

Regulation, Scheme and syllabus for B.Voc Degree
Programme in Software Development
(To be introduced from 2014 admissions)

1. INTRODUCTION

The University Grants Commission (UGC) has launched a scheme on skills development based higher education as part of college/university education, leading to Bachelor of Vocation (B.Voc.) Degree with multiple exits such as Diploma/Advanced Diploma under the NSQF. The B.Voc. programme is focused on universities and colleges providing undergraduate studies which would also incorporate specific job roles along with broad based general education. This would enable the graduates completing B.Voc. to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge.

The proposed vocational programme in Software Development will be a judicious mix of skills, professional education related to Software Development and also appropriate content of general education. It is designed with the objective of equipping the students to cope with the emerging trends and challenges in the Software Development environment.

2. ELIGIBILITY FOR ADMISSION

Eligibility for admissions and reservation of seats for B.Voc Software Development shall be according to the rules framed by the University from time to time. No student shall be eligible for admission to B.Voc Software Development unless he/she has successfully completed the examination conducted by a Board/ University at the +2 level of schooling or its equivalent in science stream. Those who passed Vocational Higher Secondary course will get an additional weightage of 25 marks in the ranking index. For the calculation of ranking mark in any stream, convert the qualifying examination mark to 1200.

3. NATURE OF THE COURSE

This course follows 2(b) pattern of the University under first degree CBCS program with appropriate modifications.

- No open course is envisaged
- No Electives are included
- Total credits enhanced to 180 instead of 120

- Working hours per week is increased to 30 hours
- All vocational subjects are treated as core course.
- Multiple exit points are permitted, that is, if willing, candidate can quit after the successful completion of first & second year. Candidate do so, can't be re-entered.
- There will not be provisions for improvement.
- A candidate who failed in a semester may get two supplementary chances. Only failed papers are to be written in the supplementary examination.

- **CURRICULUM**

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

4. DURATION

The duration of the B.Voc. Software Development shall be three years consisting of six semesters. The duration of each semester shall be five months inclusive of the days of examinations. There shall be at least 90 working days in a semester and a minimum 540 hours of instruction in a semester.

5. PROGRAMME STRUCTURE

The B.Voc Software Development shall include:

- Language courses (English)
- General Education Components
- Skill Components
- Project
- Industrial Training
- Soft Skills and Personality Development Programmes
- Study tours

6. CREDIT CALCULATION

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

- One Credit would mean equivalent of 15 periods of 60 minutes each, for theory, workshops/labs and tutorials;
- For industrial visit, the credit weightage for equivalent hours shall be 50% of that for lectures/workshops;

- For self-learning, based on e-content or otherwise, the credit weightage for equivalent hours of study should be 50% or less of that for lectures/workshops.

7. COURSE STRUCTURE

NSQF Level	Skill Component Credits	General Education Credits	Normal calendar duration	Exit Points / Awards
Year 3	36	24	Six Semesters	B.Voc.
Year 2	36	24	Four semesters	Advanced Diploma
Year 1	36	24	Two semesters	Diploma
TOTAL	108	72		

As per the UGC guidelines, there are multiple exit point for a candidate admitted in this course. If he/she is completing all the six semester successfully, he/she will get B. Voc degree in Software Development. If he/she is completing the first four semesters successfully, he/she will get an advanced diploma in Software Development. If he/she is completing the first two semesters he/she will get a diploma in Software Development. B Voc Degree holder is expected to acquire the skills needed for a software developer or entrepreneur. Advanced diploma holder is expected to become a multi-skilled Software associate. Diploma holder is expected to become Data interpreter.

8. PROGRAMME STRUCTURE

The mathematics papers with code MM1231.9, MM1131.9 and English paper with code EN1111.4, EN1211.4 are adopted from the approved syllabus of the concerned boards developed for BCA course.

Semester 1

General Education				Skill Component			
No.	Title	Credit	Hrs/Week	No.	Title	Credit	Hrs/Week
EN1111	Speaking and Listening skills	4	4	VS 313	Introduction to IT	4	4
VS 311	Aptitude & Logical reasoning	4	4	VS 314	Programming Principles	4	4
VS 312	Managerial Economics	4	4	VS 315	Word Processing & Image editing	4	4
				VS 316	Photoshop Lab	3	3
				VS 317	Page maker Lab	3	3
	Total	12	12		Total	18	18

Semester II

General Education				Skill Component			
No.	Title	Credit	Hrs/Week	No.	Title	Credit	Hrs/Week
EN1211	Writing and Presentation skills	4	4	VS 322	Animation software	4	4
VS 321	Environmental Studies	4	4	VS 323	Network & Internet Applications	4	4
MM1131.9	Mathematics I	4	4	VS 324	C Programming	4	4
				VS 325	C PgmingLab	3	3
				VS 326	Animations Lab	3	3
	Total	12	12		Total	18	18

Semester III

General Education				Skill Component			
No.	Title	Credit	Hrs/Week	No.	Title	Credit	Hrs/Week
VS 331	Business Statistics	4	4	VS 334	Web application & development	4	4
VS 332	System Analysis & Design	4	4	VS 335	Computer H/W & Maintenance	4	4
VS 333	Management Information Systems	4	4	VS 336	Operating Systems	4	4
				VS 337	Web Development Lab	3	3
				VS 338	Computer Hardware Lab	3	3
	Total	12	12		Total	18	18

Semester IV

General Education				Skill Component			
No.	Title	Credit	Hrs/Week	No.	Title	Credit	Hrs/Week
MM1231.9	Mathematics II	4	4	VS 343	Network Administration	3	4
VS 341	Business Informatics	4	4	VS 344	Object Oriented Programming	3	4
VS 342	Financial Accounting	4	4	VS 345	Visual Tools	3	4
				VS 346	Visual Tools Lab	2	3
				VS 347	OOP & network Lab	3	3
				VS 348	Industrial Training	4	
	Total	12	12		Total	18	18

Semester V

General Education				Skill Component			
No.	Title	Credit	Hrs/Week	No.	Title	Credit	Hrs/Week
VS 351	Introduction to information security	4	4	VS 354	Programming in Java	4	4
VS 352	Principles of Management	4	4	VS 355	Software Testing	3	4
VS 353	Entrepreneurship Development	4	4	VS 356	Software Engineering	3	4
				VS 357	Java Lab	3	3
				VS 358	Study tour	2	
				VS 359	Major Project (Phase I)	3	3
	Total	12	12		Total	18	18

Semester VI

General Education				Skill Component			
No.	Title	Credit	Hrs/Week	No.	Title	Credit	Hrs/Week
VS 361	Human Resource Development	4	4	VS 364	Mobile Application Development	4	4
VS 362	Free and Open Source Softwares (FOSS)	4	4	VS 365	Database Administration	4	4
VS 363	IT & Society	4	4	VS 366	Advanced Java	3	4
				VS 367	Android & Java Lab	3	3
				VS 368	Major Project (Phase II)	4	3
	Total	12	12		Total	18	18

9. DISTRIBUTION OF MARKS

Semester	Code No	Subject	General/Skill	Credit	Contact Hrs	Marks ESE	Marks CE	Total Marks
	EN1111	Listening and Speaking Skills in English	General	4	72	80	20	100
	VS 311	Aptitude and Logical Reasoning	General	4	72	80	20	100
	VS 312	Managerial Economics	General	4	72	80	20	100
ONE	VS 313	Introduction to IT	Skill	4	72	80	20	100
	VS 314	Programming Principles	Skill	4	72	80	20	100
	VS 315	Word processing and Image Editing	Skill	4	72	80	20	100
	VS 316	Photoshop Lab	Skill	3	54	80	20	100
	VS 317	Page Maker Lab	Skill	3	54	80	20	100
	EN	Writing and Presentation	General	4	72	80	20	100

