

**KADI SARVA VISHWAVIDYALAYA
GANDHINAGAR**



**Bachelor of Science
(Computer Science)**

(3 Years Full Time: 6 Semesters Programme)

June 2018

KADI SARVA VISHWAVIDYALAYA

CHOICE BASED CREDIT SYSTEM

FOR

**Bachelor of Science
(Computer Science)**

Choice Based Credit System:

As per the guidelines given by the University Grants Commission (UGC) to bring equality, efficiency and excellence in the UG Education System, Choice Based Credit System (CBCS) has been adopted. CBCS offers wide range of choices to students to select the courses based on their interest and career objectives. It provides flexibility to students to opt for the courses of their choice and / or undergo additional courses to strengthen their Knowledge and Skills.

For the B.Sc. (Computer Science) programme, conceptual division of courses:

- Core Courses
- Elective Courses
- Ability Enhancement Courses
- Skill Enhancement Courses

KSV has designed curricula for all its UG programmes in line with the current requirements and best practices followed internationally which includes IT enabled interactive teaching, Expert Lectures, Hands on Workshops, Industrial Visits and study tours.

All programmes of the KSV follow credit-based system. The method of teaching is student-centered and facilitates students for self-learning. Encourages students for group activities and motivates them to work on innovative projects and research. Some of the unique features of KSV include:

- Objective based Industrial visits
- Regular seminars and lectures by leading academicians and experts from the industry
- Hands on practical based workshops
- Sarva Netrutva programmes for developing leadership qualities
- Real-scenario based projects, case studies and assignments
- Placement assistance through on-campus and off-campus interviews

Syllabus of B.Sc. (CS)

Semester – I

- CSUEC01. Environmental Studies
- CSCC01. Programming in C
- CSCC02. Internet Fundamentals and Cyber Laws
- CSCC03. Basics of Electronics
- CSCC04. Office Automation
- CSCC05. Project – I
- CSUEC02. Sports/Social Activity/Cultural Activity

Semester - II

- CSUEC03. Professional Communication Practices
- CSCC06. Discrete Mathematics
- CSCC07. Object Oriented Programming using C++
- CSCC08. Data Structures and Algorithms
- CSCC09. Computer Networks
- CSCC10. Project – II
- CSUEC04. Sports/Social Activity/Cultural Activity

Semester - III

- CSUEC05. Business Communications
- CSCC11. Probability Theory and Statistics
- CSCC12. Relational Database Management System - I
- CSCC13. Web Development using PHP
- CSCC14. Computer Organization and Microprocessors
- CSCC15. Project – III

Semester - IV

- CSCC16. Operations Research
- CSCC17. Relational Database Management System - II
- CSCC18. Systems Analysis and Design
- CSCC19. Operating Systems
- CSEC01. **Elective – I**
CSEC01 (A) Object Oriented Programming using JAVA
CSEC01 (B) Web Development using .NET
CSEC01 (C) Python Programming
- CSCC20. Project – IV

Semester - V

- CSCC21. Android Programming
- CSCC22. Network Security and Cryptography
- CSEC02. **Elective – I**
CSEC02 (A) Big Data Analytics
CSEC02 (B) Basics of Cloud Computing
CSEC02 (C) Information Retrieval
- CSEC03. **Elective – II**
CSEC03 (A) Embedded Computing Systems
CSEC03 (B) Internet of Things
CSEC03 (C) Semantic Web
- CSCC23. Project – V

Semester - VI

- CSCC24. Project Work

KADI SARVA VISHWAVIDYALAYA , GANDHINAGAR

B.Sc. CS Programme

CBCS STRUCTURE

SEMESTER - I

Sr. No	Subject Code	Name of Subject	Total Credit	Teaching Scheme (Per Week)		Examination Scheme			
				Th	Pr	MID	External		Total Marks
							Th	Pr	
1	CSUEC01	Environmental Studies	2	2	0	15	35	0	50
2	CSCC01	Programming in C	6	4	4	30	70	50	150
3	CSCC02	Internet Fundamentals and Cyber Laws	6	4	4	30	70	50	150
4	CSCC03	Basics of Electronics	4	4	0	30	70	0	100
5	CSCC04	Office Automation	2	0	4	0	0	50	50
6	CSCC05	Project - I	2	0	4	30	0	70	100
7	CSUEC02	Sports/Social Activity/Cultural Activity	2	0	4	50	0	0	50
Total			24	14	20	185	245	220	650

SEMESTER - II

Sr. No	Subject Code	Name of Subject	Total Credit	Teaching Scheme (Per Week)		Examination Scheme			
				Th	Pr	MID	External		Total Marks
							Th	Pr	
1	CSUEC03	Professional Communication Practices	3	2	2	15	35	0	50
2	CSCC06	Discrete Mathematics	4	4	0	30	70	0	100
3	CSCC07	Object Oriented Programming using C++	6	4	4	30	70	50	150
4	CSCC08	Data Structures and Algorithms	6	4	4	30	70	50	150
5	CSCC09	Computer Networks	4	4	0	30	70	0	100
6	CSCC10	Project – II	2	0	4	30	0	70	100
7	CSUEC04	Sports/Social Activity/Cultural Activity	2	0	4	50	0	0	50
Total			27	18	18	215	315	170	700

SEMESTER - III									
Sr. No	Subject Code	Name of Subject	Total Credit	Teaching Scheme (Per Week)		Examination Scheme			
				Th	Pr	MID	External		Total Marks
							Th	Pr	
1	CSUEC05	Business Communications	3	2	2	15	35	0	50
2	CSCC11	Probability Theory and Statistics	4	4	0	30	70	0	100
3	CSCC12	Database Management System - I	6	4	4	30	70	50	150
4	CSCC13	Web Development using PHP	6	4	4	30	70	50	150
5	CSCC14	Computer Organization and Microprocessors	4	4	0	30	70	0	100
6	CSCC15	Project – III	2	0	4	30	0	70	100
Total			25	18	14	165	315	170	650

SEMESTER – IV									
Sr. No	Subject Code	Name of Subject	Total Credit	Teaching Scheme (Per Week)		Examination Scheme			
				Th	Pr	MID	External		Total Marks
							Th	Pr	
1	CSCC16	Operations Research	4	4	0	30	70	0	100
2	CSCC17	Database Management System – II	6	4	4	30	70	50	150
3	CSCC18	Systems Analysis and Design	5	4	2	30	70	50	150
4	CSCC19	Operating Systems	5	4	2	30	70	50	150
5	CSEC01	Elective – I	6	4	4	30	70	50	150
	CSEC01 (A)	Object Oriented Programming using JAVA							
	CSEC01 (B)	Web Development using .NET							
	CSEC01 (C)	Python Programming							
6	CSCC20	Project – IV	2	0	4	30	0	70	100
Total			28	20	16	180	350	270	800

SEMESTER – V									
Sr. No	Subject Code	Name of Subject	Total Credit	Teaching Scheme (Per Week)		Examination Scheme			Total Marks
				Th	Pr	MID	External		
							Th	Pr	
1	CSCC21	Android Programming	6	4	4	30	70	50	150
2	CSCC22	Network Security and Cryptography	6	4	4	30	70	50	150
3	CSEC02	Elective – I	5	4	2	30	70	50	150
	CSEC02 (A)	Big Data Analytics							
	CSEC02 (B)	Basics of Cloud Computing							
	CSEC02 (C)	Information Retrieval							
4	CSEC03	Elective – II	5	4	2	30	70	50	150
	CSEC03 (A)	Embedded Computing Systems							
	CSEC03 (B)	Internet of Things							
	CSEC03 (C)	Semantic Web							
5	CSCC23	Project – V	2	0	4	30	0	70	100
Total			24	16	16	150	280	270	700

SEMESTER - VI									
Sr. No	Subject Code	Name of Subject	Total Credit	Teaching Scheme (Per Week)		Examination Scheme			Total Marks
				Th	Pr	MID	External		
							Th	Pr	
1	CSCC24	Project Work	24	0	30	200	0	400	600
Total			24	0	30	200	0	400	600

Detailed Syllabus

Kadi Sarva Vishwavidyalaya B.Sc. (CS) Semester – I (First Year)

Subject : Environmental Studies
Subject Code : CSUEC01

Objective:

Environmental study is a multidisciplinary academic field which systematically studies human interaction with the environment in the interests of solving complex problems. Environmental studies bring together the principles of sciences, commerce economics and social sciences so as to solve contemporary environment problems.

Learning Outcomes:

At the end of the subject the students shall have learnt the following:

- Basic knowledge about the environment and its allied problems.
- Methods of environment protection and environment improvement.
- Skills to help the concerned individuals in identifying and solving environmental problems.

Unit - I

Definition, Scope and basic principles of ecology and environment, Current environment issues – climate change, Global warming, Acid rain, Ozone Layer Depletion, Natural Resources – Renewable and non renewable resources, Pollution Air, Water, soil, Marine, Thermal, Noise Pollution – Causes and Effects

50%

No. of Lectures: - 14

Unit - II

Ecosystem: Basic concepts, components of ecosystem, Trophic levels, Food chains and food web, Ecological pyramids, ecosystem functions. Energy flow in ecological systems, energy efficiencies. Biogeochemical Cycles: Importance, gaseous and sedimentary Cycles. Carbon, Nitrogen, Phosphorus, Hydrogen and sulphur Cycles.

No. of Lectures: - 14

50%

Total No. of Lectures: - 28

References:

Environmental studies, By N.K. Uberoi, SecondEdition, Excel books of publication
Environmental studies, By Erach Bharucha for UGC
Environmental Management By N.K. Uberoi, SecondEdition,
Excel books of publication
Science and Technology, By Ashok Kumar Singh, TMH

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			Total Marks
			Internal	External		
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
2	0	2	15	35	0	50

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – I (First Year)

Subject : Programming in C
Subject Code : CSCC01

Objective:

To acquaint the students with graphical flow diagrams to represent logic and learn basic principles of programming.

Learning Outcomes:

After studying this subject, student will be able to

- Draw flowcharts
- Develop program in C
- Able to know importance of an array by real life example as well as technical problem solving.
- Able to develop functions and enrich their skill to library function and user define side.
- Able to develop a small type of data storing with File Handling
- Able to know the importance pointer

Unit - I

25%

Program Concept, Characteristics of Programming, Various stages in Program Development Programming aids Algorithms, Flow Charts - Symbols, Rules for making Flow chart, Programming Techniques – Top down, Bottom up, Modular, Structured - Features, Merits, Demerits, and their Comparative study. Programming Logic- Simple, Branching, Looping, Recursion, Cohesion & Coupling, Programming Testing & Debugging & their Tools.

