# SAURASHTRA UNIVERSITY

## RAJKOT – INDIA



**Re-Accredited**
**Grade B by NAAC**
**(CGPA 2.93)**

## CURRICULAM

## UGC - B.Voc. Under National Skills Qualification Framework (NSQF)

## Bachelor of Vocational – Applied Computer Technology

(B.Voc.- ACTech.)

(Sanctioned by UGC vide letter no. D.O. No. F. 2-2/2014(B.Voc.) Dt. 5-5-2014

to Shree Manibhai Virani & Smt. Navalben Virani Science College-Rajkot)

## (Semester I and Semester II)

## Effective From June – 2014

**Bachelor of Vocational – Applied Computer Technology**
**(3 years – Six Semester Full Time Course)**

**Ordinance, Regulations and Examination Scheme :**

**O.S. B.Voc.-ACTech. – 1 :**

Candidate for admission to the Bachelor of Vocational – Applied Computer Technology (B.Voc.-ACTech.) must have passed standard 12th or equivalent examination from Gujarat higher secondary board or any other board.

**Lateral Entry** : Candidate seeking admission directly in third semester of Bachelor of Vocational – Applied Computer Technology (B.Voc.-ACTech.) must have passed Examination of either Diploma in Engineering in Computer Engineering(CE) / Computer Science(CS) / Information Technology(IT) OR B.C.A./B.Sc.I.T. first year from any recognized university.

**O.S. B.Voc.-ACTech. – 2 :**
The duration of the course will be of three full time academic years. The examination for the Bachelor of Vocational – Applied Computer Technology (B.Voc.-ACTech.) course will be divided into six semesters.
**Multi-level Exit** : Candidate will be eligible to receive Diploma after first 2 semesters and Advance Diploma after 4 semesters according to guidelines of  UGC. No candidate will be allowed to join any other course or service simultaneously.

**O.S. B.Voc.-ACTech.  – 3 :**
Candidate who have passed an equivalent examination from any other board or examining body and is seeking admission to the Bachelor of Vocational – Applied Computer Technology (B.Voc.-ACTech.) course will be required to provide necessary eligibility certificate.

**O.S. B.Voc.-ACTech.  – 4 :**
No candidate will be admitted to any semester examination for Bachelor of Vocational – Applied Computer Technology (B.Voc.-ACTech.) unless a student has put on at least 85% of the total lecture periods and practical periods in each subject in each semester.

**O.S. B.Voc.-ACTech.   – 5 :**
No candidate will be permitted to reappear at any semester examination, which he has already passed. The marks of successfully completed paper will be carrying forwarded for the award of class.

**O.S. B.Voc.-ACTech.  – 6 :**
There shall be an examination at the end of each semester to be known as Pre Diploma (first semester) examination, Diploma (second semester) examination, Pre Advanced Diploma (third semester) examination, Advanced Diploma (forth semester) examination, Pre B.Voc. Degree (fifth semester) examination and B.Voc. Degree (sixth semester) examination. At which a student shall appear in that portion of theory papers, practical and viva – voice if any, for which he has kept the semester in accordance with the regulations in this behalf.

A candidate whose term is not granted for what so ever reason shall be required to keep attendance for that semester or term when the relevant papers are actually taken at the college.

**O.S. B.Voc.-ACTech. – 7 :**

Guidelines to keep term of B.Voc. ACTech.;

A candidate will be permitted to continue his/her study up to the 4th semester examination without passing his/her previous semester examination.

A candidate can take admission to fifth (pen-ultimate) semester if he/she is failing in NOT more then two subjects of previous (1 to 4) semesters.

A candidate can take admission to Sixth (Ultimate Final) Semester if he/she is not failing in more then two subjects of 5th Semester. Provided he/she should have cleared all 1 to 4 semester.

**R.S.B.Voc.-ACTech.**

**Standard of Passing**

The standard of passing for Bachelor of Vocational – Applied Computer Technology (B.Voc.-ACTech.) degree examination will be as under :

1) To pass any semester examination of the Bachelor of Vocational – Applied Computer Technology (B.Voc.-ACTech.) degree, a candidate must obtain at least  40%  marks in the university examination separately in each course of theory and practical.

2) Total marks of each theory paper are 100 (External examination 70 marks + Internal examination 30 marks)

3) Total marks of each practical and project-viva paper are 100. No internal examination marks in practical and project-viva papers.

4) Those of the successful candidates who obtain 50% or more marks in the aggregate of all the semester taken together will be placed in the **second class** and those who obtain 60% or more marks in the aggregate of all the semester taken together will be placed in the **first class**. The successful candidates who obtain 70% or more marks in the aggregate of all the semester taken together will be declared to have passed the examination in the **first class with distinction.**

5) A result of candidate who have obtained admission directly in Bachelor of Vocational – Applied Computer Technology (B.Voc.-ACTech.) semester – III will be declared by considering his marks of semester III to VI in aggregate and accordingly class will be awarded as per normal percentage of marks fixed for other candidate.

