Dr. B.R. Ambedkar University, Agra

Dharma Samaj College, Aligarh

B.Voc. Degree

In

Information Technology

Scheme and syllabus for B.Voc Information Technology

The University Grants Commission (UGC) has launched a scheme on skills development based higher education as part of college/university education, leading to Bachelor of Vocation (B.Voc.) Degree with multiple exits such as Diploma/Advanced Diploma under the NSQF.The B.Voc.programme is focused on universities and colleges providing undergraduate studies which would also incorporate specific job roles along with broad based general education. This would enable the graduates completing B.Voc. to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge The proposed vocational programme in Information Technology will be a judicious mix of skills, professional education related to Information Technology and also appropriate content of general education. It is designed with the objective of equipping the students to cope with the emerging trends and challenges in the Information Technology environment.

ELIGIBILITY FOR ADMISSION

Eligibility for admissions and reservation of seats for B.Voc Information Technology Industry shall be according to the rules framed by the University from time to time. No student shall be eligible for admission to B.Voc Information Technology unless he/she has passed the Plus Two of the Higher Secondary Board of Kerala or that of any other university or Board of Examinations in any state recognized as equivalent to the Plus Two of the Higher Secondary Board in Kerala, with not less than 45 % marks in aggregate. However SC/ST, OBC, and other eligible communities shall be given relaxation as per University rules.(Those who passed Vocational Higher Secondary course will get a weightage of 25 marks.)

CURRICULUM

The curriculum in each of the years of the programme would be a suitable mix of general education and skill development components.

DURATION

The duration of the B. Voc Information Technology shall be three years consisting of six semesters. The duration of each semester shall be five months inclusive of the days of

examinations. There shall be at least 90 working days in a semester and a minimum 540hours of instruction in a semester.

PROGRAMME STRUCTURE

- The B.Voc Information Technology shall include:
- Language courses
- General Education Components
- Skill Components
- Project
- Industrial Training
- Soft Skills and Personality Development Programmes
- Industrial Visit

CREDIT CALCULATION

The following formula is used for conversion of time into credit hours.

- One Credit would mean equivalent of 18 periods of 60 minutes each, for theory,
- Workshops/labs and tutorials;
- For internship/field work, the credit weightage for equivalent hours shall be 50% of that for lectures/workshops;
- For self-learning, based on e-content or otherwise, the credit weightage for equivalent• hours of study should be 50% or less of that for lectures/workshops.

COURSE STRUCTURE

NSQF Level	Skill Component Credit	General Education Credit	Normal Calendar Duration	Exit/Point Awards
Year 3	36	24	Six Semester	B.Voc
Year 2	36	24	Four Semester	Advance Diploma
Year 1	36	24	Two Semester	Diploma
Total	**108**	**72**		**72**

As per the UGC guidelines, there is multiple exit point for a candidate admitted in this course. If he/she is completing all the six credits successfully, he/she will get B. Voc degree in Information Technology. If he is completing the first four semesters successfully, he/she will get an advanced diploma in Computer Science. If he/she is completing the first two credits

he/she will get a diploma in Computer Science. B Voc Degree holder is expected to acquire the skills needed for a Software developer or entrepreneur

PROGRAMME STRUCTURE

Semester	Code	Title of Paper	General Education	Skill Component	Total Marks
Semester 1st	IT-BV-G101	Communication Skills in English	4		100
	IT-BV-G102	Introduction to IT	4		100
	IT-BV-G103	Fundamentals of Computer and Software Development	4		100
	IT-BV-S104	Programming in 'C' Language		4	100
	IT-BV-S105	Project– I (Based on MsOffice)		4	100
	IT-BV-S106	Software Lab- I		5	100
	IT-BV-S107	Software Lab- II		5	100
Total			**12**	**18**	**700**
Semester 2nd	IT-BV-G201	Fundamentals of Windows and Server Administration	4		100
	IT-BV-G202	Mobile and Wireless Technologies	4		100
	IT-BV-G203	Internet & Web Development	4		100
	IT-BV-S204	Data Structure Through 'C'		4	100
	IT-BV-S205	Project – II		4	100
	IT-BV-S206	Software Lab – III		5	100
	IT-BV-S207	Software Lab – IV		5	100
Total			**12**	**18**	**700**
Semester 3rd	IT-BV-G301	Cloud Computing	4		100
	IT-BV-G302	Basics of Data Communication	4		100
	IT-BV-G303	E-Commerce	4		100
	IT-BV-S304	Object Oriented Programming in C++		4	100
	IT-BV-S305	Object Oriented Programming in Java		4	100
	IT-BV-S306	Software Lab – V		5	100

	IT-BV-S307	Software Lab – VI		5	100
		Total	**12**	**18**	**700**
Semester 4th	IT-BV-G401	Discrete Mathematics	4		100
	IT-BV-G402	Human Resource Management	4		100
	IT-BV-G403	Introduction to RDBMS & SQL	4		100
	IT-BV-S404	Net Programming		4	100
	IT-BV-S405	Software Lab – VII		4	100
	IT-BV-S406	Software Lab – VIII		5	100
	IT-BV-S407	Industrial Training/ Mini Project-III		5	100
		Total	**12**	**18**	**700**
Semester 5th	IT-BV-G501	Environmental Studies	4		100
	IT-BV-G502	Entrepreneurship Development	4		100
	IT-BV-G503	Management Information System	4		100
	IT-BV-S504	Computer Networks		4	100
	IT-BV-S505	PHP Programming		4	100
	IT-BV-S506	Software Lab –IX		5	100
	IT-BV-S507	Software Lab – X		5	100
		Total	**12**	**18**	**700**
Semester 6th	IT-BV-G601	EHS	4		100
	IT-BV-G602	Software Engineering	4		100
	IT-BV-G603	Cyber Security	4		100
	IT-BV-S604	Internship & Final Project VI		18	100
		Total	**12**	**18**	**400**

NSQF Level	Skill Component Credits	General Education Credits	Normal Calendar Duration	Exit Point/Awards

Year 3	36	24	Six Semester	B.Voc
Year 2	36	24	Four Semester	Advance Diploma
Year 1	36	24	Two Semester	Diploma
Total	108	72		

SOCIAL SERVICE/ EXTENSION ACTIVITIES

Students are to participate in Extension/ NSS/ NCC or other specified social service, sports, literary and cultural activities during 3rd/ 4th semester. These activities have to be carried out outside the instructional hours and will fetch the required one credit extra over and above the minimum prescribed 180 credits

ATTENDANCE

The minimum number of hours of lectures, tutorials, seminars or practical which a student shall be required to attend for eligibility to appear at the end semester examination shall not be less than 75 per cent of the total number of lectures, tutorials, seminars or practical sessions. Internships, study tours and soft skill and personality development programmes are part of the course and students must attend in these activities to complete a semester.

EVALUATION AND GRADING

The Evaluation of each Course shall consists of two parts1) Continuous Evaluation (CE) 2) End Semester Evaluation (ESE) The CE and ESE ratio shall be 1:4 for both Courses with or without practical. There shall be a maximum of 80 marks for ESE and maximum of 20 marks for CE. For all Courses (Theory and Practical), Grades are given on a 7-point scale based on the total percentage of mark (CE+ESE) as given below.

CRITERIA FOR GRADING

Percentage of Marks	CCPA	Letter of Grade
90 and above	9 and above	A+ Out Standing
80 to < 90	8 to < 9	A Excellent
70 to < 80	7 to < 8	B Very Good
60 to < 70	6 to < 7	C Good
50 to < 60	5 to < 6	D Satisfactory
40 to < 50	4 to < 5	E Adequate

Below 40	<4	F	Fail

CONTINUOUS EVALUATION (CE)

All records of Continuous Evaluation shall be kept in the Department and shall be made available for verification by the University, if and when necessary

ATTENDANCE (MAX.MARKS 5)

The allotment of marks for attendance shall be as follows:

Attendence Less than 75%	1 Marks
75% and less than 80%	2 Marks
80% and less than 85%	3 Marks
85% and less than 90%	4 Marks
90% and above	5 Marks

ASSIGNMENTS OR SEMINARS: (MAX. MARKS 5)

Each student shall be required to do one assignment or one seminar for each Course. Valued assignments shall be returned to the students. The seminars shall be organized by the teacher/teachers in charge of CE and the same shall be assessed by a group of teachers including the teacher/ teachers in charge of that Course. Assignments/Seminars shall be evaluated on the basis of their quality. The teacher shall define the expected quality of an assignment in terms of structure, content, presentation etc. and inform the same to the students. Due weight shall be given for punctuality in submission. Seminar shall be similarly evaluated in terms of structure, content, presentation, interaction etc.

TESTS: (MAX. MARKS 10)

For each Course there shall be one class test during a semester. Valued answer scripts shall be made available to the students for perusal within 10 working days from the date of the test.

ANNOUNCEMENT OF RESULTS OF CE

The results of the CE shall be displayed within 5 working days from the last day of a semester. Complaints regarding the award of marks for CE if any have to be submitted to the Head of the Department within 3 working days from the display of results of CE. These complaints shall be examined by the Department Committee and shall arrive at a decision, which shall be communicated to the student. The Statement of marks of the CE of all the students shall be approved by the Department Committee, countersigned by the Principal and forwarded to the Controller of Examinations within 15 working days from the last day of the semester. The University has the right to normalize the CE, if required, for which separate rules shall be framed.

END SEMESTER EVALUATION (ESE):

End Semester Evaluation of all the Courses in all the semesters shall be conducted by the University. The results of the ESE shall be arranged to be published according to the Examination Calendar prescribed by the University Level Monitoring Committee (ULMC), which shall not exceed 45 days from the last day of the examination.

PROJECT/DISSERTATION WORK:

For each First Degree Programme there shall be a Project/Dissertation Work during the sixth semester on a topic related to any issues in Information Technology industry. The Project/Dissertation work can be done either individually or by a group not exceeding five students under the supervision and guidance of the teachers of the Department. The topics shall either be allotted by the supervising teacher or be selected by the students in consultation with the supervising teacher.

The project work shall have the following stages:

- Project proposal presentation and literature review - 5th semester.
- Field work and data analysis - 6th Semester.
- Report writing and draft report presentation - 6th Semesters.
- Final report submission - 6th Semester

The report shall be printed and spiral bound with around 50 A4 size pages.