Two	1211	Skills in English						
	VS 321	Environmental studies	General	4	72	80	20	100
	MM113 1.9	Mathematics I	General	4	72	80	20	100
TWO	VS 322	Animation Softwares	Skill	4	72	80	20	100
	VS 323	Network & Internet Applications	Skill	4	72	80	20	100
	VS 324	C Programming	Skill	4	72	80	20	100
	VS 325	C programmingLab	Skill	3	54	80	20	100
	VS 326	Animations Lab	Skill	3	54	80	20	100
Three	VS 331	Business Statistics	General	4	72	80	20	100
	VS 332	System analysis and Design	General	4	72	80	20	100
	VS 333	Management Information system	General	4	72	80	20	100
THREE EE	VS 334	Web Application & Development	Skill	4	72	80	20	100
	VS 335	Computer HW & Maintenance	Skill	4	72	80	20	100
	VS 336	Operating System	Skill	4	72	80	20	100
	VS 337	Web Development Lab	Skill	3	54	80	20	100
	VS 338	Computer hardware Lab	Skill	3	54	80	20	100
Four	MM123 1.9	Mathematics II	General	4	72	80	20	100
	VS 341	Business Informatics	General	4	72	80	20	100
	VS 342	Financial Accounting	General	4	72	80	20	100
	VS 343	Network Administration	Skill	3	54	80	20	100
	VS 344	Object Oriented Programming	Skill	3	54	80	20	100
	VS 345	Visual Tools	Skill	3	54	80	20	100
	VS 346	Visual Tools Lab	Skill	2	36	80	20	100
	VS 347	OOP& Network Lab	Skill	3	54	80	20	100
	VS 348	Industrial Training	Skill	4				

Five	VS 351	Introduction to Information Security	General	4	72	80	20	100
	VS 352	Principles of Management	General	4	72	80	20	100
FIVE	VS 353	Entrepreneurship Development	General	4	72	80	20	100
	VS 354	Programming in Java	Skill	3	54	80	20	100
	VS 355	Software Testing	Skill	3	54	80	20	100
	VS 356	Software Engineering	Skill	3	54	80	20	100
	VS 357	Java Lab	Skill	3	54	80	20	100
	VS 358	Study Tour	Skill	2				
	VS 359	Major Project (Phase I)	Skill	3	54		100	100
SIX	VS 361	Human Resource development	General	4	72	80	20	100
	VS 362	Free and Open Source Softwares (FOSS)	General	4	72	80	20	100
	VS 363	IT & Society	General	4	72	80	20	100
	VS 364	Mobile Application development	Skill	4	72	80	20	100
	VS 365	Database Administration	Skill	4	72	80	20	100
	VS 366	Advanced JAVA	Skill	3	54	80	20	100
	VS 367	Android & Java Lab	Skill	3	54	80	20	100
	VS 368	Major Project (Phase II)	Skill	4	72	240	60	300
		TOTAL MARKS		180		3920	1080	5000

10. SOCIAL SERVICE/ EXTENSION ACTIVITIES

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

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 per cent of the total number of lectures, tutorials, seminars or practical sessions. Internships, study tours and soft skill and personality development programmes are part of the course and students must attend in these activities to complete a semester.

12. EVALUATION

There shall be Continuous Evaluation (CE) and End Semester Evaluation (ESE) for B. Voc (Software Development) course. CE is based on specific components viz., attendance, tests, assignments and seminars. The CE shall carry a weightage of 20 Per cent and ESE shall carry a weightage of 80 per cent. The weightage of each component of CE shall be: Attendance – 1, assignment / seminar – 1 and test papers -2. The teacher shall define the expected quality of an assignment in terms of structure, content, presentation etc. and inform the same to the students. Due weight may be given for punctuality in submission. 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
75 % & less than 80 %	- D Grade
80 % & less than 85%	- C Grade
85 % & less than 90%	- B Grade
90 % & above	- A Grade

13. ASSIGNMENTS/ SEMINARS

Each student shall be required to do one assignment or one seminar for each course. The seminars shall be organized by the teacher / teachers in charge of CE and the same shall be assessed by a group of teachers including the teacher / teachers in charge of that course.

14. TESTS

For each course there shall be at least two class tests during a semester. Grades for the test component in CE shall be awarded on the basis of the grades secured for the better of the two class tests. Valued answer scripts shall be made available to the students for perusal within 20 days from the date of the test.

15. END SEMESTER EVALUATION (ESE)

End Semester Examination of all the courses in all semesters shall be conducted. The duration of examination of all courses shall be 3 hours.

16. EVALUATION OF PROJECT

The report of the project shall be submitted to the Department in duplicate before the completion of the sixth semester. There shall be no CE for project work. A Board of two

examiners appointed by the University shall evaluate the report of 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 on a 5 point scale and the grades are given below:

18. LETTER GRADE PERFORMANCE

A - Excellent

B - Very Good

C - Good

D - Average

E - Below Average

19. 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.

20. SYLLABUS

EN 1111: LISTENING AND SPEAKING SKILLS

No. of credits: 4

No. of instructional hours: 4 per week

AIMS

1. To familiarize students with English sounds and phonemic symbols.
2. To enhance their ability in listening and speaking.

OBJECTIVES

On completion of the course, the students should be able to

1. listen to lectures, public announcements and news on TV and radio.
2. engage in telephonic conversation.
3. communicate effectively and accurately in English.
4. use spoken language for various purposes.

COURSE OUTLINE

Module 1

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 and 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 and informal - set expressions in different situations –greeting – introducing - making requests - asking for / giving permission - giving instructions and directions – agreeing / disagreeing – seeking and giving advice - inviting and apologizing telephonic skills - conversational manners.

Module 4

Dialogue Practice

(Students should be given ample practice in dialogue, using core and supplementary materials.

COURSE MATERIAL**Modules 1 – 3**

Core reading: *English for Effective Communication*. Oxford University Press, 2013.

Further reading:

1. Marks, Jonathan. *English Pronunciation in Use*. New Delhi: CUP, 2007.
2. Lynch, Tony. *Study Listening*. New Delhi: CUP, 2008.
3. Kenneth, Anderson, Tony Lynch, Joan MacLean. *Study Speaking*. New Delhi: CUP, 2008.

Reference:

Jones, Daniel. *English Pronouncing Dictionary* 17th Edition. New Delhi: CUP, 2009.

Module 4:

Core reading: *Dramatic Moments: A Book of One Act Plays*. Orient Black Swan, 2013.

The following One-act plays prescribed:

1. Serafin and Joaquin Alvarez Quinters - *A Sunny Morning*
2. H.H.Munro - *The Death Trap*
3. Vincent Godefroy - *Fail Not Our Feast*

Language Course - LISTENING AND SPEAKING SKILLS: EN 1111

Time: Three hours

Maximum Marks: 80

END SEMESTER EVALUATION

External written exam to be conducted by the University

I. Very short answer type

10 questions covering all the four modules.

Answer all the questions.

Each question to be answered in a word or a sentence

Mark distribution: 10 x 1 = 10

II. Short answers

8 questions out of 12 - the questions will be based on all the four modules. Each question to be answered in a short paragraph not exceeding 50 words

Mark distribution: 8 x 2 = 16

III. Short essays or paragraphs

6 questions out of 9 - the questions will be based on all the four modules. Each question to be answered in a paragraph not exceeding 100 words

Mark distribution: 6 x 4 = 24

IV. Long essays

2 questions out of 4 - The essays will be based on all the four modules. Each question to be answered in about 3 pages

Mark distribution: 2 x 15 = 30

Model Question Paper

Time: Three hours

Maximum Marks: 80

I. Answer all questions, each in a word or a sentence

1. Which sound is common to the following words: “home”, “soap”, “shoulder” and “social”?
2. Which of the following is a verb: ‘subject’, ‘apple’, ‘child’, ‘produce’?
3. Which of the following has the vowel ‘u’ - ‘wool’, ‘womb’, ‘zoom’, ‘swoon’?
4. How is the word ‘heart’ pronounced?
5. How is the word ‘debut’ pronounced?
6. How many syllables are there in the word ‘communication’?
7. In which play does the character Analytikos appear?
8. Which play is identified by the sub-title “A Comedy of Madrid in One Act”?
9. Name the reigning prince of Kedaria, the central character in Munro’s play.
10. Identify the source of the title of Vincent Godefroy’s play “Fail Not Our Feast”.

(10 x 1 = 10 marks)

II. Answer any eight, each in a short paragraph not exceeding 50 words

11. Divide any eight of the following words into syllables:
achievement, laudable, constitutional, reproductive, improbability, journalism, enthusiasm, mandatory, conspiracy, elementary
12. Give the orthographical version of the following transcribed words
/gɒzæmneɪn/, /fiʃlɪŋ/, /nænɪti n/, /ədendə/, /kri:tər /
/kæjuəl/, /nænəl/, /n.jən/
13. Transcribe the following words in phonetic script marking word stress:
Accommodate, coincidence, bridegroom, frequency, eradicate, dependent, respectful, secretariat.
14. Mark the stress in the following sentences:
a. How do you spell it?
b. Don't worry if you make a mistake.
15. Underline words which are weakened in speech in the following sentence:
I haven't got a car of my own, but sometimes I borrow one from a friend and drive to see my brother and sister-in-law.
16. Mark intonation in the following questions.
a. Are we late?
b. Who would like some ice cream?
17. Mark intonation in the following statements.
a. I am easily satisfied with the very best.
b. You are coming.
18. The friendship between Joan, Matilda and Nora.
19. The news conveyed by the police to Joan.
20. The reason for Don Gonzalo's ill temper at the beginning of the play.
21. Dr.Stronetz in the "The Death Trap"
22. Why do the assassins decide not to kill Prince Dimitri?