**Bachelor of Vocational – Applied Computer Technology (Semester – I & II )**
**Saurashtra University**
**Effective from June - 2014**


**UGC B.Voc.- Applied Computer Technology ( Semester – I )**

| Sr. No. | Paper No. | Subject Name | Credit |
|---------|-----------|--------------|--------|
| 1 | 1.1 | Editorial Communication Skill | 5 |
| 2 | 1.2 | Building logic using C Language | 5 |
| 3 | 1.3 | Foundation of Speed Mathematics and Statistics | 5 |
| 4 | 1.4 | Fundamental of Computer (PC Software - MS Office & DOS) | 5 |
| 5 | 1.5 | Practical - I (Based on 1.2) | 5 |
| 6 | 1.6 | Practical - II (Based on 1.4) | 5 |
| **Total Credits of Semester - I** | | | **30** |

## 1.1 : Editorial Communication Skill

| Sr. No. | Topic | Detail | Marks | Min. Lect. |
|---|---|---|---|---|
| 1 | **Grammar** | 1. Determiners<br>2. Tenses<br>• Defining a Verb<br>• Chief forms of a Verb<br>• Tense and Time<br>• Further Division of Tenses<br>  o The Present Tense<br>  o The Past Tense<br>  o The Future Tense<br>3. Active – Passive Voice<br>• Introduction<br>• Defining the Voice<br>• Some General rules regarding the change of voice<br>4. Modals & Auxiliaries<br>• Introduction to Auxiliaries<br>• The Primary Auxiliaries<br>• Introduction to Modals<br>• The Most Commonly used Modals<br>• Important points about the Modals<br>• Modals and Their Uses<br>5. Prepositions / Prepositional Phrases | 20 | 10 |
| 2 | **Writing Comprehension** | 1. **Business Letters :**<br>• Introduction<br>• Functions of a Business Letter<br>• Inward Structure / Layout of a Business Letter<br>• Other Important Parts of Business Letter<br>• Outward appearance of a business letter<br>• Arrangement Styles<br>• Salient Features of a Business Letter<br>• Legal Aspects of a business Letters<br>• Kinds of Business Letter<br>Inquiry & Reply Order<br>& Reply Cancellation of<br>order Complaint /<br>Adjustment Sales<br>Letter<br>2. **Report Writing :**<br>• Introduction<br>• The Nature of a Report<br>• The P's of an Effective Report<br>• Functions of a Report<br>• Preparing a Report<br>• Types of Reports<br>• Business report | 28 | 20 |

| | | | | |
|---|---|---|---|---|
| | | • Press report<br>**3. Job Application / Resume Writing.**<br>• Introduction<br>• A Cover Letter<br>• Curriculum Vitae / Resume<br>**4. Letters of Appointment & Resignation.** | | |
| 3 | **Conversation Skills** | Conversations based on everyday situation / Dialogue Writing.<br>• Introduction<br>• Nature of Conversations<br>• Purpose of conversation<br>• Guidelines for Effective Conversation Skills<br>• Proverbs used in Everyday Conversation with their Meanings / Explanations<br>• Comparisons used in Everyday Conversation<br>• Practical Conversations | 14 | 10 |
| 4 | **Communication Skills** | (1) Communication – Meaning, Features & Process<br>(2) Verbal & Non – Verbal comm.<br>Verbal<br>    Oral Communication<br>    Written Communication<br>Non – Verbal<br>    Body language<br>    Space<br>    Para language<br>    Others<br>(3) Group discussion skills<br>• Meaning<br>• Characteristic<br>• Do's & Don'ts<br>• Relevance<br>• Moderating a group discussion<br>(4) Presentation skills<br>• Meaning<br>• Planning a presentation skills<br>• Preparing a presentation skills<br>• Delivering a presentation skills<br>• Presentation skills<br>(5) Public Speaking<br>• Meaning<br>• Essential of effective public speaking<br>(6) Facing Interviews<br>• Importance<br>• Do's & Don'ts | 38 | 20 |
| | | **Total** | 100 | 60 |

Students seminar - 5 Lectures.
Expert Talk - 5 Lectures
Students Test - 5 Lectures.

