



**Rayat Shikshan Sanstha's  
Yashwantrao Chavan Institute of Science,  
Satara**

**SYLLABUS FOR  
B. Voc. (Software Development)**

**Second Year SEMESTER III / IV  
With effect from JUNE 2019  
Year 2019-20 onwards**

## **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
<b>TOTAL</b>	<b>108</b>	<b>72</b>		

As per the UGC guidelines, there are multiple exit points 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 III

General Education				Skill Component			
No.	Title	Credit	Hrs/Week	No.	Title	Credit	Hrs/Week
VS 331	Business Statistics	4	4	VS 334	Web Designing (HTML,CSS)	4	4
VS 332	System Analysis & Design	4	4	VS 335	Web Development (PHP/ Mysql)	4	4
VS 333	Management Information Systems	4	4	VS 336	Graphic Designing(Coral Draw)	4	4
				VS 337	Web Designing & development Lab	3	3
				VS 338	Graphic Designing(Coral Draw)Lab	3	3
	<b>Total</b>	<b>12</b>	<b>12</b>		<b>Total</b>	<b>18</b>	<b>18</b>

## Semester IV

General Education				Skill Component			
No.	Title	Credit	Hrs/Week	No.	Title	Credit	Hrs/Week
MM1231.9	Mathematics II	4	4	VS 343	ASP.NET with C#.NET	3	4
VS 341	Business Informatics	4	4	VS 344	Advanced SQL with Oracle	3	4
VS 342	Financial Accounting	4	4	VS 345	Computer HW & Maintenance	3	4
				VS 346	ASP.NET & C#.NET Lab	2	3
				VS 347	ASQL & Oracle Lab	3	3
				VS 348	Industrial Training	4	
	<b>Total</b>	<b>12</b>	<b>12</b>		<b>Total</b>	<b>18</b>	<b>18</b>

## 9. DISTRIBUTION OF MARKS

Semester	Code No	Subjects	General/Skill	Credits	Contact Hrs	Marks ESE	Marks CE	Total Marks
Sem III	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
	VS 334	Web Designing (HTML,CSS)	Skill	4	72	80	20	100

	VS 335	Web Development (PHP/ MySQL)	Skill	4	72	80	20	100
	VS 336	Graphic Designing(Coral Draw)	Skill	4	72	80	20	100
	VS 337	Web Designing & development Lab	Skill	3	54	80	20	100
	VS 338	Graphic Designing (Coral Draw) Lab	Skill	3	54	80	20	100
Sem IV	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	ASP.NET with C#.NET	Skill	3	54	80	20	100
	VS 344	Advanced SQL with Oracle	Skill	3	54	80	20	100
	VS 345	Computer HW & Maintenance	Skill	3	54	80	20	100
	VS 346	ASP.NET & C#.NET Lab	Skill	2	36	80	20	100
	VS 347	ASQL & Oracle Lab	Skill	3	54	80	20	100
	VS 348	Industrial Training	Skill	4				
		<b>TOTAL MARKS</b>		<b>60</b>		<b>1280</b>	<sup>320</sup>	<b>1600</b>

## 10. SOCIAL SERVICE/ EXTENSION ACTIVITIES

Students are to participate in Extension/ NSS/ NCC or other specified social service, sports, literary and cultural activities during 3<sup>rd</sup>/ 4<sup>th</sup> 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

Very

Good

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 ( Semester III and IV )**

### **VS 331 BUSINESS STATISTICS**

**(72)**

#### **Learning 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.
- To enable the students to know Correlation and Regression
- To enable the students to know Index numbers , Time series analysis

#### **SYLLABUS:**

##### **Unit I—Introduction:**

**(18)**

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.

**Unit II—Correlation:** (18)

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.

**Unit III--Regression analysis:** (18)

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

**Unit IV--Index numbers:** (18)

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.

**Time series analysis** - Meaning and definition- components- Measurement of long term trend- Moving average method- Method of Least squares- Application in business.

