PROGRAMME STRUCTURE: B.Voc. Degree Programme in Software Development

SEMESTER – I

General Education				Skill Component			
No.	**Title**	**Credit**	**Hrs/week**	**No.**	**Title**	**Credit**	**Hrs/week**
BSG-101	Communication Skills	4	4	**BSS-101**	Introduction to IT	4	4
BSG-102	Aptitude & Logical Reasoning	4	4	**BSS-102**	Fundamentals of Programming	4	4
BSG-103	Managerial Economics	4	4	**BSS-103**	Word Processing & Image editing	4	4
				BSL-231	Photoshop Lab	3	6
				BSL-232	LaTex Lab	3	6
	TOTAL	**12**	**12**		**TOTAL**	**18**	**24**

SEMESTER – II

General Education				Skill Component			
No.	**Title**	**Credit**	**Hrs/week**	**No.**	**Title**	**Credit**	**Hrs/week**
BSG-104	Documentation & Presentation methods	4	4	**BSS-104**	Multimedia & Animation	4	4
BSG-105	Environmental Studies	4	4	**BSS-105**	Network & Internet Applications	4	4
BSG-106	Mathematics-I	4	4	**BSS-106**	C Programming	4	4
				BSL-233	C Programming Lab	3	6
				BSL-234	Animation Lab	3	6
	TOTAL	**12**	**12**		**TOTAL**	**18**	**24**

SEMESTER – III

General Education				Skill Component			
No.	**Title**	**Credit**	**Hrs/week**	**No.**	**Title**	**Credit**	**Hrs/week**
BSG-107	Business Statistics	4	4	**BSS-107**	Web Programming	4	4
BSG-108	System Analysis & Design	4	4	**BSS-108**	Computer Hardware & Maintenance	4	4
BSG-109	Management Information Systems	4	4	**BSS-109**	Operating Systems	4	4
				BSL-235	Web Development Lab	3	6
				BSL-236	Computer Hardware Lab	3	6
	TOTAL	**12**	**12**		**TOTAL**	**18**	**24**

SEMESTER – IV

General Education	Skill Component

No.	Title	Credit	Hrs/week	No.	Title	Credit	Hrs/week
BSG-110	Mathematics -II	4	4	**BSS-110**	Network Administration	3	4
BSG-111	E Commerce	4	4	**BSS-111**	Object Oriented Programming	3	4
BSG-112	Financial Accounting	4	4	**BSS-112**	Visual Tools	3	4
				BSL-237	**Practical (Visual Tools & Network Lab)**	5	10
				BSL-239	Industrial Training	4	
	TOTAL	**12**	**12**		**TOTAL**	**18**	**22**

SEMESTER – V

General Education				Skill Component			
No.	**Title**	**Credit**	**Hrs/week**	**No.**	**Title**	**Credit**	**Hrs/week**
BSG-113	Introduction to Information Security	4	4	**BSS-113**	JAVA Programming	4	4
BSG-114	Principles of Management	4	4	**BSS-114**	Software Testing	3	4
BSG-115	Entrepreneurship Development	4	4	**BSS-115**	Software Engineering	3	4
				BSL-240	Practical (JAVA Lab & Major Project Phase I)	6	12
				BSL-241	Internship/Industrial visit	2	
	TOTAL	**12**	**12**		**TOTAL**	**18**	**24**

SEMESTER – VI

General Education				Skill Component			
No.	**Title**	**Credit**	**Hrs/week**	**No.**	**Title**	**Credit**	**Hrs/week**
BSG-116	Human Resource Development	4	4	**BSS-116**	Mobile Application Development	4	4
BSG-117	Free & Open Source Softwares	4	4	**BSS-117**	Database Administration	4	4
BSG-118	IT & Society	4	4	**BSS-118**	Advanced JAVA	3	4
				BSL-243	Android & JAVA Lab.	3	6
				BSL-244	Major Project (Phase II)	4	8
	TOTAL	**12**	**12**		**TOTAL**	**18**	**26**

9. DISTRIBUTION OF MARKS:

There are total 50 papers - 18 General Education papers and 32 Skill component papers. Each paper shall be of 100 marks. As per CBCS guidelines, 40 marks in each component shall be towards continuous assessment and 60 marks shall be towards the End-Semester Examination of that component. So, General

Education papers shall carry total 18 x 100 = 1800 marks and Skill Component papers shall carry 32 x 100 = 3200 marks. Net computed total shall be 1800 + 3200 = 5000 marks.

Distribution of continuous assessment marks in each theory paper shall be as under:

Attendance	5 Marks
Assignment-I	5 Marks
Assignment-II	5 Marks
Class Test I	10 Marks
Class Test II	10 Marks
Mid Semester Examination	15 Marks
TOTAL	40 Marks

Best of Class Test-I & Class Test II shall be posted in the mark-sheet.

Distribution of continuous assessment marks in each practical/project shall be as under:

Attendance	5 Marks
Programming Test I	5 Marks
Programming Test II	5 Marks
Mid Semester Examination	15 Marks
Documentation	10 Marks
TOTAL	40 Marks

10. SOCIAL SERVICE/EXTENSION ACTIVITIES:

Students need 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 one extra credit over and above the minimum prescribed 180 credits.

11. ATTENDANCE:

The minimum number of hours of lectures, tutorials, seminars or practicals which a student shall be required to attend for eligibility to appear at the end semester examination shall not be less than 75% of the total number of lectures, tutorials, seminars or practical sessions. Internships, Soft Skill & personality development programmes are part of the course and students must attend these activities to complete a semester.

12. EVALUATION:

There shall be continuous evaluation (CE) and End Semester Examination (ESE) for B.Voc. in Software Development course. The teacher shall define the expected quality of an assignment in terms of structure, content, presentation etc. Due weight may be given to the punctuality in the submission of assignments. Seminar shall be graded in terms of structure, content, presentation, interaction, etc. The allotment of grade for attendance shall be as follows:

Attendance less than 75%	E grade
Attendance more than 75% & less than 80%	D grade
Attendance more than 80% & less than 85%	C grade
Attendance more than 85% & less than 90%	B grade
Attendance more than 90%	A grade

13. ASSIGNMENTS/SEMINARS:

Each student shall be required to do two assignments and one seminar for each course. The seminars shall be organized by the teachers monitoring the continuous assessment and the same shall be assessed by a group of teachers including the teacher-in-charge of that course.

14. TESTS/MID-SEMESTER EXAMINATION:

For each course, there shall be two class tests and the best of the two class tests shall be posted in the mark-sheet. There shall be one mid-semester examination for each course. Valued answer scripts shall be made available to the students for perusal within 20 days from the date of the test.

15. END SEMESTER EXAMINATION:

End Semester examination of all the courses in all semesters shall be conducted. The duration of the examination of all courses shall be three hours.

16. EVALUATON OF THE PROJECT:

The documentation of the project shall be submitted to the Department in duplicate before the completion of the sixth semester. The continuous assessment of the project of 40 marks shall be as under:

Submission of the SRS/Requirement Analysis	– 20 marks
Submission of the code, its testing & Viva-Voce	– 20 marks

The End Semester assessment of 60 marks of the project shall be as under:

Documentation	– 10 marks
Usage of documentation tools	– 10 marks
Viva-Voce	– 40 marks

A board of two examiners appointed by the University shall evaluate the project work. The Viva-Voce based on the project report shall be conducted individually.

17. GRADING:

Both CE and ESE will be carried out using direct grading system in the letter grade as defined in the CBCS rules of the University of Allahabad.

18. PROMOTION TO HIGHER SEMESTERS:

Students who complete the semester by securing the minimum required attendance and by registering for the End Semester Examination of each semester conducted by the University alone shall be promoted to the next higher semester.

19. SYLLABUS:

SEMESTER I

General Paper I: COMMUNICATION SKILLS

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Enhance their ability to listening & speaking
2. Familiarize with English phonemic symbols
3. Communicate effectively in English
4. Use spoken language for various purposes
5. Converse with anyone in English

SYLLABUS

Module I

Pronunciation

Phonemic symbols; consonants; vowels; syllables; word stress; strong and weak forms; intonation

Module 2

Listening Skills

Difference between listening and hearing; Active listening; Barriers to listening; Academic listening; Listening for details; Listening & note taking; Listening for sound contents of videos; Listening to talks and descriptions; listening for meaning; listening to announcements; listening to news programmes

Module 3

Speaking Skills

Interactive nature of communication; Importance of context- formal & informal; Set expressions in different situations; Greetings; Introducing; Making requests; Asking for/Giving permission; Giving instructions & directions; Agreeing/Disagreeing; Seeking & Giving advice; Inviting and apologizing telephonic skills; conversational manners

Module 4

Dialogue Practice; Precis writing, Words, Idioms, Antonyms and synonyms.

References:

1. English for effective communication; Oxford University press; 2013
2. English pronunciation in use by Marks Jonathan, New Delhi, CUP, 2007
3. Study speaking by Lynch, Anderson & MacLean, New Delhi, CUP, 2008
4. Oxford Advanced Learners Dictionary
5. Dramatic moments: A book of one act plays; Orient Black Swan, 2013
6. Effective Communication by Ludlow and Panthon
7. A Practical English Grammar, Thomson and Marlinet

General Paper II: APTITUDE & LOGICAL REASONING

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Acquire logical skills for problem solving
2. Interpret different data
3. Establish relationship between numbers
4. Solve different logical problems

SYLLABUS

Module 1 : Data Sufficiency; Measurement; Time & distance; Arithmetic; Relationship between numbers

Module 2 : Basic mathematical relations & Formulas; Computation; Data interpretation

Module 3 : Differences; Discrimination; Decision making; Judgment; Problem Solving; Analogies; Analysis

Module 4 : Arithmetic reasoning; Relationship concept; Arithmetic number series; Similarities; Verbal & figure classification; Space visualization; Observation

References:

1. How to prepare for Logical Reasoning for CAT by Arun Sharma
2. Logical & Analytical Reasoning by A K Gupta

General Paper III: MANAGERIAL ECONOMICS

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Learn Macro & Micro economics
2. Learn about demand forecasting
3. Learn about laws of production
4. Learn about market & pricing policy and the business cycles

SYLLABUS

Module 1

Macro & Micro economics; distinction between managerial economics & traditional economics; characteristics of managerial economics; scope of managerial economics; Application of economic theories in business decisions

Module 2

Demand estimation; Law of demand; Determinants of demand; Types of demand; Price; Income; Advertisement & cross elasticity; Demand forecasting; Short & long term forecasting; methods of forecasting; forecasting the demand of new products