**Total Lectures    60 + 15 = 75**

**Reference Book**

1. High School English Grammar and Composition By Wren & Martin
2. Communication Skills by Bharat & Company

| | | 1.2 : Building Logic using C Language | | |
|---|---|---|---|---|
| **No.** | **Topics** | **Details** | **Marks** | **Min. Lec.** |
| 1 | Pre Programming Techniques | Importance of preprogramming techniques<br>Pre programming tools<br>    Algorithm<br>    Flow charts<br>Dry Run (preparation of sample data set for testing of logic)<br>Writing algorithms and development of flowcharts with dry run for the given list of problems | 10 | 6 |
| 2 | Getting started with C | C program structure<br>C Character sets<br>Constants, Variables and Keywords in C<br>Various Data Types<br>Type Casting<br>Various Operators<br>Hierarchy of Operations | | 6 |
| 3 | Various Controls Structures | Decision<br>    if, if-else,Nested if-else, if-elseif<br>    Conditional (Ternary) operator<br>    Switch Case<br>Loops<br>    for, while, do while, Nesting of loops<br>    Use of break an continue statements,<br>    goto with lable | 90 | 14 |
| 4 | Header files & Library Functions | Importance of header files<br>Introduction to some popular header files and its library functions:<br><stdio.h>: printf(),scanf(),fflush(),gets(),puts()<br><conio.h>:<br>getch(),getche(),getchar(),clrscr(),gotoxy(),<br>    textcolor(),textbackground(), cprintf(),<br><math.h>:<br>abs(),exp(),sqrt(),log(),ceil(),floor(),pow(),<br>    fmod(),fabs()<br><string.h>:<br>strlen(),strcpy(),strcmp(),strcat(),strlwr(),<br>    strupr(),strrev()<br><ctype.h>:<br>isalpha(),isdigit(),isalnum(),isspace(),isupper(),<br>    islower(),isprint(),toupper(),tolower() | | 5 |

| 5 | User defined functions | Different type of UDF<br>Functions with no arguments, no return value<br>Functions with no arguments, with return value<br>Functions with arguments, no return value<br>Functions with arguments, with return value<br>Call by reference & Call by value<br>Recursion<br>Creation of your library<br>Storage classes & scope of variables | | 5 |
|---|---|---|---|---|
| 6 | Arrays | Concept of Single & Two dimensional arrays<br>Initializations & working with array<br>Passing array elements to function<br>Sorting of numeric & string array<br>String operations | | 6 |
| 7 | Structures | How to define a structure<br>Accessing structure elements<br>Memory allocation<br>Array of structure<br>Array within structure<br>Structures as a function argument<br>Union | | 5 |
| 8 | Pointer | Introduction of Pointers<br>Pointer to Variables<br>Pointer to Array<br>Pointer within Array<br>Pointer To Structure<br>Pointers within structure<br>Pointer to Pointer<br>Use of pointers in Dynamic Programming<br>        Memory Allocation Functions<br>        malloc , realloc , calloc, free | | 6 |
| 9 | Data file handling | Concept of data file and file structure<br>Text file and binary file<br>Opening and closing of data file (fopen(),fclose())<br>Write data/ Record to data file<br>(fprint(),fwirte(),fputs())<br>Reading from data file (fscanf(),fread(),fgets())<br>File handling functions(feof(),ferror(),fseek(),<br>ftell(),rewind())<br>Command line arguments | | 5 |
| 10 | Misc. | Typedef<br>Symbolic Constants<br>C Preprocessor<br> #define,  #include | | 2 |
| | **Total** | | **100** | **60** |

Student Seminar      – 5 Lectures
Expert Talk          – 5 Lectures
Student Test         – 5 Lectures

**Total Lectures      60 + 15 = 75**


**Reference Books:**
1. Programming in ANSI C          E.Balaguruswami
2. Let Us C                       Yashwant Kanetkar
3. Working with C                 Yashwant Kanetkar
4. Programming in C               Schaum Series Publication

| | | **1.3 : Foundation of Speed Mathematics and Statistics** | | |
|---|---|---|---|---|
| **Sr. No.** | **Topic** | **Detail** | **Mark** | **Lectures** |
| 1. | Set Theory | ➢ Introduction<br>➢ Methods of Representation of a Set<br>➢ Different Types of Sets<br>➢ Operations on Set and its Properties<br>    • Union of Sets<br>    • Intersection of Sets<br>    • Complement of Sets<br>    • Difference of Sets<br>➢ Cartesian Product of Sets<br>➢ Typical Examples | 20 | 12 |
| 2. | Matrix | ➢ Introduction<br>➢ Different Types of Matrices<br>➢ Addition and Subtraction of two Matrices<br>➢ Multiplication of two Matrices<br>➢ Adjoint of Matrix<br>➢ Determinant of Matrix<br>➢ Inverse of Matrix<br>➢ Typical Examples | 20 | 12 |
| 3. | Co-ordinate Geometry | ➢ Introduction<br>➢ Distance between two Points in $R_2$<br>➢ Section Formula<br>➢ Area of Triangle<br>➢ Different Types of Equations of Lines<br>➢ Parallel Lines<br>➢ Perpendicular Lines<br>➢ Typical Examples | 20 | 12 |
| 4. | Number System | ➢ Types of Number System [Binary / Octal / Decimal / Hexadecimal ]<br>➢ Conversions<br>    • Decimal to Binary / Octal / Hexadecimal<br>    • Binary to Decimal / Octal / Hexadecimal<br>    • Octal to Binary / Decimal / Hexadecimal<br>    • Hexadecimal to Binary / Octal / Decimal<br>➢ Complement | 20 | 12 |