**Learning Outcomes:**

- Students will be able to understand importance of Business Statistics.
- Students will understand correlation.
- After learning business statistics student will understand and able to do Regression analysis, Time series analysis, Index numbers

**REFERENCES:**

1. Gupta.S.P. *Statistical Methods*, Himalaya Publishing House, Mumbai.(Unit I, Unit II)
2. Elhance.D.L .*Fundamentals of Statistics*, KitabMahal, Allahabad. (Unit I)
3. Gupta.B.N. *Statistics - Theory and Practice*, SahityaBhawan Publications, Agra. (Unit I, Unit II)
4. Sanchetti D.C and KapoorV.K .*Statistics - Theory, Methods and Application*, Sultan Chand & Sons(Unit III, Unit IV, Unit V)

**VS 332 SYSTEM ANALYSIS AND DESIGN****(72)****Learning 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
- Testing the software and hardware

**SYLLABUS:****Unit I: Overview of System analysis and Design:****(18)**

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.

**Unit II: System design: (18)**

Design objectives, Process and stages of system design, Design methodologies, structured design, structured walkthrough, audit considerations, audit trails, detailed design, modularization, Unit specification, software design and documentation tools, top down and bottom up approaches

**Unit III: Testing & System Conversion: (18)**

Unit and integration testing, testing practices and plans, system control and quality assurance, training, conversion, operation plans, system administration.

**Unit IV: Hardware and Software selection: (18)**

Benchmarking, Financial considerations in selection software selection, vendor selection, and performance and acceptance criteria.

**Learning Outcomes:**

After learning business statistics student will understand:

- How to analyse system and design any system.
- Various types of feasibility studies and how to use it.
- How to test any system.
- Suitable and useful hardware and software for system.

**REFERENCES:**

**Core**

Award, EM, *Systems Analysis and Design*, Galgotia Pub, 1991(Unit I-IV)

**Additional**

Lesson, *System analysis and Design*, SRA pub, 1985(Unit I, Unit II)

Rajaraman V, *Analysis and Design of Information systems*, PHI, 1991(Unit III, Unit IV)

**Learning Objectives:**

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

- Working of information systems
- Transaction processing system.
- Select the hardware and software required for a system
- How to optimise information system

**SYLLABUS:****Unit I: Introduction:****(18)**

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;

**Unit II: Processing & Requirements:****(18)**

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

**Unit III: Concepts and Systems:****(18)**

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.

**Unit IV: Optimization: (18)**

Optimization techniques, difference between optimization tools and DSS tool expert system, difference between expert system and management information system. Role of chief Information officer.

**Learning Outcomes:**

After learning business statistics student will understand:

- How information systems works in organization.
- System processing and requirements
- Conceptual application of various systems.
- Optimisation of information systems.

**REFERENCES:**

- Management Information Systems, by Rajaraman (Unit I, Unit II)
- Management Information Systems, by S. SADAGOPAN, Prentice-Hall of India (Unit III, Unit IV)
- Management Information Systems By Uma G. Gupta, Galgotia Publications (Unit I, Unit III)
- Management Information Systems By JAWADEKAR, W.S., Tata McGraw-Hill (Unit III, Unit IV)

**VS 334 Web Designing (HTML, CSS) (72)**

**Learning Objectives:**

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

- HTML, CSS, Java script
- 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
- To understand how tools work like Dream viewer

## **SYLLABUS:**

### **Unit-I: Introduction to HTML: (18)**

Introduction to HTML Editors, Applications of HTML, Difference between HTML and XML, Basic HTML Elements, Headings, HTML, Paragraphs HTML Styles.

### **Unit-II: Commands in HTML: (18)**

Table, Hyperlink creation in HTML, Cascade Style Sheet, CSS Links, Web Page Designing using HTML, Comments in HTML.

### **Unit –III: HTML Form Design: (18)**

HTML Forms, Form Elements in HTML, Input Types HTML, Input Attributes.

### **Unit –IV: Introduction to Dream viewer software: (18)**

Interface of Dream viewer, Toolbox Workspace, Web Page designing using Dream viewer, Applications, Advantages and Disadvantages of Dream viewer.

