

KADI SARVA VISHWAVIDYALAYA - GANDHINAGAR

Teaching & Examination scheme
Effective from Academic Year June 2010 onwards

BACHELOR OF COMPUTER APPLICATIONS

B C A SEMESTER-IV

Sr. No./ Subject Code	Subject Title	Credit	Teaching Scheme		Exam Scheme					
			Theory/ Practical.	Tut	Theory		Practical		T.W +Sessional Marks	Total Marks
					Hrs.	Max Marks	Hrs .	Max Marks		
BCA401	OS internals & Programming	4	3	1	3	60	-	-	40	100
BCA402	Web Technologies –I (HTML, PHP)	4	3	1	3	60	-	-	40	100
BCA403	Multimedia Systems	4	3	1	3	60	-	-	40	100
BCA404	Client/Server Applications	4	3	1	3	60	-	-	40	100
BCA405	Computer Networks –I	4	3	1	3	60	-	-	40	100
BCA406	Practical (401)	2	2	-	-	-	3	30	20	50
BCA407	Practical (402)	2	2	-	-	-	3	30	20	50
BCA408	Practical (403)	4	2	2	-	-	3	50	50	100
BCA409	Project Work (404 OR 405)	2	2	-	-	-	-	-	50	50
Total			23	7						750
Total Hours			30							
Total Credits of semester			30							

KADI SARVA VISHWAVIDYALAYA
BCA – SEMESTER -IV
BCA 401 OS INTERNALS & PROGRAMMING

Rationale: 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

- Understand that what is operating system
- Management 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

Teaching and Evaluation Scheme: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of internal examinations which consist of Term Work such as class test, quizzes, class participation, home assignments, presentation, Regular Attendance (i.e. Minimum 85%), Internal marks which consist of 40 (20 Term Work + 20 Sessional Exams) marks and External marks which consist of 60 for University examination.

Subject Code	Subject Title	Teaching Scheme				Exam Scheme					
		Cr.	Th	Pr	Tu	Theory		Practical		T.W. + Sessional Marks	Total Marks
						Hr s.	Max Marks	Hrs.	Max Marks		
BCA 401	OS Internals & Programming	4	3	-	1	3	60	-	-	40	100
BCA 406	Practical (401)	2	-	2	-	-	-	3	30	20	50

Course Content:

PART I- OS INTERNAL

[70%]

Unit 1 : Operating System's Process and Process Synchronization

[20%]

Introduction to OS, Operating System Services. Process Concept, Process Scheduling, Operations of Process, Process Cooperation, Inter Process Communication, Classical problems of Synchronization Critical regions.

No. of Lectures : 06

Unit 2: CPU Scheduling and Deadlocks

[20%]

Basic Concepts, Scheduling Criteria, Scheduling Algorithms (FCFS, SJF, Priority Scheduling, RR). Deadlocks, Conditions on Deadlocks, Strategies for handling deadlock, deadlock prevention, recovery from deadlock.

No. of Lectures : 06

Unit 3: Memory, File and Device Management

[30%]

Memory Management: Logical and Physical address space, swapping, contiguous allocation, paging, segmentation, Segmentation with Paging, page replacement algorithms. File Management: File Concept, Access Methods, Directory Structure, Allocation Methods, Free space Management. Device Management : Overview, System devices, disk Scheduling, disk management.

No. of Lectures : 12

PART II- PROGRAMMING

[30%]

Unit 4 : Understanding the Commands

[15%]

- Locating commands, Internal and external commands, Command structure, Flexibility of command usage
- Basic Commands Unix/Linux:
- Mkdir, rmdir, cp, mv, ls, cal, date, cat, cd, find, head, tail, ps, passwd, nohup, touch, sh, who, chmod
- 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 : 05

No. of Practical : 12

Unit 5: Shell Scripting

[15%]

What is Shell Scripting, The Shell Language vs. Other Programming Language, Vi Editor, Creating a simple script, other ways to execute scripts, Putting Comments in Shell Scripts, Shell Input and Output, Working with Variables, Command-Line Arguments. Arithmetic operations, Conditional Execution, Writing loops, break and continue command, the && and || operators, select command.