| | | | | |
|---|---|---|---|---|
| | | • 1's Complement<br>• 2's Complement<br>➢ Addition of Two Binary Numbers<br>➢ Subtraction of Two Binary Numbers Using 1's & 2's Complement | | |
| 5 | Mind Techniques | ➢ Positive Affirmations<br>➢ Creative Visualization<br>➢ Memory Techniques<br>➢ Visualization Techniques<br>➢ Meditation<br>➢ Observation<br>➢ Concentration<br>➢ Mind Relaxation<br>➢ Determination<br>➢ Mind Control | 20 | 12 |
| | | **Total** | **100** | **60** |

Student Seminar     – 5 Lectures
Expert Talk           – 5 Lectures
Student Test       – 5 Lectures

**Total Lectures     60 + 15 = 75**

**Reference Books:**
1. Theory of Matrices by Shantinarayan
2. Co-ordinate Geometry by A. K. Sharma
3. Basic Set Theory by Azriel Levy
4. Set Theory an Introduction by Robert L. Vaught
5. Computer Fundamentals  – By P. K. Sinha.
6. Secretes of mind power by Harry lorayne
7. The essence of law of success by napoleon Hill

| Unit | Topic | Detail | Marks | Min Lec. |
|------|-------|--------|-------|----------|
| | | **1.4 : Fundamental of Computer (PC Software - MS Office & DOS)** | | |
| 1 | Basics & Booting Procedure | Introduction to Computers, Characteristics, Data Processing Cycle | 20 | 12 |
| | | History and Generations of Computers | | |
| | | Classification of Computer by Processing Capabilities | | |
| | | Micro, Mini, Mainframe and Super Computers | | |
| | | Block diagram of computer, Layered Approach of Operating System, booting process | | |
| | | Types of Operating Systems, Introduction to BIOS and CMOS | | |
| | | What is software? Types of Software | | |
| | | Types of Languages (Assembler / Compiler /Interpreter) | | |
| | | Machine Level Language, Assembly Level Language | | |
| 2 | Hardware & Peripherals | What is hardware? Types of Input Devices, Output Device, Peripherals | 10 | 6 |
| | | Types of Memory, Internal, External | | |
| 3 | Computer Assembly, Installation & Trouble Shooting | Identification of Components | 20 | 12 |
| | | Assembling computer | | |
| | | Operating System & Software Installation, Security | | |
| | | Configuration of Printer and other Multimedia Devices , Updating Software, Hardware problems and their solutions | | |
| | | Use of Multi-meter, soldering, line tester, etc | | |
| 4 | Word Processing Using Ms Word | Introduction to Word, Font, Paragraph, Style, Editing ,Pages, tables. | 15 | 9 |
| | | Illustrations, bookmark, hyperlink, header footer, text, symbol , | | |
| | | Page layout ribbon, Foot note End note, Caption, Mail merge, | | |
| | | Spell check, comments, Document View, Show Hide, Zoom, Window and Office Button Options, Printing documents. Password Protection. | | |
| 5 | Spread Sheet Using Ms Excel | Sheet Introduction, Selecting row, column, cell, changing height, and Formula bar. | 25 | 15 |
| | | Cell Referencing - Relative, Absolute, Mixed, | | |
| | | Calculative Examples like salary sheet, mark sheet etc. Conditional formatting, inserting, deleting row or column, cell | | |
| | | Changing height and width, Pivot table and Pivot chart, types of different chart, editing charts. What if Analysis. | | |

| | | | | |
|---|---|---|---|---|
| | | Print Preview and Page Layout, Useful functions from Function Library. Data sorting and subtotaling, filter, Protecting sheet. | | |
| 6 | Presentation Using Ms Power Point | Inserting new slide, different layout of slide, Inserting date, slide number, movie, sound, object, header footer, Designing slide theme and background, custom animation, slide transition Rehearse timings, slide show , Setup slide show, hide slide, different views of slide Use of slide master, Printing handout, slide, etc | 10 | 6 |
| | **Total** | | **100** | **60** |

Student Seminar     – 5 Lectures
Expert Talk         – 5 Lectures
Student Test        – 5 Lectures

**Total Lectures      60 + 15 = 75**

**Reference Books:**
1. Pc Software For Windows Made Simple    - R.K. Taxali
2. Introduction To Information Technology    - V.Rajaraman
3. Computer Fundamentals  –  By P.K.Sinha.
3. Ibm Pc And Clones: Hardware, Troubleshooting And Maintenance  - Govindarajalu

| 1.5 : Practical – I (Based on 1.2) | |
|---|---|
| **Topics** | **Marks** |
| **1.2** | **100** |

| 1.6 : Practical – II (Based on 1.4) | |
|---|---|
| **Topics** | **Marks** |
| **1.4** | **100** |