### **Learning Outcomes:**

- About background coding in modern web sites with HTML and CSS
- About best practice in tagging text and other content
- About theories and conventions in web design, e.g. Balance, colour, lines
- About famous web designers
- About different ways to convey a given content to specific user groups

### **Ref Books :-**

- The Complete Reference HTML and XHTML 4/e Thomas A. Powell – TMH(Unit I, Unit II)
- HTML beginners guide – by Wendy Willard – TMH(Unit II, Unit III)
- HTML black book by Steven Holzner – Dream-tech press(Unit III, Unit IV)

## **VS 335WEB DEVELOPMENT (PHP/ MySQL) (72)**

### **Learning Objectives:**

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

- Develop application using PHP, MySQL
- 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
- To understand how tools works like Joomla



## **SYLLABUS:**

### **Unit I-Introduction to PHP: (18)**

Introduction, XAMPP, PHP Syntax, Variables, Strings, Constants, Operators, Echo /Print statements.

### **Unit II-Decision making and looping: (18)**

If- Else, Else if, Switch, Loops, For, foreach, While, Functions, string functions, user defined functions, Date and Time function, Arrays.

### **Unit III- Introduction to MySQL: (18)**

Basic introduction to database management system and its commands, SQL commands, MySQL Interface, MySQL toolbar, MySQL Commands, Data Types.

### **Unit IV-ADVANCED PHP: (18)**

Opening and closing a file, Coping ,renaming and deleting a file, File Uploading & Downloading, Object Terminology - Creating objects, Class, Methods, Properties, Inheritance and Constructor,

### **Learning Outcomes:**

Create PHP scripts that:

- Demonstrate the basics of PHP programming
- Use object-oriented PHP,
- Experiment with database design
- Create and deploy a portable web-based system.
- Test and debug PHP scripts.

### **Reference Books:-**

1. PHP: The Complete Reference - McGraw-Hill Education(Unit I, Unit II)
2. Learning PHP, MySQL & JavaScript: With JQuery, CSS & HTML5 - by Robin Nixon(Unit III, Unit IV)

### **VS 336 Graphic Designing (Coral Draw) (72)**

### **Learning Objectives:**

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

- Design various graphical content
- Explain the ways Coral draw works
- Study of layers, objects.
- Understand working of layout tools, printing & File format.

## **SYLLABUS:**

### **Unit I: CorelDraw Interface: (18)**

Starting and quitting CorelDraw X7, Object Overview, Tools Overview, Working with multiple drawings, Undoing, redoing, and repeating actions, zooming, panning, and scrolling

### **Unit II: Tool, Object, and Layers: (18)**

Study of Tools, Working with objects, working with lines, outlines, and brushstrokes, working with layers, Set Default Font and Size Artistic Text, Text effects.

### **Unit III: Text, Color, Fill: (18)**

Working with colour, changing the transparency of objects, Adding and manipulating text, formatting text, filling objects, Using color management.

### **Unit IV: Working with pages & layout tools, printing& File format: (18)**

Specifying the page layout, choosing a page background, Adding, duplicating, renaming, and deleting pages, printing basics, preparing files for print Service providers, Importing and exporting files, Supported file formats.

## **Learning Outcomes:**

At the end of this student will be able to:

- Create various designs using Coral Draw.
- To operate coral draw and its various tools.
- Formatting files, printings, and apply layouts.

## **REFERENCES:**

1. CorelDraw Training - Back to the Basics and Beyond(Unit I, Unit II)
2. CorelDraw X7 the Official Guide - Gary David Bouton(Unit III, Unit IV)

## **VS 337 Web Designing & Development – LAB (54)**

### **Learning Objectives:**

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

- HTML, CSS,
- Trending technologies in web development
- How to apply style sheets and scripts.
- Design and develop advanced websites.

## **SYLLABUS**

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
6. Cascading Style sheets
7. Creating and browsing XML database
8. HTML forms and Fields
9. Exercises covering basic introduction to JavaScript
- 10: Development of a web site involving a variety of tools practiced above
11. Working of control and looping structures in PHP
12. Creating Web page and its database connectivity using PHP.
13. Data manipulation Inserting, Deleting, Updating Records with PHP MySQL Commands.
14. Create, Read, Write File using PHP.
- 15 .Integrating Website using PHP, MySQL

### **Learning Outcomes:**

After studying this student will learn

- Working of HTML, CSS,
- New Trending technologies in web development
- Able to apply style sheets and scripts.
- Able to Design and develop advanced websites.