The layout is: Font:

Times New Roman Size: 12

Line Spacing: 1.5

Margin: Left - 1.25; Right-1; Top-1; Bottom-1

The project report should be submitted to the Department at least 15 days before the last working day of the sixth semester. The candidate shall prepare three copies of the report: two copies for submission to the Department and one copy for the student to bring at the time of viva-voce

STRUCTURE OF THE REPORT:

1. Title Pages
2. Certificate of the supervising Teacher with signature
3. Contents
4. List of Tables, Figures, Charts etc
5. Chapter 1- Introduction, Review of literature, Statement of the problem, Need and Significance of the study Objectives of the study, Research Methodology, Cauterization scheme etc.   **(5-8 pages)**
6. Chapter II - Theoretical Back ground   **(5-8 pages)**
7. Chapter III - Data Analysis and Interpretation
8. Chapter) IV Summary, Findings and Recommendations
9. Appendix Questionnaire, Specimen copies of forms, other exhibits
10. Appendix Questionnaire, Specimen copies of forms, other exhibits
11. Bibliography (Books, journal articles, website etc. used for the project work

EVALUATION

- A Board of two examiners appointed by the University shall evaluate the report.
- There shall be no Continuous Evaluation for the Project work.
- Evaluation of project should involve evaluation of the report with a project based vivavoce
- A Viva voce based on the project report shall be conducted individually by the Board of Examiners.
- The total credits for Project work is 3.
- The Maximum Marks for evaluation of the report shall be

100 distributed among the following components,

1. Statement of the problem -   10
2. Objectives of the study –   5
3. Review of literature -   5
4. Methodology -   15
5. Analysis and Interpretation -   5
6. Presentation of the report -   10
7. Findings and suggestions -   10

8. Bibliography –   5
9. Viva-Voce –   25

                      Total – 100

Total marks for the ESE of Practical is 80.The components of ESE of Practical have to be set by the Chairmen, Boards of Studies, concerned.

The marks for the components of Practical for Continuous Evaluation shall be as shown below

A	Attendance	5 marks
B	Record	5 marks
C	Test	5 marks
D	Performance, Punctuality and skill	5 marks

The marks of a Course are consolidated by combining the marks of ESE and CE (80+20). A minimum of 40% marks (E Grade) is required for passing a Course with a separate minimum of 40%(E Grade) for Continuous Evaluation and End Semester

EVALUATION

Consolidation of SCPA:

SCPA is obtained by dividing the sum of Credit Points (CP) obtained in a semester by the sum of Credits (C) taken in that semester. After the successful completion of a semester, Semester Credit Point Average (SCPA) of a student in that semester shall be calculated.

For the successful completion of a semester, a student has to score a minimum SCPA of 4.00 (E Grade). However, a student is permitted to move to the next semester irrespective of his / her SCPA.

Consolidation of CCPA: An overall letter Grade (Cumulative Grade) for the whole Programme shall be awarded to the student based on the value of CCPA using a 7-point scale, as given below. It is obtained by dividing the sum of the Credit Points in all the Courses taken by the student, for the entire Programme by the total number of Credit

OVERALL GRADE IN A PROGRAMME

Percentage of Marks	CCPA	Letter of Grade

90 and above	9 and above	A + Outstanding
80 to < 90	8 to <9	A Excellent
70 to < 80	7 to <8	B Very Good
60 to < 70	6 to <7	C Good
50 to < 60	5 to <6	D Satisfactory
40 to< 50	4to<5	E Adequate
Below 40	<4	F Failure

The Marks of the Courses taken over and above the minimum prescribed Credits shall not be counted for computing CCPA.

For the successful completion of a Programme and award of the Degree, a student must pass all Courses satisfying the minimum Credit requirement and must score a minimum CCPA of 4.00 or an overall grade of E.

The Marks of the Courses taken over and above the minimum prescribed Credits shall not be counted for computing CCPA.

For the successful completion of a Programme and award of the Degree, a student must pass all Courses satisfying the minimum Credit requirement and must score a minimum CCPA of 4.00 or an overall grade of E.

PATTERN OF QUESTIONS

Question Type	Total No of Questions	No of Question to be answered	Marks of Each Questions	Total Marks
Very short answer type(One word to Maximum of 2 sentences)	10	10	1	10
Short answer(Not to exceed one paragraph)	12	8	2	16
Short essay(Not to exceed 120 words)	9	6	4	24
Long essay	4	2	15	30
Total	35	26		80

GRACE MARKS:

Grace marks shall be awarded for Sports/Arts/ NCC/NSS in recognition of meritorious achievements

MARK CUM GRADE SHEET

The University under its seal shall issue to the students a Mark cum Grade Sheet on completion of each semester indicating the details of Courses, Credits, Marks for CE and ESE, Grades, Grade Points, Credit Points and Semester Credit Point Average (SCPA) for each Course.

The Consolidated Mark cum Grade sheet issued at the end of the final semester on completion of the Programme shall contain the details of all Courses taken during the entire Programme including Additional Courses taken over and above the prescribed minimum Credits for obtaining the Degree. However, for the calculation of CCPA, only those Courses in which the student has performed the best with maximum Credit Points alone shall be taken subject to the minimum requirements of Credits for successful completion of a Programme. The Consolidated Mark cum Grade sheet shall indicate the CCPA and CCPA(S)* and the overall letter grade for the whole Programme. The Consolidated Mark cum Grade sheet shall also indicate all the Audit Courses (Zero Credit) successfully completed by the student during the whole Programme.

No student shall be eligible for the award of the Degree unless he/she has successfully completed a Programme of not less than 6 semesters duration and secured at least 180 Credits (excluding Credits for Social Service/Extension Activities) as prescribed by the Regulations.

The Degree to be awarded shall be called Bachelors of Vocation in Information Technology as specified by the Board of Studies and in accordance with the nomenclature specified by the Act and Statutes of the University.

* CCPA(S) is CCPA for specialized subjects. (It is computed in a similar manner but without considering the Language Courses, Foundation Course for Language and Open Course)

BVoc-IT-G-101: COMMUNICATION SKILLS IN ENGLISH

YEAR: 1   CREDIT: 4   SEMESTER: 1   MAXIMUM MARKS: 100

UNIT I

Communication: Meaning, Importance, and Process, Objectives of Communication, Effective Communication, Means/ Media and Types of Communication, Channels of Communication, Barriers to Communication, Voice Training, Importance of Feedback. Interview, Report Writing, Speeches and Presentations, Documentation.

UNIT II

Preparation of Extempore speech: Group Discussion, Debates, Declamation; Stage Confidence. Business Correspondence: Definition, Importance Business letters: Essential features, Parts and Layout, Types: Purchase order letter, Enquiry Letter, Quotation Letter, Acceptance Letter, Refusal Letter, Follow up Letter and Cancellation of order letter.

UNIT III

Personality Development: Types of personality, Dynamics of Personality, Personality Traits, Influences on Personality, Personality Analysis through body language and Individual habits, Physical Aspects of personality, Emotional Stability.

UNIT IV

Memory Training: Mind and mental development, Mental Blocks, Manners and Art of Living.

Suggested Text Books:

1. The Written Word, Vandan R.Singh, Oxford University Press, 2006.

2. Business Communication, M.K. Sehgal, Vandana Khetarpal, ABE Books, 2006.

3. Succeeding through Communication, Subhash Jagota, Excel books, 2009.

4. Business Communication: A Practical Approach, Shruti D. Naik, Dreamtech, 2015.

BVoc-IT-G-102: INTRODUCTION TO IT

YEAR: 1   CREDIT: 4   SEMESTER: 1   MAXIMUM MARKS: 100

UNIT I

Computer characteristics: Historic Evolution of Computers; Classification of computers: Microcomputer, Minicomputer, mainframes, Supercomputers; Personal computers: Desktop, Laptops, Palmtop, Tablet PC; Hardware & Software; Speed, storage, accuracy, diligence.

UNIT II

Hardware: CPU, Memory, Input devices, output devices. Memory units: RAM (SDRAM, DDR RAM, RDRAM etc. feature wise comparison only); ROM-different types: Flash memory; Auxiliary storage: Magnetic devices, Optical Devices; Floppy, Hard disk, Memory stick, CD, DVD, CD-Writer; Input devices - keyboard, mouse, scanner, speech input devices, digital camera, Touch screen, Joystick, Optical readers, bar code reader; Output devices: Display device, size and resolution; CRT, LCD; Printers: Dot-matrix, Inkjet, Laser; Plotters, Sound cards & speaker.

UNIT III

Software: System software, Application software; concepts of files and folders, Introduction to Operating systems, Different types of operating systems: single user, multitasking, timesharing multi-user; Booting, POST;

UNIT IV

Operating systems: Windows & Linux; Application software: Generic Features of Word processors, Spread sheets and Presentation software; Computer Viruses & Protection.

Suggested Text Books:

1. Fundamentals of Computers, E. Balaguruswamy, McGraw hill, 2014.

2. Information Technology: The Breaking wave, Dennis P Curtain, McGrawhill, 2014.

3. Introduction to Computers, Peter Norton, McGraw Hill, 2010.

4. Fundamentals of Information Technology, Durgesh Pant, Mahesh Kumar Sharma, Laxmi Publication, 2008.

BVoc-IT-G-103: FUNDAMENTALS OF COMPUTER AND SOFTWARE DEVELOPMENT

YEAR: 1   CREDIT :   4   SEMESTER: 1   MAXIMUM MARKS: 100

UNIT I

Number System: Non-positional and positional number systems, Base conversion, Concept of Bit and Byte, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other.

UNIT II

Understanding Basics of Software Development: Basic Requirements for Software Development. Describing Software Quality Attributes and the problems associated with software and software Development. Professional issues related to Software Development. Understanding Core Programming,

UNIT III

Understanding Programming Technique: Object oriented Programming. Opportunities and Challenges facing software engineering.