No. of Lectures: - 14

Unit - II

25%

C language basics: C character set, Identifiers and keywords, Data types, Enumeration type, constants, variables, declarations, qualifiers – long, short and unsigned declarations, expressions, symbolic constants, input/output functions, compound statements, arithmetic operators, unary operators, relational and logical operators, assignment operators, increment and decrement operators, Precedence and order of evaluation, conditional operators, bit operators, type casting, using library functions in math.h

Control flow: If statement, if...else statement, nested if..else statement, switch statements, looping – for loop , while loop, do ... while statements, nested loop structure, break, continue and go to statements.

No. of Lectures: - 14

Unit - III**25%**

Arrays & Strings: Single dimensional arrays, multidimensional arrays, initializing array using static declaration, Searching and sorting of Arrays, Array of Characters, Character arrays and strings, String handling Functions.

No. of Lectures: - 14**Unit - IV****25%**

Structures: Definition of Structures, declaration, structure passing to functions, array of structures, arrays with in structures, unions, typedef statements.

Pointers: Introduction to pointers, Benefits of using pointers, Concept of pointer, Declaring pointer variable, Initialization of pointer variable.

No. of Lectures: - 14**Total No. of Lectures: - 56****Text Books:**

Programming in ANSI C 4E , E. BalaGuruswamy, TMH
 Programming in C, Byron S Gottfried, Shaum's Outline series. TMH

References:

Computer Fundamentals By P K Sinha & Priti Sinha Fourth Edition.
 B. Kernighan and D. Ritchie, "The ANSI C Programming Language", PH

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			Total Marks
			Internal	External		
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	4	6	30	70	50	150

Practical List:

Student should prepare flow chart of the given program before practical.

1. Programs using Basic Constructs.
2. Programs using Control Structure.
3. Programs using Arrays.
4. String Manipulation Programs.
5. User Defined Function Programs.
6. Programs using Structure.
7. Programs using Pointer.
8. Program based on file management.

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – I (First Year)

Subject : Internet Fundamentals and Cyber Laws
Subject Code : CSCC02

Objective:

In this subject students will learn about basic understanding of the components of Internet and its technologies.

Learning Outcomes:

After studying this subject, student will be able to

- Create WebPages.
- Apply different styles on that WebPages.
- Create and maintain Website.

Unit - I

25%

Internet – Introduction, Basic Communication, Local Area Network, Packet Switching, Internet: A Network of Networks, ISPs and Network Connections, IP Address, Transaction Control Protocol (TCP), Domain Names.

No. of Lectures: - 14

Unit - II

25%

Internet Services: Electronic Mail, Bulletin Board Services (Network News), Browsing the World Wide Web, Automated Web Search (Search Engines), Audio and Video Communication, Faxes and Files (FTP), Remote Login.

No. of Lectures: - 14

Unit - III

25%

Facilities for Secure Communication, Electronic Commerce and Business. Web Programming – Introduction to HTML, Creating Web Pages, Formatting Tags, Font, Lists, Table, Form, Marquee, Frame Tags, and Creation of simple websites.

No. of Lectures: - 14

Unit - IV

25%

Cyber Crimes- Computer Crime, Nature of Crimes, Penalty for damage to computer, Computer system, Tampering with Computer source documents, Hacking, and Computer related offences, Theft, The Language of Cyber space.

No. of Lectures: - 14

Total No. of Lectures: - 56

Text Books:

- “The Internet”, Douglas. E. Comer, Prentice hall of India – Third Edition
- HTML Black Book
- “Cyber Law Crimes”, Barkhs and U. Rama Mohan, Asia Law House, New Edition

References:

- “Internet Complete Reference, Harley Hahn.

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			Total Marks
			Internal	External		
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	4	6	30	70	50	150

Practical List:

1. Develop HTML document for web page of your favorite Teacher. Design the page with attractive background color, text color, and background color.
2. Develop HTML document for web page of your favorite national hero with attractive color combination, suitable heading and horizontal rule.
3. Write HTML code with example of ordered list, Unordered List and nested list.
4. Write HTML code with example of Table to print your mark sheet.
5. Write HTML code with example of Table to print your Restaurant menu card.
6. Write HTML code with example of Table to print shopping bill.
7. Write frameset tags and frame tags for following frameset.
8. Develop complete webpage using frame and frameset which gives information about your college.
9. Design feedback form with appropriate fields.
10. Design website for your university containing general information about university, brief history, features, and various courses. Each page should have different color combination.

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – I (First Year)

Subject : Basics of Electronics
Subject Code : CSCC03

Objective:

The students need to learn basic concepts of digital circuits and system which leads to design of complex digital system such as microprocessors. The students need to know combinational and sequential circuits using digital logic fundamentals.

Learning Outcomes:

After studying this subject, student will able to learn

- Students will able to explain Number systems and logic circuits.
- The student should be able to solve logic function minimization.
- The students should be able to differentiate between combinational and sequential circuits such as decoders, encoders, multiplexers, demultiplexers, flipflops, counters, registers.
- Determine the behavior of analog and digital communication systems.

Unit - I

25%

Number systems, Operations and Codes :- Decimal numbers – Binary Numbers – Decimal to binary conversion – Binary arithmetic – 1's and 2's complement of binary numbers – Signed numbers – Arithmetic operations with signed numbers – hexadecimal numbers – octal numbers – binary coded decimal – digital codes – error detection and correction codes.

No. of Lectures: - 14

Unit - II

25%

Logic gates :- The inverter – AND – OR – NAND – NOR – Exclusive OR – Exclusive NOR Gates.
Boolean algebra and logic simplification: - Laws and rules of Boolean algebra – De-Morgan's theorems – simplification of logic expressions using Boolean algebra – SOP and POS expressions – the Karnaugh map – Karnaugh map minimizations.

No. of Lectures: - 14

Unit - III

25%

Combinational Logic :- Implementation of a logic circuit from a Boolean expression – Implementation of a logic circuit from a truth table – Minimizing a logic circuit – The Universal property of NAND and NOR gates
Logic Functions :- Adders – Parallel Binary Adders – Comparators – Decoders – Encoders – Code Converters – Multiplexers – De-multiplexers – Parity Generators/Checkers.

No. of Lectures: - 14

Unit - IV**25%**

Flip Flops:- Latches – Edge triggered flip flops – Master-Slave Flip Flops -- Flip-Flop Operating Characteristics – Flip-Flop Applications. Counters:- Asynchronous Counter Operation – Synchronous Counter Operation.

Shift Registers:- Serial In/Serial Out Shift Registers – Serial In/Parallel Out Shift Registers – Parallel In/Serial Out Shift Registers – Parallel In/Parallel Out Registers .

No. of Lectures: - 14**Total No. of Lectures: - 56****Text Books:**

- Digital Fundamentals – Eighth edition – Floyd and Jain – Pearson education

References:

- Digital logic and computer design – Morris Mano PHL
- Digital computer fundamentals - Bartee T

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	0	4	30	70	0	100

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – I (First Year)

Subject : Office Automation
Subject Code : CSCC04

Objective:

This subject gives a practical introduction to the office automation package. Microsoft Office is used. It makes the students proficient in the use of MICROSOFT OFFICE packages namely MS Word, MS Excel, MS Power Point and MS Access.

Learning Outcomes:

- After completion of the course, students would be able to create and format documents, spreadsheets, make small presentations and preparing databases
- Students can describe the features and functions of the major categories of Microsoft office packages.

Teaching Methodology:

Subject is taught practically throughout. Students will be given the Practical assignment as per the topic taken in lab.

MS Word - Working with Documents

--Opening & Saving files, Editing text documents, Inserting, Deleting, Cut, Copy, Paste, Undo, Redo, Find, Search, Replace, Formatting page & setting Margins, Converting files to different formats, Importing & Exporting documents, Sending files to others, Using Tool bars, Ruler, Using Icons, using help

Formatting Documents - Setting Font styles, Font selection- style, size, colour etc, Type face - Bold, Italic, Underline, Case settings, Highlighting, Special symbols, Setting Paragraph style, Alignments, Indents, Line Space, Margins, Bullets & Numbering.

Setting Page style – Formatting Page, Page tab, Margins, Layout settings, Paper tray, Border & Shading, Columns, Header & footer, Setting Footnotes & end notes – Shortcut Keys; Inserting manual page break, Column break and line break, Creating sections & frames, Anchoring & Wrapping, Setting Document styles, Table of Contents, Index, Page Numbering, date & Time, Author etc., Creating Master Documents, Web page.

Creating Tables- Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Sorting, and Formula,

Drawing - Inserting ClipArts, Pictures/Files etc., Tools – Word Completion, Spell Checks, Mail merge, Templates, Creating contents for books, Creating Letter/Faxes, Creating Web pages, Using Wizards, Tracking Changes, Security, Digital Signature.

Printing Documents – Shortcut keys.

Introduction to MS Office – MS Excel

MS Excel: Spread Sheet & its Applications, Opening Spreadsheet, Menus - main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types. Working with Spreadsheets- opening, Saving files, setting Margins, Converting files to different formats (importing, exporting, sending files to others), Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys.

Entering & Deleting Data- Entering data, Cut, Copy, Paste, Undo, Redo, Filling Continuous rows, columns, Highlighting values, Find, Search & replace, Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc, Inserting Functions, Manual breaks,

Setting Formula - finding total in a column or row, Mathematical operations (Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae.

Formatting Spreadsheets- Labeling columns & rows, Formatting- Cell, row, column & Sheet, Category - Alignment, Font, Border & Shading, Hiding/ Locking Cells, Anchoring objects, Formatting layout for Graphics, Clipart etc., Worksheet Row & Column Headers, Sheet Name, Row height & Column width, Visibility - Row, Column, Sheet, Security, Sheet Formatting & style, Sheet background, Colour etc, Borders & Shading – Shortcut keys.

Working with sheets – Sorting, Filtering, Validation, Consolidation, and Subtotal.

Creating Charts - Drawing.

Printing. Using Tools – Error checking, Spell Checks, Formula Auditing, Creating & Using Templates, Pivot Tables, Tracking Changes, Security, Customization

MS Access:

Introduction, Planning a Database, Starting Access, Access Screen, Creating a New Database, Creating Tables, Working with Forms, Creating queries, Finding Information in Databases, Creating Reports, Types of Reports, Printing & Print Preview – Importing data from other databases viz. MS Excel etc.

MS Power point: Introduction to presentation – Opening new presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts.

Creating a presentation - Setting Presentation style, Adding text to the Presentation. **Formatting a Presentation** - Adding style, Colour, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout. Adding Graphics to the Presentation- Inserting pictures, movies, tables etc into presentation, Drawing Pictures using Draw.

Adding Effects to the Presentation- Setting Animation & transition effect.

