l Ltd. N. Delhi
4. Mastering Java-2 Latest John Zukonshi  BPB Publications  B-14, CONNAUGHT PLACE, New Delhi-110001
5. Using Java-2 platform  Joseph L Weber PHI (Eastern Economy Edition)


### LIST OF EQUIPMENT
1. Hardware : Unix/Windows based PC (for detail, please refer Annex – I)
2. Software : Java compiler / Visual Java.

# INTERNETWORKING & WEB TECHNOLOGY

| L | T | P | | **Curri. Ref. No.: CSE506** |
|---|---|---|---|---|
| *3* | *1* | *3* | | |

**Total Contact Hrs: 105**          **Total marks: 150**          *Theory: 100*
*Theory: 45*                                                                        *End Term Exam: 75*
*Tutorial: 15*                                                                     *P.A.: 25*
*Practical: 45*                                                                   *Practical: 50*
**Pre requisite: CSE407**                                                  *End Term Exam: 25*
**Credit: 5**                                                                       *P.A : 25*


**Theory**
Total Period    : 45
Period          : 3 P/W

| UNIT | TOPIC/SUB-TOPIC | TOTAL HRS. |
|---|---|---|
| 1. | **Internet Fundamentals** | 4 |
| | 1.1    Motivation for internetworking | |
| | 1.2    History and scope of internet | |
| | 1.3    Internet protocol and standardization | |
| | 1.4    Role of ISP & Factors for choosing an ISP | |
| | 1.5    Internet service providers in India | |
| | 1.6    Types of connectivity such as Dial Up, Leased, VSAT etc. | |
| | 1.7    Internet server and client modules on various operating systems | |
| | | |
| 2. | **TCP/IP** | 13 |
| | 2.1    TCP/IP internet layering model | |
| | 2.2    Reliable stream transport service (TCP) | |
| |     2.2.1    Need for stream delivery | |
| |     2.2.2    Properties of reliable delivery service | |
| |     2.2.3    Providing reliability | |
| |     2.2.4    Idea behind slide windows | |
| |     2.2.5    Ports connections and end points | |
| |     2.2.6    Segment, stream, sequence number | |
| |     2.2.7    TCP segment format | |
| |     2.2.8    TCP header | |
| |     2.2.9    TCP Checksum computation | |
| |     2.2.10  Acknowledgement and retransmission | |
| |     2.2.11  Time out and retransmission | |
| |     2.2.12  Response to congestion | |
| |     2.2.13  Establishment of a TCP connection | |
| |     2.2.14  Source and destination address | |
| |     2.2.15  Protocol number | |
| |     2.2.16  Checksum | |
| |     2.2.17  Closing TCP connection | |
| |     2.2.18  TCP connection reset | |
| | 2.3    Connection less data gram delivery (Internet Protocol) | |

3.3 Telnet
    3.3.1    Telnet protocol
    3.3.2    Server domain
    3.3.3    Telnet clients
    3.3.4    Terminal emulation
3.4 Internet Relay Chat
    3.4.1    IRC network and servers
    3.4.2    Channels

**4.    Cyber Security**    6
4.1 Overview of Cyber Security threats & Vulnerability
4.2 The need for computer security
4.3 Firewalls: introductory concepts & its requirement, IPS/ IDS
4.4 Specific intruder approach
4.5 Security strategies
4.6 Security tools and techniques
4.7 Encryption, Authentication,
4.8 ISO 27001: 2011 security compliance: integrity, confidentiality, availability.
4.9 Enterprise networking & access to Internet, Antivirus
4.10 Identity and Access Management

**5.    Switching, Routing & Enterprise LAN**    14
5.1 Introduction to Enterprise LAN
    5.1.1  Design issues
    5.1.2  Multiple VLAN Management
    5.1.3  Network Zone Management
    5.1.4  Inter VLAN Routing
5.2 Overview of Switches (L2)
    5.2.1  Switch configuration
    5.2.2  Core / Distribution / Access Switches
    5.2.3  DHCP, STP, Link Aggregation  and other Protocol assignment
    5.2.4  Switch Traffic QOS.
5.3 Router Management
    5.3.1  Routing protocols
    5.3.2  Basic Router Management
    5.3.3  Router configuration
5.4 Wireless LAN
    5.4.1  Wireless Access Point – Standalone mode
    5.4.2  Wireless LAN Controller (WC)
    5.4.3  Access Point connected through WLC
5.5 Introduction to server VLAN Management

**6.    Search Engines**    3
6.1 Technology overview
6.2 Popular search engines

6.3     Registration of web site in a search engines

**Practical**

Total Periods     : 45
Periods : 3 P/W

1.      Installation of network components under Windows 2013/ LINUX
2.      Installation of TCP/IP
3.      Installation of Intranet
4.      Configuration of one web server including Apache, ISS
5.      Deployment of HTML files in Intranet servers
6.      Practical on different Internet services (WWW, Mail, FTP, Chat)
7.      Proxy server configuration using Linux server
8.      Managed Switch configuration: VLAN, DHCP, Zone Management
9.      Router configuration using static routes
10.     Wireless Access Point configuration in standalone mode.