(8 x 2 = 16 marks)

III. Answer any six, each in a paragraph not exceeding 100 words

23. Mark the primary stress in eight of the following words
adverb, atomic, banana, collector, designer, distinction, intensity, melody, police, provide, savage, undertake, university, yesterday, zenith.
24. Transcribe eight of the following in phonetic script:

ability, beautiful, calm, capable, development, easy, general, harm, important, juice, know,
music, real, share, urgent, zero.

25. Prepare a speech to be delivered on the Human Rights Day in about 150 words.
26. What is the difference between active and passive listening? (Answer in about 100 words).
27. Why is English called an unphonetic language?
28. The role of Mason in "Fail Not Our Feast".
29. Irony in "Fail Not Our Feast".
30. Dona Laura's narration of the story of her death.
31. Dr.Stronetz's role in "The Death Trap".

(6 x 4 = 24 marks)

IV. Answer any two, each in about three hundred words:

32. Narrate the story of Gonzalo and Laura, bringing out the elements of humour.
33. Analyse the relevance of the title of the play "The Death Trap".
34. Write dialogues on the following topics, each in about 80 words:
 - a. An accidental meeting of two old friends at the railway station.
- b. You want to visit New Delhi. Make a telephonic enquiry about the availability of a berth on the train.
- c. You are a new comer on the campus. You want to find out more about private accommodation on the neighbourhood. Compose a dialogue between you and your friends on the topic.
 - d. Compose a dialogue between you and a stranger you met at the bus stop. How will you help him reach his destination?
35. a. Conduct a group discussion on 'Global Warming' with four participants.
- b. Read the short lecture below on computers and take down the notes.

With a computer connected to the internet, you can send electronic messages to other users (this is called e-mail) hold electronic conversations, transfer computer files, or find information on thousands of different subjects. In the modern times internet is also used for buying and selling goods. This is known as 'e-commerce' or 'e-com' in short. More and more banks and financial institutions are encouraging their customers to do all their transactions through the internet. It is also possible to book tickets for travel to different parts of the country through the internet. The number of people connected to the internet and the volume of information going through it is increasing. It

brings about a change, people begin to work from home, order shopping, visit library, choose and watch videos, all through the net.

(2 x 15 = 30 marks)

VS 311 APTITUDE& LOGICAL REASONING

1. AIM

To impart students with logical skills to solve problems easily

2. OBJECTIVES

At the end of the course the students will be able to

- Interpret different data
- Establish relationship between numbers
- Solve different logical problems

3. SYLLABUS

Module I: Data sufficiency, Measurement, Time and distance, Arithmetic, Relationship between numbers

Module II: Basic mathematical relations and formula, Computation, Data interpretation

Module III: Differences, Discrimination, Decision-making, Judgment, Problem-solving, Analogies, Analysis

Module IV: Arithmetic reasoning, Relationship concept, Arithmetic number series, Similarities, Verbal and figure classification, Space visualization, Observation

4. REFERENCES

- How to Prepare for Logical Reasoning for the CAT by Arun Sharma
- Logical and Analytical Reasoning by A.K. Gupta

VS 312 MANAGERIAL ECONOMICS

1. SYLLABUS

Module I: Introduction – Economics – Macro and Micro economics, managerial economics – distinction between managerial economics and traditional economics – characteristics of managerial economics – scope of managerial economics – Application of economic theories in business decisions.

Module II: Demand Estimation – Demand– Law of Demand, Determinants of demand, types of demand, elasticity of demand – price – income – advertisement & cross elasticity – uses – measurement. Demand forecasting – short term and Long term forecasting – methods of forecasting – forecasting the demand for new products.

Module III : Theory of Production – Production function – Cobb Douglas Production function – Laws of production–Law of Diminishing Returns–Law of returns to scale–Economies and diseconomies of scale–Isoquant curve – Iso cost curve–optimum combination of inputs.

Module IV: 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.

Module V: Business Cycles – Introduction – phases of a business cycle – causes and indicators – Theories of business cycles – control of business cycles.

2. REFERENCES

1. Maheswari.K.L and Varshney. Managerial Economics, Sultan Chand & Sons, New Delhi.
2. Mote V.L, Samuel Paul and Gupta G.S. Managerial Economics, Tata McGraw-Hill Publishing Co. Ltd., New Delhi.
3. Gupta G.S. Managerial Economics, Tata McGraw-Hill Publishing Co. Ltd. New Delhi.
4. Dwivedi N.D. Managerial Economics, Vikas Publishing House, New Delhi.
5. Reddy P.N and Appanniah. H.R. Principles of Business Economics, S. Chand & Co. Ltd. New Delhi.

VS 313 INTRODUCTION TO IT

1. AIM:

- To create overall generic awareness about scope of the field of IT and to impart basic personal computing skills.
- To create background knowledge for the various courses in the programme.

2. OBJECTIVES:

- ✓ To introduce the basic terminology in the field of IT
- ✓ To impart functional knowledge about PC hardware, operations and concepts
- ✓ To impart functional knowledge in the use of GUI Operating System
- ✓ To impart functional knowledge in a standard office package (word processor, spread sheet and presentation softwares) and popular utilities

- ✓ To impart functional knowledge about networks and internet.
- ✓ To give an overview of computer application in various fields and an overall generic awareness about the scope of the field of IT

3. SYLLABUS

Module-I:Computer characteristics: Speed, storage, accuracy, diligence; Digital signals, Binary System, ASCII; Historic Evolution of Computers; Classification of computers: Microcomputer, Minicomputer, mainframes, Supercomputers; Personal computers: Desktop, Laptops, Palmtop, Tablet PC; Hardware & Software; Von Neumann model.

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

Module-III:Software- System software, Application software; concepts of files and folders, Introduction to Operating systems, Different types of operating systems: single user, multitasking, time-sharing multi-user; Booting, POST; Basic features of two GUI operating systems: Windows & Linux (Basic desk top management); Programming Languages, Compiler, Interpreter, Databases; Application softwares: Generic Features of Word processors, Spread sheets and Presentation softwares; Generic Introduction to Latex for scientific typesetting; Utilities and their use; Computer Viruses & Protection, Free software, open source.

Module-IV:Computer Networks- Connecting computers, Requirements for a network: Server, Workstation, switch, router, network operating systems; Internet: brief history, World Wide Web, Websites, URL, browsers, search engines, search tips; Internet connections: ISP, Dial-up, cable modem, WLL, DSL, leased line; email, email software features (send receive, filter, attach, forward, copy, blind copy); characteristics of web-based systems, Web pages, introduction to HTML.

4. REFERENCES

4.1 Core

- ❖ E. Balaguruswamy, *Fundamentals of Computers*, McGraw hill, 2014

4.2 Additional

- Dennis P Curtain, *Information Technology: The Breaking wave*, McGrawhill, 2014
- Peter Norton, *Introduction to Computers*, McGrawhill, Seventh edition

VS 314 PROGRAMMING PRINCIPLES

1. AIM

- To give an awareness about the background knowledge required for problem solving

2. OBJECTIVES

At the end of the course the students will be able to

- Explain problem solving steps
- Develop algorithm for different problems
- Draw flow chart
- Analyse algorithms

3. SYLLABUS

Module1: Problem Solving and the Computer: Problem Definition, Solution Design, Solution Refinement, Testing Strategy Development, Program Coding and Testing, Documentation Completion, Program Maintenance.

Module II:Software and Types of Software, Programming Languages- Machine Language, AssemblyLanguage, High Level Language, Object Oriented Language and its features.

ModuleIII: Algorithms and Their Representations, Flow charts, Pseudo code, Types of Programming, Languages, Structured Programming, Different approaches of Programming: Top-down and Bottom-up, Life Cycles Stages of Programming, Features of a good computer program.

Module IV:Areas of algorithm study, performance analysis – space complexity, time complexity, asymptotic notations (O , Ω , θ).