Printing Handouts, Generating Standalone Presentation viewer

Reference Books :

- MS-Office 2007 Training Guide Paperback By S Jain.
- Microsoft Office 2010 Paperback by Bittu Kumar
- MS Windows 7 Training Guide by S Jain

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			Total Marks
			Internal	External		
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
0	4	2	0	0	50	50

Practical List:

1. Preparing a Govt. Order / Official Letter / Business Letter / Circular Letter Covering formatting commands - font size and styles - bold, underline, upper case, lower case, superscript, subscript, indenting paragraphs, spacing between lines and characters, tab settings etc.
2. Preparing a news letter: To prepare a newsletter with borders, two columns text, header and footer and inserting a graphic image and page layout.
3. Creating and using styles and templates To create a style and apply that style in a document To create a template for the styles created and assemble the styles for the template.
4. Creating and editing the table To create a table using table menu To create a monthly calendar using cell editing operations like inserting, joining, deleting, splitting and merging cells To create a simple statement for math calculations viz. Totaling the column.
5. Creating numbered lists and bulleted lists To create numbered list with different formats (with numbers, alphabets, roman letters) To create a bulleted list with different bullet characters.
6. Printing envelopes and mail merge. To print envelopes with from addresses and to addresses To use mail merge facility for sending a circular letter to many persons To use mail merge facility for printing mailing labels.
7. Using the special features of word To find and replace the text To spell check and correct. To generate table of contents for a document To prepare index for a document.
8. Create an advertisement Prepare a resume. Prepare a Corporate Circular letter inviting the share holders to attend the Annual Meeting.
9. Using formulas and functions: To prepare a Worksheet showing the monthly sales of a company in different branch offices (Showing Total Sales, Average Sales). Prepare a Statement for preparing Result of 10 students in 5 subjects (using formula to get Distinction, I Class, II Class and Fail under Result column against each student).
10. Operating on the sheets: Finding, deleting and adding records, formatting columns, row height, merging, splitting columns etc. Connecting the Worksheets and enter the data.
11. Creating a Chart: To create a chart for comparing the monthly sales of a company in different branch offices
12. Using the data consolidate command: To use the data consolidate command to calculate the total amount budgeted for all departments (wages, travel and entertainment, office supplies and so on) or to calculate the average amount budgeted for – say, department office expenses.
13. Sorting Data, Filtering Data and creation of Pivot tables
14. Creating Student's address Database and then list the data on the screen in alphabetical order.
15. Performing various queries.
16. Generating in tables Access
17. Generating the Report from Database
18. Importing and exporting data
19. Creating a new Presentation based on a template – using Auto content wizard, design template and Plain blank presentation.
20. Creating a Presentation with Slide Transition – Automatic and Manual with different effects.
21. Creating a Presentation applying Custom Animation effects – Applying multiple effects to the same object and changing to a different effect and removing effects.
22. Creating and Printing handouts.

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – I (First Year)

Subject : Project - I
Subject Code : CSCC05

Objective:

By studying the different theoretical and fundamental concept, students must ensure their learning by developing real time or scenario based applications on the fundamental concept. The project development as a subject will help them to learn and understand the applications of the concept which they are learning from different subjects in the semester.

- Primarily, student must gain the knowledge about the applications of the fundamentals.
- Importantly, they need to also learn the technology trends and develop their skills on those technologies during project development.

Learning Outcomes:

Students will be able to learn and perform the daily professional, communication and operational task useful for employment purpose.

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
0	4	2	30	0	70	100

A) Project based tutorials on MS-Office/Open-Office Automation like:

- Text Document (Word): Document Formatting features, Macro, Mail Merge Wizard.
- Spreadsheet (Excel): Applying different Formulae, Calc Functions, Charts, Lookup functions
- Presentation (Power Point): Preparing Presentation of any topic with all type of visuals, hyperlinks, etc.

B) Project based on Internet fundamentals:

- Website design and development using HTML.

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – I (First Year)

Subject : Sports/ Social Activity/ Cultural Activity
Subject Code : CSUE02

Objective:

Education is a pretty broad concept that surpasses the four walls of a classroom. The core aim of education is to foster all round development of a student. All round development essentially means intellectual, physical, moral, sensible and social development.

Co-Curricular activities are those which are undertaken side by side with the curricular activities. Co-curricular activities render a number of values like:

- Educational values
- Psychological values
- Development of Social Values
- Development of Civic Values
- Physical Development Values
- Recreational Values
- Cultural Values

Learning Outcomes:

Role of Co-curricular activities in a student's life cannot be put into words easily. But some of the major benefits include:

- Overall Personality
- Strengthened Self Confidence
- Developed Specialized Skills
- Improved Academic Performance
- Greater Opportunities
- Sense of Responsibility
- Exposure to New Activities

Under this course, student will take activities such as Sports /Cultural /Social under the direction and guidance of their coordinator/mentor. Students will report their progress to coordinator/mentor.

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
0	4	2	50	0	0	50

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – II (First Year)

Subject : Professional Communication Practices
Subject Code : CSUEC03

Objective:

The courses in the Professional Communication Skills Series help students refine their verbal and non-verbal communication skills so that they can effectively inform and persuade different audiences in different contexts. Effective communication is recognized as crucial to enhance performance, both personally and professionally. Communication involves the whole range of ways in which people pass information or messages back and forwards in non-verbal, verbal and written formats. It includes the information they give and receive how people make meaning of this information and how they use it. Individuals most likely to be promoted and succeed have something in common: they communicate effectively. They listen actively; express ideas clearly, speak confidently and authentically, and write effectively.

The subject will strengthen the communication skills of the students and will enhance their professionalism, personal presence, and potential for advancement. No matter what their level, there is always opportunity to refine skills and increase impact.

Classes in the subject program are designed for students who want to:

- Learn and practice principles essential to good oral and written communication
- Gain useful and pragmatic strategies for communicating in a variety of workplace situations
- Speak, write, and listen with increased confidence and competence
- Enhance leadership skills and opportunities for career promotion
- Develop personal presence and greater self-trust
- Learn in a supportive environment

Learning Outcomes:

Students with a bachelor's degree studying this subject should be able to:

- Demonstrate critical and innovative thinking.
- Display competence in oral, written, and visual communication.
- Apply communication theories.
- Show an understanding of opportunities in the field of communication.
- Use current technology related to the communication field.
- Respond effectively to cultural communication differences.
- Communicate ethically.
- Demonstrate positive group communication exchanges.

Unit - I**25%**

Listening Strategies: Active listening – Types of Listening, Barriers to listening – Listening and note taking– Listening to announcements – Listening to audio visuals/media.

No. of Lectures: - 07**Unit - II****25%**

Speaking Strategies: Speech Process, Conversation Techniques, Word stress and rhythm – Pauses and sense groups – Falling and rising tones – Fluency and pace of delivery – Art of small talk – Participating in conversations – GD skills and telephonic skills, Answering Technique.

No. of Lectures: - 07**Unit - III****25%**

Reading Strategies: Reading Process, Surveying articles/textbook/newspaper/magazine, etc, reading with a purpose – making predictions – Active – Passive Reading, Understanding text structure – Locating main points – Making inferences - Reading graphics - reading critically –Vocabulary Skills.

No. of Lectures: - 07**Unit - IV****25%**

Writing Strategies: Sentence Structure, Note Making and essay writing, Resume and - e-mail.

Professional Strategies: Etiquettes - Presentation Skills - Body Language

No. of Lectures: - 07**Total No. of Lectures: - 28****Reference books:**

1. Effective technical Communication, Rizvi Ashraf, McGraw Hill
2. Book of Etiquette and Manners, Prem P. Bhalla & Nimeran Sahukar
3. Personality Development by McGraw Hill pub
4. Management Communication by Anubha Singh and James O'Rourke

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			Total Marks
			Internal	External		
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
2	2	3	15	35	0	50

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – II (First Year)

Subject : Discrete Mathematics
Subject Code : CSCC06

Objective:

The objective of this course is to present the foundations of many basic computer related concepts and provide a coherent development to the students for the courses like Fundamentals of Computer Organization, RDBMS, Data Structures, Analysis of Algorithms, Theory of computation, Cryptography, Artificial Intelligence and others.

Learning Outcomes:

This course will enhance the student's ability to think logically and mathematically.

Unit - I

25%

Mathematical Logic: Introduction, Connectives, statement formulas, principle of substitution, validity of arguments, Quantifiers, Proof techniques.

No. of Lectures: - 14

Unit - II

25%

Lattices and Boolean Algebra: Relation and ordering, partially ordered sets, Lattices as poset, properties of lattices, Lattices as algebraic systems, sublattices, direct product and homomorphism, complete lattices, bounds of lattices, distributive lattice, complemented lattices.

Introduction, definition and important properties of Boolean Algebra, Sub Boolean algebra, direct product and homomorphism, join-irreducible, meet-irreducible, atoms, anti atoms, Stone's representation theorem. (Without Proof), Note : No proof is required for Theorems or Results on lattices and Boolean Algebra. Theorems should be justified and explained by suitable examples.

No. of Lectures: - 14

Unit - III

25%

Applications of Boolean Algebra : Boolean expressions and their equivalence, Minterms and Maxterms, Free Boolean algebra, Values of Boolean expression, canonical forms, Boolean functions, representation of Boolean function, Karnaugh maps, minimization of Boolean function, Quine_ Mccluskey algorithm, Application to Relational Database.

No. of Lectures: - 14

Unit - IV**25%**

Group Theory : Definition and examples of groups, abelian group, cyclic groups, permutation groups, subgroups & Homomorphism, Cosets and Lagrange's Theorem (without proof), Normal subgroups, Quotient Groups.
 Graph Theory : Basic concepts of Graph theory, paths, reachability and connectedness, matrix representation of graph, trees.

No. of Lectures: - 14**Total No. of Lectures: - 56****Text Books:**

- Digital Fundamentals – Eighth edition – Floyd and Jain – Pearson education
- “Discrete Mathematical Structures with Applications to Computer Science”, J. P. Tremblay and R. Manohar, Tata McGraw-Hill
- “Discrete Mathematical Structure”, D. S. Malik, M. K. Sen, Cengage Learning Suggested
- Discrete Mathematics and its applications, Tata McGraw-Hill, 6th edition, K. H. Rosen.
- Discrete Mathematical Structure, Pearson Education, Bernard Kolmann & others, Sixth Edition
- Discrete Mathematics with Graph Theory, PHI, Edgar G. Goodaire, Michael M. Parmenter.
- Logic and Discrete Mathematics, Pearson Education, J. P. Tremblay and W. K. Grassman.

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	0	4	30	70	0	100

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – II (First Year)

Subject : Object Oriented Programming using C++
Subject Code : CSCC07

Objective:

Understanding basic concept of Object Oriented Programming using C++.

Learning Outcomes:

After studying this subject

- Students will able to solve problem related to real life entities by using inheritance, templates.
- Students will be able to develop functions.

Unit – I: Overview of C++

25%

Introduction to features of object oriented programming v/s procedural programming, OOP Basic Concepts, Basic Syntax and Structure, Data Types and Modifiers, Variables, Operators, sizeof and typedef, Decision Making, Loop Types, Storage Classes, Functions.