UNIT IV

Computer Networks: Connecting computers, Requirements for a network: Server, Workstation, switch, router, network operating systems; Internet: brief history, World Wide Web, Websites, URL, browsers, search engines, search tips; Internet connections, email, (send receive, filter, attach, forward, copy, blind copy)

Suggested Text Books:

1. Foundations of Computing, P.K. Sinha and P. Sinha, BPB, 2006.

2. Fundamentals of Information Technology, Chetan Srivastva, Kalyani Publishers, 2008.

3. Software Engineering, Roger S.Pressman, Tata Mcgraw Hill, 2007.

4. Software Engineering, Ian Somerville, PHI, 2008.

5. Fundamental of Software Engineering, Rajib Mall, PHI, 2004.

BVoc-IT-S-104: PROGRAMMING IN 'C' LANGUAGE

YEAR: 1   CREDIT: 4   SEMESTER: 1   MAXIMUM MARKS   : 100

UNIT I

Overview of C: History of C, Importance of C, Elements of C: C character set, identifiers and keywords, Data types, Constants and Variables, Assignment statement, Symbolic constant, Structure of a C Program, printf(), scanf() Functions, Operators & Expression: Arithmetic, relational, logical, BVITwise, unary, assignment, shorthand assignment operators, conditional operators and increment and decrement operators, Arithmetic expressions, evaluation of arithmetic expression, type casting and conversion, operator hierarchy & associativity.

UNIT II

Decision making & branching: Decision making with IF statement, IF-ELSE statement, Nested IF statement, ELSE-IF ladder, switch statement, goto statement. Decision making & looping: For, while, and do-while loop, jumps in loops, break, continue statement, Nested loops.

UNIT III

Functions: Standard Mathematical functions, Input/output: Unformatted & formatted I/O function in C, Input functions viz. getch(), getche(), getchar(), gets(), output functions viz., putch(), putchar(), puts(), string manipulation functions. User defined functions: Introduction/Definition, prototype, Local and global variables, passing parameters, recursion.

UNIT IV

Arrays, strings and pointers: Definition, types, initialization, processing an array, passing arrays to functions, Array of Strings. String constant and variables, Declaration and initialization of string, Input/output of string data, Introduction to pointers. Storage classes in C: auto, extern, register and static storage class, their scope, storage, & lifetime.

Suggested Text Books:

1. The C Programming Language, Brian W. Kernighan, Dennis Ritchie, 2015.

2. Programming in ANSI C, E. Balagurusamy, TMH, 2008.

3. Let us C, Yashwant Kanetker, BPB, 2016.

4. C: The Complete Reference, Herbert Schildt, McGraw Hill, 2000.

BVoc-IT-S-105: PROJECT– I (BASED ON MS-OFFICE)

YEAR: 1   CREDIT: 4   SEMESTER: 1   MAXIMUM MARKS   : 100

NOTE : STUDENT HAVE TO SUBMIT PROJECT REPORT ON MS- OFFICE SYLLABUS

1. MS-word: Design, create and modify a range of business documents, Displaying Different Views of a Document, Creating and Saving a Document, Selecting, Modifying, Finding and Replace Text, Align Text Using Tabs, Display Text as List Items. Apply Borders and Shading, Preview a document, and adjust its margins and orientation, Insert & Format a Table, Convert Text to a Table, Check Spelling and Grammar, Use the Thesaurus, Print with default or custom settings, Managing Lists – Sort, Renumber, Customize a List, Apply a Page Border and Colour, Sorting Table Data, Control Cell Layout, Perform Calculations in a Table, Creating Customized Formats with Styles and Themes. Create or Modify a Text Style, Create a Custom List or Table Style. Modifying Pictures & Picture Appearance Settings, Wrap Text around a Picture, Insert and Format Screenshots in a Document, Add WordArt , Use the Mail Merge Feature including Envelopes and Labels.

2. MS-Excel: Construct a spreadsheet and populating Cell Data, Formatting Cells - Search Worksheet Data, Changing Fonts, Modify Rows and Columns, Managing Worksheets and Workbooks, Applying Formulas and Functions, Inserting Currency Symbols, Merging cells, Spell Check a Worksheet, Add Borders and Color to Cells, Printing options to output a chart, Modify the Layout of a Paragraph – Tabs, Headers, Footers, Apply Styles & Manage Formatting, Document Templates, Insert contents, page and section breaks, Apply Character Formatting. Clip Art , Symbols, Illustrations, Set Page Breaks, Page Layout Options, Manage Workbook Views, Apply Cell and Range Names, Auto Sum in Cells, Calculate Data Across Worksheets, Sort or Filter Worksheet or Table Data, Create, Modify and Format Charts, Create, modify and format spreadsheets using the full range of the software formatting, features including conditional formatting for example Hide /unhide/freeze rows and columns.

3. MS-PowerPoint: Salient features of POWER POINT, Starting ,Saving and quitting presentation, various components and elements of PowerPoint Package. Insert Clip Art and Graphs. Adding Multimedia Effects to the slide. Formatting and Editing Presentations. Adding Animation and Transition effects to the presentations.

Project Report 50 Marks o Viva Voce 50 Marks

BVoc-IT-S-106: SOFTWARE LAB- I

YEAR: 1   CREDIT: 5   SEMESTER: 1   MAXIMUM MARKS: 100

SYLLABUS Practical (Ms-Office)

1. Documentation Using MS-Word - Introduction to word processing interface, Toolbars, Menus, Creating & Editing Document, Formatting Document, Finding and replacing text, Format painter, Header and footer, Drop cap, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Previewing and printing document, Advance Features of MS-Word-Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

2. Electronic Spread Sheet using MS-Excel - Introduction to MS-Excel, Cell, cell address, Creating & Editing Worksheet, Formatting and Essential Operations, Moving and copying data in excel, Header and footer, Formulas and Functions, Charts, Cell referencing, Page setup, Macros, Advance features of MS-Excel-Pivot table & Pivot Chart, Linking and Consolidation, Database Management using ExcelSorting, Filtering, Validation, What if analysis with Goal Seek, Conditional formatting.

3. Presentation using MS-PowerPoint: Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

4. Introduction to MS Access: creating database creating and manipulating tables, forms, queries, reports, modules, importing and exporting of data.

BVoc-IT-S-107: SOFTWARE LAB- II

YEAR: 1   **CREDIT: 5**   **SEMESTER: 1**   **MAXIMUM MARKS: 100**

This laboratory course will comprise as exercises to supplement what is learnt under paper

Students are required to develop the following programs with internal documentation:

1. Assignments on Data types, Operators, Control Structure (if else, while, for, Do-while), jumping statements in C.
    a. Write a program to print the size of all the data types supported by C .
    b. Write a program to check whether the given number is a even number or not.
    c. Write a program to accept three numbers and find the largest among them.
    d. Write a program to count the different vowels in a line of text using switch.
    e. Write a program to accept two numbers and perform various arithmetic operations (+, -, *, /) based on the symbol entered.
    f. Write a program to find factorial of a number.
    g. Write a program to print all prime numbers between any 2 given limits.
    h. Write a program to print all the Armstrong numbers between any 2 given limits.
    i. Write a program to demonstrate the use of break and continue statements.
2. Assignment on Arrays(one and two dimensional) and strings (string handling functions)
    a. Write a program to find largest element in an array.
    b. Write a program to search an element in an array.
    c. Write a program to find sum and average of numbers stored in an array.
    d. Write a program to check whether a string is a Palindrome.
    e. Write a program to perform matrix addition.
    f. Write a program to perform matrix multiplication.
    g. Write a program to demonstrate string handling functions.
3. Assignment on Pointers and Array of Pointers
    a. Write a function to swap two numbers using pointers.
    b. Write a program to access an array of integers using pointers.
    c. Assignment on Structures and Unions.
    d. Write a program to create an employee structure and display the same.
    e. Write a program to create a student database storing the roll no, name, class etc and sort by name.

The laboratory experiments are based on paper BVoc-IT-S-104: PROGRAMMING IN 'C' LANGUAGE

BVoc-IT-G-201: FUNDAMENTALS OF WINDOWS AND SERVER ADMINISTRATION

YEAR: 1   CREDIT: 4   SEMESTER: 2   MAXIMUM MARKS: 100

UNIT I

Understanding Windows Programming Basics: Identify Windows application types, Implement user interface design. Install a Windows Services application. Accessing Data in a Windows Forms Application: Understand data access methods for a Windows Application, Understand databound controls.   Deploying a Windows Application: Understand windows application deployment methods, integrating data.

UNIT II

Windows 7/8: Installing, upgrading and migrating to Window 7/8, Deploying Windows 7/8, Configuring disk and device drivers, Configuring, file access and printers on Window 7/8 client. Installation: Installation Server 2008, Drivers, Working with windows 2008 Devices, Troubleshooting Devices & Drivers, Managing system updates.

UNIT III

 Working With Disk Storage: Type of Disk Storage, Type of volumes, Implementing fault tolerance, Use disk management tools, Disk Quota, Troubleshooting disk management, Shadow copy.

UNIT IV

Domain Controller: Install Active Directory, Manage Active Directory Component, Working with OU Structure, Working with Domain User account, Working with Domain Groups. Domain Name Services (DNS): Define Name resolution, Install DNS, Configure DNS Client, Manage and Troubleshoot DNS. Dynamic Host Configuration Protocol: Configure DNS Server, Backup and Recovery, Steps for Backup and Recovery.

Suggested Text Books:

1. Mastering Window Server 2008, Mark Minasi, John Paul Mueller, Wiley, 2009.

2. MCSA Windows Server 2012 R2 Complete Study Guide: Exams 70-410, 70-411, 70412, and 70-417, Sybex, 2012.

3. MCTS Windows 7 Configuration Study Guide: Exam 70-680, William Panek, Wiley, 2010.
4. Red Hat Enterprise Linux 7: Desktops and Administration, Richard Petersen, Surfing turtle, 2017. 5. Windows Server 2008 Inside Out, William Stanek, Microsoft press, 2008

BVoc-IT-G-202: MOBILE AND WIRELESS TECHNOLOGIES
YEAR: 1   CREDIT: 4   SEMESTER: 2   MAXIMUM MARKS: 100

UNIT I

Introduction to mobile communication and computing: Why mobile communications, Use-cases, applications, Definition of terms: Challenges, history, Wireless Transmission, Wireless networks in comparison to fixed networks, Simple reference model (TCP/IP model), Influence of mobile communication to the layer model. Wireless Transmission–I : Frequencies for communication- Frequencies for mobile communication, Frequencies and regulations, Signals (physical representation of data, function of time and location.