**REFERENCE BOOKS**

1.      Internet working with TCP/IP Vol – I : principles, protocols and architecture – by Douglas E. Comer – PHI
2.      Internet working with TCP/IP Vol – II : design, implementation and internals – by Douglas E. Comer & David L. Stevens – PHI
3.      Internet working with TCP/IP Vol – III : client server programming and applications – by Douglas E. Comer  & David L. Stevens – PHI
4.      HTML : the definitive guide – by Chuck Musciano & Bui Kennedy - SPD
5.      E-MAIL security : how to keep your electronic messages private – by Bruce Schneier – John Wiley
6.      Dynamic HTML : the definitive reference – by Danny Goodman – SPD
7.      Dynamic HTML in Action – by Schurman & Pardi – PHI/Microsoft Press

**LIST OF EQUIPMENT**

**Hardware** :     Stand alone PC
                   (for detail, please refer Annex – I)
                   Managed Network Component like L2 Switch, Router, Access Point
                   Intel Xeon Based Server with 8 GB Ram and 300 GB of Disk Space (minimum)

**Software** :     Web browser (Internet Explorer & Netscape Navigator) with internet connection

# PROFESSIONAL PRACTICES – IV

| L | T | P | | Curri. Ref. No.: CSE511 |
|---|---|---|---|---|
| 0 | 0 | 2 | | |

**Total Contact hrs : 30**     **Total marks: 50**     *Theory: 0*

*Theory: 0*                                          *End Term Exam: 0*

*Tutorial: 0*                                        *P.A.: 0*

*Practical: 30*                                      ***Practical: 50***

**Pre requisite: NIL**                               *End Term Exam: 0*

**Credit: 1**                                        *P.A.: 50*

**Practical**
Total Periods: 30
Periods: 2P/W
**Aim :-** The course aims to equip students with basic knowledge and skills about Computer networking, data communication and troubleshooting of common problems.

**Objective: -** On completion of this course, the Student will be able to:

- Install different types of software
- Perform System maintenance & trouble-shooting
- Communicate between PC and other related device

**Suggested List of activities to be done:**

- Installation of Operating system and other software
- Installation of Open source software application
- Installation of database (SQL/MySQL)
- System maintenance and troubleshooting
- Communication between PC and other devices like mobile or palmtop through Bluetooth or other technologies.

**SUGGESTED LEARNING RESOURCES**

1.    Computer Troubleshooting – by K. MacRae, G. Marshal, Haynes Publishing.
2.    Handbook of Computer Troubleshooting – by M. Byrd, J. Pearson, R.A. Saigh, The Glen Lake Publishing Company.

# TERM - VI

# MULTIMEDIA TECHNOLOGY & APPLICATIONS

| | | | |
|---|---|---|---|
| *L* | *T* | *P* | **Curri. Ref. No.: CSE501** |
| 4 | 0 | 4 | |

**Total Contact hrs: 120**  **Total marks: 200**  *Theory: 100*
*Theory: 60*  *End Term Exam: 75*
*Practical: 60*  *P.A.: 25*
**Pre requisite: NIL**  *Practical: 100*
*Credit: 6*  *End Term Exam: 50*
*P.A : 50*

**Theory**
Total Periods    : 60
Periods : 4 P/W

| UNIT | TOPIC/SUB-TOPIC | TOTAL HRS. |
|---|---|---|
| **1.** | **Multimedia : Basic Overview** | **4** |
| | 1.1  Characteristics of Multimedia: multiple media, non-linearity, interactive, compatibility. | |
| | 1.2  Hardware and software requirement (including audio and video systems) | |
| | 1.3  Multimedia Application: entertainment, education & training, business, tourism and hospitality, medicine, design and engineering application. | |
| | 1.4  Creation of multimedia document | |
| **2.** | **Digital Media Representation** | **4** |
| | 2.1  Analog Representation | |
| | 2.2  Digital Representation | |
| | 2.3  Analog to Digital conversion and vice-versa | |
| | 2.4  Sampling, sampling rate, Quantization and Quantization Error | |
| | 2.5  Limitation of digital representation | |
| **3.** | **Overview of Multimedia Building Blocks** ( text, image, graphics, audio, video) | **2** |
| **4.** | **Animation** | **15** |
| | 4.1  Introduction and Background of Animation | |
| | 4.2  Uses of Animation | |
| | 4.3  Types of Animation – cell animation, path animation, 2D & 3D animation | |
| | 4.4  Role of computers in animation | |
| | 4.5  Key-frames and Tweening | |
| | 4.6  Movement creation – coordinate system, transformations | |
| | 4.7  Principles of Animations – squash and stretch, anticipations, staging, follow-through and overlapping , slow-in slow-out, arcs, timing, exaggeration, appeal, secondary action. | |
| | 4.8  Animation Techniques – onion skinning, motion cycling, masking, flipbook animation, sound addition, rotoscoping and blue-screening, colour cycling. | |
| **5.** | **Compression** | **14** |
| | 5.1  Need for Compression | |
| | 5.2  Types of Compression – lossless and lossy, intra-frame and inter-frame, | |
| | 5.3  Types of Redundancies – statistical, psycho-visual | |

     5.4     CODEC

     5.5     Lossless / Statistical Compression Techniques – entropy, RLE, Huffman, arithmetic coding, LZ, LZW DPCM coding

     5.6     Lossy / Perceptual Compression Techniques – Transform, psycho-analysis, inter-frame corrélation,

     5.7     JPEG image Coding Standard

**6.     Multimedia Architecture     3**

     6.1     User Interfaces – GUI, widget toolkit, GTK+, X windows system, motif.

     6.2     Streaming Technology – overview, advance system format (ASF), web radio, quality of service (QOS).

**7.     Multimedia Application Development     18**

     7.1     Multimedia Software Life Cycle – feasibility study, requirement analysis, project planning and management, designing, implementation, integration, delivery and maintenance.