No. of Lectures: - 14

Unit - II: Core C++ Concepts:

25%

Classes and Objects: Defining Class and Object, Access Controls in Classes, Accessing Data Members, Member Functions in class, Type of Member Functions, Inline Functions, Constructor and Destructor, Initializer List, Namespace, Static and Const Keyword, References, Copy Constructor, Pointer to Members.

No. of Lectures: - 14

Unit - III: Inheritance, Polymorphism and Overloading.

25%

Inheritance: Introduction, Types of Inheritance, Order of Constructor call, Upcasting.

Polymorphism: Function Overriding, Virtual Functions, Abstract Class and Pure Virtual Functions, Virtual Destructors.

Overloading: Operator Overloading and Function Overloading.

No. of Lectures: - 14

Unit – IV: C++ Miscellaneous

25%

Files streams, Exception handling, Memory Management, Multithreading.

No. of Lectures: - 14

Total No. of Lectures: - 56

Text Books:

- E.Balaguruswamy, Object Oriented Programming in C++

References

- Schaums Outline series, *Programming in C++*
- Venugopal, Rajkumar, Ravishankar, *Mastering C++*, Mc Graw Hill
- Stroustrup, Bjarne, *The C++ Programming Language*, Addison Wesley
- Robert Lafore, *Object Oriented Programming in C++*, McGraw Hill

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	4	6	30	70	50	150

Practical List:

1. Programs based on input and output.
2. Programs on Iterations, Control structures.
3. Examples of function overloading.
4. Examples of all types of constructor, destructor.
5. Programs based on all types of Inheritance.
6. Examples of Virtual functions and dynamic polymorphism.
7. Programs of operator overloading.
8. Programs which performs exception handling.

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – II (First Year)

Subject : Data Structures and Algorithms
Subject Code : CSCC08

Objective:

Introduce students to the concept, role and importance of data structure. To identify the key differences between various data structures and operations on data structures.

Learning Outcomes:

After studying this subject

- Implement various operations of data structures.
- Use of data structures for real applications.

Unit - I

25%

Programming Concepts: Introduction to Data structure and its classification (Primitive, non-Primitive: linear- nonlinear), Basic Terminology, Data Structure Operations;

Arrays: Introduction, Linear Arrays, Representation of Linear Arrays in Memory, traversing Linear Arrays, Insertion, Deletion and Merging in Linear Arrays; Multidimensional Arrays; Matrices, Sparse Matrices, Pointer Arrays, Application of Arrays.

No. of Lectures: - 14

Unit - II

25%

Stacks: Properties of stack, Stack Representation using Array, Stack Operations (PUSH, POP, PEEP); Implementation of Stacks. Application of Stacks-Evaluating Arithmetic Expression using Stacks -Infix to Postfix Notation.-Evaluating a Postfix Notation-

Queues: Properties of Queue, Implementation of Queue, Circular Queue, Priority Queue, Double Ended queue, Queue representation using Array, Queue operations (Insert, Delete), Application of Queues.

No. of Lectures: - 14

Unit - III

25%

Linked List: Introduction, Representation of Linked List, Singly linked list, doubly linked list, Circular linked list, Operations of linked list (Insertion, Deletion, Traversal, split, join).

Graphs and Trees: Definition and concepts of trees, Representation of Binary tree, Traversals operations of Binary search tree, Graph Terminologies, Representation of Graphs.

No. of Lectures: - 14

Unit - IV

25%

Sorting and Searching

Use of various data structures for searching and sorting, linear and binary search

Sorting Techniques: Bubble sort, Selection Sort, Insertion Sort, Shell Sort, Merge Sort.

Searching Techniques: Linear search, Binary search.

No. of Lectures: - 14

Total No. of Lectures: - 56

Text Books:

- Classic Data Structures by Samanta, Debasis

References:

- Schaum's Outline Series: Theory and Problems of Data Structures-Seymour Lipschutz
- Introduction to data structures with application-Jean-Paul Tremblay &G.Sorenson
- Data structures using c and C++ , Tanenbaum

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	4	6	30	70	50	150

Practical List:

1. Sample programs for array implementation with different operation
2. Write a Program for bubble sort and selection sort.
3. Write a program to implement Insertion sort.
4. Write a program to implement Quick Sort.
5. Write a program to implement Binary Search.
6. Write a program to implement linear search.
7. Write a program to implement stack
8. Write a program to implement Simple Queue.
9. Write a program to implement Circular Queue.
10. Write a program to implement Double Ended Queue.
11. Write a program for Single linked list.
12. Write a program for Single circular linked list.
13. Write a program for Double linked list.
14. Write a program for Double Circular linked list.

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – II (First Year)

Subject : Computer Networks
Subject Code : CSCC09

Objective:

One of the major components of computer based information systems is computer networks. Through computer networks we can share hardware, Software, Processing, Data and Applications besides getting global connectivity for internet based communication and services.

For diploma students it is important to understand the function of computer networks and obtain requisite knowledge about hardware and software requirements of networks and acquire skills to establish a network using necessary hardware & software tools and configure various services over it. The objectives of this course are to make students learn the technology of establishing, commissioning (making operational) and maintaining computer networks.

Learning Outcomes:

After successful completion of the course students should be able to:

- Describe various protocols, models in networks.
- Explain operations of TCP, HTTP, and DNS.
- Illustrate use of Subnets, Ipv4 and Ipv6 in computer networks.
- Design simple computer networks.
- Establish and Commission simple computer networks
- Identify and solve network operational problems.

Unit - I

25%

Basics of Computer Network

Definition & history of networks, Usage of Computer Networks, Standard Organizations and Protocols, Line Configuration, Network Topology: Star, Ring, Bus, Mesh, Tree, Hybrid, Categories of network : Based on scope, Based on Connection, Applications and features of different types of servers: File server, Print Server, Mail Server, Web Server, Proxy Server

No. of Lectures: - 14

Unit - II

The Reference Model for network communication

25%

OSI model & function of each Layer, TCP/ IP model, Connection oriented v/s Connectionless approach, Comparison of OSI & TCP/IP Models

No. of Lectures: - 14

Unit - III

25%

Transmission Media

Types of Transmission Media, Guided Media: Twisted Pair, Coaxial Cable, Fiber, Un Guided Media: Electromagnetic spectrum, Radio Transmission, Microwave Transmission, Infrared Transmission, Satellite Communication

Network devices

Repeaters, Hubs , Switches , Routers , Access Points , Gateways , Bridges , Difference between Layer 2 and Layer 3 Switches, Introduction of Network Management software

No. of Lectures: - 14

Unit - IV

25%

IP Protocol and Network Applications

IP Protocol – IP v4, IP v6, Addressing Schemes, Subnet & masking, DNS, Email, FTP, HTTP

No. of Lectures: - 14

Total No. of Lectures: - 56

Text Books:

1. Computer Networks Andrew S Tannebaum & David J Wetherall, Pearson, 2012
2. Data Communication & Networking, Forouzen, Tata McGraw Hill
3. Data & Computer Communication, Williams Stallings, Prentice Hall of India
4. Networks for Computer Scientists and Engineers, Youlu Zheng & Shakil Akhtar Oxford University Press, 2

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			Total Marks
			Internal	External		
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	0	4	30	70	0	100

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – II (First Year)

Subject : Project - II
Subject Code : CSCC10

Objective:

By studying the different theoretical and fundamental concept of object oriented, students must ensure their learning by developing real time or scenario based applications. The project development as a subject will help them to learn and understand the real time applications of the concept.

- Primarily, student must gain the knowledge about the applications of the fundamentals.
- Importantly, they need to also learn the technology trends and develop their skills on those technologies during project development.

Learning Outcomes:

- Students will be able to learn and perform object oriented programming applications using C/C++.

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
0	4	2	30	0	70	100

Content:

- Project based on any selected topic like “Student Registration” or any other title using tool Turbo – C/C++ and Data Structure & File Management Concept.

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – II (First Year)

Subject : Sports/ Social Activity/ Cultural Activity
Subject Code : CSUE04

Objective:

Education is a pretty broad concept that surpasses the four walls of a classroom. The core aim of education is to foster all round development of a student. All round development essentially means intellectual, physical, moral, sensible and social development.

Co-Curricular activities are those which are undertaken side by side with the curricular activities. Co-curricular activities render a number of values like:

- Educational values
- Psychological values
- Development of Social Values
- Development of Civic Values
- Physical Development Values
- Recreational Values
- Cultural Values

Learning Outcomes:

Role of Co-curricular activities in a student's life cannot be put into words easily. But some of the major benefits include:

- Overall Personality
- Strengthened Self Confidence
- Developed Specialized Skills
- Improved Academic Performance
- Greater Opportunities
- Sense of Responsibility
- Exposure to New Activities

Under this course, student will take activities such as Sports /Cultural /Social under the direction and guidance of their coordinator/mentor. Students will report their progress to coordinator/mentor.

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
0	4	2	50	0	0	50

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – III (Second Year)

Subject : Business Communication
Subject Code: CSUEC05

Objective:

The intention behind this syllabus is to give as much help as possible in increasing the ability to use and utilize English effectively in business. Business firms today are constantly reviewing the form and substance of their messages – both Oral and Written. Henceforth Business Communication is required in semester-III. As the student, after being Post graduated, has to ultimately work in the industry and hence must know the basic Communication which is seen applied vehemently in the corporate and well in the social life. This course encompasses the business communication's concepts and their uses and applications.

Learning Outcomes:

After the subject being taught the student will be able to know:

1. Definition and fundamentals of communication.
2. Students will undoubtedly be held accountable for the appearance and correctness of the messages on which they work.
3. Learn to adopt those basic skills to meet the special requirements of business.
4. Ability to identify various ways of organizing a message and to decide which the best is.
5. Learning the use of Practical communication to improve the effectiveness of verbal message during an oral interaction

Unit – I

25%

Effective Business Communication:

Important to Communicate, Defining Communication?, Communication in Context, Your responsibilities as a Communicator.

Delivering Your Message

What Is Language?, Messages, Principles of Verbal Communication, Language Can be an Obstacle to Communication, Emphasis Strategies, Improving Verbal Communication

No. of Lectures: - 7

Unit - II

25%

Effective Business Writing

Oral vs Writtern Communication, Learning Good Writing Skills, Style in Writing Communication, Principle of Writtern Communicaiton, Overcoming barrier to effective Communication.

Writing Preparation and Preesantation

A planning Checklist for Business Message, Ethics, Plagiarisam and Reliable Sources, Reading and Analysis, Writing Style

No. of Lectures: - 7

Unit - III**25%****Business Writing in Action**

Text, E-mail and Netiquettes, Memorandum and Letters writing, Business Proposal, Report, Resume, Message Writing

No. of Lectures:**- 7****Unit - IV****25%**

Group Communication, Teamwork, and Leadership, Group Problem Solving, Business and Professional Meetings, Group Life Cycles and Member

No. of Lectures: - 7**Total No. of Lectures: - 28****References:**

1. Effective technical Communication, Rizvi Ashraf, McGraw Hill
2. Management Communication by Anubha Singh and James O'Rourke
3. Effective English for Business Communication by Burtness and Clark
4. Effective technical communication by M.Ashraf Rizvi
5. Business communication by U.S.Rai and S.M.Rai
6. Business communication today by Bovee, Thill and Schazman

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			Total Marks
			Internal	External		
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
2	2	3	15	35	0	50

Assignments:

The students shall be given assignments on regular time intervals on the topics taught in form of questions which they have to write in the assignment notes and submit. The teacher shall evaluate the same and keep the record for internal assessment.