UNIT II

Wireless Telecommunication Systems: GSM: Overview, Performance characteristics of GSM (w.r.t. analog sys.), GSM: Mobile Services, Architecture of the GSM system, system architecture, GSM - TDMA/FDMA, GSM hierarchy of frames, GSM protocol layers for signaling, Mobile Originated Call, Mobile Originated Call, 4 types of handover, Handover decision, Handover procedure, Data services in GSM, GPRS quality of service, GPRS architecture and interfaces, GPRS protocol architecture. Medium Access Control: Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), FDMA, TDMA, CDMA. UNIT III Wireless LANs : Mobile Communication Technology according to IEEE (examples), Characteristics of wireless LANs (Advantages and disadvantages), Comparison: infrared vs. radio transmission, Comparison: infrastructure vs. ad-hoc networks, 802.11 - Architecture of an infrastructure network, 802.11 - Architecture of an ad-hoc network, IEEE standard 802.11, 802.11 - Layers and functions, WLAN: IEEE 802.11b, WLAN: IEEE 802.11a, Some more IEEE standards for mobile communications.

UNIT IV

Mobile Network Layer: Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP). Mobile Transport Layer I: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP. Mobile Transport Layer II: Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.Data processing and mobility.   4G Technology: The basics of 4G, What is 4G, 4G capable phone.

 Suggested Text Books:
1. Mobile Communications, Jochen Schiller, Addison-Wesley, 2004.
2. Handbook of Wireless Networks and Mobile Computing, Stojmenovic and Cacute, Wiley, 2002.
3. Mobile Database System, Vijay Kumar, Wiley publication, 2010.
4. 5G Mobile and Wireless Communications Technology, Afif Osseiran, Jose F. Monserrat, Patrick Marsch, Mischa Dohler, Takehiro Nakamure, Cambridge University press, 2016.

BVoc-IT-G-203: INTERNET & WEB DEVELOPMENT

YEAR: 1   CREDIT: 4   SEMESTER: 2   MAXIMUM MARKS: 100

UNIT I

Internet: History of internet, The early years, The global Internet, A global information infrastructure, Review of packet switching and its relevance to the internet, topologies, Routers, Dial-up access, IP address. Transmission Control Protocol (TCP), Domain names, Names and IP address, TCP/IP, Flexibility, Reliability and efficiency.

UNIT II

World Wide Web (WWW): Browsing the World Wide Web (WWW), HTML, Web page design with HTML, Features and importance of HTML. Advanced WEB technologies.

UNIT III

HTML: General Introduction to Internet and WWW; Text tags; Graphics, Video and Sound Tags; Link and Anchor Tags; Table Tags; Frame Tags; Miscellaneous tags (layers, image maps etc); CSS; DHTML; Example Applications; HTML Forms and Fields.

UNIT IV

Javascript: Basic data types; control structures; standard functions; arrays and objects, event driven programming in Javascript; Example Applications.

 Suggested Text Books:

1. Advanced Programming in Web Design, V.K. Jain, Cyber Tech Publications, 2008.

2. Internet and Worldwide web programming: How to Program, H M Deitel, P J Deitel, A B Goldberg, Pearson, 2007.

3. Web Technologies: A Computer Science Perspective, Jackson, Pearson Education, 2007.

4. PHP: The Complete Reference, S. Holzner, TMH, 2007.

5. HTML & Web Design, K. Jamsa, Konrad King, TMH, 2002.

6. Servlet Programming, J. Hunter, William Crawford, O'REILY, 2010.

7. Murach's Java Servlets and JSP, J. Murach, Andrea Steelman, Murach's, 2008.

8. Java Servlet & JSP Cookbook, R. Hoekman Jr., Schorr Pub, 2004.

BVoc-IT-S-204: DATA STRUCTURE THROUGH 'C'

YEAR: 1   CREDIT: 4   SEMESTER: 2   MAXIMUM MARKS: 100

UNIT I

Introduction: Elementary data organization, Data Structure definition, Data type vs. data structure, Categories of data structures, Data structure operations, Applications of data structures, Algorithms complexity and time-space tradeoff, Big-O notation. Strings: Introduction, Storing strings, String operations, Pattern matching algorithms.

UNIT II

Arrays: Introduction, Linear arrays, Representation of linear array in memory Multidimensional arrays, Operations in Arrays, Sparse arrays. Linked List: Introduction, Array vs. linked list, Representation of linked lists in memory, Traversal, Insertion, Deletion, Searching in a linked list, Header linked list, Circular linked list, Two-way linked list, Threaded lists, Garbage collection, Applications of linked lists.

UNIT III

Stack: Introduction, Array and linked representation of stacks, Operations on stacks, Applications of stacks: Polish notation, Recursion. Queues: Introduction, Array and linked representation of queues, Operations on queues, Deques, Priority Queues, Applications of queues. UNIT IV Tree: Introduction, Definition, Representing Binary tree in memory, Traversing binary trees, Traversal algorithms using stacks Tree: Header nodes, Threads, Binary search trees, Searching, Insertion and deletion in a Binary search tree, AVL search trees, Insertion and deletion in AVL search tree. B-trees, Searching, Insertion and deletion in a B-tree, B+tree, Huffman's algorithm, General trees.

Suggested Text Books:

1. Fundamentals of Data Structures in C, Horowitz, Sahni & Anderson, Orient longman, 2006.

2. Data Structures and Algorithm Analysis in C, Mark Allen Weiss, Addison-Wesley, 2007.

3. Data Structures, Seymour Lipschutz, TMH, 2006.

4. Expert Data Structures with C, R. B. Patel. Khanna Book Publishing, 2006.

5. Classic Data Structures, D. Samanta, PHI, 2006.

BVoc-IT-S-205: PROJECT – II

YEAR: 1   CREDIT: 4   SEMESTER: 2   MAXIMUM MARKS: 100

SYLLABUS

1. Installation Window 7 and 8, upgrading Windows 7 & 8. Deploying Windows 7/8.
2. Configuring disk and device drivers, Configuring file access, Install printers on Window 7/8 client.
3. Configuring network connectivity and wireless network connections.
4. Install UTP(Straight, Cross, Rollover Cables), IP Addressing with LAN, Subnetting, Implement Wireless Network with LAN.
5. Installation Server 2008, Drivers, Working with windows 2008 Devices, Troubleshooting Devices & Drivers, Managing system updates.
6. Implementing fault tolerance, Use disk management tools, Disk Quota, Troubleshooting disk management, Shadow copy.
7. Install Active Directory, Manage Active Directory Component, Working with OU Structure, Working with Domain User account, Working with Domain Groups, Troubleshooting Active Directory.
8. Configure Auditing, Enable Auditing, Working with Security logs, Install terminal services, Configure terminal services, Working with Remote desktop, Working with telnet, Working with SSH, Manage terminal Services, Network Traffic Monitoring.
9. Install DNS, Configure DNS Client, Manage and Troubleshoot DNS.
10. Configure DNS Server, Working With Super Scope, Configure DHCP Client, Manage and Troubleshoot DHCP Server.
11. Configure VPN , Manage and Troubleshoot on VPN.
12. Implement and Manage Group Policy, Creating GPO"s, Linking GPO"s to Active Directory.

Project Report 50 Marks o Viva Voce 50 Marks

BVoc-IT-S-206: SOFTWARE LAB-III

YEAR: 1   CREDIT: 5   SEMESTER: 2   MAXIMUM MARKS: 100

SYLLABUS

The laboratory experiments are based on paper BVoc-IT-G-203: Internet & Web Development

BVoc-IT-S-207: SOFTWARE LAB-IV

YEAR: 1   CREDIT: 5   SEMESTER: 2   MAXIMUM MARKS: 100

SYLLABUS

The laboratory experiments are based on paper BVoc-IT-S-204: Data Structure Through 'C'

BVoc-IT-G-301: CLOUD COMPUTING

YEAR: 2   CREDIT: 4   SEMESTER: 3   MAXIMUM MARKS: 100

UNIT I

Introduction: Objectives, From collaborative to the Cloud – A short history Client – Server Computing, Peer-to-Peer Computing, Distributed Computing, Collaborative Computing, Cloud Computing, Functioning of Cloud Computing, Cloud Architecture, Cloud Storage, Cloud Services, Industrial Applications.

UNIT II

Business Values, Introduction: Objectives, Service Modeling, Infrastructure Services, Platform Services, Software Services - Software as service modes- Massively scaled software as a service- Scale of Economy, Management and Administration.

UNIT III

Cloud Service Administration: Service Level Agreements and Monitoring Support Services- Accounting Services, Resource Management- IT Security- Performance Management- Provisioning- Service Management, Untangling Software Dependencies.

UNIT IV

Migrating to the Cloud: Introduction- Objectives, Cloud Services for individuals- Available Services - Skytap Solution, Cloud Services Aimed at the mid – market, Enterprise Class Cloud Offerings- MS Exchange - VMotion- VMWare v Center Converter- Hyper – V Live Migration, Migration Applications needed for migration - Moving existing data to cloud- Using the Wave approach.

Suggested Text Books:

1. Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Michael Miller, Que Publications, 2009.

2. Cloud Computing for Dummies, Judith Hurwitz, Robin Bloor, Marcia Kaufman and Fern Halper; Wiley Publishing Inc., 2010.

3. Cloud Computing and SOA Convergence in Your Enterprise: A step by step guide, David S. Linthicum, Addison Wesley, 2010.

4. Cloud Security and Privacy: An enterprise perspective on Risks and Compliance, Tim Mather, Subra Kumaraswamy and Shahed Latif, O'rielly, 2010.

5. Cloud Computing: A Hands-on Approach, Arshdeep Bahga, Vijay Madisetti, Orient Blacksawan, 2014.

BVoc-IT-G-302:   BASICS OF DATA COMMUNICATION

YEAR: 2   CREDIT: 4   SEMESTER: 3   MAXIMUM MARKS: 100

UNIT I

Data Communications, Data Networking, and the Internet: Data communication and networking for today's enterprise, communication model, data communications, networks, the Internet. Protocol architecture and Internet based applications: The need for a protocol architecture, the TCP/IP protocol architecture, the OSI model, standardization within a protocol architecture, traditional Internet based applications, multimedia.

UNIT II

Data transmission: Analog and digital data transmission, transmission impairments, channel capacity Transmission media: Guided transmission media, wireless transmission, wireless propagation, line-of-sight transmission

UNIT III

Signal encoding techniques: Digital data-digital signals, digital data-analog signals, analog data-digital signals, analog data – analog signals. Digital data communication techniques Asynchronous and synchronous transmission, types of errors, error detection, error correction, line configuration.