Module 3

Theory of production; Production function; Cobb Douglas Production function; Laws of production; Law of diminishing returns; Law of return to scales; Economies & diseconomies of scale; Isoquant curve; Isocost curve; Optimum combination of inputs

Module 4

Market & pricing policy; Different types of markets; Pricing objectives; Role of cost in pricing; Demand factor in pricing; Factors to be considered when formulating a pricing policy; cost plus pricing; marginal cost pricing; going rate pricing; breakeven point pricing; Product line pricing; pricing of a new product; pricing over the life cycle of a product; Business cycles; Phases of business cycles; Causes & indicators; Theories & control of business cycles

References:

1. Managerial economics by Maheshwari & Varshney, Sultan Chand & sons
2. Managerial economics by Mote, Paul & Gupta, TMH
3. Managerial economics by Dwivedi N.D., Vikas Publishing House
4. Principles of Business Economics by Reddy P.N. & Appanniah H R, S Chand & sons

Skill Paper I: INTRODUCTION TO IT

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Create general awareness about scope of IT (hardware, operations and concepts of networks)
2. Gain base for the various courses in this programme
3. Gain functional knowledge about the use of GUI OS
4. Gain functional knowledge about MS-OFFICE contents

SYLLABUS

Module 1

Computer Characteristics:

Speed, storage and accuracy; difference between analog & digital signals; Characteristics of digital signals; Number systems; Uniform & Non-uniform codes; Historic evolution of computers; Classification of computers; Difference between Computer organization & Computer architecture; Von Neumann model & Harvard architecture

Module 2

Hardware:

CPU, Memory; Input & Output devices; Memory units; Types of RAM & ROM; Flash memory; Types of secondary storage and difference between them; Description of the secondary storage – magnetic devices, optical devices, CD, DVD, CD-writer; Description of input devices- keyboard, mouse, scanner, microphone, digital camera, touch screen, joystick, bar code reader, MICR, OCR ; Description of output devices – serial and parallel printers, plotters, speaker, sound card; CRT, LED, LCD, Seven segment LED

Module 3

Software

System software & application software; Concept of files and folders; Introduction to operating systems; Types of operating systems; Cold & warm booting; POST; Basic features of two GUI operating systems: Windows & Linux; Programming languages; Text editor; Compiler & interpreter; Databases; Generic features of word processor; Spreadsheet & Presentation softwares; Introduction to LaTex for scientific typesetting; Utilities & their use; Computer viruses & malwares; Open source softwares

Module 4

Computer networks

Requirement of networking; Advantages & Disadvantages; Wired & Wireless networks; Types of media required; Server, Workstation; Switch; Router; Bridge; Network operating systems; Internet: Brief history, World Wide Web; Websites; Browsers; Search engines; Internet connections: ISP, Dial-up, cable modem, WLL, DSL, Leased line; E-mail; E-mail software features; Characteristics of web based systems; Web pages; Introduction to HTML

References:

1. Fundamentals of Computers by E. Balguruswamy, McGraw Hill, 2014
2. Computer Fundamentals by Sanders
3. Introduction to computers by Peter Norton; McGraw Hill, 7th edition
4. Fundamentals of Computers by V. Rajaraman
5. Information Technology: The breaking wave by Dennis P Curtain, McGraw Hill, 2014

Skill Paper II: FUNDAMENTALS OF PROGRAMMING

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to

1. Go for problem solving & explain problem solving steps
2. Develop algorithm for different problems
3. Draw the corresponding flow chart
4. Analyze algorithms

SYLLABUS

Module 1

Problem solving and the computer

Problem definition; Solution design; Solution refinement; Testing strategy development; Program coding & Testing; Documentation completion; Program maintenance

Module 2

Software & types of Software

Programming Languages – Machine Language, Assembly Language, High Level Language, Object oriented Language and its features

Module 3

Algorithms & Flow Charts

Algorithms and their representations; Drawing Flow charts using ANSI symbols; Pseudo code & modular algorithms; Structured Programming; Different approaches of programming; Top down & Bottom up approach; Life cycle stages of programming; Features of good computer program

Module 4

Areas of algorithm study; Analysis of algorithms; Performance analysis – Space & time complexity; Use of asymptotic notations (O,Ω,Θ)

References:

1. How to Solve it by Computers by Droomey
2. Computer Fundamentals by P K Sinha & Preeti Sinha
3. Data Structures by Horowitz & Sahani
4. Analysis of algorithms by Baluja

Skill Paper-III: WORD PROCESSING & IMAGE EDITING

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to

1. Do word-processing & prepare office documents
2. Create presentations
3. Design multimedia presentations
4. Edit images

SYLLABUS

Module 1

Word-processing

Word-processing concepts; Editing & Formatting text; Table manipulation; Indexing; Mail merge; Documentation & indentation; Inserting word art; Inserting pictures & clip arts; Auto formatting; Tools, Macros

Module 2

Power Point

Designing a presentation; Templates & Slide master; Drawing tools; Clip art & Word art; Organization charts; Graph; Output & Presentation options; Integrating with animation and multimedia packages

Module 3

Flash

Introduction; Drawing; Working with colour; Using imported artwork; Adding sound; Working with objects; Using layers; Using types; Using symbols and instances; Creating animation; Creating interactive movies; Creating Printable movies; Publishing & Exporting

Module 4

Photoshop

Getting image into photoshop; Selecting; Transforming & retouching; Painting; Applying filters for special effects; Designing web pages; Creating rollovers and animations; Preparing graphics for the web; Saving & exporting images

References:

1. Microsoft Office Word
2. Powerpoint essential training by David Rivers
3. Flash Professional for Windows & Macintosh by Katherine Ulrich
4. Exploring Microsoft Word comprehensive by Robert T Grauer & Maryann Barber
5. Adobe Flash Professional Hands-on training by Todd Perkins

Skill Lab –I: PHOTOSHOP LAB

No. of credits: 3 **No. of instructional hours: 6 per week**

Students shall be provided hands-on knowledge about Photoshop software for editing images.

Skill Lab- II: PAGEMAKER LAB

No. of credits: 3 **No. of instructional hours: 6 per week**

Students shall be provided hands-on knowledge about Pagemaker & LaTex software for editing text.

SEMESTER – II

General Paper – IV: DOCUMENTATION & PRESENTATION SKILLS

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to

1. Master writing techniques to meet academic & professional needs
2. Understand the mechanism of general and academic writing
3. Recognize the different modes of writing
4. Improve their reference skills, take notes
5. Prepare & present seminar papers and project reports effectively

SYLLABUS

Module 1

Writing as a skill; its importance; mechanism of writing; Words & Sentences; Paragraph as a unit of structuring a whole text; Combining different sources; Functional use of writing- Personal, Academic & Business Writing; Creative use of writing

Module 2

Writing process; Planning a text; Finding materials; Drafting; Revising; Editing; Finalizing the draft; Keyboard skills; Word processing & Desktop publishing

Module 3

Writing models; Essay; Precis; Expansion of ideas; Dialogue; Letter writing; Personal letters; Formal letters; CV; Surveys; Questionairre; E-mail; Fax; Job application; Report writing

Module 4

Presentation as a skill; Elements of presentation strategies; Audience; Objectives; Key ideas; Structuring the material; Organizing content; Audio-visual aids; Handouts; Use of Powerpoint; Clarity of presentation; Non-verbal communication; Seminar paper presentation & discussion

References:

1. English for effective communication, Oxford University Press, 2013
2. Students must write by Robert Barras, Routledge, 2006
3. Academic writing by Stephen bailey, Routledge, 2006
4. Study writing by Hamp Lyons, Liz, Ben Heasley, Cambridge University Press, 2008
5. Academic writing by Ilona Leki, CUP, 1998
6. Writing skills by McCarter, Sam, Norman Whitby, Macmillan India, 2009
7. Effective presentation by Jay, Pearson, 2009

General Paper – V: ENVIRONMENTAL STUDIES

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to

1. Understand better about the deteriorating condition of our environment
2. Develop a sensitivity to environment
3. Develop pride in social and environmental activism

SYLLABUS

Module 1

Multi-disciplinary nature of environmental studies

Definition; Scope & importance; Need for public awareness; Ecology & Ecosystems; Definition of Ecology; Structure & function of an ecosystem; Producers; Consumers and Decomposers; Energy flow in an ecosystem; Ecological succession; Food chains; Food webs and ecological pyramids; Introduction, types, characteristic features and function of forest ecosystem; grassland ecosystem, desert ecosystem, aquatic ecosystem (ponds, streams, lakes, rivers, oceans and estuaries)

Module 2

Biodiversity & its conservation

Introduction, genetic, species and ecosystem diversity definition; Value of biodiversity; biodiversity at global, national and local levels; India as a mega diversity nation; hot spots of biodiversity; Threats to biodiversity – habitat loss, poaching of wild life, Man wildlife conflicts; endangered and endemic species of India; Conservation of biodiversity in in-situ & ex-situ

Module 3

Natural Resources

Air resources – features, composition, structure, air quality management; Forest resources; Water resources; Mineral resources; Food resources; Energy resources; Land resources; Environmental pollution – definition, air pollution, Water pollution, Marine pollution, Thermal pollution; soil pollution; Noise pollution; Nuclear hazards; Waste management; Cleaner technologies – green technology; Reuse & recycling; Solid waste management; Role of individuals to prevent pollution; Pollution case studies; Disaster management – Floods, Earthquakes, Cyclones, Landslides

Module 4

Social Issues and the Environment

From unsustainable to sustainable development; Urban problems related to energy, water conservation; Rain water harvesting; Water shed management; Resettlement and rehabilitation of people – its problems and concerns, Case studies,; Environmental ethics – environmental value relationships, Environmental ethics and species preservation, climate change, global warming, acid rain, Ozone layer depletion, Nuclear accidents and holocaust; case studies; waste land reclamation; consumerism and waste products; legislation to protect the environment, environmental protection act; prevention and control of pollution act (Dirt & water); Wild life protection act; Forest conservation act; Environmental management system; Public hearing & role of NGOs, ISO 9000 and 14000; Issues involved in enforcement of environment legislation; Public awareness; Environmental economics – environment and standard living

References:

1. Understanding environment by Kiran B Chokkas et al
2. Environmental Science & Engineering by P Venugopal Rao, PHI
3. Environmental studies by Benny Joseph, TMH
4. Essentials of Environmental Studies by Kurien Joseph & R Nagendran, Pearson
5. Rescuing a planet under stress and a civilization in trouble by Lester R Brown & Plan B, Orient Longman