1. Quizzes: Written or oral quizzes shall be taken in the class a record of the same shall be kept by the teacher concerned for internal assessment.
2. Case Analysis: Students will get a case to analyze and they have to search the core to decide ethically about the situation as it will be easy for them to grasp and it will give them initial exercise to become good manager.
3. Debate: Debate shall be conducted on regular time intervals on application and utility of the concepts and principles taught in the subject
4. Presentation: with the help of presentation skills students will learn to make more effective presentations on various topics.
5. Role Play: These activities enhance their ability to speak confidently in public. In this activity students will be given certain issue or topic to perform in group or individually.
6. Mock – Interview: there will be panel of few students and the rest will be job seekers. They will participate actively to get the job. From this exercise students will learn Pre/Post preparations for an interview. They will learn the behavior before/during/after the interview.
7. Library work: Students shall be given particular topics to study, prepare notes sitting in the library and submit / present in the class. The concerned subject teacher shall record for the internal assessment purpose.

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – III (Second Year)

Subject : Probability Theory and Statistics

Subject Code: CSCC11

Objective:

The learning objective of the adaptation course is to provide students with essential tools in probability theory to understand the theory of statistics and their applications.

Learning Outcomes:

After completing the study of the discipline the student should:

- Know the most widely used probability distributions and recognize them in applications.
- Know the main tools to describe a random variable, such as the probability density function, the cumulative distribution function, and the moment generating function.
- Recognize the importance of the central limit theorem and understand when it is appropriate to use normal approximations for the distribution of a statistic.
- Be able to derive maximum likelihood estimators.
- Possess techniques of proving theorems and thinking out counter-examples.

Unit-1

25%

Introduction to Statistics, Basic concepts, population and sample, Collection of data, census and sampling .Methods of sampling-Random and Non Random sampling methods, Frequency distributions-Measures of central tendency, measures of dispersion, moments, skewness and kurtosis, Correlation and Regression analysis Types of correlations, Methods of studying simple correlation, properties of correlation coefficient.

No. of Lectures: - 14

Unit-2

25%

Different approaches to probability, conditional probability, Independence of events, Addition and multiplication theorems, Baye's theorem (Only Statement), simple problems based on Baye's theorem, Random variables and probability distributions discrete and continuous.-distribution function and its properties. Extension to bivariate case [elementary concept only]

No. of Lectures: - 14

Unit-3

25%

Expectation and its properties., Mean variance and moments in terms of expectation. Moment generating function and characteristic function- simple problems, Standard probability distributions- Binomial, Poisson, Uniform and Normal [mean variance and MGF]-problems relating to practical applications.

No. of Lectures: - 14

Unit-4**25%**

Central Limit theorem[without proof] and its applications, Sampling distributions Definition, parameter, statistic, Standard error[concept only], sampling distribution of the sample mean, t,X² and F statistic definition and properties[without proof] Estimation –Concept of Point and Interval estimation –Point estimate and its properties. Test of significance-Elementary ideas and simple problems.

No. of Lectures: - 14**Total No. Of Lectures:- 56****References:**

1. SC Gupta and VK Kapoor-Fundamentals of mathematical statistics-Sultan Chand and Sons
2. Probability and statistics –Schaums outline series

Additional References

1. Hogg R.V.Craig A.L. Introduction to mathematical statistics. American publishing Co Pvt Ltd.
2. Yulg U.G. Kendoll M.G.An Introduction to theory of statistics, Chailes Griffin & Co Ltd
3. Draper N.A.,Smith H Applied Regression Analysis,John Wiley & sons
4. William Mendenhall ,Robert J Beaver, Barbara M Beaver, Introduction to probability and statistics,Thomson 2007

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	0	4	30	70	0	100

KadiSarvaVishwavidyalaya
B.Sc. (CS) Semester – III (Second Year)

Subject : Database Management System - I
Subject Code : CSCC12

Objective:

The aim of this subject is to get broad understanding of the basic concepts of database management system in particular relational database system. The students will also develop the skills to design database system and develop application programs to manage & retrieve data from different perspective using Structured Query Language (SQL) in ORACLE.

Learning Outcomes:

The course should be taught and implemented with the aim to develop various types of skills so that students are able to acquire following competency:

Design, Develop and manage databases for simple applications using Structured Query Language (SQL) in ORACLE.

Unit- I 25%

Introduction to DBMS and RDBMS:

What is Database Management System, History of Database System, Purpose of Database System, Advantages and Disadvantages of Database System

Introduction to RDBMS, The Relational Model, Introduction to SQL, Working with relations of RDBMS, Advantages and Disadvantages of Relational Database

No. of Lectures: 14

Unit - II 25%

Database design:

Entity-Relationship model: Basic concepts, Design process, constraints, Keys, Design issues, E-R diagrams.

Relational Database design: Functional Dependency – definition, trivial and non-trivial FD, closure of FD set, closure of attributes, irreducible set of FD, Normalization – 1NF, 2NF, 3NF, BCNF.

No. of Lectures: 14

Unit - III 25%

Introduction to SQL:

Basics of SQL, DDL, DML, DCL, structure – creation, alteration, defining constraints –

Primary key, foreign key, unique, not null, check, IN operator,

Functions - aggregate functions, Built-in functions – numeric, date, string functions.

No. of Lectures: 14

Unit - IV 25%

Advanced SQL:

Aggregate Functions and GROUP BY clause, Retrieving data from Multiple Tables using Join, SET Operators.

Sub-Queries: Single-row, Multiple-row, Correlated – Sub-queries, Inline View–EXISTS, NOT EXISTS, IN, ANY, ALL operators.

Transaction control commands – Commit, Rollback, Savepoint.

No. of Lectures: 14

Total No. of Lectures: 56

Reference Books:

1. Database system concepts', 6th Edition –Abraham Silberschatz, Henry Korth, S, Sudarshan, (McGraw Hill International)
2. Database systems : "Design implementation and management"- Rob Coronel, 4thEdition, (Thomson Learning Press)
3. Database Management Systems - Raghu Ramkrishnan, Johannes Gehrke Second Edition, (McGraw Hill International)
4. Database Management System - Alexis Leao, Mathews Leon, (leon press)
5. Fundamentals of Database Systems - RemezElmasri ,Shamkant Navathe,Pearson,5th Ed
6. Database Systems – a Practical approach to design , implementation & Management Thomes M. Colnolly, Carolyn E. Begg, Pearson 4th Ed.

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	4	6	30	70	50	150

Practical List:

1. Implement SQL queries to perform various DDL Commands.
2. Implement SQL queries to perform various DML Commands.
3. Implement SQL queries using Date functions
4. Retrieve data using SELECT command and various SQL operators.
5. Implement SQL queries using Numeric functions
6. Implement SQL queries using Character Functions
7. Implement SQL queries using Conversion Functions
8. SQL queries using Comparison Operators, Logical Operators in WHERE clause
9. Sorting data using ORDER BY clause
10. Implement SQL queries using Aggregate functions and group by clause
11. Implement SQL queries using Set operators
12. SQL queries based Joins
13. Sub-Queries - Single-row, Multiple-row, Correlated – Sub-queries, Inline View, EXISTS, NOT EXISTS, IN, ANY, ALL operators
14. Transaction based queries using COMMIT, ROLLBACK, SAVEPOINT

KadiSarvaVishwavidyalaya
B.Sc. (CS) Semester – III (Second Year)

Subject : Web Development using PHP
Subject Code : CSCC13

Objective:

Students would learn about web-based application development using PHP & MySQL. Students to acquire knowledge in areas like PHP Programming Fundamentals, OOP Concepts and database application with MySQL. We will introduce students to PHP application development using AJAX and JQuery.

Learning Outcomes:

After successful completion of the course students should be able to:

- Importance of PHP
- Learn about PHP Syntax, Arrays, Loops
- PHP and MySQL connectivity
- PHP form validation
- Learn OOP concept in PHP programming.
- Able to work with file handling, cookie and session handling.
- Learn to send mail in PHP.
- Learn to create a PHP application using AJAX and JQuery

Unit - I

25%

Evaluation of PHP, Basic Syntax, Defining variable and constant, Php Data type Operator and Expression

Handling Html Form with Php : Capturing Form Data, Dealing with Multi-value filed, Generating File uploaded form, Redirecting a form after submission.

Decisions and loop : Making Decisions Doing Repetitive task with looping Mixing Decisions and looping with Html

Function : What is a function Define a function Call by value and Call by reference Recursive function

No. of Lectures: - 14

Unit - II

25%

String : Creating and accessing String Searching & Replacing String Formatting String String Related Library function

Array : Anatomy of an Array Creating index based and Associative array Accessing array Element Looping with Index based array, Looping with associative array using each() and foreach() Some useful Library function

Working with file and Directories : Understanding file& directory Opening and closing a file Coping, renaming and deleting a file Working with directories, File Uploading & Downloading

State management : Using query string (URL rewriting), Using Hidden field Using cookies, Using session

String matching with regular expression : What is regular expression Pattern matching in Php
Replacing text Splitting a string with a Regular Expression

No. of Lectures: - 14

Unit - III

25%

Introduction to OOPS : Introduction Objects Declaring a class, The new keyword and constructor Destructor, Access method and properties using \$this, Variable Public, Private, Protected properties and methods Static properties and method, Class constant Inheritance & code reusability Polymorphism, Parent:: & self:: keyword Instanceof operator Abstract method and class
Exception Handling: Understanding Exception and error Try, catch, throw

No. of Lectures: - 14

Unit - IV

25%

PHP-MYSQL: Database Connectivity with MySql : Introduction to RDBMS Connection with MySql, Database Performing basic database operation (DML) (Insert, Delete, Update, Select) Setting query parameter Executing query Join (Cross joins, Inner joins, Outer Joins, Self joins.)
PHP MySQL Connect To a Database

No. of Lectures: - 14

Total No. of Lectures: - 56

Text Books:

1. PHP 6 and MySQL Bible – Steve Suehring, Tim Conserve & Joyce Park - Willey India
2. Professional PHP - WROX
3. Making use of PHP - Ashok Appu
4. Practical PHP & MYSQL - Jono Bacon

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			Total Marks
			Internal	External		
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	Total Marks
4	4	6	30	70	50	150

Practical List –

1. Practical based on Control Structures.
2. Practical based on Arrays.
3. Practical based on String Handling
4. Practical based on Passing Information to Form using Get and Post.
5. Practical based Mysql functions and executing different type of queries.
6. Practical based on programming with basic OOP Concept. Learning use of Inheritance, function Overloading, access modifier etc.
7. Practical based on Cookie (creating cookie, store and fetch data into/from cookie)
8. Practical based on session (Store/Fetch value into/from Session)
9. Practical based on File handling.
10. Mini Project : PHP Working with database

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – III (Second Year)

Subject : Computer Organization and Microprocessors
Subject Code : CSCC14

Objective:

Computer organization is an important aspect for students to know and learn as a computer science student. The subject gives knowledge about it. Students should have to know about importance of the programming with the basic computer, micro programs, CPU's organization, Input-Output Organization and memory organization. Student should also have knowledge about Microprocessor.