4. REFERENCES:

- Computer Fundamentals By P K Sinha&PritiSinha Fourth Edition.
- Ellis Horowitz, SartajSahni, SanguthevanRajasekharan

VS 315 WORD PROCESSING & IMAGE EDITING

1. AIM

- To create knowledge of word processing, power point, flash and photoshop

2. OBJECTIVES

At the end of the course the students will be able to

- Prepare office document
- Create presentation
- Design multimedia presentation
- Edit images

3. SYLLABUS

Module1: Wordprocessing: Word processing concepts, Editing, Formatting Text, Table Manipulation, Indexing, Mail merge, Documentation, Inserting Word Art, Inserting Picture and clip Arts, Auto formatting, Tools, Macros

Module II: Power Point: Beginning a presentation, Templates and Slide Master, Drawing Tools, ClipArt and WordArt, Organization Charts, Graph, Output and Presentation Options, Integrating with Animation and Multimedia packages.

Module III: Flash : Introduction, Drawing, Working with Colour, Using Imported Artwork, Adding Sound, Working with Objects, Using Layers, Using Type, Using Symbols and Instances, Creating Animation, Creating interactive movies, Creating Printable movies, Publishing and Exporting.

Module IV:Photoshop: Getting image into Photoshop, Selecting, Transforming and Retouching, Drawing, Painting, Applying Filters for special effects, Designing Web pages, Creating Rollovers and Animations, Preparing Graphics for the Web, Saving and exporting images.

CORE

1. *Microsoft® Office Word 2003*, Online Training Solutions Inc.
2. *PowerPoint 2003 Essential Training*,David Rivers
3. *Flash CS3 Professional for Windows and Macintosh*,Katherine Ulrich

Reference Books:

1. *Exploring Microsoft Word 2003 Comprehensive*, Robert T. Grauer and Maryann Barber
2. *Microsoft® Office PowerPoint® 2003*, Online Training Solutions Inc.
3. *Adobe Flash CS3 Professional Hands-On Training*, Todd Perkins

VS 316 PHOTOSHOP LAB

Students should provide hands-on knowledge with the Pagemaker software for preparing documents with the knowledge they acquired through module 1 of the paper VS 315

VS 317 PAGEMAKER LAB

Students should provide hands-on knowledge with the Photoshop software for editing images with the knowledge they acquired through module 4 of the paper VS 315

EN 1211: WRITING AND PRESENTATION SKILLS

No. of credits: 4

No. of instructional hours: 4 per week

AIMS

1. To familiarize students with different modes of general and academic writing.
2. To help them master writing techniques to meet academic and professional needs.
3. To introduce them to the basics of academic presentation
4. To sharpen their accuracy in writing.

OBJECTIVES

On completion of the course, the students should be able to

1. understand the mechanism of general and academic writing.
2. recognize the different modes of writing.
3. improve their reference skills, take notes, refer and document data and materials.
4. prepare and present seminar papers and project reports effectively.

COURSE OUTLINE

Module 1

Writing as a skill – its importance – mechanism of writing – words and sentences - paragraph as a unit of structuring a whole text – combining different sources – functional use of writing – personal, academic and business writing – creative use of writing.

Module 2

Writing process - planning a text – finding materials - drafting – revising – editing - finalizing the draft - computer as an aid – key board skills - word processing - desk top publishing.

Module 3

Writing models – essay - précis - expansion of ideas – dialogue - letter writing – personal letters formal letters - CV – surveys – questionnaire - e-mail – fax - job application - report writing.

Module 4

Presentation as a skill - elements of presentation strategies – audience – objectives – medium – key ideas -structuring the material - organizing content - audio-visual aids – handouts - use of power point - clarity of presentation - non-verbal communication - seminar paper presentation and discussion.

COURSE MATERIAL

Modules 1 – 4

Core reading: *English for Effective Communication*. Oxford University Press, 2013.

Further reading:

1. Robert, Barraas. *Students Must Write*. London: Routledge, 2006.
2. Bailey, Stephen. *Academic Writing*. Routledge, 2006.
3. Hamp-Lyons, Liz, Ben Heasley. *Study Writing*. 2nd Edition. Cambridge UtyPress, 2008.
4. Ilona, Leki. *Academic Writing*. CUP, 1998.
5. McCarter, Sam, Norman Whitby. *Writing Skills*. Macmillan India, 2009.
6. Jay. *Effective Presentation*. New Delhi: Pearson, 2009.

Reference:

Mayor, Michael, et al, Ed. *Longman Dictionary of Contemporary English*. 5th Edition. London: Pearson Longman Ltd, 2009.

SCHEME OF EVALUATION

The examination contains four types of questions:

I. Very short answer type. 10 questions.

Questions 1-5 intended to test the students' ability to spot grammatical errors and questions 6-10, to test the students' knowledge of synonyms of common words.

Mark distribution: 10 x 1 = 10 marks

II. Short answers

8 questions out of 12 from all the four Modules

Each question to be answered in a short paragraph not exceeding 50 words

The questions are meant to examine students' understanding of writing and presentation skills. There will be ten questions on writing skills and two questions on presentation skills.

Mark distribution: 8 x 2 = 16 marks

III. Short essays or paragraphs

6 questions out of 9 from all the four Modules.

Each question to be answered in a paragraph not exceeding 100 words.

The questions will cover the following topics:

1. One personal/business letter.
2. One pre'cis.

3. One dialogue writing.
4. Survey questionnaire.
5. Newspaper Report writing.
6. Writing an email
7. One question testing the theoretical knowledge on any of the writing models.
8. Two questions on presentation skills to check the theoretical knowledge.

Mark distribution: 6 x 4 = 24 marks

IV. Long essays.

2 questions out of 4 from all the three/four Modules.

Each question to be answered in about 3 pages.

The questions will cover the following areas/topics:

1. A topic of general nature for writing an essay in about 300 words.
2. A topic of general nature for writing a report in about 300 words.
3. One topic of general nature and interest for the students to create content for 15-20 slides in crisp language and proper sequence for Power Point Presentation.
4. Preparation of a CV with the cover letter.

Mark distribution: 2 x 15 = 30 marks

NB:

The questions are intended to check spelling grammar, plan and coherence and above all the individual/distinctive writing style.

Focus should be more on manner than on matter.

Model Question Paper

Time: Three hours

Maximum Marks: 80

I. Answer all questions.

A. Rewrite the following sentences, correcting the errors if any.

1. Twenty miles are really along distance to walk.
2. **We will discuss the matter when you will come tomorrow.**
3. Study hard lest you will fail.
4. *For a whole week Loretta came to class on everyday with her hair a different colour.*
5. *I am having two cars.*

B. Write one synonym each for the following words.

6. Courteous
7. Abundant

8. Magnanimous
9. Authentic
10. Beautiful

(10 x 1 = 10 marks)

II. Answer any eight, each in a short paragraph not exceeding 50 words

11. What is the difference between a précis and a summary?
12. What is a memo report?
13. Write any two points that should be kept in mind while preparing slides for a presentation.
14. Name any four types of business letters.
15. Write four important differences between spoken and written communication?
16. What are the mechanics of writing?
17. What is the difference between formal letters and informal letters?
18. Briefly mention the advantages of editing a text.
19. What is the etiquette regarding forwarding emails?
20. What is the role of non-verbal communication in professional presentations?
21. Give two examples of complimentary closes used in formal letters.
22. What are the features of a functional resume?

(8 x 2 = 16 marks)

III. Answer any six, each in a paragraph not exceeding 100 words

23. Write a letter to your friend abroad highlighting the tourist centres of your district.
24. Write a pre'cis of the following passage reducing it to one third of its length.

Though Tagore was essentially a poet, he was more than a mere poet as Gandhi was more than a mere politician. His genius enriched whatever it touched. Like the sun after which he was named (Rabi means the Sun) he shed light and warmth on his age, vitalised the mental and moral soil of his land, revealed unknown horizons of thought and spanned the arch that divides the East from the West. The vitality of his genius is truly amazing. No less amazing are the variety and beauty of the literary forms he created. He gave to his people in one life time what other peoples have taken centuries to evolve – a language capable of expressing the finest modulations of thought and feeling, a literature worthy to be taught in any university in the world. There was no field of literary activity which was not explored and enriched by his daring adventures, and many of these were virgin fields in Bengali which his hands were the first to stir into fruitfulness. He is one of the world's five writers whose works withstand the challenge of the severest tests of modern times.

25. Anishi's parents are working abroad. Anish is working in Bangalore. Now they discuss where to settle down. Write a conversation among them in about 80 words.

26. Prepare a questionnaire for conducting a survey on the rising number of suicides in your locality.
27. You are the reporter of 'The Hindu'. Prepare a report of the flower show recently conducted by the horticultural society in your Panchayath.
28. What are the 'dos and don'ts' one should keep in mind while composing an email?
29. How will you manage your stage fright during a presentation?
30. What are the common pitfalls encountered while making group presentations?
31. Write an email to your boss congratulating him on being promoted.