**Bachelor of Vocational – Applied Computer Technology (Semester – I & II )**
**Saurashtra University**
**Effective from June - 2014**

**UGC B.Voc.- Applied Computer Technology ( Semester – II)**

| Sr. No. | Paper No. | Subject | Credit |
|---|---|---|---|
| 1 | 2.1 | Web Designing & Internet (HTML ,CSS, JavaScript ) | 5 |
| 2 | 2.2 | Fundamental of  Networking | 5 |
| 3 | 2.3 | Object Oriented Programming using C++ | 5 |
| 4 | 2.4 | Desk Top Publishing  (Photoshop & Corel Draw) | 5 |
| 5 | 2.5 | Practical - I (Based on 2.1) | 5 |
| 6 | 2.6 | Practical - II (Based on 2.3 & 2.4) | 5 |
| **Total Credits of Semester - II** | | | **30** |

| | | 2.1 : Web Designing & Internet (HTML ,CSS, JavaScript ) | | |
|---|---|---|---|---|
| **Sr. no** | **Topics** | **Details** | **Marks** | **Min Lec.** |
| 1 | Internet | ➢ Introduction to Internet<br>  • What is Internet?<br>  • Use of Internet?<br>➢ Applications of Internet<br>  • World wide web(web page, web site, web client and web server)<br>  • Web browsers<br>  • Search engines<br>  • Email<br>  • Blogs and forums<br>  • Social media and chatting<br>  • E-commerce<br>  • FTP<br>  • Bookmarks<br>➢ Internet Search<br>  • Basic search<br>  • Tips and Tricks for search<br>➢ How to stay safe on internet?<br>➢ How to download and upload?<br>➢ IP addressing | 20 | 10 |
| 2 | HTML | ➢ Introduction<br>➢ HTML Block Structure<br>➢ Basic tags:<br>  • Texts formatting tags<br>  • Line breaks<br>  • Link<br>  • Color<br>  • Image<br>  • List creation<br>  • Table<br>  • Frame<br>  • Form<br>➢ HTML multimedia<br>  • HTML Plug-in<br>  • HTML Audio<br>  • HTML Video<br>➢ Introduction to HTML 5 | 25 | 20 |

| | | | | |
|---|---|---|---|---|
| 3 | | ➤ Basics of CSS<br>➤ Types of CSS<br>➤ Selectors of CSS (class and id)<br>➤ Properties:<br>   • Background property<br>   • Text property<br>   • Font property<br>   • Table property<br>   • Box modal property<br>   • Border property<br>   • Margin property<br>   • Padding property<br>   • Align property<br>   • Image property<br>➤ Page layouts<br>   • Using DIV and SPAN tag<br>➤ Introduction to DHTML | 20 | 12 |
| 4 | Javascript | ➤ Introduction to Scripting Language<br>➤ JS syntax<br>➤ JS variables<br>➤ JS Operators<br>➤ JS control structures<br>   • Control statements<br>   • Looping statements<br>   • Sequential statements<br>➤ JS Dialog boxes<br>➤ User defined functions<br>➤ Built-in objects and properties<br>   • Number object<br>   • Date object<br>   • Math object<br>   • String object<br>   • Array object<br>   • History object<br>   • Navigator object<br>➤ User defined objects<br>➤ Built-in functions<br>➤ JS Events<br>➤ JS Timing Events<br>➤ JS DOM (Methods and property)<br>➤ Cookies<br>➤ JS Errors (throw and try catch block) | 35 | 18 |
| | | **Total** | **100** | **60** |

Student Seminar    – 5 Lectures
Expert Talk        – 5 Lectures
Student Test      – 5 Lectures

**Total Lectures**     **60 + 15 = 75**

**Reference Books:**
1. Beginning Web Programming with HTML, XHTML, and CSS by Jon Duckett Wrox Publication.
2. Beginning JavaScript by Paul Wilton Wrox Publication.
3. Practical HTML 4.0 by Lee Philips
4. World wide web design with HTML by Cxavier
5. Internet The Complete Reference –Young
6. Internet For Every One -Leon
7. http://www.w3schools.com