No. of Lectures : 06

No. of Practical : 12

Total No of Lectures :- 35 Hrs.

Total No of Practical :- 24 Hrs.

Text Book :

1. Operating System Concepts – Silberschatz & Galvin, Addison Wesley
2. The Complete Reference- UNIX - Kenneth Rosen, Douglas Host, Rachel Klee

Reference Books :

1. Modern Operating System – Andrew S. Tanennbaum
2. Operating Systems – William Stallings.
3. UNIX concepts and Applications – Sumitabha Das, TMH
4. UNIX Shell Programming – Yashwant Kanitkar

Instructional Strategies:

1. Building Background
2. Direct Instruction
3. Review and check of Prior knowledge
4. Integrate topics and concepts
5. Guided Practice

6. Independent Practice
7. Demonstration using technology tools
8. Provide examples to transfer learning
9. Case Studies.

Teaching and Examination Scheme

UNIT	Examination Scheme %weightage	Teaching Scheme No of	
		Theory	Practical
Unit 1	20	6	0
Unit 2	20	6	0
Unit 3	30	12	0
Unit 4	15	5	12
Unit 5	15	6	12
TOTAL	100%	35	24

Question Bank (Theory)

1. Explain the terms:
Operating System, Process, PCB, Dispatcher, Deadlock, Page, Frames, Page table, Frame Table, Internal Fragmentation, External Fragmentation, File, File Pointer, Logical Address space, Physical Address space, File Open Table, Swapping, Context Switch
2. Explain different elements of system.
3. Explain the services of Operating System
4. Explain all System Components
5. Explain Process States
6. Explain Inter Process Communication
7. Explain different Scheduling Criteria.
8. Explain different Scheduling Algorithms.
9. Explain different Strategies to handling deadlock.
10. Explain paging and segmentation with example.
11. Explain different structures of page table.
12. Explain different Access methods of File.
13. Explain different Directory Structure.
14. Explain Disk Scheduling.
15. Explain Free Space Management.
16. Explain different Allocation methods for file.
17. Differentiate Logical Address Space and Physical Address Space.
18. Differentiate External Fragmentation and Internal Fragmentation.
19. Explain Segmentation with paging.
20. Explain Protection of Page table.
21. Differentiate Dynamic Partitioning and Static Partitioning

Question Bank (Practical)

1. Which are the features of UNIX?
2. What do you mean by multitasking and multi-user OS?
3. Explain the role of Kernel, Shell, and Hardware in UNIX Architecture.
4. Differentiate External Command and Internal Command.
5. Explain the Flexibilities of Command Usage.
6. What do you mean by Shell Script? Give the Advantages.
7. Explain the structure of command.
8. Differentiate Shell Programming and Other programming language.

9. How can we execute the shell script?
10. What do you mean by command line argument? How can we give?
11. What is the difference between && and || operators? How can they apply?
12. What is the difference between user variable and system variable?
13. How can we give the comments in shell scripts?
14. Explain the expr command.
15. How to find the location of commands?

Explain Commands:

Mkdir, rmdir, cp, mv, ls, cal, date, cat, 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

Simple Shell-Scripts:

1. Write a shell script to display "Hello World!"
2. Write a shell script to perform arithmetic operations on two numbers.

if-else statements:

1. Write a shell script to check that given number is even or odd.
2. Write a shell script to check that given year is leap year or not.
3. Write a shell script to find the percentage and also find the class.
(if percentage >= 70 then distinction, percentage >= 60 then first class,
percentage >= 50 then second class, percentage >= 35 then pass class else fail)
4. Write a shell script to find the greatest number from three given number.