Learning Outcomes:

After studying this subject, student will be able to expose to extensive development and use of computer organization. They know about the assembly language and machine language. The students will be able to understand how the computer is designed and how various instruction works. Students will learn about memory addressing and its mode to transfer data. They will learn about different memory types and its organization. They will learn about importance of Microprocessors.

Unit - I

25%

Basic Computer Organization and Design Instruction codes, Computer registers, computer instructions, Timing and Control, Instruction cycle, Memory-Reference Instructions, Inputoutput and interrupt, Complete computer description, Design of Basic computer, design of Accumulator Unit. Programming The Basic Computer :Introduction, Machine Language, Assembly Language, assembler, Program loops, Programming Arithmetic and logic operations, subroutines, I-O Programming.

No. of Lectures: - 14

Unit - II

25%

Micro programmed Control: Control Memory, Address sequencing, Micro program Example, design of control Unit.

Central Processing Unit : Introduction, General Register Organization, Stack Organization, Instruction format, Addressing Modes, data transfer and manipulation, Program Control. Reduced Instruction Set Computer (RISC)

No. of Lectures: - 14

Unit - III

25%

Input-Output Organization:

Input-Output Interface, Asynchronous Data Transfer, Modes Of Transfer, Priority Interrupt, DMA, Input-Output Processor (IOP) CPU IOP Communication, Serial communication.

Memory Organization :Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory.

No. of Lectures: - 14

Unit - IV**25%**

Evolution of Microprocessor: Architecture of 8-bit and 16-bit microprocessor, Machine language instructions (8 bit). Addressing Modes, Instruction formats, Instruction sets, Instruction cycle, Clock cycles, Timing diagrams. Interrupts, Bus and Interfacing concepts : Memory interfacing, I/O Interfacing and Ports. Storage Device Interfacing, 8085 and 8086 microprocessor, 32 bit processor.

No. of Lectures: - 14**Total No. of Lectures: - 56****Text Books:**

- 1) M. Morris Mano, Computer System Architecture, Pearson
- 2) Introduction to Microprocessor by Gaonkar – PHI

References:

- 1) Andrew S. Tanenbaum and Todd Austin, Structured Computer Organization, Sixth Edition, PHI
- 2) M. Murdocca & V. Heuring, Computer Architecture & Organization, WILEY
- 3) John Hayes, Computer Architecture and Organization, McGrawHill
- 4) Introduction to Microprocessor by Mukhopadhyay
- 5) Advanced Microprocessor by Tabak

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			Total Marks
			Internal	External		
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	0	4	30	70	0	100

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – III (Second Year)

Subject : Project - III
Subject Code : CSCC15

Objective:

By studying the different theoretical and fundamental concept, students must ensure their learning by developing real time or scenario based applications on the fundamental concept. The project development as a subject will help them to learn and understand the applications of the concept which they are learning from different subjects in the semester.

- Primarily, student must gain the knowledge about the applications of the fundamentals.
- Importantly, they need to also learn the technology trends and develop their skills on those technologies during project development.

Learning Outcomes:

Students will be able develop their skills in analysis, design, development, testing and implementation through the development of small application.

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
0	4	2	30	0	70	100

Students will do project in groups using technology/tools of their choice with the approval of Project coordinator/HOD. Guidelines for the technology/tools/tasks are listed below:

1) Projects on C/C++: The projects on C and C++ will enhance the knowledge and logical programming skills. The Applications of Procedural and Object Oriented will be learnt as it would cover up the fundamentals. The projects involving the core concepts like File Management, Pointer, Memory Management, Multithreading, Exception Handling, etc, can be more useful. Projects related to MIS, etc can be offered at initial stage.

2) Projects on Web Fundamentals in HTML: There are lot more learning outcomes in creating Web Page using HTML. Doing projects in HTML Offers Sure things for Web Page Creation:

- Insert a graphic within a web page.
- Create a link within a web page.
- Create a table within a web page.
- Insert heading levels within a web page.
- Insert ordered and unordered lists within a web page.
- Use cascading style sheets.
- Create a web page.
- Validate a web page.
- Publish a web page.

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – IV (Second Year)

Subject : Operations Research
Subject Code : CSCC16

Objectives:

- Trace the origin and development of operations research
- Understand the various types of models in operations research and their advantages
- Describe the methodology of operations research
- Understand the role of decision-making in operations research
- Describe the application, use and limitations of operations research

Unit-1: **25%**

Introduction to Operation Research (OR) Origin and Development of OR, nature of OR, characteristics, of OR, classification of problems in OR, MODELS IN OR, phases of OR, uses and limitations of OR, methodologies in OR, APPLICATIONS IN OR.

No. of Lectures: - 14

Unit 2: **25%**

Linear programming - concept of linear programming model, mathematical formulation of the problem, graphical solution methods linear programming methods - simplex method.

No. of Lectures: - 14

Unit-3: **25%**

Transportation problem: Mathematical models for transportation problem, types. Assignment problem- Hungarian method.

No. of Lectures: - 14

Unit-4: **25%**

Decision Theory: Introduction, decision under certainty decision under risk, decision under uncertainty, decision tree Network Scheduling by CPM/PERT - Introduction, basic concept, constraints in network, critical path method (CPM), PERT network, PERT calculations. Advantages of network (PERT/CPM).

No. of Lectures: - 14

Total No. of Lectures: 56

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	0	4	30	70	0	100

Assignments:

1. Nature and Characteristic Features of Operations Research (OR)
2. Models and Modeling In OR Applications

3. Limitations Of OR
4. Briefly describe the graphic and simplex methods of solving a linear programming problem.
5. Write short notes on:
 - (a) Limitations of linear programming
6. What is linear programming? What types of problems can linear programming help in solving? What characteristics must a problem have if linear programming is to be used?
7. Explain the following briefly with examples:
 - a. North West Corner Rule
 - b. Least Cost Method
 - c. Vogel's Approximation Method
8. Explain an algorithm to solving a transportation problem.
9. Describe an assignment problem giving a suitable example.
10. Explain the difference between a transportation problem and an assignment problem.
11. What do you understand by 'decision theory'?

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – IV (Second Year)

Subject : Database Management System - II
Subject Code : CSCC17

Objective:

The primary objective of this course is to provide in-depth knowledge of back-end development through PL/SQL concepts and programming.

Learning Outcomes:

Students will learn Basic features of PL/SQL, Data retrieval and Exception handling in PL/SQL, Creating and managing named PL/SQL blocks (Procedure, function, package and triggers) and advanced features of PL/SQL.

Unit- I

25%

PL/SQL Concepts:

PL/SQL – Overview, PL/SQL – Block structure, PL/SQL – Data Types, Declaring Variable, Writing Simple PL/SQL Block, Labeling Blocks, Nesting Blocks.

Using - Arithmetic operators, Relational operators, Comparison operators, Logical operators, String operators.

Control Structures - IF, CASE, LOOP, FOR, WHILE.

No. of Lectures: 14

Unit- II

25%

PL/SQL Programming:

Exception handling: Defining exceptions, Using the when others clause, Ensuring complete error checking, Passing error messages to calling routine

Cursors in PL/SQL: Cursor basics, Using a cursor for a multi-row SQL query.

Basics of stored procedures, functions, packages, Basics of Sequences

Triggers in PL/SQL: Triggers and database events, Defining a trigger, Timing a trigger, Enabling and disabling a trigger.

No. of Lectures: 14

Unit - III

25%

Transaction Management:

Transaction concepts, properties of transactions, serializability of transactions, testing for serializability, System recovery, Two- Phase Commit protocol, Recovery and Atomicity, Log-based recovery, concurrent executions of transactions and related problems, Locking mechanism, solution to concurrency related problems, deadlock, , two-phase locking protocol, Isolation, Intent locking.

No. of Lectures: 14

Unit - IV

25%

Oracle Database Concepts:

Oracle database architecture – Logical structures, Physical structures, Memory Structures, Background processes.

Database startup and shutdown types.

Backup and recovery – Logical backup, Physical backup, Backup methods, Instance recovery, Full recovery.

Performance tuning using indexes, types of indexes.

No. of Lectures: 14

Total No. of Lectures: 56

Reference Books:

1. Database system concepts', 6th Edition –Abraham Silberschatz, Henry Korth, S, Sudarshan, (McGraw Hill International)
2. Database systems : "Design implementation and management"- Rob Coronel, 4thEdition, (Thomson Learning Press)
3. Database Management Systems - Raghu Ramkrishnan, Johannes Gehrke Second Edition, (McGraw Hill International)
4. Database Management System - Alexis Leao, Mathews Leon, (leon press)
5. Fundamentals of Database Systems - RamezElmasri ,Shamkant Navathe,Pearson,5th Ed
6. Database Systems – a Practical approach to design , implementation & Management Thomes M. Colnolly, Carolyn E. Begg, Pearson 4th Ed.

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	4	6	30	70	50	150

Practical list:

Designing and implementation of following:

- Simple PL/SQL Blocks
- PL/SQL Blocks using built-in functions
- PL/SQL blocks using Arithmetic operators,Relational operators Comparison operators, Logical operators, String operators
- PL/SQL blocks using Control Structures IF, CASE, LOOP, FOR, WHILE
- PL/SQL Blocks using cursors
- PL/SQL Blocks for Error Handling
- Stored Procedures
- Functions
- Triggers
- Packages and usage of in-built packages

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – IV (Second Year)

Subject : Systems Analysis and Design
Subject Code : CSCC18

Objective:

Systems Analysis is a central part of systems development. The objective is that the students should acquire an overview of principles, methods and techniques of systems development, and gather experience from a development project in which a specific development method is used. It comprises the process of turning a set of user requirements into a logical system specification and encompasses various activities to achieve this end. The traditional systems lifecycle has been challenged by alternative models, for example the spiral (iterative and incremental) lifecycle and rapid application development. Systems development approaches including the structured approach, the object oriented approach are useful.

Learning Outcomes:

Student will able to.