| | | 2.2 : Fundamentals of Networking | | |
|---|---|---|---|---|
| **Sr. No.** | **Topics** | **Details** | **Marks** | **Min Lec.** |
| 1. | Introduction of Networking | Network concepts<br>• What is network<br>• Use of network<br>Network model<br>• peer – to – peer<br>• client – server<br>Network Types<br>• LAN<br>• MAN<br>• WAN<br>Network Services<br>• File service<br>• Print service<br>• Comm. service<br>• Data base service<br>• Security service,<br>• Application service<br>Client Server Configuration | 10 | 5 |
| 2. | Basics of Networking | Network Access Methods<br>• CSMA / CD & CSMA / CA<br>• Token passing<br>• Polling<br>Network Topologies<br>• Bus<br>• Ring<br>• Star<br>• Mesh<br>• Tree<br>• Hybrid<br>Advanced Network Topologies<br>• Ethernet<br>• CDDI<br>• FDDI<br>Communication Methods<br>• Unicasting<br>• Multicasting<br>• Broadcasting | 10 | 5 |

| 3. | Network Models | OSI reference model with 7 layers<br>TCP/IP network model with 4 layers | 10 | 5 |
|---|---|---|---|---|
| 4. | Transmission Media | Transmission Media<br>Types of Transmission media<br>• Guided media<br>   o Coaxial Cable,<br>   o Twisted Pair Cable,<br>   o Crimping of Twisted pair cable<br>   o Fiber Optic Cable<br>• Unguided media<br>   o Infrared, Laser, Radio<br>   o Microwave<br>   o Bluetooth tech. | 10 | 6 |
| 5. | Multiplexing & Switching Concepts | Different Frequency Ranges<br>Multiplexing & Demultiplexing<br>Multiplexing Types<br>• FDM<br>• TDM<br>• CDM<br>• WDM<br>Switching Tech.<br>• Circuit Switching<br>• Message Switching<br>• Packet Switching | 5 | 4 |
| 6. | Network Devices | CABLE NETWORK DEVICES<br>LAYER1 DEVICES<br>• LAN CARD<br>• MODEM<br>• DSL & ADSL<br>• HUB(Active, Passive, Smart hub)<br>• REPEATER<br>LAYER 2 DEVICES<br>• SWITCH(Manageable, Nonmanagable)<br>• BRIDGE(Source route, Transactional)<br>LAYER 3 DEVICES<br>• ROUTER<br>• LAYER 3 SWITCH<br>• BROUTER<br>• GATEWAY<br>• Network Printer<br>Establishment of network,<br>use of Cable and Connector<br>Crimping<br>Switch & Hub Configuration | 15 | 9 |

| 7. | Network Protocols | Layer 1 Protocols<br>• USB<br>• DSL<br>Layer 2 Protocols<br>• PPP<br>Layer 3 Protocols<br>• ARP<br>• RARP<br>• IP<br>• EGP<br>• IGRP<br>• IGMP<br>• ICMP<br>• IPX<br>• RIP<br>• OSPF<br>Layer 4 Protocols<br>• TCP<br>• UDP<br>• SPX<br>Layer 7 Protocols<br>• DHCP<br>• BGP<br>• DNS<br>• FTP<br>• HTTP & HTTPS<br>• SMTP<br>• POP3 & IMAP<br>• IRC<br>• SNMP | 20 | 14 |
| 8. | IP Addressing | What is IP address?<br>Classes of IP Address<br>Types of IP address<br>IPv4<br>• Class structure<br>• Subneting<br>• Supernetting<br>• CIDR<br>IPv6<br>• Basic structure of ipv6<br>• Implementation of ipv6 | 10 | 6 |

| 9. | Internet connection & Sharing | Internet Terminology<br>ISP<br>Intranet & Extranet<br>Technology related Internet<br>&bull; Dial up tech.<br>&bull; ISDN network tech.<br>&bull; Lease line tech.<br>VPN<br>&bull; Types of VPN<br>&bull; Use of VPN<br>&bull; VPN protocols (PPTP, L2TP, IPsec.)<br>Proxy server, Firewall | 10 | 6 |
|---|---|---|---|---|
| | | **Total** | **100** | **60** |

Student Seminar     – 5 Lectures
Expert Talk         – 5 Lectures
Student Test       – 5 Lectures

**Total Lectures     60 + 15 = 75**

**Reference Books:**

1.  1 Networking Essential by Glenn Berg Tech. Media
2.  Data Communication & Networking – B A Forouzan
3.  URL: http://compnetworking.about.com/
4.  URL: http://searchnetworking.techtarget.com/