## **REFERENCES**

1. The Complete Reference HTML and XHTML 4/e Thomas A. Powell – TMH
2. HTML beginners guide – by Wendy Willard – TMH
3. HTML black book by Steven Holzner – Dream-tech press
4. Server Database and Application Development by Prof. DepaliR.Dhainje
5. Programming PHP O'Reilly(SPD)-By Rasmus Lerdorf& Kevin Tatroe.
6. PHP: The Complete Reference - McGraw-Hill Education

**Learning Objectives:**

- Students should be provided with hands-on experience on Coral draw.
- Exploring various tools to design graphical contents of Coral Draw.
- Innovative ideas to improve logic to develop and create impressive graphics.
- Student should learn Flex Design and Folding Brochure Design

**Practical:**

- 1) Simple Coffee Logo Design in CorelDraw X7.
- 2) Creating Label Design in CorelDraw X7.
- 3) Dispersion Effect: CorelDraw X7.
- 4) Creating a realistic looking Candle design in CorelDraw X7.
- 5) How to Draw WATER DROP effect in CorelDraw X7.
- 6) How to draw simple scenery with CorelDraw X7.
- 7) Easy way to draw Rainbow & Sky in CorelDraw X7.
- 8) Glossy Icon Vector in CorelDraw X7.
- 9) Realistic 3D Bottle Design | CorelDraw X7.
- 10) How to make-Brochure Design in CorelDraw x7.
- 11) Create Simple Wedding Card Design in CorelDraw X7.
- 12) Professional Business Card in CorelDraw X7.
- 13) Create Paper advertisement Design in CorelDraw X7.
- 14) Creating a Professional Certificate Design in CorelDraw X7.
- 15) Flex Design in CorelDraw X7.
- 16) Folding Brochure Design in CorelDraw X7

**Learning Outcomes:**

- Students will have hands-on experience on Coral draw.
- Student will Explore various tools to design graphical contents of Coral Draw.
- Innovative ideas to improve logic to develop and create impressive graphics.
- Able to work on Flex Design and Folding Brochure Design

**REFERENCES**

1. CorelDraw Training - Back to the Basics and Beyond
2. CorelDraw X7 the Official Guide - Gary David Bouton
3. CorelDRAW 2018 in Simple Steps by DT Editorial Services
4. Corel Draw Training Guide by Satish Jain

**Learning Objectives:**

- To practice Proof Methods,
- To practice Logic, Set Theory,
- To know Relations, Functions, Algebraic Structures,
- Understand working of Graph Theory, Matlab etc.

**SYLLABUS:****Unit–I: Proof Methods, Logic: (18)**

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

**Unit–II: Set Theory, Relations, And Functions: (18)**

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.

**Unit–III: Algebraic Structures: (18)**

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

**Unit–IV: Graph Theory & Miscellaneous Topics: (18)**

Introduction, Graph Notation, Topological sort, Graph Propagation algorithm, Depth First, Breadth-first searches, Shortest Path algorithms, directed acyclic graphs. Graphical representations of functions, Graphical interpretation of convergence, Complex Mapping, Fractals, Grammars, Languages and Automaton. Introduction to Matlab (Matrix, Linear Algebra, Graphics operations)

**Learning Outcomes:**

At the end student will be able to:

- Practice Proof Methods
- Apply Logic when creating systems.
- Using Set Theory, Relations, Functions, Algebraic Structures, Graph Theory, Matlab.

## REFERENCES

### Core

\_ RajendraAkerkar, RupaliAkerkar, *Discrete Mathematics*, Pearson Education(Unit I- Unit V)

### Additional

\_ RM Somasundaram, *Discrete Mathematical structures*(Unit I, Unit II)

\_ Calvin C. Clawson, *Mathematical Mysteries, The beauty and magic of Numbers*, Viva Books Pvt Ltd, (Unit III, Unit IV)

\_ RudraPratap, *Getting Started with MATLAB*, Oxford University Press(Unit IV, Unit V)

## VS 341 BUSINESS INFORMATICS(72)

### Learning Objectives:

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

- Have 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

## SYLLABUS

### Unit–I: Introduction: (18)

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

### Unit–II: Systems: (18)

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.

### Unit–III: Segments in Business: (18)

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.