While, For and Until loop:

1. Write a shell script to display 1 to 10 numbers.
2. Write a shell script to display 10 to 1 numbers.
3. Write a shell script to display 1 to n numbers.
4. Write a shell script to display n to 1 numbers.
5. Write a shell script to find the addition, subtraction, division, and multiplication of two given numbers.
6. Write a shell script to find the sum of 1 to 10 numbers.
7. Write a shell script to find the sum of 1 to n numbers.
8. Write a shell script to find the factorial of given number.
9. Write a shell script to display the Fibonacci series.
10. Write a shell script to display the multiplication table of given number.
11. Write a shell script to display the multiplication table of 1 to n no.
12. Write a shell script to display the reverse number of given digit. (365=563)
13. Write a shell script to display the sum of given digit. (365 → 3+6+5=14)

Test Statements:

1. Write a shell script to check that given string is null or not.
2. Write a shell script to check that two given strings are equal or not.
3. Write a shell script to check that given file exists or not.
4. Write a shell script to check that given file exists and readable or not.
5. Write a shell script to check that given file exists and writable or not.
6. Write a shell script to check that given file exists and executable or not.
7. Write a shell script to check that given file exists and regular or not.
8. Write a shell script to check that given file is directory or not.

(All Programs will be also implemented by command line)

KADI SARVA VISHWAVIDYALAYA
BCA – SEMESTER -IV
BCA 402- Web Technologies-I (HTML , PHP)

Rationale: Internet & HTML (Hyper Text Markup Language) is the web designing tool which is used for developing static web page. DHTML (Dynamic HTML) is used for creating interactive websites using HTML.PHP (PHP Hyper Preprocessor) is a client side scripting language. it is used to develop interactive website. PHP is open source software.

Learning Outcomes: The student will be able to:

- Learn about basic Internet Knowledge.
- Understand how to develop static webpage.
- Able to develop static Website.
- Able to develop dynamic WebPages using PHP.

Teaching and Evaluation Scheme: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of internal examinations which consist of class test, quizzes, class participation, home assignments, project reports, presentation, Regular Attendance (i.e Minimum 85%), Internal which consist of 40 (20 Term Work + 20 Sessional Exams) marks and University examination,.

Sr. No./ Subject Code	Subject Title	Teaching Scheme		Exam Scheme					
		Cr.	Theory/ Practical + Tut	Theory		Practical		T.W +Sessional Marks	Total Marks
				Hrs	Max Marks	Hrs	Max Marks		
BCA 402	Web Technologies-I (HTML , PHP)	4	3 + 1	3	60	-	-	40	100
BCA 407	Practical 402	2	2	-	-	3	30	20	50

Course Content:

Part – I HTML (Hyper Text Markup Language) & CSS [50%]

Unit 1: Introduction to HTML & Tags [20%]

Introduction to HTML, HTML documents structure tags, HTML text formatting tags, Inserting Special characters, Anchor tag, List tag, Adding images and sound.

No. of Lectures: 08
No. of Practical: 04

Unit 2: Advanced HTML [20%]

Tables, Frames and floating, developing forms.

No. of Lectures: 06
No. of Practical: 06

Unit 3: CSS (Cascading Style Sheet) [10%]

Introduction to CSS, Need of design in HTML pages, Tag structure, various selectors (ID, class), Various properties of font and div tag.

No. of Lectures: 05
No. of Practical: 04

Part – II PHP (PHP Hyper Preprocessor)**[50%]****Unit 4: Introduction to PHP****[20%]**

Introduction to PHP, Data Types, Variables, Expressions and Operators, Flow-Control Statements, Including Code, Embedding PHP in Web Pages, Functions, Variable Functions, Anonymous Functions, Strings, String Manipulation, Regular Expressions, Arrays, Multidimensional Arrays, Traversing Arrays, Sorting, Acting on Entire Arrays,.

No. of Lectures: 06**No. of Practical: 04****[10%]****Unit 5: Object oriented Programming**

Objects, Accessing Properties and Methods, Declaring a Class, Introspection, Serialization.

No. of Lectures: 03**No. of Practical: 02****Unit 6: Data Access & Error Handling****[20%]**

Web Techniques, HTTP Basics, Server Information, Processing Forms, Setting Response Headers, Maintaining State, Databases, Using PHP to Access a Database, Security, Session Fixation, File Uploads, File Access, PHP Code, Handling Output, Error Handling.