     7.2     Conceptualization - subject matter/theme, target audience, objectives

     7.3     Content Collection and Processing

     7.4     Story

     7.5     Flow-line

     7.6     Script – general guidelines, guidelines for text based information, guidelines for audio information, guidelines for interactivity, guidelines for learner control, guidelines for feedback

     7.7     Storyboard – guidelines for: text, visual element, motion video, animation, audio

     7.8     Hardware and software for implementation.

     7.9     Authoring Metaphors – slide show, book, windowing, timeline, network, icon metaphor.

     ----

     ---

     **60**

**Practical**

Total Periods    : 60

Periods : 4 P/W

1.     **Sound Forge**

     Sound recording and editing through sound forge XP

     1.1     The main screen

     1.2     The data window

     1.3     Opening an existing file - playing a sound file

     1.4     Playing a section of a file

     1.5     Copying data to a new file

     1.6     Saving a file

     1.7     Simple editing

     1.8     Advanced editing

     1.9     Editing sound formats

          1.10     Applying sound processing functions

          1.11     Recording sound using sound forge.

2. **Adobe Premiere**
   2.1 Creating desktop video with Adobe Premiere
   2.2 Creating on Adobe Premiere movie
   2.3 Starting a new project importing clips, assembling the cliping construction window, previewing the movie, changing duration of a cell, creating a transition, adding other clips and transitions.
   2.4 Applying filters to a clip
   2.5 Changing the time unit in the construction window
   2.6 Using preview command to preview the transition and filter effects
   2.7 Adding sound to movie
   2.8 Connecting and capturing source video through broadway cord
   2.9 Editing and compressing the video
3. **Adobe Photoshop**
   3.1 Scanning image
   3.2 Creating new images
   3.3 Changing foreground and background colours
   3.4 Creating and using paths
   3.5 Editing and retouching
   3.6 Duplicating images
   3.7 Layers - linking with layers
   3.8 Grouping a images
   3.9 Rubber stamp and pattern stamp tool
       3.10 Painting - paintbrush tool, air-brush tool, pencil tool, eraser tool, gradient tools
       3.11 Photoshop filters

4. **Author ware**
   4.1 Introduction - system requirements, installing, general features
   4.2 Knowledge objects - introduction to knowledge objects, choosing a knowledge object, adding a knowledge object file, authorware knowledge objects
   4.3 Authoring basics - icon based authoring what each icon does the toolbar, working with icons on the flow line, authoring - step by step, distribution requirements, packaging an AW piece, packaging an AW piece for the web
   4.4 Creating interactions - components of an interaction, How an interaction works, tracing the flow through an interaction, setting up an interaction step by step
   4.5 Directing the flow - Decision structure, frameworks, navigation structures -step by step
   4.6 Transitions, Positioning and motion - using transition for special effects, positioning objects using the motion icon, making objects move step by step.

5. **Director**
   5.1 Introduction - system requirement, installing director
   5.2 Basic - Overview, work area, adding interactivity with lingo, using the score, using markers, selecting and editing frames in the scores using xtras
   5.3 Sprites - creating, selecting and layering sprites positioning, splitting and joining sprites

5.3 Working with cast members and casts - using the cast window, creating cast members

5.4 Behaviours - attaching behaviour, creating and modifying behaviour

5.5 Colour, Tempo and transitions - animation, navigation and user interaction, movies in a window, sound, video and synchronization, distributing movies.

6. **Tool book Instructor**

6.1 Introduction - system requirement, installing instructor

6.2 Understanding Instructor concepts - planning the project, building an application, using open script

6.3 Exploring the Instructor interface - about the Instructor, Visual interface using tools in Instructor

6.4 Using the book specialist - working with books and pages, working with Toolbook II catalogues, working with objects, setting object properties, adding buttons, working with text & hotwords, working with list boxes and combo boxes, adding graphics, using multimedia, hiding, showing and animating objects, creating a quiz using question objects.