UNIT IV

Multiplexing: Frequency division multiplexing, synchronous time division multiplexing, statistical time division multiplexing, Asymmetric digital subscriber line. Spread spectrum :Concept of spread spectrum, frequency hopping spread spectrum, direct sequence spread spectrum, code-division multiple access

Suggested Text Books:

1. Data and Computer Communication, W. Stallings, Prentice Hall of India, 2007.

2. Data Communication and Networking, B. A. Forouzan, McGraw-Hill, 2007.

3. Computer Networks, Prentice Hall, A. S. Tanenbaum, 2008.

4. Internetworking with TCP/IP, D. Comer, Prentice Hall of India, 2006.

5. TCP/IP Illustrated: The Protocol, W. Richard Stevens, Addison-Wesley, 2011.

6. Cryptography and Network Security: Principles and Practice, W. Stallings, PHI, 2008.

7. A course in number theory and cryptography, N. Koblitz, Springer, 2008.

8. Secure Coding in C and C++, R. C. Seacord, Addison-Wesley, 2005.

9. Network Security with OpenSSL, J. Viega, M. Messier, P. Chandra, O'Reilly, 2009.

10. Secure Programming Cookbook for   C   and   C++:   Recipes   for Cryptography, Authentication, Input Validation & More, J. Viega, M. Messier, O'Reilly, 2009.

BVoc-IT-G-303: E-COMMERCE

YEAR: 2   CREDIT: 4   SEMESTER: 3   MAXIMUM MARKS: 100

UNIT I

Introduction to E-Commerce: Defining Commerce; Main Activities of Electronic Commerce; Benefits of E-Commerce; Broad Goals of Electronic Commerce; Main Components of E-Commerce; Functions of Electronic Commerce – Communication, Process Management, Service Management, Transaction Capabilities; Process of E-Commerce; Types of E-Commerce; Role of Internet and Web in E-Commerce; Technologies Used; ECommerce Systems; Pre-requisites of E-Commerce; Scope of ECommerce; E-Business Models.

UNIT II

E-Commerce Activities: Various Activities of E-Commerce; Various Modes of Operation Associated with E-Commerce; Matrix of E-Commerce Types; Elements and Resources Impacting E-Commerce and Changes; Types of E-Commerce Providers and Vendors; Man Power Associated with ECommerce Activities; Opportunity Development for E-Commerce Stages; Development of E-Commerce Business Case; Components and Factors for the Development of the Business Case; Steps to Design and Develop an ECommerce Website.

UNIT III

E-Marketing: Traditional Marketing; E-Marketing; Identifying Web Presence Goals – Achieving web presence goals, Uniqueness of the web, Meeting the needs of website visitors, Site Adhesion: Content, format and access; Maintaining a Website; Metrics Defining Internet Units of Measurement; Online Marketing; Advantages of Online Marketing. E-Payment Systems: Electronic Funds Transfer; Digital Token Based EPayment Systems; Modern Payment Systems; Steps for Electronic Payment; Payment Security; Net Banking.

UNIT IV

E-Customer Relationship Management: Customer Relationship Management (CRM) Electronic Customer Relationship Management; Need, Architecture and Applications of Electronic CRM. Implementation of E-Commerce: WWW.EBAY.COM - B2C Website – Registration, Time factor, Bidding process, Growth of eBay; PayPal – New Trend in Making Payments Online; National Electronic Funds Transfer.

Suggested Text Books:

1. Introduction to E – Commerce, Nidhi Dhawan, International Book House, 2013.

2. Concepts of E-Commerce, Adesh K. Pandey, S. K. Kataria & Sons, 2010.

3. E-Commerce, Fundamentals And Applications, Henry Chan, Raymond Lee, Tharam Dillon and Elizabeth Chang, Wiley, 2007.

4. E-Commerce: The Cutting Edge of Business, K.K. Bajaj, Debjani Nag, MCGraw Hill, 2005.

BVoc-IT-S-304: OBJECT ORIENTED PROGRAMMING IN C++

YEAR: 2   CREDIT: 4   SEMESTER: 3   MAXIMUM MARKS: 100

UNIT I

Introduction to C++: key concepts of Object-Oriented Programming Advantages Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures : - Decision Making and Statements : If .. else ,jump, goto, break, continue, Switch case statements - Loops in C++ : For, While, Do - Functions in C++ - Inline functions – Function Overloading.

UNIT II

Classes and Objects: Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects –friend functions – Overloading member functions – BVIT fields and classes – Constructor and destructor with static members.

UNIT III

Overloading: Overloading unary, binary operators – Overloading Friend functions – type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchal, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.

UNIT IV

Pointers: Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes – Memory models – new and delete operators – dynamic object – Binding , Polymorphism and Virtual Functions. Files – File stream Exception Handling Miscellaneous functions.

Suggested Text Books:

1. Object-oriented programming with ANSI and TURBO C++, Ashok N. Kamthane, Pearson , 2003.

2. Object-oriented programming with C++, E. Balagurusamy, TMH, 2006.

3. Programming with C++, John R Hubbard, TMH. 2000.

BVoc-IT-S-305: OBJECT ORIENTED PROGRAMMING IN JAVA

YEAR: 2   CREDIT: 4   SEMESTER: 3   MAXIMUM MARKS: 100

UNIT I

Java Evolution: History – Features – How Java differs from C and C++ – Java and Internet – Java and www –Web Browsers. Overview of Java: simple Java program– Structure – Java Tokens – Statements – Java Virtual Machine.

UNIT II

Java Constructs: Constants, Variables, Data Types - Operators and Expressions – Decision Making and Branching: if, if ..else, nested if, switch, ? : Operator - Decision Making and Looping: while, do, for – Jumps in Loops - Labeled Loops – Classes, Objects and Methods.

UNIT III

Programming: Arrays, Strings and Vectors – Interfaces: Multiple Inheritance – Packages: Putting Classes together – Multithreaded Programming.

UNIT IV

Errors and Exceptions: Managing Errors and Exceptions – Applet Programming – Graphics Programming. Managing Input / Output Files in Java : Concepts of Streams- Stream.

Suggested Text Books:

1. Programming with java – a primer, E. Balagurusamy, TMH, 2012.

2. The complete reference java 2, Patrick Naughton & Hebert Schildt, McGraw Hill, 2012.

3. The programming with Java, John R. Hubbard, TMH, 2009.

BVoc-IT-S-306: SOFTWARE LAB-V

YEAR: 2   CREDIT: 5   SEMESTER: 3   MAXIMUM MARKS: 100

SYLLABUS

The laboratory experiments are based on paper BVoc-IT-S-304: Object Oriented Programming in C++

BVoc-IT-S-307: SOFTWARE LAB-VI

YEAR: 2   CREDIT: 5   SEMESTER: 3   MAXIMUM MARKS: 100

SYLLABUS

The laboratory experiments are based on paper BVoc-IT-S-305: Object Oriented Programming in Java.

BVOC-IT-G-401: DISCRETE MATHEMATICS

YEAR: 2   CREDIT: 4   SEMESTER: 4   MAXIMUM MARKS: 100

UNIT I

Set theory: (Basic definitions), union, intersection, complement, difference of sets, DeMorgan's Laws, Subsets, power sets, Equal vs. equivalent sets, Cartesian products

UNIT II

Relations and Functions: Relations and functions, Symmetry, transitivity, reflexivity, Equivalence classes, Congruence, Functions, domain, range, co-domain of functions, Oneto-one, onto function, inverse of a function.

UNIT III

Permutations and Combinations: Permutations, Combinations, Binomial Theorem, Pascal's Triangle, Towers of Hanoi, Recurrence Relations, Graphs and Trees. UNIT IV Groups: Definitions, Examples, Properties, Semigroups, Monoids, Sub Groups, Normal SubGroup, Homomorphism

Suggested Text Books:

 1. Discrete Mathematical Structures, Tremblay and Manohar, Tata McGraw Hill, 2007.

2. Discrete Mathematics, Semyour Lipschutz, Varsha PatilIInd, Schaum"s Series, TMH, 2009.

3. Discrete Mathematical Structures, Kolman, Busby and Ross, PHI, 2009.

4. Elements of Discrete Structures, C. L. Liu, 2002.

5. Discrete Mathematics and its application, K. H. Rosen, MacGraw Hill, 2010.

6. Fundamental Approach to Discrete Mathematics, D. P. Acharjaya, Sreekumar, New Age, 2008.

BVoc-IT-G-402: HUMAN RESOURCE MANAGEMENT

YEAR: 2   CREDIT: 4   SEMESTER: 4   MAXIMUM MARKS: 100

UNIT I

Introduction to Human Resource Management: Importance--scope and objectives of HRM. Evolution of the concept of HRM- Approaches to HRM- Human Resource Development- HRD and competitive advantage- .

UNIT II

Personal Skills: Knowing oneself- confidence building- defining strengths-thinking creatively- personal values-time and stress management. Social Skills- Appropriate and contextual use of language- non-verbal communication- interpersonal skills- problem solving.

UNIT III

Personality Development: Personal grooming and business etiquettes, corporate etiquette, social etiquette and telephone etiquette, role play and body language.

UNIT IV

Presentation skills: Group discussion- mock Group Discussion using video recording- public speaking. Professional skills - Organizational skills- team work- business and technical correspondence- job oriented skills-professional etiquettes

 Suggested Text Books:

1. Human Resource Management-Text and Cases, V. S. P. Rao, Excel Books, 2010.

2. Interpersonal Skills for Travel and Tourism, Jon Burton, Lisa Burton, Longman, 2007.

3. Business Communication Today, Courtland L. Bovee, C. Allen Paul, John V. Thill, Pearson, 2014.

4. Effective Business Communication, Herbert W. Hildebrandt, Herta A. Murphy, Jane P. Thomas, McGraw Hill, 2008.

BVoc-IT-G-403: INTRODUCTION TO RDBMS & SQL

YEAR: 2   CREDIT: 4   SEMESTER: 4   MAXIMUM MARKS: 100

UNIT I

Introduction to database systems: File Systems Versus a DBMS, View of data, Data abstraction, View levels, Data models, Instances and Schemas, Data Independence, Database languages, Database architecture, Database users, Database administrator, Role of DBA. The Entity Relationship (ER) model Entity sets, Relationship sets, Attributes, Constraints, Mapping Cardinalities, Keys, ER diagrams, Weak entity sets, Strong entity sets. Normalization, need for normalization, functional dependency, Normal forms-First, Second, Third, BCNF, Multi valued functional dependency, Fourth and Fifth Normal forms.