General Paper – VI: MATHEMATICS I

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Differentiation
2. Solving differential equations
3. Learn about complex numbers
4. Linear programming
5. Fourier series

SYLLABUS

Module 1

Review of basic differentiation; Differentiation of hyperbolic functions; derivatives of hyperbolic functions; inverse hyperbolic functions; logarithmic differentiation, implicit differentiation; Leibnitz theorem; Mean value theorem; Rolle's theorem; Lagrange's mean value theorem, Maxima & Minima

Module 2

Differential equations; general concepts; Formulation & Solution of differential equations; solution of higher order liner Des, Partial differentiation; Laplace & Inverse Laplace transforms

Module 3

Theory of numbers, Prime numbers, Unique factorization theorem; Euclidean algorithm; Congruence; Fermat's theorem; Wilson's theorem

Module 4

Markov processes; Harmonic analysis and Fourier series, Linear Programming

References:

1. Advanced Engineering Mathematics by Erwin Kreyzig, New Age international
2. Differential Calculus by Shanthi Narayan, S Chand & Co.
3. Differential equations and their applications by Zafar Ahsan
4. Getting started with MATLAB by Rudra Pratap, Oxford University Press

Skill Paper – IV: ANIMATION SOFTWARE

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Create skills in animation
2. Create objects using Blender and 3D Max
3. Add special effects

SYLLABUS

Module 1

Introduction to 3D Max; Introduction to Blender; Creating objects; Selecting objects; Transforming objects

Module 2

Animation; Modifying/editing objects

Module 3

Compound objects; Cameras; Light effects

Module 4

Maps and material; Rendering & special effects

References:

1. 3D Studio Max Bible by Kelly L Murdock
2. 3D Studio Max in motion: Basics using 3D Studio Max by Stephen J Ethier & Christine A Ethier

Skill Paper – V: COMPUTER NETWORK & INTERNET APPLICATIONS

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Explain different components of internet
2. Discuss different applications of internet

SYLLABUS

Module 1

Computer Network

Introduction; Use of Computer networks; Network hardware and software requirement; Ways of classifying computer networks, Protocol & its hierarchy; Layered approach to network design; ISO-OSI model; TCP/IP reference model

Module 2

Internet

History; Switching techniques; Internet, Intranet, Extranet & iNTRANET; Network topologies, Network devices; Classful & Classless addressing; Subnetting & supernetting; TCP & UDP; Guaranteed delivery; Recovering the datagrams; Automatic retransmission; Brief discussion on distributed computing; Domain names and DNS; Flexibility; Reliability & Efficiency

Module 3

Electronic mail

Mail box, Sending, Notification, Reading, How it works, Address format, E-mail to and from non-Internet sites, Access to service via E-mail, Speed and reliability, Impact and significance, Joining a mailing list; Bulletin Board Services (BBS), Network norms, News group, Selection, Subscription, Reading, submitting, article, How BBS woks; File Transfer Protocol (FTP) Store/ retrieve, Binary and text files, How FTP works, Impact and significance, Remote login, How it works, TELNET

Module 4

Browsing the World Wide Web (WWW), How a browser works, Software used to access, URLs, Browser. WWW documents, HTML, Web page design with HTML, Features and importance of HTML; Advanced WEB technologies, CGI, How it works. CGI and advertising Search engines, Browsing, Searching, and Search tool, Advanced search engines, Examples of search engines.

References:

1. Introduction to Data Communication & Networking by Forouzan, TMH
2. Internet For Everyone by Leon and Leon, LeonTechworld, Chennai
3. The Internet Book by Douglas E Comer,, 2nd Edition, PHI
4. The Internet Tool Kit by Nancy Cadeno, BPB Publications.
5. ABC's of the Internet by Christian Crumlish, 2nd Edition, BPB Publications
6. Java Hand Book by Patrick Naugton, Tata McGraw Hill

Skill Paper - VI: C PROGRAMMING

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to

1. Do structured programming and problem solving.
2. Acquire moderate skills in programming in a industry-standard programming language

SYLLABUS

Module 1

Introduction to programming

Character set, Variables and Constants, Rules for naming the Variables/Identifiers; Basic data types of C, int, char, float, double; storage capacity – range of all the data types; Storage classes; Basic constructs

Module 2

Basic Elements

Operators and Expressions: Assignment Operator, Arithmetic Operator and Arithmetic expression, Relational Operator and Relational exp., Logical Operator and how it is used in condition, Expression Evaluation (Precedence of Operators); simple I/O statements, Control structures, if, if else, switch-case, for, while, do-while, break, continue; Arrays, Defining simple arrays, Multi-dimensional arrays, declaration, initialization and processing

Module 3

Functions & Pointers

Concept of modular programming; Library, User defined functions, declaration, definition & scope, recursion, Pointers: The & and * Operators, pointer declaration, assignment and arithmetic, visualizing pointers, call by value, call by reference, dynamic memory allocation.

Module 4

Advanced features

Array & pointer relationship, pointer to arrays, array of pointers. Strings: String handling functions; Structures and unions; File handling: text and binary files, file operations, Library functions for file handling, Modes of files.

References:

1. Programming in C by Ashok N. Kamthene, Pearson Education, 2nd ed.
2. Programming in ANSI C by E.Balaguruswamy, McGrawhill

Skill Lab – III: C PROGRAMMING LAB

No. of credits: 3 **No. of instructional hours: 6 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Learn the basic features of DOS, Windows, software tools (word processor, spread sheet, presentation s/w) and algorithmic thinking and problem solving in a industry standard programming language
2. Create, Save, Copy, Delete, Organise various types of files and manage the desk top in general
3. Use a standard word processing package, Use a standard spread-sheet processing package and use a standard presentation package Exploiting popular features
4. Write, debug and analyze structured programs.

SYLLABUS

1. Familiarization of important DOS/Windows/Linux features.
2. Practice on basic features of word processor, spread sheet and presentation software.

The C laboratory work will consist of 15-20 Experiments:

1. Testing out and interpreting a variety of simple programs to demonstrate the syntax and use of the following features of the language: basic data types, operators and control structures.
2. 1-D Arrays: A variety of programs to declare, intitialise, read, print and process 1-D arrays of various basic data types. Processing to include, selection, sum, counting, selective sum, selective counting, reversing etc.
3. Pointers: A large number of trivial programs involving all possible data types to familiarize the syntax of pointers in a variety of situations and to draw memory diagrams based on the observations.
4. Structures: A variety of programs to declare, intitialise, read, print and process structures made up of a variety of data types and structures.
5. 2-D Arrays: A variety of programs to declare, intitialise, read, print and process 2-D arrays of various basic data types. Processing to include, selection, sum, counting, selective sum, selective counting, reversing etc.
6. Array of Structures and Structure of Arrays: Programs to demonstrate declaration and processing of structure of arrays and array of structures.
7. Pointers to Arrays: A number of programs to demonstrate handling of 1-D and 2-D arrays using pointers and to draw memory diagrams based on the observations.
8. Pointers to Structures: A number of programs to demonstrate use of pointers to structures and to draw memory diagrams based on the observations.
9. Functions –I: Simple Examples of declaring and using functions of the following categories (i) no argument, no return, (ii) argument, no return, (iii) no argument, return, (iv) argument, return, all pass by value
10. Functions –II: Declaring and using functions with pass by reference, Passing and Returning structures, Recursive functions.
11. Files: Simple Example involving use of multiple files: declaring, opening, closing, reading from and writing to text files.
12. Files: Example involving use of multiple files: declaring, opening, closing, reading from and writing to binary files.
13. Library functions: A variety of Examples demonstrating (i) string processing functions (ii) a variety of selected library functions
14. Debugging programs involving syntactic and/or logical errorsP

16-20: Developing programming solutions to problems including program design, algorithm development and data structure selection.

References:

1. C: How to Program by *D*eitel & Deital, Pearson Education
2. The C Puzzle Book by Alan R Feuer, Pearson Education
3. Test Your C Skills by YashvantKanetkar, BPB Publications

Skill Lab – IV: ANIMATIONS LAB

No. of credits: 3 **No. of instructional hours: 6 per week**

Students shall have hands-on experience with the 3D Max software and Blender software for creating animation.

SEMESTER - III

General Paper – VII: BUSINESS STATISTICS

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to

1. Apply appropriate statistical tools and techniques in different business situations.
2. Understand statistical techniques as are applicable to business.
3. Apply statistical techniques for quantification of data in business.

SYLLABUS

Module 1

Introduction

Meaning, definition, functions, objectives and importance of statistics; Distrust of statistics; Collection, classification, tabulation and presentation of data; Measures of central tendency and Measures of dispersion; relevance and applicability of each technique in business.

Module 2

Correlation

Meaning and definition; correlation and causation; Types of correlation; Methods of measuring correlation for ungrouped data; Karl Pearson's co- efficient of correlation and its interpretation; Probable error; Coefficient of determination; Spearman's rank correlation; co-efficient of Concurrent deviation; Application of different measures of correlation in business.

Module 3

Regression analysis

Meaning and definition; Types of Regression; Regression lines; determination of simple linear regression; Regression equations and their application in business; Properties of correlation and regression co-efficients; Comparison of regression and correlation

Module 4

Index numbers

Meaning and importance; Problems in construction of index numbers; Methods of constructing of index numbers; Simple aggregative, Average of Price relatives, Lasperye's, Paasche's, Dorbisch - Bowley's, Marshall-Edgeworth's and Fisher's ideal index numbers; Test of Consistency: Time Reversal Test and Factor Reversal Test; Chain Base Index Nos.; Shifting of Base year; Cost of living Index and its use in determination of wages; Wholesale Price Index Number; Population index; inflation index, Operational indices- Sensex and Nifty.

Module 5

Time series analysis

Meaning and definition; components; Measurement of long term trend; Moving average method; Method of Least squares; Application in business.