- To understand the systems analyst's activities, and apply current tools and techniques.
- To develop an awareness of the different approaches that may be taken to systems analysis.
- To understand the role of systems analysis within various systems development life cycles.
- Will be able to implement SDLC by small case studies.
- Use appropriate methods and techniques to produce a systems analysis for a given scenario.
- Evaluate the tools and techniques that may be used by a systems analyst in a given context.
- Discuss various systems analysis approaches and explain their strengths and weaknesses.

Unit - I

25%

Information, Information System, Information Gathering

- Types of Information, Need of Computer Based Information System, Management Structure, Management and Information Requirement, Quality of Information
- Variety and Example of Information system, Overview and design of Information system, The Role and Task of System Analyst, Attribute of System Analyst, Tool used by system Analyst
- Information Gathering, Method for Searching of Information

No. of Lectures: - 14

Unit - II

25%

System Requirement Specification, Feasibility Analysis, Data flow Diagram, Decision Table, Logical Database Design

- System Development Method: Structured Analysis - Software Development Life Cycle Stages and Object Oriented Analysis concept
- Fact Finding Techniques : Interview Steps, Document Review, Observation, Questionnaires and Surveys, Sampling, Research
- System Requirement Specification, Data Dictionary, Steps in System Analysis
- Deciding project goal, Types of Feasibility, Feasibility report,
- Symbol used in DFD, Describing System with DFD, Leveling of DFD, Logical and Physical DFD
- Decision table terminology and development
- ER Model, Relationship and cardinality, Normalization

No. of Lectures: - 14

Unit - III**25%****Object Oriented System Modeling**

Object and its Properties, Implementation of Class, Identifying object in Application, Modeling System with Object, Use Case Diagram, Sequence Diagram, Activity Diagram

No. of Lectures: - 14**Unit - IV****25%**

System Implementation: Coding Concept; Software Quality Assurance concept; Types of Software testing – Unit Testing, Integration Testing and System Testing; Documentation Concept and Types, Management Approval

No. of Lectures: - 14**Total No. of Lectures: - 56****References:**

[1] System Analysis and Design Methods; 4th edition; by Shelly, Cashman, Rosenblatt; Cengage Learning India Edition.

[2] Analysis and Design of Information Systems, 2nd Edition, By V Rajaraman, (PHI)

[3] Self Study Guide to Analysis and Design of Information Systems, By V Rajaraman, (PHI)

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	2	5	30	70	50	150

Assignments:

Based on given system, Student has to develop following using Visio Tool.

1. System Requirement Specification for Particular System.
2. Data Flow Diagram up to 1st Level.
3. Entity Relationship diagram
4. Use Case Diagram, Sequence diagram, Activity Diagram Object Diagram for given System
5. Tool searching for Testing. Test Case Design for Given Case Study

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – IV (Second Year)

Subject : Operating System
Subject Code: CSCC19

Objective:

Operating System and Programming provides the concept of operating system and its different components like process management, memory management, file management, device management.

Learning Outcomes:

From this subject, the student will be able to:

- Introduced about Operating System
- Understand the technical aspects of different Components of Operating System like Process Management, Memory Management, File Management, Device Management, etc.
- Understand the Concept of Deadlock
- Understand the Concept of CPU Scheduling
- Learn Linux/ UNIX Basic Commands and Shell Scripting.

Unit-I:

25%

Introduction: What is an Operating System? Operating System Services. Mainframe Systems, Desktop Systems, Multiprocessor Systems, Distributed Systems, Clustered Systems, Real- Time Systems. **Computer-System Structures:** Operation, I/O Structure, Storage Structure, Storage Hierarchy. **Operating-System Structures:** System Components; Operating-System Services; System Calls; System Programs; System Structure, System Design and Implementation, System Generation. Processes: Process Concept; Process Scheduling, Operations On Processes.

No. of Lectures: - 14

Unit II

25%

CPU Scheduling & Deadlocks: Basic Concepts; Scheduling Concept & Criteria; Scheduling Algorithm (FCFS, SJF, Priority Scheduling, RR). **Deadlocks,** Conditions on Deadlocks, Strategies for handling deadlock, deadlock prevention, recovery from deadlock.

No. of Lectures: - 14

Unit III

25%

Storage and File Management: Memory Management- Backward, Swapping, Contiguous Memory Allocation, Paging, Segmentation, Segmentation with Paging. **File-System Interface:** File Concept; Access Methods; Directory Structure; Protection. **File-System Implementation:** File-System Structure; File-System Implementation; Directory Implementation; Allocation Methods, Free-Space Management.

No. of Lectures: - 14

Unit IV:

25%

The Linux System and Shell Scripting: History; Design Principles; Kernel Modules; Process Management; Scheduling; Memory Management; File Systems; Input And Output; Security.
Basic Commands Unix/Linux:

- Mkdir,rmdir,cp,mv,ls,cal,date,cut,cd,find,head,tail,ps,passwd,nohup,touch,sh,who,ch mod
- Finding Patterns in Files (grep, egrep, fgrep, look)
- Counting Lines, Words and File Size (wc, nl),
- Working with Columns and Fields (cut, paste, colrm, join)
- Sorting the Contents of Files (sort, uniq)
- Comparing Files (cmp, comm., diff, patch)
- Examining File Contents(od, strings, tac)
- Changing Information in files (tr, sed)
- Performing Mathematical Calculations (bc, dc).

No. of Lectures: - 14
Total No. Of Lectures: 56

Text book: 1. A. Silberschatz et.al.-Operating System Concepts, 6th Edition, John Wiley Inc., 2003

Reference books:

1. H.M. Deitel -Operating Systems, 6th Edition, Pearson Education, 2006
2. D.M. Dhandhare - Operating Systems, 2nd Edition, Tata McGraw Hill, New Delhi, 2006

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			Total Marks
			Internal	External		
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	2	5	30	70	50	150

Assignments:

1. Commands like:

Mkdir,rmdir,cp,mv,ls,cal,date,cut,cd,find,head,tail,ps,passwd,nohup,touch,sh,who,chmod, grep, egrep, fgrep, look, wc, nl, cut, paste, colrm, join, sort, uniq, cmp, comm., diff, patch, od, strings, tac, tr, sed, bc, dc

2. Simple Shell-Scripts with if-else statements, While, For and Until loop.

Sample Programs on Shell Scripting:

3. Write a program to print "Hello World".
4. Write a program to interchange the value of two variables.
5. Write a program on Shell Script Arguments.
6. Write a program using 'expr' for integer arithmetic
7. Write a program to enter five numbers and find the MAX number.
8. Write a Shell program to check and display 10 leap years.
9. Write a Shell program to find the area and circumference of a circle.
10. Write a Shell program to check the given number and its reverse are same.
11. Write a Shell program to check the given string is palindrome or not.
12. Write a Shell program to find the sum of odd and even numbers from a set of numbers.
13. Write a Shell program to find the roots of a quadratic equation.
14. Write a Shell program to check the given integer is Armstrong number or not.
15. Write a Shell program to execute various UNIX commands using case statements set of numbers.
16. Write a Shell program to display student grades.
17. Write a Shell program to find the sum of two numbers using function programming.

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – IV (Second Year)

Subject : Object Oriented Programming using JAVA
Subject Code : CSEC01 (A)

Objective:

To introduce Object oriented concepts and programming so that the student can work on any object oriented language in the future. To develop problem-solving and programming skills essential in professional programming using the Java language.

Learning outcomes:

At the end of the course, student will be able to:

- Become comfortable with object oriented programming: Learn to think in objects
- Understand the use of APIs in robust, enterprise three level application developments.
- Understand the essentials of the Java class library, and understand how to learn about other parts of the library when you need them.
- Understand the Java features for secure communications over the internet.
- Develop event driven Graphical User Interface (GUI) programming

Unit - I

25%

- **Introduction to Java**
 - A Short History of Java
 - Features of Java
 - Comparison of Java and Other Language(C,C++,etc)
 - Java Tools And Editors
 - Java Environment
- **Programming Concepts of Basic Java**
 - Object-Oriented Programming
 - Built In Data Types
 - Variables and Constants
 - Operators
 - Arithmetic
 - Relational
 - Logical
 - Bit-wise
 - Assignment
 - Operator Precedence
 - User Parenthesis
 - Simple Java Program
 - Output using println() method
 - Memory Allocation using new Operator
 - Input using Java Scanner
 - Control Statements
 - If, If-Else
 - Switch-Case

- For
- While, Do-While
- Nested Loops
- Jump Statement
- Break, Continue
- Arrays, Strings & Vectors, HashTable, Array List

No. of Lectures: - 14

Unit - II

25%

• Classes , Objects and Methods

- Class Fundamentals
- Creating Objects of a Class
- Reference Variable
- Instance Variable
- Defining Your Own Classes and Use of 'this' Keyword.
- Using Predefined Classes
- Constructors and their Overloading
- Methods and their Overloading
- Garbage Collector and Finalize Method
- Final Variable and Method
- Static Variables and Methods
- Recursion
- Understanding pass by value and pass by reference for Java
- Nested Classes
- Wrapper Classes
- Visibility Control: Data Hiding and Encapsulation
- Inheritance
 - Inheritance Basics (extends Keyword) and Types of Inheritance
 - Superclass and Subclass and use of Super Keyword
 - Method Overriding and Use of final keyword related to method and class

No. of Lectures: - 14

Unit - III

25%

- Interface – Multiple Inheritance
 - Introduction
 - Defining Interface
 - Extending Interface
 - Implementing Interface
 - Accessing Interface Variables
- Use of Abstract Class and Method
- Package
 - Introduction
 - Java API Packages
 - Using System Packages
 - Creating Package
 - Accessing Package
 - Using Package
 - Adding Class to a Package
 - Controlling Access to Class Members
 - Using Access Attributes

- Specifying Access Attributes
- Choosing Access Attributes
- **Managing Errors and Exceptions**
 - Introduction
 - Types of Error
 - Compile-Time Errors
 - Run-Time Errors
 - Exceptions
 - Syntax of Handling Exceptions (try-Catch)
 - Multiple try and catch Statement
 - Using Finally Statement
 - Exception Objects
 - The Throwable Class
 - Standard Exceptions
 - Defining Your Own Exceptions
 - Defining an Exception Class
 - Throwing Your Own Exception
 - An Exception Handling Strategy

No. of Lectures: - 14
25%

Unit - IV

- **Managing Input/output Files in Java**
 - Introduction
 - Stream classes
InputStream , FileInputStream ,ObjectInputStream,
OutputStream,FileOutputStream,ObjectOutputStream, DataOutputStream, Reader and
Writer classes, Reader, BufferedReader, InputStreamReader, FileReader, Writer,
BufferedWriter, FileWriter, PrintWriter
 - Serialization and deserialization
 - StringBuffer
- **Multithreaded Programming**
 - Understanding Threads
 - Creating Threads
 - Extending the Thread Class
 - Implementing the Runnable Interface
 - Starting New Thread
 - Stopping and Blocking Thread
 - Connecting Threads
 - Thread Scheduling
 - Synchronization
 - Deadlocks
 - Thread Priorities
- **Applet Programming**
 - Introduction
 - Applet Life Cycle.
 - Applet HTML Tags.
 - Passing parameters to Applet
 - Getting input from User