**REFERENCE BOOKS**

1. Multimedia Communication – by Keno et al – PH
2. Principles of Multimedia – by Ranjan Parekh, Mc Grew Hill.
3. Fundamentals of Computer Graphics & Multimedia – by Mukherjee – PHI
4. Multimedia – An Introduction – by John Villamil & Louis Molina – Prentice Hall
5. Multimedia – Production Planning & Delivery – by John Villamil & Louis Molina – Prentice Hall
6. Multimedia – Sound & Video – by Jose Lozano – Prentice Hall
7. Multimedia Graphics – by John Villamil & Leony Fernandez, Elias – Prentice Hall
8. Manuals for Sound Forge, Adobe Premiere, Adobe Photoshop, Authorware Attain, Director, Toolbook Instructor

**LIST OF EQUIPMENT**

**Hardware :**       Multimedia PC
                     (for detail, please refer Annex – I)

**Software :**       Abobe Master Collection

# E-COMMERCE

*L        T        P*            **Curri. Ref. No.: CSE601 A**
*3        1        0*

**Total Contact hrs : 60**        **Total marks: 100**        ***Theory: 100***
*Theory: 45*                                                  *End Term Exam:75*
*Tutorial: 15*                                                *P.A.: 25*
*Practical: 0*                                                ***Practical: 0***
**Pre requisite: NIL**                                       *End Term Exam: 0*
***Credit: 4***                                              *P.A : 0*

**Theory**
Total Period    : 45
Period          : 3 P/W

| UNIT | TOPIC/SUB-TOPIC | Total Hrs. |
|------|-----------------|-----------|
| 1. | **Basics of E-Commerce** | 4 |
| 2. | **Architecture**<br>Electronic Commerce: Framework ,<br>Media convergence of Application, | 6 |
| 3. | **Technology**<br>Electronic Data Interchange (EDI): concept,<br>Application (legal security and privacy) Issues,,<br>EDI and Electronic commerce<br>Standardization and EDI,<br>EDI Software implementation,<br>Envelope for message Transport,<br>Internet-based EDI | 15 |
| 4. | **Applications**<br>Consumer application<br>Organization application<br>Electronic payment System: Digital Systems, Token, Smart Cards,<br>Credit Cards, Risks in Electronics Payment system, Designing<br>electronic payment system | 15 |
| 5. | **Payment Gateways and Their usage**<br>Internet monetary payment & security requirements<br>Payment & purchase order process<br>On-line Electronic cash<br>Master Card / Visa secure E-Transaction Payment Processing | 5 |

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45

**Tutorial**

Total Period   : 15
Period         : 1 P/W

Case Study and Reporting of the various e-commerce site functioning in domestic and international paradigm.

REFERENCE BOOKS :

1. E-Commerce: The cutting edge of business – by K.K. Bajaj, D.Nag  TMH

2. E-Commerce – by S. Pankaj, APH Publishing Corporation

3. E-Commerce: An Introduction – Amir Manzoor, Lambert Academic Publishing

4. E-Commerce: A Knowledge Base – by B.C. Satterlee, Writers Club Press.

# NETWORK SECURITY & CRYPTOGRAPHY

| | | | |
|---|---|---|---|
| *L* | *T* | *P* | **Curri. Ref. No.: CSE601 B** |
| *3* | *1* | *0* | |

**Total Contact hrs : 60**    **Total marks: 100**    ***Theory: 100***
*Theory: 45*                                            *End Term Exam: 75*
*Tutorial: 15*                                          *P.A.: 25*
*Practical: 0*                                          ***Practical: 0***
**Pre requisite: NIL**                                  *End Term Exam: 0*
**Credit: 4**                                           *P.A.: 0*

**Theory**
Total Period    : 45
Period          : 3 P/W

| UNIT | TOPIC/SUB-TOPIC | TOTAL HRS. |
|---|---|---|
| 1 | **POSSIBLE ATTACKS ON COMPUTERS**<br>1.1 The Need for Security<br>1.2 Security Approach<br>1.3 Principles of Security<br>1.4 Types of Attacks | 5 |
| 2 | **CRYPTOGRAPHY CONCEPTS**<br>2.1 Plain text & Cipher Text<br>2.2 Substitution techniques<br>2.3 Transposition techniques<br>2.4 Encryption & Decryption<br>2.5 Symmetric & Asymmetric key cryptography | 10 |
| 3 | **SYMMETRIC & ASYMMETRIC KEY ALGORITHMS**<br>3.1 Symmetric key algorithm types<br>3.2 Overview of Symmetric key cryptography<br>3.3 Data encryption standards<br>3.4 Over view of Asymmetric key cryptography<br>3.5 The RSA algorithm<br>3.6 Symmetric & Asymmetric key cryptography<br>3.7 Digital signature | 15 |
| 4 | **DIGITAL CERTIFICATE & PUBLIC KEY INFRASTRUCTURE**<br>4.1 Digital certificates<br>4.2 Private key management<br>4.3 PKIX Model<br>4.4 Public key cryptography standards | 8 |
| 5 | **INTERNET SECURITY PROTOCOL**<br>5.1 Basic concept<br>5.2 Secure socket layer | 4 |

5.3 Transport layer security
5.4 Secure Hyper-text transfer protocol(HTTPs)
5.5 Time stamping protocol (TSP)
5.6 Secure electronic transaction (SET)

| | | |
|---|---|---|
| **6** | **IP SECURITY (IPSEC) & VIRTUAL PRIVATE NETWORK (VPN)** | **3** |

6.1 Introduction to IP SEC
6.2 VPN

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**45**

### REFERENCE BOOKS

1. Cryptography & Network security ; By: A. Kahate : TMH
2. Cryptography & Network Security – by William Stallings : Pearson India.
3. TCP/IP Guide – by Charles M. Kozierok: No Startch Press.