References:

1. Statistical Methods by Gupta.S.P. Himalaya Publishing House, Mumbai.
2. Fundamentals of Statistics by Elhance.D.L, KitabMahal, Allahabad.
3. Statistics - Theory and Practice by Gupta.B.N., SahityaBhawan Publications, Agra.
4. Statistics - Theory, Methods and Application by Sanchetti D.C and Kapoor V.K , Sultan Chand & Sons
5. Statistics - Concept and Application by Nabendu Pal and Haded Sarkar S.A, PHI, NewDelhi.
6. Business Mathematics and Statisticsby Agarwal B.M., Ane Books Pvt.Ltd., New Delhi.
7. Statistics for Management by Richard I. Levin and David S. Rubin, PHI

General Paper – VIII: SYSTEM ANALYSIS AND DESIGN

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Have an overview of how a software is developed and what are the different stages by which the development take place
2. Explain the background study required for developing a system 3. 3. 3. Design a new system
4. Discuss types of testing
5. Select the hardware and software required for a system

SYLLABUS

Module 1

Overview of System analysis and Design

Business system concepts; project selection; sources of project requests; preliminary investigation; System development life cycle - Feasibility analysis, design, implementation, testing and evaluation, project review. Feasibility study – technical, behavioural and economical feasibility; cost and benefit analysis; fact finding techniques; DFD, Data dictionaries; Decision analysis; Decision trees and tables.

Module 2

System design

Design objectives; Process and stages of system design; Design methodologies; Structured design; Structured walkthrough; Audit considerations, audit trials; Detailed design; Modularization, module specification; Software design and documentation tools; top down and bottom up approaches

Module 3

Testing & System Conversion

Unit and integration testing; Testing practices and plans; System control and quality assurance; Training; Conversion; Operation plans; System administration.

Module 4

Hardware and Software selection

Benchmarking; Financial considerations in software selection; Vendor selection; Performance and acceptance criteria.

References:

1. Systems Analysis and Design by Awad, EM,, Galgotia Pub, 1991
2. Analysis and Design of Information systems by Rajaraman V, PHI, 1991

General Paper – IX: MANAGEMENT INFORMATION SYSTEMS

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Know about transaction processing
2. Know about MIS & DSS
3. Optimization techniques

SYLLABUS

Module 1

Introduction to information systems

Information systems in organizations; Information Technology Concepts; The IS Revolution; Information requirement for the different levels of 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

Module 2

Transaction processing system

Hardware and software requirements; tools used; Case studies; Merits and demerits of transaction processing system.

Module 3

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 decisions-unstructured approach, cost and values of unstructured information.

Module 4

Optimization techniques

Difference between optimization tools and DSS tools; Expert system; Difference between expert system and management information system; Role of chief Information officer.

References:

1. Management Information Systems, by Rajaraman
2. Management Information Systems, by By S. Sadagopan, PHI
3. Management Information Systems by Uma G. Gupta, Galgotia Publications
4. Management Information Systems by W S Javdekar, Tata McGraw-Hill

Skill Paper VII: WEB APPLICATION & DEVELOPMENT

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Know the technology of web sites and various tools and languages required for technical and creative design of state-of-the-art web sites
2. Basic skills in moderately complex use of the following tools/scripts/ languages: HTML, DHTML, CGI Script, Perl, CSS, Java script, ASP and JSP.
3. Choose the appropriate web tools/languages for creating state-of-the art websites
4. To explore current trends and styles in web design and applications

SYLLABUS

Module 1

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; simple introduction to XML and VRML

Module 2

CGI Programming

HTML Forms and Fields; Perl: Basic control structures, data types and basic features; CGI Programs: GET & POST methods, simple applications; Cookies; Server Side Includes; Example Applications;

Module 3

Javascript

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

Module 4

Architecture of java Servelets; Servelet Structure; Servelet Life Cycle; Request and Response Objects; Sessions; Invoking Servelets;

References:

1. Advanced Programming in Web Designby V.K. Jain,, Cyber Tech Pub.
2. Principles of Web Design by Joel Sklar, Vikas Publications
3. Internet and Worldwide web programming: How to Program by H M Deitel, P J Deitel & A B Goldberg,, 3/e, Pearson Education

Skill Paper – VIII: COMPUTER HARDWARE & MAINTENANCE

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Gain knowledge of computer hardware and ways of maintaining it.
2. Explain the working of computers
3. Identify different components of computers and explain their uses

SYLLABUS

Module 1

Study of PC/AT motherboards

Block diagram architecture of motherboard. CMOS setup and their features; configuring extended, expanded memory; cache memory; shadow memory, EDO RAM etc.

Module 2

Buses

Study of Bus Standards: Brief study of various bus standards: ISA, EISA, VL, PCI, PCMCIA etc, Display Cards & Monitors: Description of different types of display cards Monitors: CRT construction and working, vertical stage, horizontal state, 9 pin input type -monitor, block diagram & description of color monitor.

Module 3

Drive Systems

Various parts of FDD, types of floppies, geometry of floppy, various recording formats, interface signals, floppy drive alignment track 0, and adjustment, formatting of floppies, Types of hard disk drives, IDE, EIDE, SCSI, Geometry of hard disk drive, Interface signal, tape drives, DVD, introduction to RMD, various concepts of hard disk drives, types of formatting, partitioning and handling of hard disk drive.

Module 4

Types of memory

Physical Memory, Memory modules:- SIMMs, DIMMs, RIMMs, Brief study of conventional base memory, Upper memory area, High memory area, Extended memory, Expanded memory. General Troubleshooting and Maintenance, Type of maintenance: Preventive and break down maintenance, assembly and disassembly of PC and its various parts, startup problems, run problems their identification and remedy, Problem of keyboard, displays, printers, FDD's, HDD's, SMPS motherboard, their identification and remedy

References:

1. Modern all about motherboard by Lotia and Nair.
2. Modern all about Hard Disk by Lotia and Nair.
3. Micro processor Architecture, Programming and applications with 8085 by R S. Gaonkar.
4. Introduction to assembly language programming in 8086 by Venugopal and Ravikanth.
5. Upgrading and repairing PCs by Scott Muller with Creigzacker.

Skill Paper – IX: OPERATING SYSTEMS

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. To understand the internal working of operating systems
2. To understand the installation of windows
3. Explain the ways of diagnosis
4. Make a system secure

SYLLABUS

Module 1

Basics of Operating System

Differences between DOS, Windows 2000 /XP and Linux operating systems, starting and exiting from a program in Windows 2003 / XP,Linux, files and folders in Windows 2003 / XP/ Linux copying and moving files under Windows 2003 / XP, the use of explorer, study of control panel and its settings

Module 2

Installation and Administration of Windows 2003 and Linux

The minimum hardware requirements for the installation, the steps involved in installation; Booting process of Windows 2003 /XP / Linux the plug and play feature of Windows 2003 / XP- the automatic detection of new hardware at booting time, the boot sector , Architecture of Windows 2003 / XP, the Recycle bins, DLL files, The Windows registry and its importance, the device drivers, the addition of new hardware and software to a Windows 2003 / XP system, the device manager of 2003/ XP, changing of display settings, setting of screen savers and their password protection, configuration of keyboard & mouse in Window 2003 /XP

Module 3

Taking Care of System Health & Debugging

System testing and diagnosis using available diagnostic programs like AMIDIAG, PC tools, Norton utilities etc and latest trends. Debugging Tools, procedures, features and their use.

Module 4

Windows based back-up Procedures & Disaster Prevention

Write protection of your software; MS-Windows delete protection, crash recovery, preventing hard disk failure, Back-up & Restore procedures, types of back-up, media for back-up, Raid systems. Preparation of bootable CD and FD.

References:

1. Windows Internals - Part 1by Mark Russinovich, David A. Solomon and Alex Lonescu
2. Windows Internals - Part 2 by Mark Russinovich, David A. Solomon and Alex Lonescu
3. Operating System Concepts by Peterson and Silbershatz

Skill Lab – V: WEB DEVELOPMENT LAB

No. of credits: 3 **No. of instructional hours: 6 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Gain exposure to various tools and languages required for technical and creative design of web sites
2. To practice moderately complex use of the following scripts/languages/technologies: HTML, DHTML, CSS, Java script, CGI Script, Perl,

SYLLABUS

The laboratory work will consist of 15-20 Experiments.

Part A (HTML)

Part B (Javascript, XML, Perl, CGI)

1. Practicing basic HTML tags, text tags test styles, paragraph styles, headings, lists
2. Tables in HTML, Frames in HTML, nested frames, Link and Anchor Tags
3. Including graphics, video and sound in web pages, including Java applets
4. Layers & Image Maps
5. Creating animated Gifs, simple flash animations
6. Cascading Style sheets
7. DHTML
8. Creating and browsing XML database
9. Installing VRML plugins and viewing VRML source files
10. HTML forms and Fields
11. Exercises covering basic introduction to perl
12. Installing web server, setting CGI, connecting HTML forms to Perl Scripts (CGI programming)
13. Exercises covering basic introduction to Javascript

14-20: Development of a web site involving a variety of tools practiced above

References:

1. Advanced Programming in Web Design by V.K. Jain, Cyber Tech Pub.
2. Internet and Worldwide web programming: How to Program by H M Deitel, P J Deitel& A B Goldberg,, 3/e, Pearson Education

Skill Lab – VI: COMPUTER HARDWARE LAB

No. of credits: 3 **No. of instructional hours: 6 per week**

Students shall be provided with hands-on experience on hardware assembling, trouble shooting, installation of operating system and other softwares, ensure security of systems and so on.

SEMESTER - IV

General Paper – X: MATHEMATICS - II

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Understand Boolean algebra and logic
2. Learn Set Theory, Relations & Functions
3. Learn algebraic structures and codes
4. Learn Graph Theory

SYLLABUS

Module 1

Proof Methods, Logic

Formal proofs, Propositional reasoning, Proofs by contradiction, False Proofs, Proofs by Induction, Symbolic Logic: Boolean expressions, Logical Equivalance, DeMorgan's Law, tautologies, Implications, Arguments, Fallacies, Normal forms in prepositional logic, Resolution

Module 2

Set Theory, Relations, Functions

Review of Set theory concepts, set operations, characteristic functions, fuzzy set theory basics, Relations: operations on relations, equivalence relations & partitions, partial orders, ordered sets, Warshal's algorithm, Functions, Recursion.

Module 3

Algebraic Structures

Algebra, DeMorgan's Law, Group, Ring, Polish Expressions, Communication Model and error corrections, Hamming Codes

Module 4

Graph Theory

Introduction, Graph Notation, Topological sort, Graph Propagation algorithm, Depth First, Breadth-first searches, Shortest Path algorithms, Directed acyclic graphs.