**Unit IV: Advanced Informatics: (18)**

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

**Learning Outcomes:**

At the end student will understand:

- Role of IT in business.
- B concepts of e-commerce in systems.
- Aware of different types of e-commerce web sites and different modes of payments
- Aware of security and legal issues in e-commerce

**REFERENCES**

**Core:** Erfan Turban et.al., *Electronic Commerce–A Managerial Perspective*, Pearson Education (Unit I-Unit IV)

**Additional:** R Kalokota, Andrew V. Winston, *Electronic Commerce – a Manger’s guide*, Pearson (Unit I-Unit IV)

**VS 342 FINANCIAL ACCOUNTING (72)**

**Learning Objectives:**

- Familiarizing the student with the basic accounting terminologies
- Capable of journalizing, posting and preparing final accounts.
- Work manually and in computerized form.
- Student should know how to record Transactions

**SYLLABUS:**

**Unit I: Introduction: (18)**

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.

**Unit II: Conceptual Frame work: (18)**

Accounting Concepts, Principles and Conventions, Accounting Standards

**Unit III: Recording of transactions: (18)**

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

**Unit IV: Preparation of final accounts: (18)**

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

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

**Learning Outcomes:**

At the end student will understand:

- Basic accounting terminologies
- Capable of journalizing, posting Final account
- Capable of preparing final accounts both manually and in computerized form.

**Reference Books:**

Financial Accounting Paperback – 2002 by P.C. Tulsian (Unit I II III)

Financial Accounting Paperback – 5 Nov 2015 by Hanif (Unit IV V)

**VS 343 ASP.NET with C#.NET (72)**

**Learning Objectives:**

Student should learn

- Controls, Event, Validation & Ajax
- Database with ADO.NET, LINQ and Crystal Report
- Working with advanced tools in ASP and C sharp tools
- C# language advanced features

**SYLLABUS:**

**Unit I -.Introduction, Controls, Event, Validation & Ajax: (18)**

Introduction: Understanding Visual studio IDE environment, Design view, Source view, Output window, Error list window, Property window, Object Browser window, Start page, Toolbar and Toolbox, ASP.NET life cycle, Using .NET Framework Class Library.Different Controls: Introduction to control class, TextBox control, Button Control, Label Control, Image control, ImageButton control, ImageMap control, DropDownList control, CheckBox



control, RadioButtoncontrol, Table control, Calendar control, SiteMap control , TreeView control , Menu control, Validation controls, Login controls, Database controls. Event handling: Application\_Start, Application\_End, Page\_Load ,Page\_Unload, Click event:OnClick , TextChanged event: OnTextChanged , Command event: OnCommand , CheckedChanged event: OnCheckedChanged , SelectedIndexChangedevent:OnSelectedIndexChanged, postback events, Using event argument etc. Validation Control: Introduction, basic validation controls, validation techniques, using advanced validation controls like: Regular Expression Validator Control, Compare Field Validator Control Range Validator Control, Validation Summary Control, Custom Validator Control. State Management: Using view state, using session state, using application state, using cookies and URL encoding. Master Pages: Creating master pages, content pages, nesting master pages, accessing master page controls from a content page. Navigation: Understanding Site Maps, Using the Sitemap Path Control, Formatting the Sitemap Path Control, Using the Menu Control, Using Tree View Control. Ajax: Introducing AJAX, Working of AJAX, Using ASP.NET AJAX server controls.

## **Unit II -.Database with ADO.NET, LINQ and Crystal Report: (18)**

Database Elements: ADO.NET Object model, Data Binding, Using Connection, Command, Data Reader classes, Queries returning result sets, Passing parameters in queries, Using Repeater control, Data Adapter, Using Data Set (Typed), Data Table, Data Row & Data Column, Introducing the ADO.NET Entity Framework, Mapping Your Data Model to an Object Model, CRUD with ASP.NET, Authentication and Authorization with ASP.NET.

Microsoft SQL Server 2008 Overview: Introduction to Microsoft SQL Server 2008, Advantages /Features of SQL Server, Queries using SQL Server performing create ,select ,update, delete etc. Design View in SQL Server Various Constraints in SQL SERVER( Primary Key, Unique Key, Foreign Key, NULL/Not Null Constraint) Various Function in SQL Server, Export/Import Data using SQL Server.

Crystal Report: Adding a Crystal Report to an ASP.NET Application, Inserting Fields, Text, and Special Fields, Sorting, Grouping, and Subtotaling, Using Select Expert, Dynamic Formatting, Using the Crystal Reports Viewer.