UNIT II

Data Definition in SQL: Data types, Creation, Insertion, Viewing, Updation, Deletion of tables, modifying the structure of the tables, Renaming, Dropping of tables. Data Constraints – I/O constraints, Primary key, foreign key, unique key constraints, ALTER TABLE command.

UNIT III

Database Manipulation in SQL: Computations done on table data - Select command, Logical operators, Range searching, Pattern matching, Grouping data from tables in SQL, GROUP BY, HAVING clauses, Joins – Joining multiple tables, Joining a table to itself. Views - Creation, Renaming the column of a view, destroys view, Granting and revoking permissions: Granting privileges, Object privileges, Revoking privileges.   UNIT IV Program with SQL: Data types: Using set and select commands, procedural flow, if, if /else, while, goto, global variables, Security - Locks, types of locks, levels of locks. Cursors - Working with cursors, Error Handling, Developing stored procedures, create, alter and drop, passing and returning data to stored procedures, using stored procedures within queries, building user defined functions , creating and calling a scalar function , implementing triggers, creating triggers , multiple trigger interaction.

Suggested Text Books:

1. Fundamentals of Database Systems, Elmasri & Navathe, Pearson Education, 2007.

2. Database System Concepts, Abraham Silberschatz, Henry Korth, McGraw Hill, 2006.

3. Introduction to Database Systems, C J Date, Addison Wesley, 2005. 4. SQL, PL/SQL the Programming Language of Oracle, Ivan Bayross, BPB, 2010.

BVoc-IT-S-404: .NET PROGRAMMING

YEAR: 2   CREDIT: 4   SEMESTER: 4   MAXIMUM MARKS: 100

UNIT I

Basic of the .net framework: .net architecture, managed code, assemblies, CLR, execution of assemblies code, IL, JIT, .NET framework class library, common type system, common language specification, interoperability with unmanaged code.

UNIT II

Introduction to VB.Net and C#: VB.Net: Net features, Data Types C#: Data Types, Operators, Garbage Collection, Jagged Array, Collection (Array list, Hash table), Indexer(One Dimension) and property, Delegates and events (Multicasting, Multicasting Event), Exception Handling.

UNIT III

ADO.Net & Object Oriented Concepts (Using VB.Net or C#): Basic window control, Architecture of ADO.Net, Comparison with ADO, .Net Data provider, Data Adapter, Data Set, Data Row, Data Column, Data Relation, command, Data Reader, Data Grid Constructor, Destructor, Abstraction, interface, polymorphism (Over loading and over ridding)

UNIT IV

ASP.Net : Anatomy of ASP.NET Page, Server Controls : label, dropdown list box, validation controls, list box, text box, radio button, check box, State Management: session, caching, Authentication (window,.Net Passport, Forms Based), Authorization, web services, Advance Grid Manipulation.

 Suggested Text Books:

1. Applied .Net Framework Programming, In MS VB.Net, Jeffrey Richter, Francesco Balena, TMH 2009.

2. Complete Reference C#, Herbert Schildt, TMH Publication, 2010.

3. Microsoft Visual Basic.NET step by step, Michael Halvorsan, PHI, 2009.

4. Microsoft ASP.Net With C#.Net step by step, G. Andew Duthie, PHI, 2008.

5. .NET 4.5 Programming 6-in-1, Black Book, Kogent Learning Solutions Inc., Dreamtech, 2013.

BVoc-IT-S-405: Software Lab-VII

YEAR: 2   CREDIT: 5   SEMESTER: 4   MAXIMUM MARKS: 100

SYLLABUS

The laboratory experiments are based on paper BVoc-IT-G-403: INTRODUCTION TO RDBMS & SQL

BVoc-IT-S-406: Software Lab-VIII

YEAR: 2   **CREDIT: 5**   **SEMESTER: 4**   **MAXIMUM MARKS: 100**

SYLLABUS

The laboratory experiments are based on paper BVoc-IT-S-404: .Net Programming

BVoc-IT-S-407: INDUSTRIAL TRAINING/ MINI PROJECT-III

YEAR: 2   CREDIT: 4   SEMESTER: 4   MAXIMUM MARKS: 100

In This course student will have to do Industrial training on live project for 3 Months. The

Industry should be ISO certified. In Last Student have to Submit Project Report of their training to the supervisor.

1. Project Report   50 Marks

2. Viva Voce 50 Marks

BVoc-IT-G-501: ENVIRONMENTAL STUDIES

YEAR: 3   CREDIT: 4   SEMESTER: 5   MAXIMUM MARKS: 100

UNIT I

Environment and Ecosystem: Environment: Introduction, importance and components of Environment; Scope and importance of environmental studies Ecosystems: Concept, structure and Function of an ecosystem; Energy flow, Ecological succession, Food chains, Food webs, Ecological pyramids, Ecological Niche and Keystone Species. UNIT II Natural Resources and Conservation : Introduction and classification of Natural Resources (a) Forest resources: Use and over-exploitation, deforestation, Timber extraction, mining, dams and their effects on forests and tribal people (b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, interlinking of rivers, dams-benefits and problems. rain water harvesting, watershed management. (c) Energy resources: Growing energy needs, renewable, non-renewable and alternate energy resources. (d) Land resources: Land as a resource, land degradation, human induced landslides, soil erosion and desertification. water logging and salinity Biodiversity: Introduction, issues and concerns

UNIT III

Environmental Issues and Management : Introduction to Environmental Pollution Causes, effects and control measures of: (a) Air pollution (b) Water pollution, (c) Soil pollution (d) solid waste, (e) Noise pollution (f) Nuclear hazards Sustainable development: concept and issues Environmental ethics: Issues and possible solutions. Environmental Issues relating to Climate change, global warming, acid rain, ozone layer depletion UNIT IV Human and Environment : Population-Environment Relationship; Environment and human health; Role of Information Technology in environmental management and human health.

 Suggested Text Books:

1. Text Book of Environmental Studies, Bharucha Erach, University Press (India), 2005.

2. The Biodiversity of India, Bharucha Erach, Mapin Publishing Pvt. Ltd, 2003.

3. Environmental Science, S. C. India Santra, New Central Agency Pvt Ltd., 2005.

4. Perspectives in Environmental Studies, Kaushik, Anubha & Kaushik, New Age International (P) Ltd. Publisher, 2006.

5. Environmental Geography, Singh Savindra, Prayag Pustak Bhawan, 2003.

BVoc-IT-G-502: ENTREPRENEURSHIP DEVELOPMENT

 YEAR: 3   CREDIT: 4   SEMESTER: 5   MAXIMUM MARKS: 100

UNIT I

Concepts of entrepreneur: Entrepreneur- Definitions-Characteristics ofentrepreneurClassification of entrepreneur-Entrepreneurial traits- Entrepreneurial functions-role of entrepreneurs in the economic development- Factor effecting entrepreneurial growthEntrepreneurship - Meaning- definition- Entrepreneur VsIntrapreneur- Women Entrepreneurs-Recent development-Problems-Entrepreneurial Development Programmes- Objectives of EDP-Methods of training- Phases of EDP.

UNIT II

Institutional support and incentives to entrepreneurs: Functions of Department ofIndustries and Commerce (DIC) - Activities of Small Industrial Development Corporation (SIDCO)- Functions of National Small Industries Corporation(NSIC)-Functions of Small Industries Development Bank of India (SIDBI)-Khadi Village Industry Commission (KVIC)Small Industries Service Institute (SISI)- Functions and services of Kerala Industrial Technical Consultancy Organisation (KITCO)-Activities of Science and Technology Entrepreneurship Development Project (STEDP)-Strategies of National entrepreneurship Development Board(NEDB)-Objectives of National Institute for entrepreneurship and small business development (NIESBUD)- Techno park-Functions of techno park IncentivesImportance- Classification of incentives- Subsidy- Types of Subsidy

UNIT III

Micro Small and Medium Enterprises: Features- Objectives- Importance- Role ofSME in the economic development- MSME Act 2006- Salient features- Credit Guarantee Fund Trust Scheme for MSMEs - Industrial estates-Classification-Benefits-Green channel-Bridge capital- Seed capital assistance-Margin money schemes –Single Window System-Sickness- Causes – Remedies- Registration of SSI UNIT IV Setting up of Industrial unit: (Only Basic study) Environment forEntrepreneurship – Criteria for selecting particular project- Generating project ideas-Market and demand analysis-Feasibility study- Scope of technical feasibility- Financial feasibility-Social cost benefit analysis-Government regulations for project clearance- -Import of capital goods- approval of foreign collaboration-Pollution control clearances- Setting up of micro small and medium enterprises-Location decision- Significance.

 Suggested Text Books:

1. Entrepreneurship and small Business Management, M. B. Shukla, Kitab Mahal Allahabad, 2012.

2. Fundamentals of entrepreneurship, Sangram Keshari Mohanty, PHI, 2011.

3. Fundamentals of Entrepreneurship, H. Nandan, PHI, 2010.

4. Project Management, C.N. Sontakki, Kalyani Publishers, 2012.

5. Innovation and Entrepreneurship, Peter F. Drucker, Harper Business, 2006.

6. Small Business Entrepreneurship, Vasanth Desai, Himalaya Publications, 2010.

BVoc-IT-G-503: MANAGEMENT INFORMATION SYSTEM

YEAR: 3   CREDIT: 4   SEMESTER: 5   MAXIMUM MARKS: 100

UNIT I

Introduction : An introduction to information systems, Information systems in organizations, Information Technology Concepts, The IS Revolution; Information requirement for the different levels If management, transaction processing system, Management information system, Decision support system. Strategic Role of Information Systems.Business Processes; Information management, and Decision Making. Computers and Information Processing;

UNIT II

Transaction processing: Transaction processing system; hardware and software requirements, tools used, case studies, merits and demerits of transaction processing system.

UNIT III

Management: Managerial control, Information and tools required, difference between transactional system and managerial system. Frequency of taking outputs, Need for interconnected system, common database, Redundancy control, case studies. Decision support system, concept and tools, case studies, virtual organizations, strategic decisionsunstructured approach, cost and values of unstructured information.

UNIT IV

Optimization: Optimization techniques, difference between optimization tools and DSS tools expert system, difference between expert system and management information system.