Module 5

Miscellaneous Topics

Graphical representations of functions; Graphical interpretation of convergence; Complex Mapping; Fractals; Grammars; Languages and Automaton; Introduction to Matlab (Matrix, Linear Algebra, Graphics operations)

References:

1. Discrete Mathematics by Rajendra Akerkar, Rupali Akerkar, Pearson Education
2. Discrete Mathematical structures by RM Somasundaram
3. Mathematical Mysteries, The beauty and magic of Numbers by Calvin C. Clawson, Viva Books Pvt Ltd.
4. Getting Started with MATLAB by Rudra Pratap, Oxford University Press

General Paper – XI: BUSINESS INFORMATICS

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Understand the role of IT in business and the concepts and techniques of e -commerce
2. Know different types of e-commerce web sites and different modes of payments
3. Be aware of security and legal issues in e-commerce

SYLLABUS

Module 1

History of e-commerce

Definition, classification- B2B, B2C, C2C, G2C, B2G sites, ecommerce in education, financial, auction, news, entertainment sectors, Doing e-Commerce.

Module 2

Electronic payment systems

Relevance of currencies, credit cards, debit cards, smart cards, e-credit accounts, e-money, security concerns in e commerce, authenticity, privacy, integrity, non-repudiation, encryption, secret key cryptography, public key cryptography, digital signatures, firewalls

Module 3

Mass marketing

Segmentation; one-to-one marketing; personalization and behavioural marketing; web advertising; online advertising methods; advertising strategies and promotions; special advertising and implementation topics

Module 4

Mobile Commerce

Attributes and benefits, Mobile Devices, Computing software, Wireless Telecommunication devices, Mobile finance applications, Web 2.0 Revolution, social media and industry disruptors, Virtual communities, Online social networking: Basics and examples, Web 3.0 and Web 4.0, Civil law, intellectual property law, common law and EC legal issues

References:

1. Electronic Commerce–A Managerial Perspective by Erfan Turban et.al., Pearson Education
2. Electronic Commerce – a Manger's guide by R Kalokota, Andrew V. Winston, Pearson Education

General Paper – XII: FINANCIAL ACCOUNTING

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Have knowledge of financial accounting
2. Familiarization with the basic accounting terminologies and capability of journalizing, posting and preparing final accounts both manually and in computerized form.

SYLLABUS

Module 1

Introduction

Financial Accounting-definition and Scope, objectives of Financial Accounting, Accounting v/s Book Keeping Terms used in accounting, users of accounting information and limitations of Financial Accounting.

Module 2

Conceptual Frame work

Accounting Concepts, Principles and Conventions, Accounting Standards

Module 3

Recording of transactions

Journals, Subsidiary Books, Ledger, Cash Book, Bank Reconciliation Statement, Trial Balance. Depreciation**:** Meaning, need & importance of depreciation, methods of charging depreciation.

Module 4

Preparation of final accounts

Preparation of Trading and Profit & Loss Account and Balance Sheet of sole proprietary business with adjustments.

Module 5

Computerized Accounting**:** Journalizing and preparing final accounts using TALLY

Skill Paper – X: NETWORK ADMINISTRATION

No. of credits: 3 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Know the practical difference between the usage of media
2. Know about the usage of various network protocols
3. Learn about the practical implementation of network security

SYLLABUS

Module 1

Network fundamentals and Data Communication

Local Area Network (LAN), Metropolitan Area Network (MAN), Wide Area Network (WAN), Wireless Networks, Internetworks; Data Communication: Channel capacity. Transmission media-twisted pair, coaxial cables, fibre-optic cables, wireless transmission, multiplexing, switching, narrowband ISDN, broadband ISDN, ATM, High speed LAN's, The Web and HTTP; File Transfer: FTP; Electronic Mail in the Internet; DNS-The Internet's Directory Service.

Module 2

Transport Layer

Introduction and Transport-Layer Services, Multiplexing and Demultiplexing, Connectionless Transport: UDP, Principles of Reliable Data Transfer, Connection-Oriented Transport: TCP, Principles of Congestion Control, TCP Congestion Control, Networking Layer & Routing- Introduction and Network Service Model, Routing Principles,HierarchicalRouting,Internetworking:Switch/Hub,Bridge,Router,Gateways, Concatenated virtual circuits, Fragmentation, Firewalls; The Internet Protocol, Routing and the Internet, What's Inside a Router, IPv6, Multicast Routing, Mobility and the Network Layer.

Module 3

Link Layer

Data Link Layer: Introduction and Services, Error Detection and Correction Techniques, Multiple Access Protocols, LAN Addresses and ARP, Ethernet. Hubs, Bridges and Switches, Wireless Links, PPP: The Point-to-Point Protocol, Asynchronous Transfer Mode (ATM), Frame Relay

Module 4

Network Security

Basics of cryptography-public key, secret key. Wireless & Mobility-Introduction to Wireless and Mobility. Wi-fi, Mobility Principles, Cellular Telephony, Mobile IP, Ad hoc Networks, Moving Beyond the Link Layer-An Interlude.

References:

1. TCP/IP Network Administration by Craig Hunt
2. The Practice of System and Network Administration by Thomas A. Limoncelli and Christina J. Hogan
3. Windows XP Professional Network Administration (Networking Series) by Toby Velte

Skill Paper – XI: OBJECT ORIENTED PROGRAMMING

No. of credits: 3 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Know the basic concepts of object orientation and impart skills in an industry standard object oriented language
2. Understand the concepts of classes and object
3. Define classes for a given situation and instantiate objects for specific problem solving
4. Reuse available classes after modifications if possible
5. Possess skill in object oriented thought process

SYLLABUS

Module 1

Concept of Object orientation

Why related data and methods should be kept as a single unit – comparison with procedural and structured programming – Classes and objects – data abstraction, encapsulation, inheritance, polymorphism, dynamic binding, message passing. Advantages of object orientation – reusability, maintenance, security, comfort in programming; Input and output streams in C++; Basic data types and declarations.

Module 2

Classes and objects in C++, access modifiers, static members, friend functions, Constructors and Destructors, polymorphism, Operator Overloading and type conversion, anonymous objects

Module 3

Inheritance- parent and child classes, private, public and protected inheritance, Multiple inheritance and multi-level inheritance, Virtual base classes. C++ and memory models – new and delete operators, Heap, dynamic objects.

Module 4

Binding & Polymorphism: Early binding, Late Binding, Pointers to derived class objects, virtual functions, Pure virtual functions, abstract classes, object slicing, exception handling in C++: try, throw and catch.

References:

1. Object oriented Programming with ANSI & Turbo C++ by Ashok N. Kamthane , Pearson Education
2. C++: how to program by H M Deitel and P J Deitel, Pearson Edu.
3. Object Oriented Programming in Turbo C++by Robert Lafore, Galgotia Publications

Skill Paper – XII: VISUAL TOOLS

No. of credits: 3 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. To get an exposure to visual language
2. Get an introduction about visual basic
3. Explain the fundamentals of visual basic
4. Discuss the various controls in visual basic
5. Narrate database connectivity in visual basic

SYLLABUS

Module 1

Introduction

Visual Basic IDE - Menu bar, Tool bar, Tool Box, Form designer, Code Editor, Properties Window, Form Layout, Project explorer, Immediate Window, Locals Window and Watch Window; Features in Visual Basic 6.0: The Language Object Based Programming, Different Data Access Models, Internet enabled Features. Wizards; Visual Basic Language**:** Variables, Constants, Data Types, User Defined Data Types, Scope of Variables, - Life Time of a Variables, Naming conventions in VB, Arrays, Dynamic Arrays, Collections, procedures,- Calling Procedures, Subroutines, Functions, calling Functions, Arguments, Named and Positional arguments, Control flow Statements, Loop Statements, Exit Statement.

Module 2

Visual Basic Standard ActiveX Controls & Objects

Standard Controls: TextBox, CheckBox, ComboBox, Option Button, Massage Box, PictureBox, Image Control, Shape control, System Controls, Timer Control, OLE container Control, Common Dialogs control. Event driven Programming and an overview of Properties, Methods and Events, Important Methods, Properties and Events of Standard Active X controls. i.e., TextBox, ListBox, ComboBox etc. Creating Groups, Creating and Adding Project files. Standard EXE Project file, adding Form file. Designing Menu Objects.Single Document Interface and Multiple Documents Interface. Drag Drop Operations.

Module 3

Input Validation

Over View of Validation Field Level Validation, Form Level Validation Masking. Error handling**:** General Error Handling in Visual Basic, Built in VB Error Objects Error Types, Creating Error Handlers. Compilation**:** P-Code compilation, Native Code Compilation, Conditional Compilation, Optimization.

Module 4

Database Programming

Introduction to different databases; Data-bound controls; Data Control; Data Access Object Model; Accessing Native Database with DAO, ODBC connectivity to any RDBMS, Remote Data Access, Remote Data Control, Accessing ODBC database with RDO, Data Report Designer**:** Creating Data Reports, Various Types of Reports, ActiveX Data Objects**:** Active Data Object Model, Uses of ADO Model, Accessing ODBC, database with ADO. Object Linking and Embedding**:** Overview of OLE, In place Activation, Creating OLE Servers. ActiveX Controls**:** Ms Flex Grid, Flex Grid, Image List Control, List View Control, Tool Bar, Status Bar etc.

References:

1. Microsoft Visual Basic 6.0 Professional-Step by Step by Halvorson, PHI, Second Edition

Skill Lab – VII: V**ISUAL TOOLS LAB**

No. of credits: 2 **No. of instructional hours: 4 per week**

The laboratory work may consist of 15-20 experiments covering the following topics:

1. Introduction to visual basic IDE- demonstration on various types of windows in IDE
2. Mouse, keyboard, focus and Scroll events.
3. Demonstrate the syntax and use of various VB data types, operators and control structures
4. Demonstration and use arrays and its types- (static, dynamic and control arrays)
5. Implementation of Functions, Procedures and Sub routines
6. Implementation of various standard activeX controls- Text box, list box, Check box, Combo box, option button, picture box, image box, timer, OLE control and message box
7. Programs to demonstrate various methods, events and properties of activeX controls
8. Program to implement the Menu Editor
9. Implementation of Single and Multiple Document Interface
10. Implementation of Input validation(form and field level)
11. Implementation of Error handling in VB
12. Program to implement Data bound controls
13. Implementing ADO and RDO to access database
14. Creating and generating data reports using report designer

Skill Lab – VIII: OOP & NETWORK LAB

No. of credits: 3 **No. of instructional hours: 6 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Gain hands-on practice of object oriented programming and problem solving in a industry-standard programming language and also hands-on practice in various user- defined static and dynamic data structures.
2. Do hands-on practice in the following topics, under a variety of programming situations with a focus on writing, debugging and analyzing object oriented programs; Basic data types and control structures in C++; managing classes and objects in a variety of situations; solving moderately complex problems involving the above and requiring selection of appropriate structures and algorithms

SYLLABUS

The laboratory work will consist of 15-20 experiments, only by using class concept.