No. of Lectures: 07**No. of Practical: 04****Total No of Lectures :- 35 Hrs.****Total No of Practical :- 24 Hrs.****Text and Reference Books:**

1. Php, mysql and apache – Julie c. Meloni.
2. Introduction to Internet and HTML scripting – Bhumik Shroff.
3. Web Technology and design – C Xavier

Instructional Strategies:

1. Building Background
2. Direct Instruction
3. Review and check of Prior knowledge
4. Guided Practice
5. Independent Practice
6. Demonstration using technology tools
7. Provide examples to transfer learning
8. Problem Solving
9. Creative thinking

Teaching and Examination Scheme

UNIT	Examination Scheme %weightage	Teaching Scheme No of	
		Theory	Practical
Unit 1	30	10	7
Unit 2	20	6	4
Unit 3	20	6	5
Unit 4	10	3	3
Unit 5	20	7	5
Unit 6	20	7	5

TOTAL	100%	32	24
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Question Bank:

1. Write PHP code to find out current date in DD/MM/YYYY format.
2. Give difference between \$_GET and \$_POST.
3. What is cookie? Explain with example.
4. Explain in detail advantages of PHP.
5. Explain PHP variables and also explain why PHP is a loosely typed language?
6. Give syntax of date () function.
7. Give syntax of mktime () function.
8. Write the Inbuilt Function that reverses the string.
9. Write the Inbuilt Function that converts the string to Uppercase.
10. When we can use \$REQUEST variable?
11. All variables in PHP start with a _____ sign symbol.
12. _____ is used to print text in php page.
13. PHP can have or extension.
14. PHP is server side scripting language because..... (Complete the statement)
15. What is an array? List Types of Array in PHP.
16. Explain for loop with example.
17. Give an example of a function that returns a value.
18. Major difference between include () and require () functions.
19. List 3 different functions used to open, close and checking end-of particular file.
20. Difference between HTML and PHP.
21. What is anchor tag?
22. How can we add image in HTML document?

List of Practical for HTML:

1. How to develop a simple webpage.
2. Develop a webpage using different HTML tags.
3. Develop a webpage using Table tag.
4. Develop a webpage using Frame tag.
5. Develop a webpage using Form tag.
6. Develop a static website using HTML tags.

List of Practical for PHP:

1. Write PHP program to print "Hello World" on the screen.
2. Write PHP program to create a variable and assign value to the variable.
3. Write a program using string operator.
4. Write a program to find the length of string.
5. Write a program using stripslashes () function.
6. Make a program using operators in PHP.
7. Write a program using If...Else statement.
8. Write a program using Numeric array, Associate array and Multidimensional array.
9. Write a program using While, for and do...while looping statement.
10. Write a program using switch statement.
11. Write a program that writes my name when function called.
12. Create a Form using PHP.
13. Create a connection to a MYSQL database.
14. Create an ODBC connection.
15. Make one application using PHP for select, Insert, Update and Delete from the Database.

KADI SARVA VISHWAVIDYALAYA
BCA – SEMESTER -IV
BCA 403 - Multimedia Systems

Rationale: Multimedia is nothing but combination of digital text, digital sound, digital image, digital video and digital Animation. How to make 2D animation. Used essentially to define applications and technologies that manipulated text, data, images, sound and full motion video.

Learning Outcomes: The student will be able to:

- Learn about Multimedia and its uses.
- Develop any Multimedia Application using Flash.
- Develop Animation using Flash.
- Learn about other Multimedia Applications.

Teaching and Evaluation Scheme: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of internal examinations which consist of class test, quizzes, class participation, home assignments, project reports, presentation, Regular Attendance (i.e Minimum 85%), Internal which consist of 40 (20 Term Work + 20 Sessional Exams) marks and University examination,.

Sr. No./ Subject Code	Subject Title	Teaching Scheme		Exam Scheme					
		Cr.	Theory/ Practical + Tut	Theory		Practical		T.W +Sessional Marks	Total Marks
				Hrs .	Max Marks	Hrs .	Max Marks		
BCA 403	Multimedia Systems	4	3 + 1	3	60	-	-	40	100
BCA 408	Practical (403)	2	2	-	-	3	30	20	50

Course Content:

Unit 1: Introduction

[20%]

What is Multimedia, Use of Multimedia in Business, Schools, Home and Public places? Overview of H/W tools including Connections Devices, Memory and Storage Devices, Input Devices, output Devices and Communication Devices and S/W tools including Text Editing and Word Processing tools, Painting and Drawing tools, 3-D Modelling and Animation tools, Image Editing tools, Sound Editing tools, and Animation Video and Digital Movie tools.