(6 x 4 = 24 marks)

IV. Answer any two, each in about three hundred words:

32. Write an essay on "Corruption in Government" in about 300 words.
33. You are the Secretary of the Music Club of your college. Prepare a report to be submitted to your Principal, apprising him of the activities of the Club.
34. Create content for 15 – 20 slides on "The Festival of Onam".
35. Your name is Karthik and you are a Postgraduate degree holder. You are applying for the post of Marketing Manager in a textile company. Prepare a CV and a covering letter that you will send to your prospective employer.

(2 x 15 = 30 marks)

VS 321 ENVIRONMENTAL STUDIES

1. AIMS:

To create better understanding about the deteriorating condition of our environment among students

2. OBJECTIVES:

On completion this course, student should:

- *Have better awareness and concern about current environmental issues*
- *Develop a healthy respect and sensitivity to environment*
- *Develop pride in social and environmental activism.*

3. SYLLABUS

Module-I: The Multi-disciplinary Nature of Environmental Studies: Definition, scope and importance, Need for Public Awareness, Ecology and Ecosystems: Definition of Ecology, Structure and function of an ecosystem, Producers, Consumers and Decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids, Introduction, types, characteristics features and function of – forest ecosystem, grassland ecosystem, desert ecosystem, aquatic ecosystem(ponds, streams, lakes, rivers, oceans, estuaries)

Module-II: Biodiversity and 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 wild life conflicts, endangered and endemic species of India, conservation of bio diversity in in-situ EX-situ

Module-III 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, reuse and recycling, solid waste management, role of individuals to prevent pollution, pollution case studies, disaster management – floods, earthquake, cyclone and landslides

Module –IV: 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- it's problems and concerns, case studies, environmental ethics- environmental value relation ships, 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, dir(prevention and control of pollution) act, water(prevention and control of pollution) act, wild life protection act, forest conservation act, environmental management systems(EMS), environmental information systems(EIS), P.I.L public hearing and role of NGOS, ISO 9000 and 14000, issues involved in enforcement of environment legislation, public awareness, environmental economics-environment and standard of living

4. Readings

- Kiran B Chokkas and others : “Understanding Environment”, Sage 2004
- P. VenugopalaRao, Environmental Science & Engineering, PHI
- Benny Joseph: Environmental Studies, Tata McGraw Hill
- Lester R Brown, Plan B: rescuing a Planet under stress and a civilization in trouble, Orient LongmanKurien Joseph & R Nagendran, Essentials of Environmental Studies, Pearson

MM1131.9 MATHEMATICS I

1. SYLLABUS

Module-I: Review of basic differentiation, Differentiation of hyperbolic functions, derivatives of hyperbolic functions, inverse hyperbolic functions logarithmic differentiation, implicit differentiation, Leibnitz's theorem, Mean value theorem, Rolle's theorem, Lagrange's mean-value theorem, Maxima and minima.

Module-II: Differential equations, General Concepts, Formulation and solution of differential equations, solution of higher order linear DEs. Partial Des, Laplace and Inverse Laplace transforms.

Module-III: Theory of Numbers, prime numbers, Unique factorization theorem, Euclidean algorithm, congruences, Fermat's theorem, Wilson's theorem.

Module-IV: Complex Numbers, Separation into real and imaginary parts, Complex mapping

Module V: Miscellaneous Topics: Markov processes. Harmonic analysis and Fourier series, Linear Programming

2. REFERENCES

2.1 Core

- ❖ Erwin Kreyzig *Advanced Engineering Mathematics*, New Age International Pvt Ltd.
- ❖ Shanthi Narayan, *Differential Calculus*, S Chand & Company
- ❖ Zafar Ahsan, *Differential Equations and their applications*.
- ❖ Rudra Pratap, *Getting Started with MATLAB*, Oxford University Press

VS 322 ANIMATION SOFTWARES

1. AIM

- To create skills in animation

2. OBJECTIVES

At the end of the course the students will be able to

- Create objects using 3DMax
- Perform animation
- Add special effects

3. SYLLABUS

Module 1: Introduction to 3D Max, Creating objects, Selecting objects, Transforming objects

Module 2: Animation, Modifying objects and Editing Objects

Module 3: Compound objects, Cameras, Lights

Module 4: Maps and Material, Rendering and Special Effects

4. REFERENCE

- 3D Studio MAX® R3 Bible by Kelly L. Murdock
- 3D Studio MAX in Motion: Basics Using 3D Studio MAX 4.2 by Stephen J. Ethier and Christine A. Ethier

VS 323 COMPUTER NETWORKS AND INTERNET APPLICATIONS-

1. AIM

- To create an awareness of internet and different tools used

2. OBJECTIVES

At the end of the course the students will be able to

- Explain different components for internet
- Discuss different applications of it

3. SYLLABUS

Module-I: Computer Network: Introduction, Uses of computer networks, Networks Hardware, LAN, MAN, WAN, Protocol hierarchies, OSI Model, TCP/IP reference model.

Module-II: History of internet, The early years, The global Internet, A global information infrastructure, Review of packet switching and its relevance to the internet, Incompatible topologies, Routers, Dial-up access, Software to create a virtual network, Datagrams, IP address.

Transmission Control Protocol (TCP) :Software for reliable communication, Guaranteed delivery, Recovering the datagrams, Automatic retransmission, Brief discussion on distributed computing, Domain names, Names and IP address, TCP/IP, Flexibility, Reliability and efficiency.

Module III: 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 works. File Transfer Protocol (FTP) Store/ retrieve, Binary and text files, How FTP works, Impact and significance, Remote login, How it works, TELNET

Module-IV: 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.

Text:

1. Ferozan. Intruduction to Data Communication & Networking, TMH.
2. Leon and Leon, Internet For Everyone, LeonTechworld, Chennai

References:

1. Douglas E Comer, The Internet Book, 2nd Edition, Prentice Hall of India.
2. Nancy Cadeno, The Internet Tool Kit, BPB Publications.
3. Christian Crumlish, ABC's of the Internet, 2nd Edition, BPB Publications
4. Patrick Naughton, Java Hand Book, Tata McGraw Hill

VS 324C PROGRAMMING

1. AIM:

- To Expose students to algorithmic thinking and problem solving and impart moderate skills in programming in a industry-standard programming language

2. OBJECTIVES:

- ✓ To expose students to algorithmic thinking and algorithmic representations
- ✓ To introduce students to basic data types and control structures in C.
- ✓ To introduce students to structured programming concepts
- ✓ To introduce students to standard library functions in C language

3. SYLLABUS

Module-I: 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;

Module-II: 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-III: 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-IV: 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.

4. REFERENCES

4.1 Core

- ❖ Ashok N. Kamthene, *Programming in C*, Pearson Education, Second edition
- ❖ E.Balaguruswamy, *Programming in ANSI C*, McGrawhill, Sixth Edition

VS 325C PROGRAMMING LAB

1. AIM:

- To provide an opportunity for hands-on practice of 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. OBJECTIVES:

After the completion of this course, the student should be able to:

- ✓ Create, Save, Copy, Delete, Organise various types of files and manage the desk top in general
- ✓ Use a standard word processing package Exploiting popular features
- ✓ Use a standard spread-sheet processing package Exploiting popular features
- ✓ Use a standard presentation package Exploiting popular features

Also, this course will provide hands-on practice in the following topics, under a variety of programming situations with a focus on writing, debugging and analyzing structured programs:

- ✓ basic data types in C.
- ✓ basic control structures in C.
- ✓ arrays, structures and files
- ✓ standard library functions in C language
- ✓ solving moderately complex problems involving the above and requiring selection of appropriate data structures and efficient algorithms

3. SYLLABUS

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

Part A

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.

Part II

2. 1-D Arrays: A variety of programs to declare, initialise, 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, initialise, 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, initialise, 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 errors
- 16-20: Developing programming solutions to problems including program design, algorithm development and data structure selection.

4. REFERENCES

4.1 Core

- ❖ Deitel&Deital, *C: How to Program*, Pearson Education
- ❖ Alan R Feuer, *The C Puzzle Book*, Pearson Education
- ❖ YashvantKanetkar, *Test Your C Skills*, BPB Publications, 3rd Edition

VS 326 ANIMATIONS LAB

Students should provide hands-on knowledge with the 3D Max software for creating animation with the knowledge they acquired through module 1 of the paper VS 322

VS 331 BUSINESS STATISTICS

1. **AIM:**To develop the skill for applying appropriate statistical tools and techniques in different business situations.