Part A:

1. Testing out and interpreting a variety of simple programs to demonstrate the syntax and use of the following features of the language: basic data types, operators and control structures.
2. Solving a problem using (i) structures and (ii) classes and comparison between the two (the problem logic and details should be kept minimal and simple to enable focus on the contrast between the two methods, for example declaring result of a set of students defining the name and total marks in the program itself).
3. Class definitions and usage involving variety of constructors and destructors

Part B:

4. Programs involving various kinds of inheritances,
5. Programs involving operator overloading and type conversions
6. Programs involving virtual base classes, friend functions
7. Program to demonstrate early and late binding
8. Program to allocate memory dynamically
9. Program involving class and function templates
10. Programs to demonstrate(i) string processing (ii) file streams (iii) a variety of selected library functions
11. Exception handling
12. Handling of 2-D arrays using pointers
13. Debugging programs involving syntactic and/or logical errors

NETWORK LAB:

1. Programs using TCP Sockets (like date and time server & client, echo server &client, etc..)
2. Programs using UDP Sockets (like simple DNS)
3. Programs using Raw sockets (like packet capturing and filtering)
4. Programs using RPC
5. Simulation of sliding window protocols
6. Experiments using simulators (like OPNET)
7. Performance comparison of MAC protocols
8. Performance comparison of Routing protocols
9. OPEN SHORTEST PATH FIRST ROUTING PROTOCOL
10. Study of TCP/UDP performance

References:

1. C++: How to Program by Deitel & Deital, Pearson Education

Skill Lab – IX: INDUSTRIAL TRAINING

No. of credits: 4

- Students should go to a software firm and undergo training on an emerging tool.

SEMESTER - V

General Paper – XIII: INTRODUCTION TO INFORMATION SECURITY

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Introduce internetworking and the issues and methods of information security over internetworks.
2. Be aware of principles and protocols of internetworks
3. Understand the basic issues in information security
4. Understand the concept of ciphers and cryptography.
5. Get an idea about various ciphers
6. Understand the concept of digital signatures and e-mail security policies
7. Get an idea about malicious softwares and remedies.

SYLLABUS

Module 1

Information Security

Network security, Confidentiality, integrity, authentication, security policy, basic network security terminology, cryptography, symmetric encryption, substitution ciphers, transposition ciphers, steganography, Block ciphers, modes of operation, Data Encryption Standard, Public key cryptography, applications, strength and weakness, RSA algorithm, key distribution (concepts only).

Module 2

Authentication

Authentication methods, message digest, digital signatures, digital signature algorithm, DSS, E-mail security: Pretty Good Privacy, working of PGP, S/MIME, MIME, IP Security, Architecture, IPSec: strengths and benefits, IPv4, IPv6, ESP protocol, Web Security: Secure Socket layer, SSL session and connection.

Module 3

Malicious Software

Viruses, working of anti-virus software, worms, Trojans, spyware, firewall, characteristics of firewall, packet filters, application level gateways, firewall architecture, trusted systems.

Module 4

Security and Law

Regulations in India. Information Technology Act 2000/2008.Cyber Crime and the IT Act 2000/2008.Indian Contract Act 1872, Indian Penal Code, Indian Copyright Act, Consumer Protection Act. Future Trends – The Law of Convergence.

References:

1. Cryptography & Network Security by Brijendra Singh, PHI.
2. Cryptography and Information Security by Pachghare, V.K., PHI.

General Paper – XIV: PRINCIPLES OF MANAGEMENT

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Get the basic principles of management to provide an overview of its practice in the global industries.
2. Get the concept of Management and Organisations Planning and decision making strategies
3. Get the concepts of organizational behavior and HR management and Leadership qualities

SYLLABUS

Module 1

Definition of Management – evolution of management principles - styles of Management – levels in management-structured and unstructured decision making – functions of management. Organizational behaviour – motivational theories

Module 2

Production & Marketing Management: Time management–workflow design – scheduling CP/M – critical path – PERT, Problems, Types of Markets – Marketing Mix – Product life cycle – pricing strategies – advertisement-sales promotion

Module 3

Quality Management. Concept of quality, total quality management, 7 sigma principles, ISO certifications, Component maturity models, CMM Levels.

Module 4

Human Resource Management: Meaning of HRM, Recruitment- selection and training – difference between training and development – on the job and off the job training.

References:

1. Principles of management by PC Tripathi and P N Reddy, 2/e, Tata McGraw Hill
2. Total Quality Management by Poornima M. Charantimath, Pearson Education
3. Basic Managerial Skills for All by E H McGrath, PHI

General Paper – XV: ENTREPRENEURSHIP DEVELOPMENT

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Have a practical insight for becoming an entrepreneur.
2. Familiarize with the latest programs of the government authorities in promoting small and medium industries.
3. Have knowledge regarding how to start new ventures.

SYLLABUS

Module 1

Concepts of entrepreneur

Entrepreneur- Definitions-Characteristics of entrepreneur-Classification of entrepreneur-Entrepreneurial traits-Entrepreneurial functions-role of entrepreneurs in the economic development- Factor effecting entrepreneurial growth-Entrepreneurship - Meaning- definition- Entrepreneur Vs Intrapreneur- Women Entrepreneurs-Recent development-Problems-Entrepreneurial Development Programmes- Objectives of EDP-Methods of training-Phases of EDP

Module 2

Institutional support and incentives to entrepreneurs

Functions of Department of Industries 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 Incentives-Importance- Classification of incentives- Subsidy- Types of Subsidy

Module 3

Micro Small and Medium Enterprises

Features; Objectives; Importance; Role of SME 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

Module 4

Setting up of Industrial unit-(Only Basic study)

Environment for Entrepreneurship ; 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.

Module 5

Project Report

Meaning; Definition; Purpose of project reports; Requirements of good report; Methods of reporting; General principles of a good reporting system; Proforma of a project report; Sample project report.

References:

1. Entrepreneurship and small Business Management by Shukla M.B. Kitab Mahal Allahabad.
2. Fundamentals of entrepreneurship by Sangram Keshari Mohanty, PHI
3. Fundamentals of Entrepreneurship by Nandan H. PHI
4. Small-Scale Industries and Entrepreneurship, Himalaya Publishing ,Delhi
5. Project Management by C.N.Sontakki, Kalyani Publishers, Ludhiana.
6. Innovation and Entrepreneurship by Peter F. Drucker
7. Small Business Entrepreneurship by Vasanth Desai, Himalaya Publications.
8. MSME Act 2006.

Skill Paper – XIII: PROGRAMMING IN JAVA

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Know the basic features of Java language and selected APIs
2. Install and work with JDK
3. Make them aware the use of java doc.
4. Practice basic data types, operators and control structures in Java
5. Practice basic handling of classes and objects in Java
6. Introduce the following selected APIs: I/O, Strings, Threads, AWT, Applet, Networking
7. Get the idea to approach and use a new package

SYLLABUS

Module 1

Brief History of Java, Special Features of Java, Data Type & Operators in Java, Arrays, Objects, the Assignment Statement, Arithmetic Operators, Relational and Logical Operators in Java, control Structures, The Java Class, Constructor, Simple Java Application, simple Java Applet, Finalizers, Classes inside classes : composition.

Module 2

Inheritance & Interface, Deriving Classes, Method Over-riding, Method Overloading, Access Modifiers, Abstract Class and Method, Interfaces, Packages, Imports and Class Path.

Module 3

Exception Handling, TheTry-Catch Statement, Catching more than one Exception, The Finally Clause, Generating Exceptions, Threads: Introduction, Creating Threads in Applications, Method in Thread Class, Threads in Applets.

Module 4

Java APIs – overview of APIs, IO Packages, Java Input Stream Classes, Java
Output Stream Classes, File Class, Graphic & Sound: AWT and Swing, Graphic methods, Fonts, Loading and Viewing Images, Loading and Playing Sound, AWT & Event Handling, Layouts, JDBC.

References:

1. Java Programming, Schaum Outline Series
2. Java: How To Program by Deitel, Pearson Education

Skill Paper – XIV: SOFTWARE TESTING

No. of credits: 3 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Get the knowledge of testing softwares
2. Discuss the basic concept of testing
3. Explain different types of testing
4. Describe the tools used for testing

SYLLABUS

Module 1

Introduction; Purpose of testing, testing and debugging, model for testing, types of testing, types of bugs Flow graphs and Path testing:- Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation

Module 2

Transaction Flow Testing -transaction flows, example of transaction testing; Dataflow testing- Basics of dataflow testing, example of dataflow testing; Domain Testing-domains and paths, Nice & ugly domains, Interfaces testing

Module 3

Paths, Path products and Regular expressions; path products & path expression, reduction procedure, regular expressions & flow anomaly detection

Module 4

Logic Based Testing- overview, decision tables, path expressions, kv charts, State Graphs and Transition testing- good & bad state graphs, state testing

References:

1. Software Testing techniques by BarisBeizer,Dreamtech
2. Software Testing in the Real World by Edward Kit, Pearson
3. Software Testing Tools by K.K.Prasad, Dreamtech

Skill Paper – XV: SOFTWARE ENGINEERING

No. of credits: 3 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Have a thorough understanding of the activities in development projects using (a) Structured Analysis and Design and (b) Object Oriented Analysis and Design
2. Appreciate the importance of having a process for software development.
3. Understand the various activities undertaken for a software development project following the Function oriented Design & Object oriented design
4. Understand the issues in code design and development
5. Test software developed using SSAD and OOAD methodologies.
6. Have in depth knowledge about the different OOAD Themes and compare them with SSAD

SYLLABUS

Module 1

Introduction

Characteristics of Software, Product and Process, Need for Software Process, Characteristics of a Software Process, Software Development Process models, Software Development Life Cycle Model: Waterfall Model, Prototyping, iterative development, Spiral Model, time-boxing model; Comparison of different Life Cycle Models, Software Project Management, Project Estimation Techniques, Software Requirements Analysis and Definition: Software Requirements, Overview of SA/SD Methodology, Requirements Specification: Need for SRS, Characteristics of an SRS, Components of an SRS, Specification Languages, Structure of a Requirements document. Functional Specification with Use cases, developing use cases, Structured Analysis, Matrics, quality metrics, Planning a project, effort estimation, COCOMO model, quality plan, risk management-assessment, control.