No. of Lectures: 06
No. of Practical: 04

Unit 2: Multimedia Text

[20%]

About various Font & Faces, using **TEXT** in multimedia – choosing text font, menus for navigation, buttons for interaction, fields for reading, FONT editing tool - resedit, fontographer, type-designer, Hypermedia and Hypertext.

No. of Lectures: 08

No. of Practical: 06

Unit 3: Multimedia Image/Animation**[30%]**

Image: Multimedia Image – bitmap, vector image, 3-D drawing and Rendering. Understanding natural light and color, computerized color, and Color Palettes. Image files format – Macintosh Format and Windows format.

Animation: What is Animation (2D and 3D Animation), Animation techniques – Cell Animation, Object Animation, and Computer Animation (Kinematics and Morphing).

No. of Lectures:08**No. of Practical: 08****Unit 4: Multimedia Audio/Video****[30%]**

Audio: Digital sound, details of MIDI Sound, MIDI v/s Digital Sound, Preparing Digital Audio files - File size v/s quality, Setting proper recording levels, Editing Digital recording, making MIDI Audio, Audio file format.

Video: How video Works, Broadcast video Standard, Integrating Computer and Television, Digital video, Video Format.

No. of Lectures: 10**No. of Practical: 06****Text Books:**

- Multimedia Making It works – Tay Vaughan

Reference Book:

- Multimedia Magic – S.Gokul

Instructional Strategies:

1. Building Background
2. Direct Instruction
3. Review and check of Prior knowledge
4. Guided Practice
5. Independent Practice
6. Demonstration using technology tools
7. Provide examples to transfer learning
8. Problem Solving
9. Creative thinking

Teaching and Examination Scheme:

UNIT	Examination Scheme %weightage	Teaching Scheme No of	
		Theory	Practical
Unit 1	20	6	4
Unit 2	20	8	6
Unit 3	30	8	8
Unit 4	30	10	6
TOTAL	100%	32	24

Question Bank:

1. What is Multimedia? Describe different environment in which multimedia might be used, give several benefits regarding multimedia.
2. List out the entire storage device and explain all the devices.
3. Explain: USB, fire wire and IDE connections.
4. Explain term: Infrared Remotes, Touch screen and Scanner.
5. Explain the features of image-editing tools in detail.
6. Differentiate: serif and sans serif.
7. What is importance of hypertext in multimedia project?
8. Give any four suggestions for choosing text for multimedia project.
9. Explain kerning, tracking and attributes of font.
10. What are trimming, time stretching and equalization?
11. What is digital audio? Explain the steps for preparing digital audio files.
12. Explain terms: tweening, kinematics, morphing.
13. What is cel animation? Explain it detail.
14. Write short note on Color palettes.
15. Write short note on Vector Image.
16. What is 2-D, 2 1/2-D and 3-D animation?
17. Explain Analog display standard
18. Write down steps for making MIDI sound.
19. Differentiate: MIDI v/s Digital sound.
20. What is Digital Video?
21. Explain digital video compression technique in detail.

Practical List:

1. Creating Different Multimedia Applications using Flash 8.
2. Create a flash document using Motion Tween.
3. Create a flash document using Shape Tween.
4. Create a flash document using more than One Layer.
5. Create a flash document using Inbuilt Timeline effect.
6. Create a flash document using Filter Effect.
7. Create a flash document using Guide Layer.
8. Create a flash document using Masking.
9. Create a flash document using more than one Scene.
10. Create a flash document using Button effect.
11. Create a flash document using Onion skinning.
12. Create a flash document using scripting on Button.
13. Develop a Mini project in Multimedia **using Flash 8,CS5,Adode CS3.**

KADI SARVA VISHWAVIDYALAYA
BCA – SEMESTER -IV
BCA_404 Client/Server Applications

Rationale: Visual Studio (2005) is the front end tool which is used for front end back end technology through ADO.NET. we can build Client – Server application using stand alone as well as conceptual network. This is the need of software industries for an utility / company related application software you can build using a) Desktop environment as well as b) Web environment. This is RAD (Rapid Application Development) interface which can use wizard as well programming skill..