# WIRELESS AND MOBILE COMMUNICATION

*L*      *T*      *P*                **Curri. Ref. No.: CSE602 A**
*3*      *1*      *0*

**Total Contact hrs : 60**    **Total marks: 100**    *Theory: 100*
*Theory: 45*                                         *End Term Exam: 75*
*Tutorial: 15*                                     *P.A.: 25*
*Practical: 0*                                    **Practical: 0**
**Pre requisite: NIL**                       *End Term Exam: 0*
**Credit: 4**                                   *P.A : 0*

**Theory**
Total Period   : 45                Periods      : 3 P/W

| UNIT | TOPIC/SUB-TOPIC | TOTAL HRS |
|------|-----------------|-----------|
| 1. | **Functional architecture** <br> Coded and encoded digital communication system architecture <br> Types of network and services, <br> Performance criterion and link budgets, PSD , Non-coherent receivers, | 7 |
| 2. | **Basic of Communications** <br> Data pulse stream,Scalar and vector communications over memory less channel, scalar reciever, Shannon channel coding theorem, <br> linear block codes, convolutional coded digital communication system, <br> Bit Error Rate, Performance, Detection criterion <br> Inphase and Quadrature phase modem, <br> QAM, QPSK, QBM, CPM, FSK, MSK | 9 |
| 3. | **Wireless Transmission** <br> Wired and wireless, Mobility of users and equipments, Electromagnetic Spectrum, Radio and Microwave communication, Infrared and Millimetre waves, Lightwave Transmission. | 7 |
| 4. | **Mobile Connectivity** <br> Cells, Framework, wireless delivery technology and switching methods, mobile information access devices, mobile data internetworking standards, cellular data communication  protocols, mobile computing application, Architecture of BSS, BSC, MSE, GMSE, Authentication, Mobile database-Protocol, scope, tools, and technology | 9 |
| 5. | **Mobile Technology** <br> GSM, CDMA, WCDMA, GPRS, EDGE, HSDPA, HSUPA (3G) and LTE (4G) Mobile communications | 8 |
| 6. | **M-Business** <br> E/M-transaction, M-money, PKI infrastructure for E-transaction | 5 <br> --------- <br> **45** |

Reference Books:

1) Mobile Communication by Jochen Schiller – Pearson Education

2) Mobile Computing by Raj Kamal – Oxford University Press

# SOFT COMPUTING

| L | T | P | | Curri. Ref. No.: CSE602 B |
|---|---|---|---|---|
| *3* | *1* | *0* | | |

**Total Contact hrs : 60**      **Total marks: 100**      *Theory: 100*
*Theory: 45*                                              *End Term Exam: 75*
*Tutorial: 15*                                            *P.A.: 25*
*Practical: 0*                                            *Practical: 0*
**Pre requisite: NIL**                                    *End Term Exam: 0*
**Credit: 4**                                             *P.A : 0*

**Theory**
Total Period  : 45
Periods       : 3 P/W

| UNIT | TOPIC/SUB-TOPIC | TOTAL HRS. |
|---|---|---|
| I | **Introduction** – What is soft computing? Principal components of soft computing – Fuzzy Systems, Artificial Neural Networks (ANN), Genetic Algorithms (GAs) – Basic concepts and synargical relationship among the components. | 3 |
| II | **Fuzz Set Theory and Fuzzy Logic** : Vagueness, Classical sets, Fuzzy sets, Membership functions & profiles, Fuzzy operations, Fuzzy transformations, Fuzzy relations, Fuzzy truth values, Linguistic variables, Fuzzy Rules and their interpretations, Fuzzy inference systems, Fuzzy controllers. | 10 |
| III | **Artificial Neural Networks (ANN) – I :** Structure and functionality of human brain, structure of a biological neuron, neural models – McCulloch-Pitts Neural Model, Perceptron – linear separability, XOR problem, ANN architectures, Activation Functions. | 8 |
| IV | **Learning by ANNs** : Types of learning – Supervised and unsupervised learning, Hebb Learning, Perceptron Learning, Delta / LMS Learning, Winner-takes-all learning strategy. | 8 |
| V | **Pattern Classification, Association, Clustering with ANNs** : Hebb Nets, ADALINE, MADALINE, Auto-associative nets, Hetero-associative nets, Hopfield Network, Kohonan's self-organizing map; Multi layered Feedforwarded Networks, Generalized Delta Rules, Back Propagation algorithm. | 8 |
| VI | **Genetic Algorithms (GAs):** Natural evolution, Darwin's principle of survival of the fittest, Modelling optimization problems in terms of evolutionary process, basic flow of Genetic Algorithms, Chromosomes, fitness function, population, Genetic operators – selection, crossover, mutation, Genetic parameters, Convergence of GAs. | 8 |
| | **Total:** | 45 |

**Text / Reference Books:**

| Name of Authors | Title of the Book | Edition | Name of the Publisher |
|---|---|---|---|
| S Roy and U K Chakraborty | Introduction to Soft Computing - Neuro-Fuzzy and Genetic Algorithms | | Pearson Education |
| J-S. R. Jung, C-T. Sun, and E. Mizutani | Neuro-Fuzzy and Soft Computing | | Pearson Education |
| A. Konar | Artificial Intelligence and Soft Computing | | CRC Press |

# LINUX OPERATING SYSTEM

| *L* | *T* | *P* | **Curri. Ref. No.: CSE 406** |
|---|---|---|---|
| *3* | *1* | *4* | |