## **Unit III -.C# language Basics: (18)**

Overview of C# Literals, Variables, Data types, Operators, Expressions, Branching and looping operations, methods, arrays, strings , Classes and Objects: class, objects, constructors, static members, static constructors, private constructors, copy constructors, destructors, member, initialization, this reference, nesting of classes.

#### **Unit IV - C# language advanced features: (18)**

Inheritance and Polymorphism: Classical inheritance, containment, inheritance, Defining a subclass, visibility control, Defining subclass, constructors, multilevel inheritance, Overriding methods, hiding methods, Abstract classes, abstract methods.

Interface: Defining an interface, extending an interface, Implementing, interface, Difference between interface and abstract class, Operator overloading.

#### **Learning Outcomes:**

- To equip the students with skills required in software industry.
- Students will learn the latest of ASP.NET in framework 4.5
- Students can apply the skill learnt in developing website or application.

#### **REFERENCES:**

- 1) ASP.NET – The Complete Reference Tata McGraw Hill. (Unit I)
- 2) Beginning ASP.NET 4.5: in C# by Imar Spaanjaars Wrox Publication. (Unit II, IV)
- 3) C# and .NET 4.5 by Christian wrox publication.(Unit III, IV)

#### **RESOURCE:**

<http://www.tutorialspoint.com/asp.net>  
<https://www.c-sharpcorner.com/>

#### **VS 344 Advanced SQL with Oracle (72)**

#### **Learning Objectives:**

- To practice moderately complex use of the following technologies ASQL, Oracle
- Student should have understand Advanced SQL Concepts
- How Stored Procedures woks
- How to handle Dynamic SQL

#### **SYLLABUS:**

#### **Unit I: Advanced SQL Concepts: (18)**

Writing Basic SQL Select Statements, Joins (Displaying Data from Multiple Tables), Aggregating Data using Group Functions, Creating Views, inline views, Controlling User Access, grant, revoke, rollback, Creating Other Database Objects (Sequences, Indexes and Synonyms).

**Unit II: Procedural language: (18)**

Types of PL/SQL blocks, Identifiers, types of Identifiers, Declarative Section, variables, Scalar Data Types, The %TYPE Attribute, PL/SQL Block Syntax, Deployment of SQL Functions in PL/SQL, Nested Blocks, Operators. Control Structures: Conditional processing using IF Statements and CASE Statements, Loop Statement, While Loop Statement, For Loop Statement, the Continue Statement, Composite Data Types, Handle Exceptions with PL/SQL.

**Unit III: Stored Procedures: (18)**

What is procedure? Syntax of creating procedure, Creating procedure with parameters, IN parameter, OUT parameter, methods of passing parameter, Invoking procedure from other procedure, The PL/SQL Execution Environment, Differences between Anonymous Blocks and Subprograms, Declaring subprograms, Handled exceptions, removing procedures Functions: Basic concept of functions, different types of functions, Advantages of using Stored Functions, The steps to create a stored function, Invoke User-Defined Functions in SQL Statements, Restrictions when calling Functions, Control side effects when calling Functions, View Functions Information, Functions and Procedures.

**Unit IV: Dynamic SQL: (18)**

Triggers: Definition, the Trigger Event Types and Body, Business Application Scenarios for Implementing Triggers, Create DML Triggers using the CREATE TRIGGER Statement and SQL Developer, Body, and Firing (Timing), Statement Level Triggers and Row Level Triggers, Creating Compound, DDL and Event Database Triggers, Compound Trigger Structure for Tables and Views, instead of trigger, DDL trigger, Comparison of Database Triggers and Stored Procedures.

**Learning Outcomes:**

To develop the skill of data base programming using advanced SQL concepts.

**REFERENCES**

1. Murach's Oracle SQL and PLSQL by Joel Murach, Murach and Associates. (Unit I-Unit II)
2. Oracle Database 11g PL/SQL Programming Workbook By: Michael Mc Laughlin, John Harper (Unit II-Unit III)
3. Oracle PL/SQL Programming Fifth Edition By Steven Feuerstein, Bill Pribyl (Unit III-Unit IV)

**Learning Objectives:**

- Explain the working of computers
- Identify different components of computers and explain their uses
- Student should understand working of buses and drive systems
- Student should recognise and understand types of memories used.