Suggested Text Books:

1. Management Information Systems, Rajaraman, PHI, 2011.

2. Management Information Systems, S. SADAGOPAN, PHI, 2014.

3. Management Information Systems: A Managerial Perspective, U.G. Gupta, West Publishing Co., 1996.

4. Management Information Systems, W. S. JAWADEKAR, TMH, 2002.

5. Management Information Systems Paperback, T. Lucey, PBPB, 2009.

BVOC-IT-S-504:   COMPUTER NETWORKS

 YEAR: 3   CREDIT: 4   SEMESTER: 5   MAXIMUM MARKS: 100
UNIT I

Introduction to communications and Networking : Introduction – Fundamental concepts - Data communications – Protocols- standards - Standards organizations - Signal propagations-

Analog and Digital signals- Bandwidth of a signal and a medium - Fourier analysis and the concept of bandwidth of a signal - The data transmission rate and the bandwidth. Information encoding: Introduction – Representing different symbols- Minimizing errors- Multimedia – Multimedia and Data compression.

UNIT II

Analog and digital transmission methods: Introduction - Analog signal, Analog transmission - Digital signal, Digital transmission - Digital signal , Analog transmission - Baud rate and BVSDs per second - Analog signal, Digital (Storage and) transmission - Nyquist Theorem. Modes of data transmission and Multiplexing: Introduction – Parallel and Serial communication - Asynchronous, Synchronous and Isochronous communication - Simplex, Half-duplex and Fullduplex communication – Multiplexing - Types of Multiplexing - FDM versus TDM. Transmission Errors: Detection and correction: Introduction – Error classification – Types of Errors – Error detection.

UNIT III

Transmission media: Introduction - Guided media - Unguided media - Shannon capacity. Network topologies, switching and routing algorithms: Introduction - Mesh topology - Star topology - Tree topology - Ring topology - Bus topology - Hybrid topology - Switching basics Circuit switching – Packet switching - Message switching - Router and Routing – Factors affecting routing algorithms - Routing algorithm -Approaches to routing.

UNIT IV

Networking protocols and OSI model: Introduction – Protocols in computer communications - The OSI model - OSI layer functions. Integrated services digital networking (ISDN): Introduction – Background of ISDN - ISDN architecture – ISDN interfaces - Functional grouping – Reference points - ISDN protocol architecture - Broadband ISDN (B-ISDN) of ATM – Packet size – Virtual circuits in ATM – ATM cells – Switching – ATM layers – Miscellaneous Topics, Network protocols; IP, IPv4, IPv6, UPD, TCP,HTTP, SHTTP, FTP, POP, SMTP, etc.

 Suggested Text Books:

1. Data and Computer Communication, W. Stallings, Prentice Hall of India, 2007.
2. Data Communication and Networking, B. A. Forouzan, McGraw-Hill, 2007.
3. Computer Networks, Prentice Hall, A. S. Tanenbaum, 2008.
4. Internetworking with TCP/IP, D. Comer, Prentice Hall of India, 2006.

BVoc-IT-S-505: PHP PROGRAMMING

YEAR: 3   CREDIT: 4   SEMESTER: 5   MAXIMUM MARKS: 100

UNIT I

Introduction: Introducing PHP – Basic development Concepts – Creating first PHP Scripts – Using Variable and Operators – Storing Data in variable – Understanding Data types – Setting and Checking variables Data types – Using Constants – Manipulating Variables with Operators.

UNIT II

Controlling Program Flow: Writing Simple Conditional Statements - Writing More Complex Conditional Statements – Repeating Action with Loops – Working with String and Numeric Functions.

UNIT III

Working with Arrays: Storing Data in Arrays – Processing Arrays with Loops and Iterations – Using Arrays with Forms - Working with Array Functions – Working with Dates and Times.

UNIT IV

Using Functions and Classes: Creating User-Defined Functions - Creating Classes – Using Advanced OOP Concepts. Working with Files and Directories: Reading Files-Writing FilesProcessing Directories. Working with Database and SQL : Introducing Database and SQL-Using MySQL-Adding and modifying Data-Handling Errors – Using SQLite Extension and PDO Extension. Introduction XML—Simple XML and DOM Extension.

Suggested Text Books:

1. Data and Computer Communication, W. Stallings, Prentice Hall of India, 2007.

2. Data Communication and Networking, B. A. Forouzan, McGraw-Hill, 2007.

3. Computer Networks, Prentice Hall, A. S. Tanenbaum, 2008.

4. Internetworking with TCP/IP, D. Comer, Prentice Hall of India, 2006.

5. TCP/IP Illustrated: The Protocol, W. Richard Stevens, Addison-Wesley, 2011.

6. Cryptography and Network Security: Principles and Practice, W. Stallings, PHI, 2008.

7. A course in number theory and cryptography, N. Koblitz, Springer, 2008.

8. Secure Coding in C and C++, R. C. Seacord, Addison-Wesley, 2005.

9. Network Security with OpenSSL, J. Viega, M. Messier, P. Chandra, O'Reilly, 2009.

10. Secure Programming Cookbook for C and C++: Recipes for Cryptography, Authentication, Input Validation & More, J. Viega, M. Messier, O'Reilly, 2009.

BVoc-IT-S-506: SOFTWARE LAB-IX

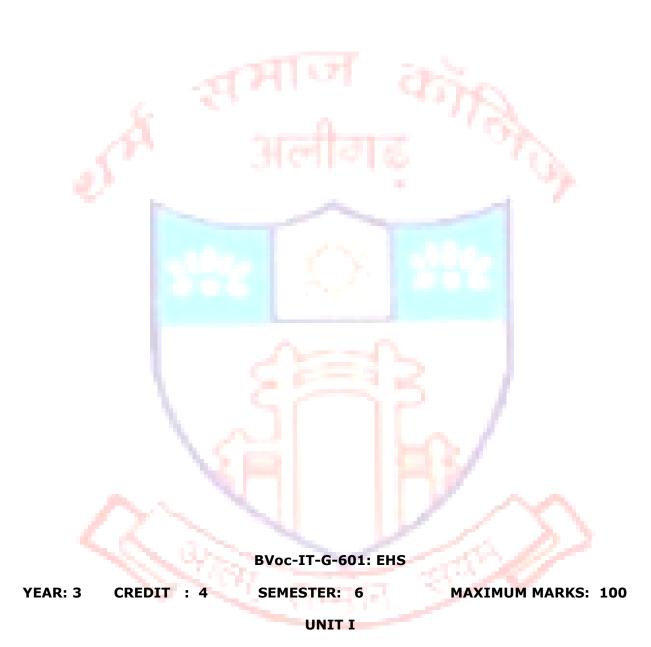**YEAR: 3   CREDIT: 5   SEMESTER: 5   MAXIMUM MARKS: 100**

SYLLABUS

The laboratory experiments are based on paper BVOC-IT-S-504: COMPUTER NETWORKS

BVoc-IT-S-507: SOFTWARE LAB-X

YEAR: 3   **CREDIT: 5**   **SEMESTER: 5**   **MAXIMUM MARKS: 100**

SYLLABUS

The laboratory experiments are based on paper BVoc-IT-S-505: PHP Programming

BVoc-IT-G-601: EHS

YEAR: 3   CREDIT : 4   SEMESTER: 6   MAXIMUM MARKS: 100

UNIT I

Geography and Environment: Geography and Environment of the Eastern Himalaya [Darjeeling, Sikkim, Bhutan, Arunachal Pradesh] Delineation of the Eastern Himalaya as a region Physiography; Climate; Drainage; Biodiversity and overview of Natural Resources UNIT II Historical background: History of Sikkim and Darjeeling since 17th century; Spatial relations (Trade and Religious linkages) of Sikkim with its neighbours- Tibet, Bhutan and Nepal. UNIT

III Society, Economy and Politics: Society and Culture in Darjeeling-Sikkim; Economy and Livelihood in Darjeeling - Sikkim with emphasis on Agriculture, Industry and Tourism; Social and Political dimensions of Sikkim-Darjeeling Himalaya

UNIT IV

Critical Environmental Issues: Development Bottlenecks: Potentials, Prospects and Implications with special reference to Hydro-resources, Communication and Industrial Development. Natural Hazards and Disaster Management, Degradation of Bio-Resources, Climate Change

Suggested Text Books:

1. Land and people of the Himalaya, S. C. Bose, Indian Publications, 1968.

2. The Himalayan Kingdoms, P. P. Karan, W. M. Jenkins, W.M, Princeton, 1963.

3. Enchanted Frontiers: Sikkim, Bhutan and India's North-Eastern Borderland, N. Rustumji, Oxford University Press, 1971.

4. The Eastern Himalayas: Environment and Economy, R. L. Sarkar and Mahendra P Lama, Atma Ram, 1986.

5. Among the Himalayas, L. A. Waddell, Mittal Publication, 1979.

BVoc-IT-G-602: SOFTWARE ENGINEERING

YEAR: 3   CREDIT: 4   SEMESTER: 6   MAXIMUM MARKS: 100

UNIT I

Introduction: Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models. Software Requirements Analysis & Specifications: Requirement engineering, requirement elicitation techniques like FAST, QFD, requirements

analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS .

UNIT II

Software Project Management Concepts: The Management spectrum, The People The Problem, The Process, The Project. Software Project Planning: Size Estimation like lines of Code & Function Count, Cost Estimation Models, COCOMO, Risk Management.

UNIT III

Software Design: Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design, Software Metrics: Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics, Software Implementation: Relationship between design and implementation, Implementation issues and programming support environment, Coding the procedural design, Good coding style.

UNIT IV

Software Testing: Testing Process, Design of Test Cases, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing, Debugging Activities. Software Maintenance: Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.

Suggested Text Books:

1. Software Engineering Concepts, Richard Fairley, TMH, 1997.

2. Software Engineering For Internet Applications, Eve Anderson, Philip Greenspun, Andrew Grumet, PHI, 2006.

3. Software Quality Engineering, Jeff Tian, Wiley India , 2006.

BVoc-IT-G-603: CYBER SECURITY

YEAR: 3   CREDIT: 4   SEMESTER: 6   MAXIMUM MARKS: 100

UNIT I

Introduction to Cyber Security: Overview of Cyber Security, Internet Governance – Challenges and Constraints, Cyber Threats:- Cyber Warfare-Cyber Crime-Cyber terrorism Cyber

Espionage, Need for a Comprehensive Cyber Security Policy, Need for a Nodal Authority, Need for an International convention on Cyberspace.