## 2.3 : Object Oriented Programming using C++

| Sr. No | Topics | Details | Marks | Min Lec. |
|---|---|---|---|---|
| 1 | Principles of object oriented programming | Procedure – oriented programming <br> Object oriented programming paradigm <br> Basic concepts of object oriented Programming <br> Benefits of object oriented programming <br> Application of object oriented programming <br> What is c++? <br> Application of c++ <br> Input/output operators  Structure of c++ program | 5 | 4 |
| 2 | Tokens, expressions and control statements | Tokens : <br> keywords, identifiers, basic data types, user defined types, derived data types, symbolic constants, type compatibility, declaration of  variables, dynamic initialization of variables, reference variables. <br><br> Operators in C++: <br> Scope resolution operator, member referencing operator, memory management operator, manipulators, type cast operator. <br><br> Expression : <br> Expression and their types, special assignment operator, implicit conversions, operator precedence Control structures <br><br> Conditional control structure:- <br> simple if, if…else , nested if else, switch etc. <br><br> Looping control structure:- <br> for, while , do…while | 10 | 7 |
| 3 | Functions in C++ | The main function <br> Function prototype <br> Call by reference <br> Return by reference <br> Inline function <br> Default arguments <br> Const arguments <br> Functions overloading | 10 | 6 |
| 4 | Classes and Objects | C structures revisited <br> Specifying a class <br> Defining member functions <br>  nesting of Member functions | 15 | 10 |

| | | private member function<br>making outside function inline<br>Arrays within a class<br>Memory allocation for objects<br>Static data member<br>Static member functions<br>Arrays of objects<br>Objects as function arguments<br>Friendly functions<br>Returning objects<br>Const member function<br>Pointer to members | | |
|---|---|---|---|---|
| 5 | Constructor and Destructor | Characteristics of constructor<br> Parameterized constructor<br> Multiple constructor in a class<br> Constructor with default argument<br> Copy constructor<br> Dynamic initialization of objects<br> Constructing two dimensional array<br> Dynamic constructor<br> Destructors | 10 | 5 |
| 6 | Operator overloading and type conversion | Concept of operator overloading<br>Over loading unary and binary operators<br>Overloading of operators using friend Function<br>Manipulation of string using operators<br>Rules for operator overloading<br>Type conversions. | 10 | 6 |
| 7 | Inheritance | Defining derived classes<br> Types of inheritance (Single, Multiple, Multi-level, Hierarchical, Hybrid)<br> Virtual base class & Abstract class<br> Constructors in derived class<br> Nesting of classes. | 10 | 5 |
| 8 | Pointer, Virtual functions and Polymorphism | Pointer to Object<br> Pointer to derived class<br> this pointer<br> Rules for virtual function<br> Virtual function and pure virtual function | 10 | 5 |
| 9 | Console I/O operations | C++ streams<br>C++ stream classes<br>Unformatted and formatted I/O operations<br>Use of manipulators. | 5 | 3 |
| 10 | Working with Files | File stream classes<br>Opening and closing a file<br>Error handling | 10 | 5 |

| | | | | |
|---|---|---|---|---|
| | | File modes<br>File pointers<br>Sequential I/O operations<br>Updating a file (Random access)<br>Command line arguments | | |
| 11 | Templates and Exception handling | Introduction to templates<br>Class templates<br>Function templates<br>Member function templates<br>Overloading of template function<br>Non-type Template argument | 5 | 4 |
| | | | 100 | 60 |

Student Seminar    – 5 Lectures
Expert Talk    – 5 Lectures
Student Test    – 5 Lectures

**Total Lectures    60 + 15 = 75**

**Reference Books:**
1. Object Oriented Programming in C++    E.Balaguruswami, BPB
2. Mastering C++    Venugopal
3. Object Oriented Programming in C++    Robaret Laphore
4. Let us C++    Yashvant Kanitkar, BPB

| Sr. No. | Topic | Detail | Marks | Min Lec |
|---|---|---|---|---|
| | **2.4 : Desk Top Publishing (Photoshop & Corel Draw)** | | | |
| 1 | CorelDRAW Basics And Interface | Exploring the CorelDraw Screen, File Management, Moving Around and Viewing Drawings, Customizing Options, Setting File Backups | 5 | 4 |
| 2 | Objects- Creation and Manipulation Drawing and Shaping Objects | Drawing and Shaping Tools, Lines, Polylines, Curves, Rectangles, Circles, Selecting & Manipulating Objects, Transforming Objects, Outlining & Filling Objects, Arranging Objects, Using Layers | 10 | 5 |
| 3 | Working With Special Effects And Texts Special Effects | Drawing With the Artistic Media Tool, Shaping an Object with an Envelope, Working with Text, Working With Paragraph, Special Text Effects, Using Symbols and Clipart, Working With Bitmaps | 15 | 8 |
| 4 | Advanced Features Special Page Layouts | Page Exporting, Printing, Exporting Drawings, Using Styles and Templates, Custom Creation Tools, Using Corel Trace, Using Corel R.A.V.E. | 15 | 10 |
| 5 | Introduction to Photoshop | About Adobe Photoshop , Graphics Basics, Exploring Menus & Panels, Customizing Workspaces, Different file formats, Work area Using Rulers and Guides, Introduction to Colour | 5 | 3 |