**Total Contact hrs: 120**       **Total marks: 175**       *Theory: 100*
*Theory: 45*                                                  *End Term Exam: 75*
*Tutorial: 15*                                                *P.A.: 25*
*Practical: 60*                                               ***Practical: 75***
**Pre requisite: CSE 405**                                    *End Term Exam: 25*
***Credit: 6***                                               *P.A : 50*

**Theory**
Total Periods     : 45
Periods : 3 P/W

| UNIT | TOPIC/SUB-TOPIC | TOTAL HRS. |
|---|---|---|
| **1.0** | **LINUX – OPERATING SYSTEM** | **4** |
| 1.1 | History and development of LINUX O.S. | |
| 1.2 | Features, Structures of LINUX O.S. | |
| 1.3 | Kernel, Shell, Applications Utilities. | |
| 1.4 | Installation requirements | |
| 1.5 | LINUX User Interface, Classes of user, Operational users, Programmers, End users | |
| 1.6 | Types of  Interface, General Command language, Command structure, Shell, Windows, Icons , slide bars, title bars | |
| **2.0** | **LINUX ESSENTIALS** | **8** |
| 2.1 | Startup & shutdown Process<br>Booting Procedure with different stages, Login process, Password concept, who, who am i , tty, date and cal commands, System shutdown | |
| 2.2 | File concept - File types in LINUX, Hierarchical directory structure, File system structure, File creating, displaying, concatenating and copying | |
| 2.3 | Creating and changing directories, removing files and directories-Cd, cp, md, rm, mkdir, rmdir, cat | |
| 2.4 | File attributes and permissions<br>Setting permissions, Changing permissions, Changing group & group ownership of a file chmod, chown, chgrp, Various users and access rights | |
| 2.5 | File processing commands<br>wc, head, tail, cut, paste join, split, sort, grep, egrep,  tr, comm, cmp, diff, more, less commands | |
| **2.6** | File formatting and printing commands<br>pr with all options, lp commands | |

| 3 | **LINUX PROCESSES AND OTHER UTILITIES** | 9 |
|---|---|---|

3.1     On line help facilities in LINUX
Man and help command

3.2     Mathematical commands
bc, expr, factor, units

3.3     Linking files and directories
Removing files and directories

3.4     Inter-process communication
Pipes ,filters, and tee  command

3.4     Other process facilities
 Background processing, Listing all active and background processes, ps command with all options, Terminating processes, Kill command, Process scheduling, Nice command, Wait command, Sleep command

3.5     Communication commands
user to user communication using write, Mailing using mail, Broadcasting messages using wall

| 4 | **VI AND OTHER EDITORS** | 8 |
|---|---|---|

4.1     vi editor
Features of vi editor,  modes of vi,  creating, editing & saving text, cursor movement commands, text scrolling commands text deletion commands, find and replace, copying and yanking text, cut and paste in vi , set commands, abbreviations and map commands, saving files & quitting vi

4.2     Introduction to joe and vim editors

| 5 | **SHELL PROGRAMMING** | 8 |
|---|---|---|

5.1     Various LINUX shells
bash, csh, ksh

5.2     Shell scripts
writing and executing, Parameter substitution, Shell variables, Standard shell variables
User define variables
Command substitution, Expressions, arithmetic operators, logical, Operators, test expressions, read statement, test command, control structures – for, while and until statements, if structure, nested if structure, if.. then.. elif statement, case structure

| 6 | **INSTALLATION AND SYSTEM ADMINISTRATION** | 8 |
|---|---|---|

6.1     Installation
Requirement & Linux file system
Boot block, super block, inode table, data blocks, Partitioning the hard disk for LINUX, Inastalling the LINUX system

6.2     System administration

Common administrative tasks, Role of system administrator
Managing user accounts – adding and deleting users, changing
permissions and ownerships
Creating and managing groups
Creating and mounting files system
Backup and restoring files
Linuxconf utility

6.3       X-configuration ,  changing X settings

6.4       KDE and Gnome graphical interfaces

----------

45

**Practical**

Total Periods     : 60

Periods           :4 P/W

- **List of Practical**

  - Practice on tty command
  - Study of password command
  - Study of who, who am i, tty,date and cal commands
  - Executing commands in background
  - Study of ps , kill commands
  - Listing the files in a directory using all options to   ls.
  - Creating sub-directories.
  - Changing the mode of a file/directory.
  - Changing the owner of a file/directory.
  - Study of file processing commands
  - Commands using pipes and I/O redirectors
  - Display date using various formats

- User to user communication using communication commands.

  - Study of  vi editor
  - Modes of vi
  - Creating and saving files using vi
  - Cursor movement commands
  - Cut and paste commands
  - Find and replace commands
  - Ex mode commands

- **Write a shell script for the following**

- The shell script should check whether every argument supplied is a file or a directory and list it accordingly.
- The shell script should check every argument and carry out the following
  . if the argument is a directory, then display the number of files or directories present in that directory.
  . If the argument is a file, then display the size of the file
  . If the argument does not exist, then create the directory.

- The shell script should accept the username as argument and find out at how many terminals has this user logged on.

- The shell script must display a list of all files in the current directory to which you have read, write and execute permissions.