2. **OBJECTIVES:**

- To enable the students to gain understanding of statistical techniques as are applicable to business.
- To enable the students to apply statistical techniques for quantification of data in business.

3. **SYLLABUS**

Module I—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 II—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 III--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 IV--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 V--Time series analysis: Meaning and definition- components- Measurement of long term trend- Moving average method- Method of Least squares- Application in business.

4. REFERENCES

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

VS 332 SYSTEM ANALYSIS AND DESIGN

1. AIM:

- To provide an overview of how a software is developed and what are the different stages by which the development take place

2. OBJECTIVES

At the end of this course, the students will be able to

- ✓ Explain the background study required for developing a system
- ✓ Design a new system
- ✓ Discuss types of testing
- ✓ Select the hardware and software required for a system

3. SYLLABUS

Module I: 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 and economical feasibility, cost and benefit analysis, fact finding techniques, DFD, Data dictionaries, Decision analysis, decision trees and tables.

Module II: 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 III: Testing & System Conversion: Unit and integration testing, testing practices and plans, system control and quality assurance, training, conversion, operation plans, system administration.

Module IV: Hardware and Software selection: Benchmarking, Financial considerations in selection software selection, vendor selection, performance and acceptance criteria.

4. REFERENCES

4.1 Core

- ❖ Award, EM, *Systems Analysis and Design*, Galgotia Pub, 1991

4.2 Additional

- Lesson, *System analysis and Design*, SRA pub, 1985
- Rajaraman V, *Analysis and Design of Information systems*, PHI, 1991

VS 333 MANAGEMENT INFORMATION SYSTEMS

1. SYLLABUS

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

Module III: 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 IV: Optimization techniques, difference between optimization tools and DSS tools expert system, difference between expert system and management information system. Role of chief Information officer.

2. REFERENCES:

- Management Information Systems, by Rajaraman
- Management Information Systems, by By S. SADAGOPAN, Prentice-Hall of India
- Management Information Systems By Uma G. Gupta, Galgotia Publications
- Management Information Systems By JAWADEKAR, W.S., Tata McGraw-Hill

VS 334 WEB APPLICATION & DEVELOPMENT

1. AIM:

- To Expose students to technology of web sites and to introduce various tools and languages required for technical and creative design of state-of-the-art web sites

2. OBJECTIVES:

To impart basic skills in moderately complex use of the following tools/scripts/languages:

- ✓ HTML, DHTML, CGI Script, Perl, CSS, Java script, ASP and JSP.
- ✓ To impart necessary ability to choose the appropriate web tools/languages for creating state-of-the art web sites
- ✓ To Expose students to current trends and styles in web design and applications

3. SYLLABUS

Module-I: 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-II: 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-III: Javascript: Basic data types; control structures; standard functions; arrays and objects, event driven programming in Javascript; Example Applications;

Module-IV: Architecture of java Servlets; Servlet Structure; Servlet Life Cycle; Request and Response Objects; Sessions; Invoking Servlets;

4. REFERENCES

4.1 Core

- ❖ V.K. Jain, *Advanced Programming in Web Design*, Cyber Tech Publications

4.2 Additional

- Joel Sklar, *Principles of Web Design*, Vikas
- H M Deitel, P J Deitel & A B Goldberg, *Internet and Worldwide web programming: How to Program, 3/e*, Pearson Education

VS 334 COMPUTER HARDWARE & MAINTENANCE

1. AIM

- To create knowledge of computer hardware and ways of maintaining

2. OBJECTIVES

At the end of the course the students will be able to

- Explain the working of computers
- Identify different components of computers and explain their uses

3. SYLLABUS

Module I: 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 II: 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 III: 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 IV: 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

Book of study :

1. B RAM -Fundamentals of microprocessors and micro computers
2. Lotia and Nair- Modern all about motherboard.
3. Lotia and Nair- Modern all about Hard Disk.

References:-

1. R S. Gaonkar- Micro processor Architecture, Programming and applications with 8085.
2. Venugopal and Ravikanth- Introduction to assembly language programming in 8086.
3. Scottmuller with Creigzacker- Upgrading and repairing PCs.

VS 336 OPERATING SYSTEMS

1. AIM

- To discuss the internal working of operating systems

2. OBJECTIVES

At the end of the course the students will be able to

- Discuss the installation of windows
- Explain the ways of diagnosis
- Make a system secure

3. SYLLABUS

Module I: 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 II: 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 III: 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 IV: 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.

4. REFERENCES

- Windows Internals - Part 1by Mark Russinovich, David A. Solomon and Alex Lonescu (2 January 2013)
- Windows Internals - Part 2by Mark Russinovich, David A. Solomon and Alex Lonescu (2 January 2013)

VS 337WEB DEVELOPMENT– LAB

1. AIM:

- To give hands-on Exposure to various tools and languages required for technical and creative design of web sites

2. OBJECTIVES:

To practice moderately complex use of the following scripts/languages/technologies:

- ✓ HTML, DHTML, CSS,
- ✓ Java script,
- ✓ CGI Script, Perl,

3. 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

4. REFERENCES

4.1 Core

- ❖ V.K. Jain, *Advanced Programming in Web Design*, Cyber Tech Publications

4.2 Additional

- H M Deitel, P J Deitel & A B Goldberg, *Internet and Worldwide web programming: How to Program, 3/e*, Pearson Education

VS 338 COMPUTER HARDWARE – LAB

- Students should 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.

MM1231.9 MATHEMATICS II

1. SYLLABUS

Module–I: Proof Methods, Logic: Formal proofs, Propositional reasoning, Proofs by contradiction, False Proofs, Proofs by Induction, Symbolic Logic: Boolean expressions, Logical Equivalence, DeMorgan’s Law, tautologies, Implications, Arguments, Fallacies, Normal forms in prepositional logic, Resolution

Module–II: 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–III: Algebraic Structures: Algebra, DeMorgan’s Law, Group, Ring, Polish Expressions, Communication Model and error corrections, Hamming Codes

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

Module V: 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)

2. REFERENCES

2.1 Core

- ❖ RajendraAkerkar, RupaliAkerkar, *Discrete Mathematics*, Pearson Education

2.2 Additional

- RM Somasundaram, *Discrete Mathematical structures*
- Calvin C. Clawson, *Mathematical Mysteries, The beauty and magic of Numbers*, Viva Books Pvt Ltd,
- RudraPratap, *Getting Started with MATLAB*, Oxford University Press

VS 341 BUSINESS INFORMATICS

1. AIM:

- To create an awareness about role of IT in business and to introduce concepts and techniques of e-commerce

2. OBJECTIVES:

By the end of this course, the student should be able to:

- ✓ Have an awareness about role of IT in business
- ✓ Have knowledge of basic concepts of e-commerce
- ✓ Be aware of different types of e-commerce web sites and different modes of payments
- ✓ Be aware of security and legal issues in e-commerce

3. SYLLABUS

Module–I: History of e-commerce, definition, classification- B2B, B2C, C2C, G2C, B2G sites, ecommerce in education, financial, auction, news, entertainment sectors, Doing e-Commerce.

Module–II: 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–III: 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 IV-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

4. REFERENCES

4.1 Core

- ❖ Erfan Turban et.al., *Electronic Commerce–A Managerial Perspective*, Pearson Education

4.2 Additional

- R Kalokota, Andrew V. Winston, *Electronic Commerce – a Manger’s guide*, Pearson

VS 342 FINANCIAL ACCOUNTING

1. AIM

- Impart knowledge of financial accounting

2. OBJECTIVES

- Familiarizing the student with the basic accounting terminologies and capable of journalizing, posting and preparing final accounts both manually and in computerized form.

3. 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

VS 343 NETWORK ADMINISTRATION

1. SYLLABUS

Module I: 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 II: 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, Hierarchical Routing, 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 III: 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 IV: Network Security- 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.

2. REFERENCES

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

VS 344 OBJECT ORIENTED PROGRAMMING

1. AIM:

- To introduce the student to the basic concepts of object orientation and impart skills in an industry standard object oriented language

2. OBJECTIVES:

On the completion of this course, the student will be able to

- ✓ Understand the concepts of classes and object
- ✓ Define classes for a given situation and instantiate objects for specific problem solving
- ✓ Reuse available classes after modifications if possible
- ✓ Possess skill in object oriented thought process

3. SYLLABUS

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

Module-III: 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-IV: 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.