| 6 | Image Manipulation & Painting tools | The Photoshop Toolbox and Options bar<br>Inserting Pictures and texts<br>Cropping Images<br>Image Magnification<br>Resizing Images<br>Adjusting Resolution<br>Transforms<br>Using Free transform,<br>Move, Rotate, Scale, Skew<br>Distort, Perspective, Flip-vertical,<br>horizontal, Invert,<br>Rotate 180º, Rotate 90º CW,<br>Rotate 90º CCW<br>Bitmap Images v/s Vector Images<br>Making Selections & Using Pen tool<br>Using Painting tools ( Brush, Pencil, Paint<br>Bucket, Gradient , Eraser, etc..)<br>Undoing and History Palette | 12 | 6 |
| 7 | Working with Layers | Creating layers and Group layer,<br>Layer Styles and Locking,<br>Merging and Flattening Layers,<br>Adjustment Layers and Fill Layers,<br>Masking Layers (Blending Mode),<br>Photoshop Channels | 5 | 5 |
| 8 | Image Post Production (Image Processing) | Color Management,<br>Levels & Curves,<br>Using Retouching tools<br>Spot Healing Brush, Clone Stamp,<br>Pattern Stamp, Red Eye, Eraser, Blur,<br>Sharpen, Smudge,<br>Dodge, Burn, Sponge<br>Blurring and Sharpening Images,<br>Color Replacement Tool,<br>The Free Transform command | 5 | 4 |
| 9 | Working with Filters | Getting started with Photoshop Filters,<br>Liquify  Command,<br>Exploring filters<br>Blur, Distort, Noise, Pixelate,<br>Render, Sharpen, Stylize<br>Smart Filters, | 8 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| | | Lens Correction | | | |
| 10 | Scripting | 1.      Action | 20 | 10 |
| | | •      Using the Action palette, Droplet | | |
| | | •      Recording, Playing, Editing Action | | |
| | | 2.      Adobe ImageReady | | |
| | | •      The Image Ready Interface | | |
| | | •      Image Maps | | |
| | | •      Image Slicing | | |
| | **Total** | | 100 | 60 |

Student Seminar     – 5 Lectures
Expert Talk          – 5 Lectures
Student Test       – 5 Lectures

**Total Lectures**      **60 + 15 = 75**

**Reference Books:**

1. Adobe Photoshop Classroom in a Book [CS]
2. http://www.photoshop.com

| 2.5 : Practical – I (Based on 2.1) | |
|---|---|
| **Topics** | **Marks** |
| **2.1** | **100** |

| 2.6 : Practical – II (Based on 2.3 & 2.4) | |
|---|---|
| **Topics** | **Marks** |
| **2.3** | **50** |
| **2.4** | **50** |

**UGC Bachelor of Vocational (Applied Computer Technology)**
**PROPOSED THEORY & PRACTICAL SUBJECTS- Sem. 3 to 6**

## Semester – III

| Sr. No. | Subject | Credit |
|---------|---------|--------|
| 3.1 | Core Java | 5 |
| 3.2 | Web Development using PHP/MYSQL | 5 |
| 3.3 | RDBMS using MS SQL Server | 5 |
| 3.4 | Basic Animation using Flash | 5 |
| 3.5 | Practical - I (Based on 3.1 & 3.4) | 5 |
| 3.6 | Practical - II (Based on 3.2 & 3.3) | 5 |
| **Total Credits of Semester - III** | | **30** |

## Semester - IV

| Sr. No. | Subject | Credit |
|---------|---------|--------|
| 4.1 | Value Education | 5 |
| 4.2 | Advance PHP (OOP, CMS, Wordpress) | 5 |
| 4.3 | Advance Web Designing ( JQuery, CSS framework, AJAX, Responsive Layout) | 5 |
| 4.4 | Project Work - I | 5 |
| 4.5 | Practical - I (Based on 4.2) | 5 |
| 4.6 | Practical - II (Based on 4.3) | 5 |
| **Total Credits of Semester - IV** | | **30** |

## Semester – V

| Sr. No. | Subject | Credit |
|---------|---------|--------|
| 5.1 | Business Etiquettes & Interview Techniques | 5 |
| 5.2 | Programming with C#.NET | 5 |
| 5.3 | Mobile Computing with Android | 5 |
| 5.4 | Project Work - II | 5 |
| 5.5 | Practical - I (Based on 5.2) | 5 |
| 5.6 | Practical - II (Based on 5.3) | 5 |
| **Total Credits of Semester - V** | | **30** |

## Semester – VI

| Sr. No. | Subject | Credit |
|---------|---------|--------|
| 6.1 | Graphics and Multimedia | 5 |
| 6.2 | Web Programming with ASP.NET | 5 |
| 6.3 | Mobile Computing with IOS | 5 |
| 6.4 | Project Work - III | 5 |
| 6.5 | Practical - I (Based on 6.1 & 6.3) | 5 |
| 6.6 | Practical - II (Based on 6.2) | 5 |
| **Total Credits of Semester - VI** | | **30** |