Learning Outcomes: The student will be able to:

- Understand the concept of Front end – Back end concept by primary level of File Handling
- A common architecture for client server interaction ADO.NET overview
- To know about components of ADO.NET
- Implement Client – Server technology using ADO.NET through Desktop as well as Web environment
- Students are able to submit a mini project using Desktop or Web interface with proper validation & authentication

Teaching and Evaluation Scheme: The main objective of evaluation is not only to measure the performance of students, but also to motivate them into some advance practical skill of 'Mini Project Development' for better performance in both the environment like Desktop(windows) and Web application.. Students are evaluated on the basis of internal examinations which consist of class test, class participation, home assignments, project reports, presentation, Regular Attendance (i.e Minimum 75%), Internal which consist of 30 (10 Term Work + 20 Sessional Exams) marks and University examination.,

Sr. No./ Subject Code	Subject Title	Teaching Scheme			Exam Scheme					
		Th./ Tut	Pr.	Tut	Theory		Practical		T.W +Sessional Marks (30)	Total Marks
					Hrs .	Max Marks	Hrs .	Max Marks		
BCA404	Client/Server Applications	4	-	1	3	60	-	-	40	100

Unit - 1: Introduction to Front end – Back end technology through File Manipulation [15%]

What is File handling ? & important of it
 Class and object of File handling
 Implementation of Stream reader and Stream writer
 Use method , property of file handling with examples and limitation

No. of Lecture : 04
No. of Practical : 03

Unit - 2: Overview of ADO.NET

[20%]

Framework of ADO.NET , advantages of it
 1- tier , 2 – tier & 3 tier architecture with it's function & importants
 Components of ADO.NET (connection , data binding source , dataset , data adopter , data reader , data view , data table , command object)
 Common environment components for windows as well as web application
 What is database ? DBMS – RDBMS , components of Database

Data base implementation (Insert , Update , Delete , Selection... etc)

No. of Lecture : 05

Unit - 3: Interaction with Windows application by ADO.NET [25%]

Data binding and it's technique (wizard and coding both)

Application implementation by connection of database , Insert , Update , Delete process with from

Implementation of error and alert message box for un authentication data entry

No. of Lecture : 06

No. of Practical : 07

Unit - 4: Data mining through query (Searching) , Report & Charts [15%]

How to search any records types of searching

Methods , property for searching data

Representation of data by crystal report (wizard technique), simple data report and Charting analyzing

Introduction to live network concept of Front end – back end technology

No. of Lecture : 06

No. of Practical : 05

Unit - 5: Introduction of Web Environment (ASP.NET - I) [10%]

What is ASP.NET ? - IDE of ASP.NET 3.0 (Visual Studio – 2005)

Architecture of ASP.NET (3 tier)

How web page interact with browser (explain by Web Engine + Web server)

Various Toolbox available for Web development

Introduction of Web site navigation & Web page Validating

No. of Lecture : 05

No. of Practical : 05

Unit - 6: Authentication & Web Interaction of front end – Back end (ASP.NET - II) [15%]

Web community development by Login control (Authentication & Authorization)

Intro. Of Data base interaction with web page by Wizard

Small web site development having Navigation , Authentication , Validation Etc

Data searching through Web environments

No. of Lecture : 04

No. of Practical : 05

Total No. of Theory : 30

Total No. of Practical : 25

Text book:

- Mastering in VB.NET by Evangelos Petroutsos : bpb Publication
- Black book ASP.NET

Reference:

- Black book of VB.NET
- Beginners of ASP.NET 2.0
- An Introduction programming using Visual Basic.NET (EEE – by David I. Schneider)
- Successful Projects in VB.NET (BPB – Christopher)

Instructional Strategies:

1. Building Background
2. Direct Instruction
3. Review and check of Prior knowledge
4. Integrate topics and concepts
5. Guided Practice
6. Independent Practice
7. Demonstration using technology tools
8. Provide examples to transfer learning
9. Mini project based demo

Teaching and Examination Scheme

UNIT	Examination Scheme %weightage	Teaching Scheme No of	
		Theory	Practical*
Unit 1	15	4	3
Unit 2	20	5	0
Unit 3	25	6	7
Unit 4	15	6	5
Unit 5	10	5	5
Unit 6	15	4	5
TOTAL	100%	30	25

* This will be performed under project work 409.