4. REFERENCES

4.1 Core

- ❖ Ashok N. Kamthane, *Object oriented Programming with ANSI & Turbo C++*, Pearson

4.2 Additional

- H M Deitel and P J Deitel, *C++: how to program*, Pearson Education
- Robert Lafore, *Object Oriented Programming in Turbo C++*, Galgotia Publications

VS 345 VISUAL TOOLS

1. AIM:

- ✓ To get an exposure to visual language

2. OBJECTIVES:

At the end of this course, the students will be able to:

- ✓ Give an introduction about visual basic
- ✓ Explain the fundamentals of visual basic
- ✓ Discuss the various controls in visual basic
- ✓ Narrate database connectivity in visual basic

3. SYLLABUS

Module I: 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 II: Visual Basic Standard ActiveX Controls & Objects: Standard Controls: TextBox, CheckBox, ComboBox, Option Button, Message 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 III: 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 IV: 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.

4. REFERENCES

4.1 Core

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

VS 346VISUAL TOOLS LAB

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

VS 347 OOP & NETWORK LAB**1. AIM:**

- To provide an opportunity for 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. OBJECTIVES:

This course will provide hands-on practice in a 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

3. 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

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

4. REFERENCES

- ❖ Deitel&Deitel, *C++: How to Program*, Pearson Education

VS 348 INDUSTRIAL TRAINING

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

VS 351 INTRODUCTION TO INFORMATION SECURITY

1. AIM:

- ✓ To introduce internetworking and the issues and methods of information security over internetworks.

2. OBJECTIVES:

On completion of this course student shall:

- ✓ Be aware of principles and protocols of internetworks
- ✓ Understand the basic issues in information security
- ✓ Understand the concept of ciphers and cryptography.
- ✓ To impart an idea on various ciphers

- ✓ Understand the concept of digital signatures and e-mail security policies
- ✓ Impart an idea on malicious softwares and remedies.

3. SYLLABUS

Module I: 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 II: 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 III: 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 IV: 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.

4. REFERENCES

4.1 Core

- ❖ Brijendra Singh, *Cryptography & Network Security*, PHI.
- ❖ Pachghare, V.K., *Cryptography and Information Security*, PHI.

VS 352 PRINCIPLES OF MANAGEMENT

1. AIM:

- To introduce the students to basic principles of management to provide an overview of its practice in the global industries.

2. OBJECTIVES:

To introduce students to:

- ✓ Concept of Management and Organisations
- ✓ Planning and decision making strategies
- ✓ Concepts of organizational behavior and HR management
- ✓ Leadership qualities

3. 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.

4. REFERENCES

4.1 Core

- ❖ PC Tripathi and P N Reddy, *Principles of management, 2/e*, Tata McGraw Hill
- ❖ Poornima M. Charantimath, *Total Quality Management*, Pearson Education

4.2 Additional

- E H McGrath, *Basic Managerial Skills for All*, Prentice Hall of India

4.3 Internet resources:

- www.prenhall.com/robbins

VS 353 ENTREPRENEURSHIP DEVELOPMENT

1. AIM: To equip the students to have a practical insight for becoming an entrepreneur.

2. OBJECTIVES:

1. To familiarize the students with the latest programs of the government authorities in promoting small and medium industries.
2. To impart knowledge regarding how to start new ventures.

3. 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-Performa of a project report-Sample project report.

4. REFERENCES

1. Shukla M.B. *Entrepreneurship and small Business Management*, KitabMahal Allahabad.
2. SangramKeshariMohanty, *Fundamentals of entrepreneurship*, PHI, New Delhi.
3. Nandan H. *Fundamentals of Entrepreneurship*, PHI, NewDelhi.
4. *Small-Scale Industries and Entrepreneurship*, Himalaya Publishing ,Delhi
5. C.N.Sontakki, *ProjectManagement*, Kalyani Publishers, Ludhiana.
6. SangamKeshariMohanty. *Fundamentals of Entrepreneurship*, PHI, NewDelhi
7. Peter F. Drucker- *Innovation and Entrepreneurship*.

8. *Vasanth Desai, Small Business Entrepreneurship, Himalaya Publications.*
9. *MSME Act 2006.*

VS 354 PROGRAMMING IN JAVA

1. AIM:

- To introduce students to basic features of Java language and selected APIs

2. OBJECTIVES:

- ✓ Let students install and work with JDK, also make them aware the use of java doc.
- ✓ Practice basic data types, operators and control structures in Java
- ✓ Practice basic handling of classes and objects in Java
- ✓ Introduce the following selected APIs: I/O, Strings, Threads, AWT, Applet, Networking
- ✓ Idea to approach and use a new package

3. SYLLABUS

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

Module-III: Exception Handling, The Try-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-IV: 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.

4. REFERENCES

4.1 Core

- ❖ *Java Programming, Schaum Outline Series*

4.2 Additional

- Deitel, *Java: How To Program*, Pearson Education

VS 355 SOFTWARE TESTING

1. AIM:

- To provide students the knowledge of testing softwares

2. OBJECTIVES:

At the end of this course, the students will be able to

- ✓ Discuss the basic concept of testing
- ✓ Explain different types of testing
- ✓ Describe the tools used for testing

3. SYLLABUS

Module-I: 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-II: 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-III: Paths, Path products and Regular expressions:- path products & path expression, reduction procedure, regular expressions & flow anomaly detection

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

4. REFERENCES:

4.1 Core

- ❖ BarisBeizer, *Software Testing techniques*, Dreamtech, second edition.

4.2 Additional

- Edward Kit, *Software Testing in the Real World*, Pearson Education of India.
- K.K.Prasad, *Software Testing Tools*, Dreamtech

VS 356 SOFTWARE ENGINEERING

1. AIM:

- To enable the students to have a thorough understanding of the activities in development projects using (a) Structured Analysis and Design and (b) Object Oriented Analysis and Design

2. OBJECTIVES:

At the end of the course, the students should be able to :

- ✓ Appreciate the importance of having a process for software development.
- ✓ Understand the various activities undertaken for a software development project following the Function oriented Design & Object oriented design
- ✓ Understand the issues in code design and development
- ✓ Test software developed using SSAD and OOAD methodologies.
- ✓ Have in depth knowledge about the different OOAD Themes and compare them with SSAD

3. 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, Matrices, quality metrics, Planning a project, effort estimation, COCOMO model, quality plan, risk management-assessment, control.

Module II: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 III: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 IV: 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.

4. REFERENCES:

4.1 Core

- ❖ Rajib Mall, *Fundamentals of Software Engineering*, Second Edition, PHI

4.2 Additional

- PankajJalote, *An Integrated Approach to Software Engineering*, Narosa
- Waman S Jawadekar, *Software Engineering*, McGraw hill, 2013
- *Journals and Magazines:* (i) Software Development, CMP Media. (ii) Software Quality Professional, ASQ.

VS 357 JAVA LAB

1. AIM:

- To provide an opportunity for hands-on practice in Java.

2. OBJECTIVES:

This course will provide 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.

3. 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
1. Programs to demonstrate methods of string class
2. Program to demonstrate AWT/Swing graphic methods
3. Program for Loading and Viewing Images, Loading and Playing Sound
4. 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

VS 358 STUDY TOUR

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

VS 359 MAJOR PROJECT (PHASE I)

- The guide lines given for the course VS368 has to be followed for this course.
- 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

VS 361 HUMAN RESOURCES DEVELOPMENT**1. SYLLABUS**

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

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

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

Module IV: Presentation skills - Group discussion- mock Group Discussion using video recording- public speaking

Module V: Professional skills - Organisational skills- team work- business and technical correspondence- job oriented skills-professional etiquettes

REFERENCE

1. Matila Treece: Successful communication: Allyun and Bacon Pubharkat.
2. Human Resource Management- Text and Cases-- VSP Rao
2. Jon Lisa Interatid skills in Tourist Travel Industry Longman Group Ltd.
3. Robert T. Reilly – Effective communication in tourist travel Industry Dilnas Publication.
4. Boves. Thill Business Communication Today Mcycans Hills Publication.
5. Dark Studying International Communication Sage Publication.
6. Murphy Hidderandt Thomas Effective Business Communication McGraw Hill.