No. of Lectures: - 14
Total No. of Lectures: - 56

Text Books:

1. Programming with Java E Balaguruswamy
2. Ivor Horton's Beginning Java - Ivor Horton , Wiley Computer Publishing
3. The complete Reference Java 2 ParickNaughton Herbert Schildt

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	4	6	30	70	50	150

Practical List

1. Write a program that displays Hello World at your monitor screen.
2. Write a Java program to convert temperature from Fahrenheit to Celsius degree.
3. Write a Java program to convert minutes into a number of years and days.
4. Write a Java program to sort a numeric array and a string array.
5. Write a Java program to find the maximum and minimum value of an array.
6. Write a Java program to get the character at the given index within the String.
7. Write a program to convert decimal number to binary format using numeric operations.
Below example shows how to convert decimal number to binary format using numeric operations.
8. Example shows how to convert string format of a number to number without calling Integer.parseInt() method. We can do this by converting each character into ascii format and form the number.
9. Write a java program to swap two string variables without using third or temp variable
10. Create a program which use the Constructor (Default constructor, Parameterized constructor, and constructor overloading)
11. Implement All type of Inheritance as an demo.(Single inheritance, multiple inheritance, multilevel inheritance)
12. Create a program which shows example of Try..Catch, Multiple Catch, and finally block
13. Write a program to create a Student class. If the mark is greater than 100 it must
14. Create an exception called MarkOutOfBounds Exception and throw it.
15. Write a program to sort the given set of integers in ascending order. Include a try
16. block to find the array out of bounds exception and catch it.
17. Create a program which generates user defined exception.
18. Create a program which generate user defined package. Use that packge in to another file.
19. Write an application that reads two different strings from two different files and write the concatenated string into another file. All file names must be given as command line arguments.

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – IV (Second Year)

Subject : Web Development using .NET
Subject Code : CSEC01 (B)

Objective:

The objective of this subject is to teach students the comprehensive steps for building dynamic, data-driven, interactive websites, web applications windows applications and console applications. This subject will teach the student about fundamentals of the Microsoft .NET Framework c#, ADO.NET. Students will be able to identify basic concepts and benefits of .NET applications. They will also learn about various development tools. In addition, the course also teaches about console applications, windows forms controls, ASP.NET controls, working with ASP.NET Web pages, adding advanced controls, and validating user input.

Learning Outcome:

After learning the course, the student will be able:

- Explain the principles of object-oriented programming.
- Write clear and effective C# code.
- Understand .NET Framework.
- Describe the basic structure of a C#.NET project and use main
- Use features of the integrated development environment (IDE)
- Create applications using Microsoft Windows® Forms
- Create applications that use ADO. NET
- Develop web applications using ASP.NET Web Forms

Unit – I

25%

Introduction to .NET Framework and ASP.NET

Microsoft .NET framework Overview, Net Architecture, Net Framework components: (CLR, CLS, CTS, MSIL, NameSpace, JIT, Metadata, FCL, Assembly, GAC, GC, Memory Management)

Basics of ASP.NET, Features of ASP.NET, Set up of work environment, start page, the menu system, toolbars, the new project dialog box, graphical designer, code designer. , Adding Controls to the Web Page, Types of ASP.NET Files, Page Life Cycle

No. of Lectures: - 14

Unit – II

25%

C# -The Basics and Console Applications in C#:

C# - The Basics and Console Applications in C#: Name Spaces - Constructor and Destructors, Function Overloading & Inheritance, Operator Overloading, Modifiers - Property and Indexers , Console Applications - Generating Console Output, Processing Console Input, Language Features and Creating .NET Projects, Namespaces Classes and Inheritance, Data Types, String Manipulation

No. of Lectures: - 14

Unit – III

25%

ASP.NET Web Form and Controls

Web Form Processing Stages(Roundtrip) , ASP.Net In-Built Objects (Response, Request, Server, Trace Objects), The Web.config File

Web Server Controls (Button, Check Box, Check Box List, Drop Down List, HyperLink, Image, Image Button, Label, Link Button, List Box, List Item, Panel, Place Holder, Radio Button, Radio Button List, Text Box) Working with Control Properties and Events,

Validation Controls (Required Field Validator, RangeValidator Control, Compare Validator, RegularExpression Validator, CustomValidator, Validation Summary)

Master Page: Basics of Master page, How Master page and Content pages are connected

No. of Lectures: - 14

Unit – IV

25%

ADO.NET

ADO.NET Architecture: DataProviders, Connection Object, Command Object, DataReader Object, DataAdapter Object, DataSet DataView , Inserting, Selecting, Updating and Deleting Records, Data Binding Controls : GridView, Repeater, Data List, FormView

No. of Lectures: - 14

Total No. of Lectures: - 56

Reference Books:

1. Inside C# - By Tom Archer, Andrew Whitechapel (Microsoft Pub)
2. ASP.NET Black Book- By Steven Holzner
3. Professional ASP.NET 2 –Wrox Series- Wallace B. McClure
4. Christian Nagel, Professional C# .Net, Wrox Publication
5. Matthew Macdonald and Robert Standefer, ASP.NET Complete Reference, TMH
6. Vijay Mukhi, C# The Basics, BPB Publications

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			Total Marks
			Internal	External		
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	4	6	30	70	50	150

Practical List:

1. Practical based on console application
2. Practical based on Control Structures
3. Practical based on asp.net Standard controls
4. Practical based on asp.net validation controls
5. Programs to learn concept of Master Page.
6. Practical based on Database connectivity of asp.net and SQL Server (Insertion, Deletion and Modification of data)
7. Practical based on use of dataset.
8. Practical based on use of datareader
9. Practical based on gridview
10. Practical based on detailsview

Kadi Sarva Vishwavidyalaya
B.Sc. (CS) Semester – IV (Second Year)

Subject : Python Programming
Subject Code : CSEC01 (C)

Objective:

Python is a modern language useful for writing compact codes specifically for programming in the area of Server side Web development, Data Analytics, AI and scientific computing as well as production tools and game programming. This course covers the basics and some advanced Python programming to harness its potential for modern computing requirements.

Learning Outcome:

After learning the course, the student will be able:

- To develop proficiency in creating based applications using the Python Programming Language.
- To be able to understand the various data structures available in Python programming language and apply them in solving computational problems.
- To be able to do testing and debugging of code written in Python.
- To be able to draw various kinds of plots using PyLab.
- To be able to create GUI applications in Python

Unit - I

25%

Introduction to python

The basic elements of python, Branching Program, Control Structures, String and Input, Iteration

Functions, Scoping and Abstraction

Functions and scoping, specifications, Recursion, Global Variables, Modules, Files, System

Functions and Parameters

No. of Lectures: - 14

25%

Unit - II

Structured Types, Mutability and Higher-order Functions

Strings, Tuples, Lists and Dictionaries, List and Mutability, Functions as objects

Exception

Handling Exceptions

No. of Lectures: - 14

25%

Unit - III

Classes and object-Oriented Programming

Abstract data type and classes, Inheritance, Encapsulation and Information Hiding

Simple algorithm and Data Structures

Search Algorithms, Sorting Algorithms, Hash Tables

No. of Lectures: - 14

25%

Unit – IV

Testing, Debugging

Types of testing – Black box and Glass-box, Debugging

Advanced Topics

Security – Encryption and Decryption, Classical ciphers, Graphics and GUI Programming – Drawing using Turtle

No. of Lectures: - 14

Total No. of Lectures: - 56

Reference Books:

- John V Guttag. “Introduction to Computation and Programming Using Python”, Prentice Hall of India
- R. Nageswara Rao, “Core Python Programming”, dreamtech
- Wesley J. Chun. “Core Python Programming - Second Edition”, Prentice Hall
- Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser, “Data Structures and Algorithms in Python”, Wiley
- Kenneth A. Lambert, “Fundamentals of Python – First Programs”, CENGAGE Publication
- Luke Sneeringer, “Professional Python”, Wrox
- “Hacking Secret Ciphers with Python”, Alweigart,
URL:<https://inventwithpython.com/hacking/chapter>

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
4	4	6	30	70	50	150

Practical List:

1. Develop programs to understand the control structures of python
2. Develop programs to learn different types of structures (list, dictionary, tuples) in python
3. Develop programs to learn concept of functions scoping, recursion and list mutability.
4. Develop programs to understand working of exception handling and assertions.
5. Develop programs for data structure algorithms using python – searching, sorting and hash tables.
6. Develop programs to learn regular expressions using python.
7. Learn to plot different types of graphs using PyPlot.
8. Implement classical ciphers using python.
9. Draw graphics using Turtle.
10. Develop programs to learn GUI programming using Tkinter.

KadiSarvaVishwavidyalaya
B.Sc. (CS) Semester – IV (Second Year)

Subject : Project - IV
Subject Code : CSCC20

Objective:

By studying the different theoretical and fundamental concept, students must ensure their learning by developing real time or scenario based applications on the fundamental concept. The project development as a subject will help them to learn and understand the applications of the concept which they are learning from different subjects in the semester.

- Primarily, student must gain the knowledge about the applications of the fundamentals.
- Importantly, they need to also learn the technology trends and develop their skills on those technologies during project development.

Learning Outcomes:

Students will be able develop their skills in analysis, design, development, testing and implementation through the development of small application.

Teaching and Examination Scheme:

Teaching Scheme (Per Week)			Examination Scheme			
			Internal	External		Total Marks
Theory (Hours)	Practical (Hours)	Total Credit	MID (Marks)	Theory (Marks)	Practical (Marks)	
0	4	2	30	0	70	100

Students will do project in groups using technology/tools of their choice with the approval of Project coordinator/HOD. Guidelines for the technology/tools/tasks are listed below:

A) Projects in C/C++/HTML: The projects on C and C++ will enhance the knowledge and logical programming skills. The Applications of Procedural and Object Oriented will be learnt as it would cover up the fundamentals. The projects involving the core concepts like File Management, Pointer, Memory Management, Multithreading, Exception Handling, etc, can be more useful. Projects related to MIS and some other real time requirements can be offered at initial stage. For HTML, There are lot more learning outcomes in creating Web Page.

B) Projects in PHP: Using PHP, Web Projects can be initiated like Build a complete website using classes and objects in PHP, Understand the concepts behind object oriented PHP, Learn all about Abstraction and Inheritance, Learn how to deal with RDBMS within OOPS framework. Basic Knowledge of PHP, JavaScript, HTML. The projects can be performed in either Core PHP or OOP PHP.

C) MySQL/Oracle Database in Projects: Projects using Database to develop console and web applications using MySQL/Oracle with their choice of the PHP languages. Projects helps to learn the applications of Database utilizing the concepts like command-line client, relational database concepts and data types, executing basic DDL and DML queries using SQL, Joining tables, etc.