Cyber Security Vulnerabilities and Cyber Security Safeguards: Cyber Security Vulnerabilities- Overview, vulnerabilities in software, System administration, Complex Network Architectures, Open Access to Organizational Data, Weak Authentication, Unprotected Broadband communications, Poor Cyber Security Awareness. Cyber Security Safeguards- Overview, Access control, Audit, Authentication, Biometrics, Cryptography, Deception, Denial of Service Filters, Ethical Hacking, Firewalls, Intrusion Detection Systems, Response, Scanning, Security policy, Threat Management.

UNIT II

Securing Web Application, Services and Servers: Introduction, Basic security for HTTP Applications and Services, Basic Security for SOAP Services, Identity Management and Web Services, Authorization Patterns, Security Considerations, Challenges. Intrusion Detection and Prevention Intrusion, Physical Theft, Abuse of Privileges, Unauthorized Access by Outsider, Malware infection.

Cryptography and Network Security: Introduction to Cryptography, Symmetric key Cryptography, Asymmetric key Cryptography, Message Authentication, Digital Signatures, Applications of Cryptography. Overview of Firewalls- Types of Firewalls, User Management, VPN Security Protocols: - security at the Application Layer- PGP and S/MIME, Security at Transport Layer- SSL and TLS, Security at Network Layer-IPSec.

UNIT III

Cyberspace and the Law : Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, National Cyber Security Policy 2013.

UNIT IV

Cyber Forensics: Introduction to Cyber Forensics, Handling Preliminary Investigations, Controlling an Investigation, Conducting disk-based analysis, Investigating Informationhiding, Scrutinizing E-mail, Validating E-mail header information, Tracing Internet access, Tracing memory in real-time.

Suggested Text Books:

1. Computer and Information Technology Handbook, John R.Vacca, Elsevier, 2013.

2. Cyber Law and Cyber Security in developing and emerging Economics, Zeinab Karake Shalboub, Lubna Al Qusinie, EE, 2010.

3. Cyber Security, Edward Amoroso, Silicon Press, 2006.

4. Cyber Space and Cyber Security, George k. Kostopoulos, CRC, 2008.

5. Cyber Forensics: A Field Manual for Collecting, Examining, and Preserving Evidence of Computer Crimes, Albert J. Marcella, Jr. and Doug Menendez, CBS Publishers & Distributors Pvt. Ltd., 2010.

BVoc-IT-S-604: INTERNSHIP & FINAL PROJECT-VI

YEAR: 3   CREDIT: 18   SEMESTER: 6   MAXIMUM MARKS: 100

 Project Work & Viva-Voce The aim of the Project work is to acquire industrial knowledge on the implementation of the Information Technology concepts. Each student should carry out

individually one Project Work and it may be a work using the software tools/ languages that they have learned. GUIDELINES • Group Size – Maximum 3 • • No. of records – No. of group members + 1 (Department copy) Certificate should include the names of all members • The minimal phases for the project are: Project search, finalization and allocation, Investigation of system requirements, Data and Process Modeling, System Design, Program design, Program coding and unit testing, System integration, System implementation and acceptance testing.

Planning the Project: The Major Project is an involved Exercise which has to be planned well in advance. The topic should be chosen in Semester 4 itself and the case study of Course CS1302 should as far as possible, be based on the project topic, though on Exceptional cases, for valid reasons, the project guide may waive this condition. Related reading, training and discussions should start from semester 5 itself.

Selection of project work: Project work could be of 3 types: Developing solution for a real-life problem: In this case, a requirement for developing a computer based solution already Exists and the different stages of system development life cycle is to be implemented successfully. Examples are Accounting Software Package for a particular organization, Computerization of administrative functions of an organization, Web Based Commerce, etc. The scope for creativity and Exploration in such projects is limited, but if done meticulously, valuable Experience in the industrial context can be gained. Innovative Product development: These are projects where a clear-cut requirement for developing a computer based solution may not be existing, but a possible utility for the same is conceived by the proposer. An Example is a Malayalam Language Editor with Spell Checker, Computer Music Software for Indian Music, Heat Engines Simulation Software for eLearning, Digital Water Marking Software, Research level project: These are projects which involve research and development and may not be as structured and clear cut as in the above case. Examples are Malayalam Character Recognition, Neural Net Based Speech Recognizer, Biometric Systems, Machine Translation System etc. These projects provide more challenging opportunities to students, but at EX level is a difficult choice. If any student identifies proper support in terms of guidance, technology and references from External organizations and also the supervisors are convinced of the ability of the student(s) to take up the project, it shall be permitted. The methodology and reporting of such projects could be markedly different from type (a) and is left to the proposer/external supervisor of the projects. Selection of Team: To meet the stated objectives, it is imperative that Major Project is done through a team effort. Though it would be ideal to select the team members at random (drawing lots) and this should be strongly recommended, due to practical considerations, students may also be given the choice of

forming themselves into teams with 3 to 5 members (teams less than 3 members may be permitted in Exceptional cases, for valid reasons). A gender mix should also be strongly suggested. A team leader shall be elected through drawing lots. Teams shall maintain team meeting minutes and ensure that every team member has tasks assigned in writing. Team meeting minutes shall form a part of the Project Report. Even if students are doing projects as groups, each one must independently take up different modules of the work and must submit the reports also independently (though, in such cases, some common materials is permissible). Evaluation will also be done independently. Selection of Tools: No restrictions shall be placed on the students in the choice of platforms/tools/languages to be utilized for their project work, though open source is strongly recommended, wherever possible. No value shall be placed on the use of tools in the evaluation of the project. Selection of Organisation & Guide: No restrictions shall be placed on the students in the choice of organization where project work may be done, in terms of locality, type (public/private) etc. It is the duty of the Head of Institute/Principal of College to ensure that the Aim, Objectives and full project guidelines are communicated to the external organization. The guide should ideally be a post-graduate with minimum 2 years of work experience. Students may also choose to do project in the college/institute (or partially in the college/institute and partially in an external organization), especially product-based work, but in such cases the supervisors must ensure that (i) industry practices are followed (ii) the students undertake a planned visit to an IT industry with international operations to make up for the loss of experience and (iii) the services of an external guide with industry experience is obtained.

Project Management: Head of Institute/Principal of College should publish a list of students, projects topics, internal guide and external organization (if any) and teams agreed, before the end of semester 5. Changes in this list may be permitted for valid reasons and shall be considered favorably by Head of Institute/Principal of College any time before commencement of the project. Any request for change after commencement should considered by a committee of 3 teachers and their recommendation shall be accepted by Head of Institute/Principal of College. Gantt-chart : of proposed activities and a draft statement of project deliverables (which may subsequently be altered if justified) should be prepared before the commencement of the project. The actual completion of each phase should be noted on the chart in the course of the project work. Students should submit a fortnightly report of progress which could be indication of percentage of completion marked on the orginal Gantt-chart, with any notes attached. Students should ideally keep a daily activity log sheet. Team meetings should be documented in the format given at the end. Changes in the submitted documents are possible, as project development is essentially an evolutionary

process. The project guide must ensure that changes are necessary due to the knowledge gained in succeeding phases of the project. The date of completion of a phase should be brought forward if the changes made are deemed to be errors and not due to additional knowledge gained from a succeeding phase.

Documentation: The following are the major guidelines: The final outer dimensions of the report shall be 21 cm X 30 cm. The colour of the flap cover shall be light green. Only hard binding should be done, with title of the thesis displayed on the spine in 20 point, Bold, Times New Roman, as in example below.

• The text of the report should be set in 12 pt, Times New Roman, Single Spaced.

• Headings should be set as follows: CHAPTER HEADINGS 20 pt, Times New Roman, Bold, All Caps and Centered.

The Gantt chart, fortnightly progress reports, and team meeting minutes mentioned in section 3.5 should appear as appendix to the project report. Regarding the body of the report, as an indicative Example, the following is given (though students should not attempt to fit every kind of project report into this format):

 – Organizational overview (of the client organization, where applicable)

– Description of the present system

– Limitations of the present system

– The Proposed system- Its advantages and features

– Context diagram of the proposed system.

– Top level DFD of the proposed system with at least one additional level of Expansion

– Structure Chart of the System

– System flowchart

– Menu Tree

– Program List

– Files or tables (for DBMS projects) list. Class names to be entered for each file in OO systems.

– List of fields or attributes (for DBMS projects) in each file or table.

– Program

– File table that shows the files/tables used by each program and the files are read, written to, updated, queried or reports were produced from them.

– Reports List with column headings and summary information for each report.

– System Coding and variable/file/table naming conventions

– System controls and standards

– Screen layouts for each data entry screen.

– Report formats for each report.

 Program documentation is suggested on the following lines:

 – Program id

– Program level run chart

– Program function Explanation

– Data entry screen (reproduced from system documentation).

– Report layout (reproduced from system documentations)

– Program level pseudo code or flowchart.

– Decision tables, decision trees, with English Explanation where necessary.

– Program listing

– Test data

– Test results.

Methodology: Wherever applicable, object oriented approach should be used for software development. The project report should generally contain details of the following steps (though students should not attempt to fit every kind of project into this format): Analysis

– Study of existing systems and its drawbacks (general)

– Understanding the functionalities of the system (detailed)

– Preparation of requirement

– Conduct of Feasibility study

– Identification of relevant Objects

– Abstraction of each object (attributed and methods)

– Relationship between objects Design

– Design of each subsystems

– Design of each classes

– Design of communications between objects

– Design of Algorithms for problem solving

– User interface Design

– Any other steps if necessary Coding and Impletion Testing Security, Backup and Recovery Mechanisms On line help and User Manuals Upgradability Possibilities

3.9 Project IPR & Utilization: The intellectual property rights in all project work done by the students shall vest with the University of Kerala, except in cases where some external organizations seek undertaking from students to concede IPR in all work done in their organization or under their guidance. Where possible, students should attempt to obtain at least a joint IPR for the University. In cases where project works are of public utility, students shall be asked to publish their work including source code and documentation, in so far as their rights are clear.

 Evaluation of Project

 1 Mid Term Evaluation 50 marks

2 Documentation 100 marks

3 Content & Methodology 50 marks

4 Viva Voce 100 marks

 The marks to be scaled to 100.