VS 362 FREE AND OPEN SOURCE SOFTWARES (FOSS)

1. AIM:

- To introduce different free and open source softwares

2. OBJECTIVES:

At the end of this course, the students will be able to

- ✓ Explain the features of free & open source software
- ✓ Familiarization with LINUX
- ✓ Work with PHP
- ✓ Demonstrate the working of MySQL

3. SYLLABUS

Module I: 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-II: 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-III: 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-IV: 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

4. REFERENCES

4.1 Core

- ❖ Julie C.Meloni, PHP, MySQL and Apache, Pearson Education
- ❖ Ivan Byross, HTML, DHTML, Javascript, Perl, BPB Publication

VS 363 IT & SOCIETY

1. AIMS:

- *To impart knowledge required for the student to emerge as computer professional*

2. OBJECTIVES:

By the end of this course, the student should be:

- Having a clear view of what professionalism is
- Aware of ethical issues in computing profession
- Aware of managing quality
- Aware of quality certifications
- Having an Exposure to Cyber law

3. SYLLABUS

Module-I: 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 –II: Codes of ethics - solving ethical conflicts, moral reasoning and ethical theories– responsibilities and rights. Computer ethics : ethics and the internet – hacking – netiquette – privacy

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

Module-IV 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

4. REFERENCES

4.1 Core References

- M Govindarajan, S Natarajan, V S Senthil Kumar, Engineering Ethics, PHI
- Poornima M. Charantimath, Total Quality Management, Pearson Education
- Richard Stallman, Free Software: A Perspective, Prajasakthi Book House, Hyderabad
- Indian Copyright Act and Indian Patent Acts

4.2 Additional References

- Deborah G Johnson, Computer Ethics, Pearson Education
- Shailendra Nigam, Total Quality Management, , Excel Books
- Charles B Fleddermann, Engineering Ethics, Pearson Education
- James S Bowman, et. Al., The Professional Edge, PHI
- NIIT, Building a Portfolio, A career enhancement guide, PHI
- Kenneth Kensington, Deepak Kumar, Experience in India : Bridging the Digital Divide, SagePublishers

VS 364 MOBILE APPLICATIONS DEVELOPMENT

1. AIM: Students will be able to:

- Build your own Android applications.
- Explain the differences between Android, Windows and other mobile development environments.

2. OBJECTIVES

This course focuses on developing applications for modern mobile phone operating systems. Most of the course is dedicated to android and Microsoft's Windows.

3. SYLLABUS

Module I: 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 II: 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 III: 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 IV: Interaction with Other Apps, Location-Aware Apps, Network and Cloud Operations, Layout Hierarchies, Audio, Photos and Video

VS 365 DATABASE ADMINISTRATION

1. SYLLABUS

Module I: 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 II: 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 III: Object Oriented Database Management Systems: Concepts, Composite objects, Integration with RDBMS applications, Issues in OODBMSs, Advantages and Disadvantages of OODBMSs

Module IV: Object-Oriented Database Design. Decision making processes, evaluation of DSS, Group decision support system. Distributed Databases

2. REFERENCES

- Database Administration: The Complete Guide to DBA Practices and Procedures by Craig S. Mullins
- MySQL Database Usage & Administration by Vikram Vaswani
- Understanding Database Administration by Pablo Berzukov

VS 366 ADVANCED JAVA

1. SYLLABUS

Module I: Introduction to Swing/JApplet, 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 II: 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 III: Introduction To Java Beans, What is Java Bean?, Advantage, Installing / Starting / Using JDK (Bean Development Kit, JAR Files, Using the Java Beans API

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

VS 367 ANDROID & JAVA Lab

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

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

VS 368 MAJOR PROJECT & VIVA

1. 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.

2. OBJECTIVES:

- ✓ To provide an opportunity to apply the knowledge gained through various courses in solving a real life problem
- ✓ To provide an opportunity to practice different phases of software/system development life cycle
- ✓ To introduce the student to a professional environment and/or style typical of a global IT industry
- ✓ To provide an opportunity for structured team work and project management

- ✓ To provide an opportunity for effective, real-life, technical documentation
- ✓ To provide an opportunity to practice time, resource and person management.

3. PROJECT GUIDELINES

- Group Size – Maximum 3
- No. of records – No. of group members + 1 (Department copy)
- Certificate should include the names of all members

The minimal phases for the project are: Project search, finalization and allocation, Investigation of system requirements, Data and Process Modelling, System Design, Program design, Program coding and unit testing, System integration, System implementation and acceptance testing.

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

3.2 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 Malayalam Language Editor with Spell Checker, Computer Music Software for Indian Music, Heat Engines Simulation Software for eLearning, Digital Water Marking Software,

(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 Malayalam 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.

3.3 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.

3.4 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.

3.5 Selection of Organisation & Guide: No restrictions shall be placed on the students in the choice of organization where project work may be done, in terms of locality, type (public/private) etc. It is the duty of the Head of Institute/Principal of College to ensure that the Aim, Objectives and full project guidelines are communicated to the external organization. The guide should ideally be a post-graduate with minimum 2 years of work experience.

Students may also choose to do project in the college/institute (or partially in the college/institute and partially in an external organization), especially product-based work, but in such cases the supervisors must ensure that (i) industry practices are followed (ii) the

students undertake a planned visit to an IT industry with international operations to make up for the loss of experience and (iii) the services of an external guide with industry experience is obtained.

3.6 Project Management: Head of Institute/Principal of College should publish a list of students, projects topics, internal guide and external organization (if any) and teams agreed, before the end of semester 5. Changes in this list may be permitted for valid reasons and shall be considered favourably by Head of Institute/Principal of College any time before commencement of the project. Any request for change after commencement should be considered by a committee of 3 teachers and their recommendation shall be accepted by Head of Institute/Principal of College.

Gantt-chart of proposed activities and a draft statement of project deliverables (which may subsequently be altered if justified) should be prepared before the commencement of the project. The actual completion of each phase should be noted on the chart in the course of the project work. Students should submit a fortnightly report of progress which could be indication of percentage of completion marked on the 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.

3.7 Documentation:

The following are the major guidelines: The final outer dimensions of the report shall be 21 cm X 30 cm. The colour of the flap cover shall be light green. Only hard binding should be done, with title of the thesis and the words “<BRIEF TITLE> BSc (CS) 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.

WEB BASED BILLING SOFTWARE: BSC(CS) PROJECT 2009

1. SECTION HEADINGS 12 pt, Times New Roman, Bold, All Caps, Left Adjusted.

1.1 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>

<COLLEGE NAME>

PROJECT REPORT

Submitted in partial fulfilment of the

Requirements for the award of

Bsc (computer science) degree of

University of kerala

2014

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 our supervision and guidance, towards partial fulfillment of the requirements for the award of the Degree of BSC (Computer Science) of the University of Kerala” with dated signatures of Internal; Guide, external guide and also Head of Institute/College.
- If the project is done in an external organization, another certificates 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 theDepartment of..... (Organization) towards partial fulfilment of the requirements for the award of the Degree of BSC (Computer Science) of the University of Kerala”.

- 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 minutes mentioned in section 3.5 should appear as appendix to the project report. Regarding the body of the report, as an indicative Example, the following is given (though students should not attempt to fit every kind of project report into this format):

- Organizational overview (of the client organization, where applicable)
- Description of the present system
- Limitations of the present system
- The Proposed system- Its advantages and features
- Context diagram of the proposed system.
- Top level DFD of the proposed system with at least one additional level of Expansion
- Structure Chart of the System
- System flowchart
- Menu Tree
- Program List
- Files or tables (for DBMS projects) list. Class names to be entered for each file in OO systems.

- List of fields or attributes (for DBMS projects) in each file or table.
- Program – File table that shows the files/tables used by each program and the files are read, written to, updated, queried or reports were produced from them.
- Reports List with column headings and summary information for each report.
- System Coding and variable/file/table naming conventions
- System controls and standards
- Screen layouts for each data entry screen.
- Report formats for each report.

Program documentation is suggested on the following lines:

- Program id
- Program level run chart
- Program function Explanation
- Data entry screen (reproduced from system documentation).
- Report layout (reproduced from system documentations)
- Program level pseudo code or flowchart.
- Decision tables, decision trees, with English Explanation where necessary.
- Program listing
- Test data
- Test results.

3.8 Methodology:

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

(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

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

Evaluation of Project

- Documentation – 80 marks
- Content & Methodology - 80 marks
- Viva Voce - 80 marks

4. REFERENCES

4.1 Core

- ❖ S A Kelkar, *Software Project Management*, Prentice Hall of India
- ❖ W Alan Randolph, Barry Z. Posner, *Effective project planning and management*, PHI

4.2 Additional

- Greg Mandanis, *Software Project Management Kit for Dummies*, IDG Books
- Joel Henry, *Software Project management*
- Frederic P B, Mythical Man-month, *Essays on Software Engineering*, Addison Wesley
- David Lamport, *Latex: A document Preparation System*, 2/e, Pearson Education