- The shell script should delete all lines containing the word "UNIX ' in the files supplied as arguments to this shell script.

- Demonstration of Installation of LINUX OS
- Mounting of filesystem – using floppy and CDROM
- Configuring X-environment
- Switching between KDE and Gnome
- Adding Group and Users logins

**REFERENCE BOOKS**

| Sl. No. | Title | Edition, Year of Publication | Author, Publisher & Address |
|---------|-------|------------------------------|------------------------------|
| 1. | Red hat Linux unleashed | Latest | Techmedia (BPB publication) |
| 2. | UNIX concept and Applications | Latest | Sumitabha Das -Tata McGraw Hill Publication, N.Delhi |
| 3. | Redhat LINUX 7.x Bible | Latest | Cristopher negus, IDG books India |
| 4. | Using LINUX | Latest | Jack Tackett, David Gunter, PIII, EEE Edition |
| 5. | Linux Installation and Administration | Latest | Nicholas Wells, Course technology, (Vikas Publishing, New Delhi) |
| 6. | Unix Operating System | Latest | Peter Nortorn- BPP Publications |

**LIST OF EQUIPMENT**

**Hardware :**  Multimedia PC
(for detail, please refer Annex – I)

**Software :**  Linux Operating System (Redhat / SuSE / Ubuntu )

<div align="center">

**(Soft Core - II)**

**ENTREPRENEURSHIP DEVELOPMENT**

</div>

| L | T | P | Curri. Ref. No.: G302 |
|---|---|---|---|
| 3 | 0 | 0 | |

**Total Contact hrs.:**       **Total marks: 100**       **Theory:**
Theory: 45                                          End Term Exam: 75
Tutorial :0                                           P.A.:  25
Practical: 0
Credit: 3

**RATIONALE**

 The course intends to provide the fundamental aspects of entrepreneurship as a means for self employment and culminating in economic development of the country.  It deals with basic issues like entrepreneurial characteristics and quality, governmental policy support and overall scenario along with opportunities and the facilities available for entrepreneurship development.

**DETAIL COURSE CONTENT**

**THEORY:**

| UNIT TOPIC / SUB-TOPIC | Lecture Hrs. |
|---|---|

**1.0    INTRODUCTION                                              10**

    1.1    Definition and functions of Entrepreneur, entrepreneurship
             quality, entrepreneurial spirit, need for entrepreneurship.
    1.2    Individual and social aspects of business – achievement motivation theory
    1.3    Social responsibilities of Entrepreneurs

**2.0    FORMS OF BUSINESS ORGANISATION                  4**

    2.1    Types of company

    2.2    Merits and demerits of different types
    2.2    Registration of small scale industries

    2.4    Conglomeration.

**3.0    SMALL SCALE AND ANCILLARY INDUSTRIES           8**

    3.1    Definition – scope with special reference to self employment.
    3.2    Procedure to start small scale and Ancillary industries
    3.3    Pattern on which the Scheme/Project may be prepared
    3.4    Sources of finance - Bank, govt., and other financial institutions.

3.5     Selection of site for factory
3.6     Factors of selection
3.7     N.O.C. from different authorities, e.g., Pollution Control Board, Factories Directorate etc.
3.8     Trade License.

**4.0     SYSTEM OF DISTRIBUTION                                       1**

4.1     Wholesale Trade
4.2     Retail trade

**5.0     SALES ORGANISATION                                            3**

5.1     Market survey, marketing trends, knowledge of competitors, product selection & its basis .
5.2     Sales promotion
5.3     Advertisement
5.4     Public relations and selling skills

**6.0     PRICING THE PRODUCT                                          1**

6.1     Basic guidelines

**7.0     INTRODUCTION TO IMPORT AND EXPORT                6**

7.1     Procedures for export
7.2     Procedures for import
7.3     Technical collaboration – international  trade
7.4     Business insurance
7.5     Rail and road transport
7.6     Forwarding formalities, FOR, FOB, CIF, etc.

**8.0     BUSINESS ENQUIRIES                                            4**

8.1     Enquiries: From SISI, DIC, SFC Dept. of Industrial Development Banks.
8.2     Offers and Quotations
8.3     Orders

**9.0     PROJECT REPORT                                               6**

9.1     Project Report on feasibility studies for small scale industries, proposal for finances from bank and other financial institutions for establishing new industries and its extension,  obtaining License enlistment as suppliers, different vetting organizations for Techno Economic feasibility report.
        Breakeven analysis, Breakeven point.

## 10.0 ENVIRONMENT LEGISLATION 2

    10.1    Air Pollution Act
    10.2    Water Pollution Act
    10.3    Smoke Nuisance Control Act
    10.4    ISO: 14000, OSHA

**SUGGESTED LEARNING RESOURCES:**

**Reference Books:**

1.      Entrepreneurship Development

      Prepared by CTSC Manila Publishers by Tata Mc Graw Hill Publishing Co. Ltd.