Module 2

Function oriented design

Problem partitioning, abstraction, modularity, Top-down and Bottom-up Strategies, coupling, cohesion, design notations-structure charts, structured design, Data Flow Diagrams, Developing the DFD Model of a system, Entity Relationship Diagram, Developing ERD of a system, Decision Trees, Decision Tables, Structured English, first-level factoring, factoring input, output and transform branches, transaction analysis, verification.

Module 3

Object-oriented design

Object-oriented design concepts, Comparison between Algorithmic Decomposition and Object Oriented Decomposition Unified Modelling Language, Object Oriented Design using UML, Class Diagram, Sequence Diagram, Collaboration Diagram; detailed design, PDL, algorithm design, state modelling of classes, design walkthroughs, critical design review, consistency checkers, other UML diagrams.

Module 4

Coding and testing

Common coding errors, structured programming, coding standards, incremental coding process, test driven development, source code control and build, refactoring, verification- code inspections, static analysis, unit testing, combining different techniques. Testing- error, fault and failure, test oracles, test cases, Black Box Testing, Equivalence Class Partitioning, Boundary Value Analysis, Cause Effect Graphing, White Box Testing- control flow based and data-flow based testing, test plan, test case specifications, defect logging and tracking, Comparison of Different Techniques.

References:

1. Fundamentals of Software Engineering by Rajib Mall, Second Edition, PHI
2. An Integrated Approach to Software Engineering by Pankaj Jalote**,** Narosa
3. Software Engineering by Waman S Jawadekar,, McGraw hill

Skill Lab – X: JAVA LAB

No. of credits: 3 **No. of instructional hours: 6 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Provide an opportunity for hands-on practice in Java.
2. Do hands-on practice, under a variety of programming situations with a focus on writing, debugging and analysing object oriented programs; basic data types and control structures in Java installing and using JDK writing applications and applets, managing classes and objects in a variety of situations using i/o, string, threads and net APIs solving moderately complex problems involving the above.

SYLLABUS

The laboratory work will consist of 15-20 Experiments.

Part A:

1. Testing out and interpreting a variety of simple programs to demonstrate the syntax and use of the following features of the language: basic data types, operators and control structures.
2. Class definitions and usage involving variety of constructors and finalizers
3. Programs involving various kinds of inheritances,
4. Program involving Method Over-riding, Method Over-loading
5. Program involving Abstract Class and Methods

Part B:

6. Program involving Interface,

7. Program to demonstrate creation and handling of packages, their imports and Class Path.

8. Programs involving a variety of Exception Handling situations

9. Program to define a class that generates Exceptions and using objects of the class.

10. Program involving creating and handling threads in applications and applets.

11-12: Programs to demonstrate methods of various i/o classes

13. Programs to demonstrate methods of string class

14. Program to demonstrate AWT/Swing graphic methods

15. Program for Loading and Viewing Images, Loading and Playing Sound

16. Programs to demonstrate various Layouts

17-18 Programs to demonstrate event handling

19. Program to demonstrate simple server-client (using a single m/c both as client and server)

20. Debugging programs involving syntactic and/or logical errors

Skill Lab – XI: STUDY TOUR

No. of credits: 2

- Students should be taken for at least 3-5 day tour to any of the software industry and the credits should be awarded based on the study tour report submitted

Skill Lab – XII: MAJOR PROJECT (PHASE I)

No. of credits: 3 **No. of instructional hours: 6 per week**

- An analysis and design report should be submitted at the end of this course. This report should be valued internally and marks should be awarded.
- Up to coding should be finished in 5th semester. Coding should begin in the 6th semester

SEMESTER -VI

General Paper-XVI: HUMAN RESOURCES DEVELOPMENT

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Know about Human Resource Management
2. Learn about creative thinking and confidence building
3. Learn about personality development and professional skills
4. Learn about public speaking and presenting oneself before others.

SYLLABUS

Module 1

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

Module 2

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.

Module 3

Personality Development

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

Module 4

Presentation skills

Group discussion- mock Group Discussion using video recording- public speaking

Module 5

Professional skills

Organisational skills- team work- business and technical correspondence- job oriented skills-professional etiquettes

References:

1. Successful communication by Matila Treece
2. Human Resource Management : Text & Cases by V S P Rao
3. Business Communication Today by Boves Thill
4. Dark Studying International Communication Sage Publication.
5. Effective Business Communication by Murphy Hidderandt Thomas, McGraw Hill.

General Paper – XVII: FREE AND OPEN SOURCE SOFTWARES (FOSS)

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Get introduced to different free and open source softwares
2. Explain the features of free & open source software
3. Familiarization with LINUX
4. Work with PHP
5. Demonstrate the working of MySQL

SYLLABUS

Module 1

Open source software

Features, advantages over proprietary software, examples**,** Free software**:** concepts, features, Free software Vs Open Source software, Free software movements. Policies, GPL, Free OS, History and Features of Linux, Various flavours of Linux, Linux Kernel and Shell, Graphical Desktops- GNOME, KDE, Linux File System and Directories

Module 2

The building blocks of PHP

Variables, globals & super globals Data types: Settype, type casting, test type, Operators & Expressions, Flow control functions in PHP, Functions: Defining a function variable scope, calling a function, returning values, setting default values for arguments, passing variable reference Arrays: creating arrays (associative multidimensional), Array related functions Working with strings: Formatting strings, indexing, strlen() functions

Module 3

Forms in PHP

Creating a simple input form, combining HTML & PHP code on a single page, redirecting the user ,creating a send mail form, File upload form Cookies: Introduction, setting a cookie with PHP, deleting a cookie, session function overview: starting a session, working with session variables, passing session IDs in the query string, destroying sessions & unsetting variables

Module 4

Database concepts

Open source database software: MySQL features MySQL data types: Numeric, date & time, string Table creation in MySQL: insert, select, where clause, ordering the result, like operator Selecting Multiple tables: using join, using queries Modifying records: update command, replace command, delete command date & time functions in MySQL Interacting with MySQL using PHP: connecting to MYSQL, Executing queries, Retrieving error messages, inserting data with PHP, retrieving data with PHP

References:

1. PHP, MySQL and Apache by Julie C.Meloni, Pearson Education
2. HTML, DHTML, Javascript, Perl by Ivan Byross, BPB Publication

General Paper – XVIII: IT & SOCIETY

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Emerge as computer professional
2. Aware of ethical issues in computing profession
3. Aware of managing quality
4. Aware of quality certifications
5. Have an Exposure to Cyber law

SYLLABUS

Module 1

What is a profession; who is a professional ; core qualities of a professional environments and their impact and complexity – social attitudes, beliefs and values

Module 2

Codes of ethics ; solving ethical conflicts; moral reasoning and ethical theories; responsibilities and rights. Computer ethics : ethics and the internet; hacking netiquette ; privacy

Module 3

Quality Management. Concept of quality, total quality management, 7 sigma principles, ISO certifications, Component maturity models, CMM Levels.

Module 4

Cyberlaw: Intellectual property rights – basic ideas ; copyright concepts – copyrights applied to softwares ; software licensing ; patents in software ; Indian copyright law and provisions for software ; Indian patent law and provisions for software ; various licencing models - arguments against copyrights and patents in software ; free softwares; GPL software freedoms; open source softwares

References:

1. Engineering Ethics by M Govindarajan, S Natarajan, V S Senthil Kumar,, PHI
2. Total Quality Management by Poornima M. Charantimath, Pearson Education
3. Free Software: A Perspective by Richard Stallman, Prajasakthi Book House, Hyderabad
4. Indian Copyright Act and Indian Patent Acts
5. Computer Ethics by Deborah G Johnson, Pearson Education
6. Total Quality Management by Shailendra Nigam, Excel
7. Engineering Ethics by Charles B Fleddermann, Pearson Edu.
8. The Professional Edge by James S Bowman, et. al., PHI
9. Building a Portfolio, A career enhancement guide, NIIT, PHI
10. Experience in India : Bridging the Digital Divide by Kenneth Kensington, Deepak Kumar, Sage Publishers

Skill Paper – XVI: MOBILE APPLICATIONS DEVELOPMENT

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Build their own Android applications.
2. Explain the differences between Android, Windows and other mobile
3. Develop applications for modern mobile phone operating systems.

SYLLABUS

Module 1

Mobile Computing

Mobile Connectivity-Cells, Framework, wireless Delivery Technology and switching methods, Mobile Information Access Devices, Mobile Data Internetworking Standards, Cellular data communication Protocols, Mobile Computing Applications. Mobile Data Bases- Protocols, Scope, Tools and Technology, M- Business.

Module 2

Android Development Tools

Eclipse integrated development environment (IDE), Android software development kit (SDK), Application development tools (ADT) plugin, Emulators and Devices: Android virtual devices (AVDs), Connecting Androids to the development platform, USB drivers for Android development, Android Development Lifecycle: "Hello World!", Running on the emulator, Running on a device

Module 3

XML Fundamentals

Trees, Elements, Attributes, Examples, Simple Interactive programs, Activity Lifecycles: Callbacks and activity pyramids, Launcher activity, Instantiation, Destroying activities, Pausing, resuming, starting and stopping activities, Saving and restoring activities,

Module 4

Interaction with Other Apps, Location-Aware Apps, Network and Cloud Operations, Layout Hierarchies, Audio, Photos and Video

References:

1. Build Mobile Websites And Apps for Smart Devices by E. Castledine
2. Jump Start Responsive Web Design by Craig Sharkie & Andrew Fisher
3. O'REILLY Building Android Apps with HTML, CSS and Javascript
4. Building Windows 8 Application Development – XAML edition by Kyle Burns
5. Beginning Android 4 Application Development by Wei-Meng Lee
6. O'REILLY Building iPhone Apps with HTML, CSS and Javascript by Jonathan Stark

Skill Paper – XVII: DATABASE ADMINISTRATION

No. of credits: 4 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Know about designing schemas for database
2. Know about the advantages of normalization
3. Make queries on the prepared database

SYLLABUS

Module 1

Introduction to Databases, Database Environment, The Relational Model and Languages: The Relational Model, Relational Algebra and Relational Calculus, QBE, Database Design:, ER diagrams and their transformation to relational design, Normalization, Security, Transaction Management: Transaction Support, Concurrency Control, Database Recovery

Module 2

Data Definition Language (DDL), Data Manipulation Language (DML), Data Control Language (DCL) commands, Database objects like – Views, indexes, sequences, synonyms and data dictionary, SQL.