KADI SARVA VISHWAVIDYALAYA
BCA – SEMESTER -IV
BCA 405 Computer Networks -I

Rationale:-Computer Networks-I focus on understanding of the concepts of communication system, network protocols transmission medias, networks security, network management.

Learning Outcome: The student will be able to-

- Concepts of Networking
- Analog and digital communication systems
- OSI and TCP/IP models
- Understanding of LANs and wireless LANs
- Understanding of network security
- Understanding of various network operating systems

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Sr. No./ Subject Code	Subject Title	Teaching Scheme			Exam Scheme					
		Th.	Pr.	Tut	Theory		Practical		T.W +Sessional Marks	Total Marks
					Hrs	Max Marks	Hrs	Max Marks		
BCA405	Computer Networks -I	3	-	1	3	60	-	-	40	100

Course Content:

Unit 1 : Network fundamentals

[10%]

What is networking, Requirement of Networking, Network elements, LAN, WAN, host, workstation, server, physical topologies, (bus, star, ring, mesh, and backbone), common network connectivity devices (NIC, hub, Switch, router, gateway, and other devices)

No. Of Lectures: 04

Unit 2 : Networking models

[10%]

The OSI model, Layers in OSI model, Layers's tasks, Entities – sender and receiver, carrier, TCP/IP protocol suite, Addressing scheme

No. Of Lectures: 03

Unit 3 : Data and Signals

[15%]

Analog and digital, periodic analog signals, digital signals, attenuation, distortion, bandwidth, throughput, latency, digital to digital conversion, analog to digital conversion, transmission modes, digital to analog conversion (ASK, PSK, FSK), analog to analog conversion (AM, FM, PM)

No. Of Lectures: 05

Unit 4 : Transmission media**[15%]**

Guided media (twisted pair cable, structure advantages and disadvantages coaxial cable structure advantages and disadvantages, fiber optics cable structure advantages and disadvantages), Unguided media (radio waves, microwaves, infrared, Bluetooth, Wi-Fi, Wi-Max)

No. Of Lectures: 04**Unit 5 : The OSI layers and its services****[20%]**

Error detection and correction block coding, data link control, framing, flow and error control, HDLC, multiple access, MAC sub layer, LLC sub layer, Logical addressing, IP Version 4, IP Version 6, unicasting, multicasting, broadcasting, addressing mapping, subnetting, UDP (operation, use of UDP, datagram format), TCP (services, features, segment, packet format), presentation layer services, Application layer services

No. Of Lectures: 06**Unit 6 : Connecting LANs and Wireless LANs****[10%]**

Backbone networks, Virtual LAN, Cellular Telephony, Satellite networks, SONET / SDH (Architecture, SONET layers), Frame relay, ATM

No. Of Lectures: 03**Unit 7 : Network Security****[10%]**

Cryptography, Symmetric-key cryptography, Asymmetric-key cryptography, various security services, message confidentiality, message integrity, digital signature, key management, E-mail security, web security, virus protection

No. Of Lectures: 03**Unit 8 : Major network operating systems****[10%]**

Microsoft Windows (Features, architecture, directory services), Linux (Features, architecture, directory services)

No. Of Lectures: 02**Text Reference Books:**

1. Network+ study guide ,by David Grath (Sybex)

Reference Books:

1. Computer networks, by Andrew S. Tanenbaum (Pearson Education)
2. Data communication and networking, by Behrouz A. Forouzan (TMH)

Instructional Strategies:

1. Building Background and gain attention
2. Classroom instructions
3. Review and check of prior knowledge through interaction (Q&A)
4. Guided practice through examples
5. Independent practice through assignments
6. Demonstration for visualization
7. Problem solving methodologies