**SYLLABUS**

**Unit I: Introduction: (18)**

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.

**Unit II: Buses: (18)**

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: types of monitors, block diagram & description of various monitors.

**Unit III: Drive Systems: (18)**

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.

**Unit IV: Types of memory: (18)**

Physical Memory, Memory Units:- 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, start-up problems, run problems their identification and remedy, Problem of Keyboard, displays, printers, HDD's, SMPS motherboard, their identification and remedy

**Learning Outcomes:**

Students will learn:

- To develop skills to maintain hardware
- Improve knowledge of hardware
- Understand working of computers

**References:-**

1. R S. Gaonkar- Micro processor Architecture, Programming and applications with 8085. (Unit I, Unit II)
2. Venugopal and Ravikanth- Introduction to assembly language programming in 8086. (Unit II, Unit III)
3. Scott muller with Creigzacker- Upgrading and repairing PCs. (Unit III,Unit IV)

**VS 346 ASP.NET & C#.NET Lab****(36)****Learning Objectives:**

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

- Give an introduction about ASP.net and C#
- Explain the fundamentals of ASP.net and C#
- Discuss the various controls in ASP.net and C#
- Narrate database connectivity in ASP.net and C#

**Practical:**

- 1). Write a C# Sharp program to print the sum of two numbers.
- 2). Write a C# Sharp program to swap two numbers.
- 3). Create one simple Web Site.
- 4). Write a C# program to print the odd numbers from 1 to 99. Prints one number per line.
- 5).Write a program in C# Sharp to create a file with text and read the file.
- 6). Write a C# Sharp program to compute the sum of the two given integer values. If the two values are the same, then return triple their sum.
- 7). Write a C# Sharp program to find the sum of first 10 natural numbers.
- 8). Write a C# Sharp program to check whether a given number is even or odd.
- 9). Write a program in C# Sharp to read a specific line from a file.
- 10).Create one simple Registration Form with SAVE, DELETE, UPADATE, SEARCH Record using SQL database.

**Learning Outcomes:**

Students will learn:

- To develop skills to create applications.
- Improve knowledge of C sharp
- Understand working of c sharp and asp.net.

**References:**

1. A Programmer's Introduction to C#, 2nd edition (Apress) - Eric Gunnerson
2. Inside C#, 2nd edition (Microsoft Press) - Tom Archer
3. Component-Based Development with Visual C# (M&T books) - Ted Faison

4. Designing Microsoft ASP.NET Applications (Microsoft Press) - Jonathon Goodyear, Brian Peek, Brad Fox
5. Microsoft ASP.NET Step by Step (Microsoft Press) - G. Andrew Duthri

**Learning 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 SQL and Oracle programs

**Practical:**

1. Write a query to list first name, last name and their salary for employee contained in the employees table.  
Note: To specify multiple columns in a SELECT list, you separate the column names with commas. For good practice insert a space after each comma for readability.
2. Write a query to display all the columns of employees table.  
Note: To display all the columns for a particular table, you can use the asterisk (\*) wildcard character as the SELECT list instead of typing the name of every column.  
The result set displays the columns in the order in which they are defined in the table
3. Write a query to list first name, last name and their salary for first 10 employee contained in the employees table.
4. Write a query to list the employees name and salary who?s daily salary is more than \$100.
5. Write a query to list the names, salary of all the employees who are working with a commission package.
6. . Write a query to display three numbers in three columns.
7. Write a query to display the result of an arithmetic expression.
8. Write a SQL statement to display specific columns like name and commission for all the salesmen.
9. Write a SQL statement to find the average purchase amount of all orders.

10. Write a SQL statement to make a list with order no, purchase amount, customer name and their cities for those orders which order amount between 500 and 2000.

**Learning Outcomes:**

Students will learn:

- To develop skills to create database.
- Improve knowledge of ASQL and Oracle
- Understand working of ASQL and Oracle

**References:**

1. Oracle SQL: the Essential Reference by David C. Kreines
2. Learning SQL, 3rd Edition by Alan Beaulieu
3. SQL: The Complete Reference by James R. Groff and Paul N. Weinberg
4. Oracle PL/SQL Programming by Steven Feuerstein

**VS 348 INDUSTRIAL TRAINING**

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