Module 3

Object oriented Database Management Systems: Concepts, Composite objects, Integration with RDBMS applications, Issues in OODBMSs, Advantages and Disadvantages of OODBMSs

Module 4

Object-oriented Database Design. Decision making processes, evaluation of DSS, Group decision support system. Distributed Databases

References:

1. Database Administration: The Complete Guide to DBA Practices and Procedures by Craig S.Mullins
2. MySQL Database Usage & Administration by VikramVaswani
3. Understanding Database Administration by Pablo Berzukov

Skill Paper – XVIII: ADVANCED JAVA

No. of credits: 3 **No. of instructional hours: 4 per week**

OBJECTIVES:

On completion of the course the students shall be able to:

1. Know about JDBC
2. Know about applets & servelets
3. Know about JSP, Swing & Java Beans

SYLLABUS

Module 1

Introduction to SwingJapplet, Icons and Labels, Text Fields, Buttons, Jbutton Class, Check Box, Radio Buttons, The Container, Panel, Windows and Frame Classes, Combo Box, Tabbed Panes, Scroll Panes, Trees, Tables, Custom Rendering of Jlist Cells, JDBC: JDBC Fundamentals, Establishing Connectivity and working with connection interface, Working with statements, Creating and Executing SQL statements, Working with Result Set Object & Result Set Meta Data

Module 2

Servlets: Introduction to Servlets (Life cycle of servlets, Java Servlets Development Kit, creating, Compiling and running servlet, The servlet API : javax.servlet package, Reading the servlet Parameters, Reading Initialization parameter, The javax.servlet.http.Package, Handling HTTP Request and Response (GET / POST Request) vi) Using Cookies, Session Tracking

Module 3

Introduction To Java Beans, What is Java Bean?, Advantage, Installing / Starting / Using BDK (Bean Development Kit, JAR Files, Using the Java Beans API

Module 4

JSP: Advantage of JSP technology (Comparison with ASP / Servlet), JSP Architecture, JSP Access Model, JSP Syntax Basic (Directions, Declarations, Expression, Scriplets, Comments, JSP Implicit Object, Object Scope, Synchronization Issue, Exception Handling, Session Management

Skill Lab – XIII: ANDROID & JAVA LAB

No. of credits: 3 **No. of instructional hours: 6 per week**

1. Familiarization with the Android Development Platform
2. Configure the settings of the Eclipse Integrated Development Environment (IDE) for Android development
3. Use the IDE to create an Android programming project. Write a short introductory program
4. Connect to an Android device and run the program on the device. Writing Android Programs
5. Use the IDE to create an app project that has buttons, string resources, View and ViewGroup objects
6. Experiment with XML, activities, manifests and intents in this project. Use the emulator to test the application
7. Load the app onto an Android device and test it on actual hardware. Expanding the App Capabilities with Lifecycles and more UI options
8. Use the IDE to create an app that has an activity lifecycle including some of the following: pause, resume, start, stop, destroy and restore.
9. Experiment with UI fragments, and flexible UIs in this project. Use the emulator to test the application
10. Load the app onto an Android device and test it on actual hardware. Demonstrating Inter-App Interaction
11. Use the IDE to create an app that has inter-application interaction.
12. Experiment with sending and getting messages to other apps in this project. Use the emulator to test the application
13. Load the app onto an Android device and test it on actual hardware. Demonstrating Location Awareness
14. Use the IDE to create an app that is location-aware. Experiment with the location manager in this project. Use the emulator to test the application
15. Load the app onto an Android device and test it on actual hardware. Building a program that demonstrates layout hierarchies
16. Use the IDE to create an app that has multiple layout hierarchies. Experiment with ListView, Lint, and ViewStubs in this project.
17. Use the emulator to test the application

18. Load the app onto an Android device and test it on actual hardware. Building a program that demonstrates network operations
19. Use the IDE to create an app that has network awareness. Experiment network and cloud messaging in this project. Use the emulator to test the application
20. Load the app onto an Android device and test it on actual hardware Incorporating audio and/or video into app projects
21. Use the IDE to create an app that has either audio or video (or both) incorporated into its design.
22. Experiment with volume, playback, photo-capture and/or video Control in this project. Use the emulator to test the application
23. Load the app onto an Android device and test it on actual hardware. Building a program around 2-D or 3-D graphics
24. Use the IDE to create an app that uses OpenGL ES with 2-D and/or 3-D graphics
25. Experiment with projections, shapes, motion transformations and renderers in this project. Use the emulator to test the application
26. Load the app onto an Android device and test it on actual hardware.

Skill Lab – XIV: MAJOR PROJECT & VIVA VOCE

No. of credits: 4 **No. of instructional hours: 8 per week**

AIM:

To expose student to industry-standard project practices, through a real-life project work under time and deliverable constraints, applying the knowledge acquired through various courses.

OBJECTIVES:

1. To provide an opportunity to apply the knowledge gained through various courses in solving a real life problem
2. To provide an opportunity to practice different phases of software/system development life cycle
3. To introduce the student to a professional environment and/or style typical of a global IT industry
4. To provide an opportunity for structured team work and Project Management
5. To provide an opportunity for effective, real-life, technical documentation
6. To provide an opportunity to practice time, resource and person management

PROJECT GUIDELINES

1. Individual projects may be done but it is preferred to have a Group Project. The size of the group must not exceed more than three members.
2. No. of records to be submitted – 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 Modelling, 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. Related reading, training and discussions should start from semester 5 itself.

Selection of project work: Project work could be of 3 types:

a) 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, Computerisation 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.

(b) 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 Devnagari Language Editor with Spell Checker, Computer Music Software for Indian Music, Heat Engines Simulation Software for eLearning, Digital Water Marking Software, Embedded system design

(c) 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 Devnagari Character Recognition, Neural Net Based Speech Recogniser, 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 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 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 favourably by Head of Institute 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.

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 original 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 blue. Only hard binding should be done, with title of the thesis and the words "<BRIEF TITLE> B.Voc. (Software Development) Project Report 200…" displayed on the spine in 20 point, Bold, Times New Roman, as in example below. In case the title is too long, a shorter version of it may be used (Like "Image Pro" instead of "Image Pro – An Interactive Image Processing package"). It is highly recommended that Latex be used for documentation.

- 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, Centered.

An example:

WEB BASED BILLING SOFTWARE: B.Voc. (SOFTWARE DEVELOPMENT) PROJECT 2021

- SECTION HEADINGS 12 pt, Times New Roman, Bold, All Caps, Left Adjusted.
- 1 Section Sub-headings 12 pt, Times New Roman, Bold, Left Adjusted.
- Titles of Figures, Tables etc are done in 12 point, times New Roman, Italics, Centered.

<PROJECT TITLE>

<STUDENT'S NAME>

<CENTRE NAME>

PROJECT REPORT

Submitted in partial fulfilment of the requirements for the award of
B.Voc. (Software Development) Degree of University of Allahabad

2021

Some general guidelines on documentation stylistics are:

- Double quotes and single quotes (“”, ‘’) should be used only when essential. In most cases words put in quotes are better highlighted by setting them in italics. Eg: This process is known as “morphing”. This process is known as *morphing.*
- Page numbers shall be set at right hand top corner, paragraph indent shall be set as 3.
- Only single space need be left above a section or sub-section heading and no space may be left after them.
- Certificate should be in the format: “Certified that this report titled ..... is a bonafide record of the project work done by Sri/Kum..... under my/our supervision and guidance, towards partial fulfillment of the requirements for the award of the Degree of B.Voc.(Software Development) of the University of Allahabad with dated signatures of Internal; Guide, external guide and also Head of Institute/College.
- If the project is done in an external organization, another certificate on the letterhead of the organization is required: “Certified that his report titled .....is a bonafide record of the project work done by Sri/Kum..... under any supervision and guidance, at the .....Department of ..... (Organization) towards partial fulfilment of the requirements for the award of the Degree of B.Voc. (Software Development) of the University of Allahabad.
- References shall be IEEE format (see any IEEE magazine or transaction). Take care in use of italics and punctuation. While doing the project, keep note of all books you refer, in the correct format, and include them in alphabetical order in your reference list. Eg: A book is cited as: Kartalopoulos, S V Understanding Neural Networks and Fuzzy Logic, BPB Publishers, 1996, pp. 21-27. (pp.21-27 indicates that pages 21-27 have been referred. If the whole book is being referred, this may be omitted. If a single page is referred, say 7, it may be cited as p.7. Report writing is NOT a hasty activity done after finishing the project. Students must try to develop the report along with the work, so as to give it flesh and blood. Drafts should be read, modified, spell checked and grammar checked at least thrice during the course of the project and before a final printout is taken, the same may be got approved from the internal guide. The students should send two interim reports to internal guides. This will also help the students in their report writing.

The Gantt chart, fortnightly progress reports, and team meeting example, the following is given (though students should not attempt to fit every kind of project minutes should appear as appendix to the project report. Regarding the body of the report, as an indicative 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 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. In such cases, instead of ER diagram/DFD etc one should draw the class diagram, activity diagram etc. 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):*

(a) 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

(b) 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

(c) Coding and Impletion

(d) Testing

(e) Security, Backup and Recovery Mechanisms

(f) On line help and User Manuals

(g) Upgradability Possibilities

The Plagiarism test report must be a part of the project, mentioning the name of the tool used to measure it.

Project IPR & Utilisation: The intellectual property rights in all project work done by the students shall vest with the University of Allahabad, 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.

References:

1. Software Project Management by S A Kelkar, Prentice Hall of India
2. Effective project planning and management by W Alan Randolph, Barry Z. Posner, PHI
3. Software Project Management Kit for Dummies by Greg Mandanis, IDG Books
4. Software Project management by Joel Henry
5. Essays on Software Engineering by Frederic P B, Mythical Man-month, Addison Wesley
6. Latex: A document Preparation System by David Lamport, 2/e, Pearson

20. SUGGESTED FORMAT OF THE PAPER FOR END SEMESTER EVALUATION:

The paper of total 60 marks may comprise of:

1.	10 very short answer type questions (compulsory)	10 x 1 = 10
2.	4 out of 8 short answer type questions	04 x 3 = 12
3.	3 out of 6 medium answer type questions	03 x 6 = 18
4.	2 out of 4 long answer type questions	02 x 10 = 20

Note: The University may from time to time revise, amend and change the Regulations.