Teaching and Examination Scheme:

UNIT	Examination Scheme %weightage	Teaching Scheme No. of Lecture
Unit-1	10	4
Unit-2	10	3
Unit-3	15	5
Unit-4	15	4
Unit-5	20	6
Unit-6	10	3
Unit-7	10	3
Unit-8	10	2
Total	100	30

Sample Question Bank

1. What is topology? Explain various topologies in detail.
2. Explain various network connecting devices in details.
3. What is OSI model? Explain in brief.
4. What is modulation? Explain AM,FM and PM in detail.
5. Explain Phase Shift Keying?
6. Give the difference between guided media and unguided media? Explain various guided media in detail.
7. Explain Transmission Control Protocol (TCP) in detail.
8. What is subnetting? Explain Class A subnetting with suitable examples.
9. Write a short note on SONET/SDH.
10. What is cryptography? Explain in detail.

KADI SARVA VISHWAVIDYALAYA
BCA – SEMESTER -IV
BCA 409 Project Work
On

Client Server Architecture (BCA 404) OR Computer Networks-I(BCA 405)

Rationale: The Project Work provides the detail working knowledge of various Application Development Tools such as VB.Net, PHP, Database Systems such as Oracle, MS SQL Server, MY SQL etc. and Network Operating Systems such as Windows Server OS, Linux Server, to implement Security Algorithms, use Directory and File Sharing Services.

Learning outcomes: The Student will be able to understand depending upon the selection of area either BCA 404 OR BCA 405 for the Project Work:

Client Server Architecture under which they will learn:

- Implementation of Client side Technologies including User Interface Development.
- Server Side Technologies including Application Server, Database Server etc.
- Application Architecture Security through various Security Algorithms.

The Installation process of Network Operating Systems and Configuring the Server side Services like File Sharing and Directory Access.

Teaching and Evaluation Scheme: The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of internal examinations consisting of 50 marks (continuous evaluation based on Project Work allocated 10 for the First Phase + 20 for the Second Phase + 20 for the Final Phase during regular lab hours) and External marks which consist of 50 for viva-voice presentation on Project Work in University Examination.

Sr. No./ Subject Code	Subject Title	Teaching Scheme				Exam Scheme					
		Cr.	Th.	Pr.	Tut.	Theory		Practical #		T.W +Sessional Marks	Total Marks
						Hrs .	Max Marks	Hrs .	Max Marks		
BCA 409	Project Work (404 OR 405)	2	-	2	-	-	-	3	50	50	100

Project work documentation content:

Phase I: Selection of Project Definition and Development Strategies. [30%]

Phase II: Project Development. [40%]

Phase III: Project Implementation and Documentation. [30%]

Instructional Strategies:

1. Building Background.
2. Demonstration using technology tools.
3. It is up to the interest of the faculty and student that he / she does the project work in any of the area either BCA 404 OR BCA 405 for the Project Work, which may be as follows:

BCA 404 :

- Library Management
- Student's management (Admission - Web based)
- Student's management (Attendance - Web based)
- Student's management (Fees)
- Employee management
- Automobiles sales & service (Web based / Desktop)
- Student's management (Exam & Result - Web based / Desktop)
- Transportation (GSRTC , Railway , Airlines - Web based)
- Online laptop selling system
- Online complain Management System

BCA 405

- Installation of Network Operating Systems such as Windows Server O.S. or Linux Network O.S..
 - Configuration of Directory / File sharing services in Network Operation System.
 - Implementation of Cryptography algorithms like
 - Substitution algorithm
 - Transposition algorithm
 - Etc.
 - Creating a LAN (Local Area Network) using various devices like computers, hub or switches and establishing communication links between devices in simulator.
4. Project should be submitted in 1 hard copy to the Institute for the evaluation.
 5. The team size should not exceed maximum 3 students, which will report to Subject Faculty.
 6. Team is decided by the subject faculty member of the institute.
 7. Minimum 2hrs are allotted to a student per week based on the regular time table.
 8. Final Project Evaluation will be done on the basis of Presentation and Viva-voice during the Internal and External Examination.