2.      Small Enterprise Management Published by ISTE, Mysore

3.      Motivation Published by ISTE, Mysore

4.      S.S.M. in Environmental Engineering Published by ISTE, Mysore

5.      Entrepreneurship New Venture Creations, Holt, Prentice Hall, India.

6.      Essence of  TQM by John Bank

7.      Rathore, B.S. and J.S. Saini(ed), A Handbook of Entrepreneurship – Panchkula : Aapga, 1997

8.      Jose Pauletal, Entrepreneurship Development, Mumbai : Himalaya Publishing House, 1996

9.      Khanka, S.S., Entrepreneurship Development, New Delhi : S. Chand and Co., 2001

10.      Nagarazan, R.S. and A.A. Arivalagar, TQM New Delhi : New Age International Publishers, 2005

11.      Bhatia, R.C., Marketing Communication and Advertising, New Delhi : Galgotia Publishing Co., 2003

  12      Sinha, J.C., and V.N. Mugali : A Textbook of Commerce, New Delhi : R. Chand and Co., 1994

# PROJECT

| L | T | P | | **Curri. Ref. No.: CSE507** |
|---|---|---|---|---|
| 0 | 0 | 12 | | |

| **Total Contact Hrs.: 180** | **Total marks: 200** | ***Theory: 0*** |
|---|---|---|
| *Theory: 0* | | *End Term Exam: 0* |
| *Tutorial: 0* | | *P.A.: 0* |
| *Practical: 180* | | ***Practical: 200*** |
| **Credit: 6** | | *End Term Exam: 100* |
| | | *P.A : 100* |

**Aim:** The main aim of the final year project is to develop student's knowledge for solving technical problems in order to produce competent and sound engineers.

## The objectives of a final year project are to:

- Allow students to demonstrate a wide range of the skills learned during their course of study

- Allow students to develop problem solving, analysis, synthesis and evaluation skills.
- Encourage teamwork.
- Improve students' communication skills through the production of professional reports

**Suggested List of activities to be done:**

1. Allow the student to choose their Project
2. Collect information, Planning, Executing, and Managing the Project
3. Documenting the Project
5. Project Assessment and Marking

# PROFESSIONAL PRACTICES -V

| L | T | P | | **Curri. Ref. No.: CSE512** |
|---|---|---|---|---|
| 0 | 0 | 2 | | |

| **Total Contact hrs : 30** | **Total marks: 50** | *Theory: 0* |
|---|---|---|

*Theory: 0*  
*Tutorial: 0*  
*Practical: 30*  
**Pre requisite: NIL**  
**Credit: 1**

*End Term Exam: 0*  
*P.A.: 0*  
***Practical: 50***  
*End Term Exam: 0*  
*P.A.: 50*

**Aim :** To familiarise and expose students more extensively with the methodology of their own subject.

**Objective:**
On completion of this course, the Student will be able to:

• Increase their understanding of ideas as presented by the work at hand.

• Be actively involved in their own learning

• Speak more articulately

• Listen better

• Read more thoroughly

• Learn to justify/ qualify opinions

• Prepare a report on the seminar presentation topic

**Suggested List of Activities:**

1. Arrangement of expert talks and attending those talks
2. Each student will be assign a suitable topic related to the subjects being taught in the respective semester on which they have to self-study, prepared a small report (5-10 pages)
3. Develop (10-15 minutes) presentation (power point presentation preferably with animation) and deliver it as seminar.
4. Presentation follows by group discussion
5. Industrial visits

**Annexure - 1**

Proposed Specification of Multimedia Desktop Computers

| Sl No. | Item | | Configuration |
|---|---|---|---|
| I | **Particulars** | : | **Multimedia Desktop Computer** |
| A | **Base Machine** | | |
| 1 | Processor | : | Intel i5 / i7 Processor (7$^{th}$ /8$^{th}$ Generations) |
| 2 | Chipset | : | Matching Chipset |
| 3 | Memory | : | 4GB / 8GB DDR3 / DDR4 RAM with 2133MHz or higher |
| 4 | Hard Drive | : | 500 GB / 1 TB SATA, HDD |
| 5 | Optical Drive | : | 16x Max DVD+/- RW with dual layer write capabilities + 16x Max DVD ROM (optional) |
| 6 | Video Card | : | 2GB PCI / PCI Express Graphics Card |
| 7 | Sound card | : | 7.1 channel output integrated audio card |
| 8 | Keyboard | : | USB or PS/2 Standard Keyboard |
| 9 | Mouse | : | Optical USB scroll mouse |
| 10 | Ports | : | 8 USB ports (USB 3.0 & 2.0), 1 serial, 1 parallel |
| 11 | LAN connection | : | 10/100/1000 Mbps Ethernet Card |
| 12 | Cabinet | : | Mini-tower |
| 13 | Monitor | : | 19" wide screen flat panel LCD monitor with Analog and DVI |
| 14 | Warranty & support | : | 3 years onsite comprehensive support and warranty |
| 15 | Operating System | : | Preloaded OEM MS Windows 10 / MS Windows 8 |
| 16 | Antivirus | : | Kaspersky / Quick Hill / Norton / Symantec protection with updates and upgrades for 36 months |
| | | | |
| B | **Optional Items** | | |
| 1 | Wi Fi connection | : | Wireless 802.11 b/g/n compliant PCI card |
| 2 | Web Cam | : | 720 HD Web Camera USB Connectivity |
| 3 | Speakers System | : | 2.1 / 5.1 channel surround speaker system with 1000 w p.m.p.o. output of reputed brand |