DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

B.C.A. – COURSE STRUCTURE

(W.E.F. July - 2011 Batch)

Subject No.	Subject name	Teaching Scheme			Exam Scheme				
		Lect.	Tu	Prac.	The.	Sess	Prac/Viva	T.W.	Total
BCA-101	Communicative English – I	4	-	-	60	40	-	-	100
BCA-103	Advanced Mathematics – I	4	1	-	60	40	-	25	125
BCA-105	Computer Fundamentals & App.	4	-	2	60	40	25	25	150
BCA-106	Programming in 'C'	4	1	3	60	40	25	25	150
BCA-107	Digital Computer Organization	4	-	-	60	40	-	25	125
									Total : 650
BCA-202	Advanced Mathematics – II	4	1	-	60	40	-	25	125
BCA-203	Intro. To Internet & HTML	4	-	2	60	40	25	25	150
BCA-204	Business Data Processing	4	-	2	60	40	25	25	150
BCA-205	Communicative English – II	4	-	-	60	40	-	-	100
BCA-206	Data Structure	4	1	3	60	40	25	25	150
									Total : 675
BCA-303	Mathematical found. & C.S-I	4	-	-	60	40	-	25	125
BCA-304	Self Development	2	-	-	60	40	-	25	125
BCA-305	Object Oriented Programming	4	1	3	60	40	25	25	150
BCA-306	Yoga	1	-	1	50	-	50	-	100
BCA-308	Fin. Acc. & Management	4	-	-	60	40	-	-	100
BCA-309	System Analysis & Design	4	-	2	60	40	-	25	125
									Total : 725
BCA-401	Data Communication & n/w	4	-	-	60	40	-	25	125
BCA-402	Visual Programming	4	1	3	60	40	25	25	150
BCA-403	Mathematical found. & C.S-II	4	-	-	60	40	-	25	125
BCA-404	Database Management System	4	-	2	60	40	25	25	150
BCA-405	Java Programming	4	1	3	60	40	25	25	150
									Total : 700
BCA-501	Internet tech. & programming	4	1	3	60	40	25	25	150
BCA-502	Operating System	4	-	2	60	40	25	25	150
BCA-503	Statistical Computing	4	-	-	60	40	-	25	125
BCA-506	Software Verification & Validation	4		2	60	40	25	25	150
BCA-507	E-Commerce & Web Tech.	4	-	2	60	40	25	25	150
									Total : 725
BCA-601	System Development Project	-	-	-	-	-	300	100	400
BCA-602	Project Seminar	-	-	-	-	-	-	100	100
									Total : 500

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-101 Communicative English - I

Teaching scheme (H/W)			Exam. Scheme (Marks)			
L	**Tu**	**Pr**	**Th**	**Ss**	**Tw**	**Total**
4	**-**	**-**	**60**	**40**	**-**	**100**

Looking at the diverse backgrounds & abilities of the thresh hold students, this syllabus aims at

(1) Importing the basic communication competency of the learners.
(2) Familiarize them with the basic contents necessary for English communication during their studies.
(3) Facilitate them in LSRW skills. &
(4) Enable them to use English language for communicational needs.

So the syllabus is need base & it has a tentativeness, to facilitate the various learners of various competencies:

(I) Introduction to Basics of Communication. [1]
(II) What is Communication? It's various definitions. [1]
(III) The salient features / Characteristics of the communication. [2]
(IV) Barriers to effective communication. [2]
(V) Improving LSRW**:** [18]
Introduction.
Verbal and Nonverbal Communication
Listening Process
GD
Forms of Oral Presentation
(VI) The Basic Vocabulary [8]

(a) How to improve vocabulary?
(b) Prefixes / Suffixes (MFU).
(c) Synonyms/ Antonyms.
(d) One word substitution.
(e) Spellings.

(VII) Developing Fluency & Pronunciation. [8]
IPA
Grammar [conjunction, auxiliaries, prepositions, articles, tenses….]
Language games

Text : / Source :

The major source of studies for the students is the classroom, which will be very interactive & full of activities related to their syllabus. They must participate actively in their classes. The faculty will be a guide, helper, motivator & facilitator for the learners, but not the traditional teacher. So the learner's evaluation will be based on the class work only. The tests & exams will be based entirely on the class work & the participation of the learners in the classroom activities.

--- Prof. Rajanikant Jain.
Co - ordinator English Communication.

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-103-Advanced Mathematics - I

Teaching scheme		Exam. Scheme (Marks)			
L	**Tu**	**Th**	**Ss**	**Tw**	**Total**
4	**1**	**60**	**40**	**25**	**125**

(1) Equations and Inequalities : [6]

a) Linear equation
b) Methods to solve Linear equation
c) Quadratic equations
d) Methods to solve Quadratic equations

(2) Determinants : [6]

a) Basic definitions
b) Properties of determinants
c) Creamer's Rule

(3) Matrices : [8]

a) Definitions
b) Algebra of Matrices
c) (Addition, Subtraction and Multiplication)
d) Computation of inverse(By Matrix Method)
e) Solution of simultaneous equation in two or three unknown by Matrix Method
f) Row and Column Transformation
g) Computation of Inverse by Gauss elimination Method
h) Solution of simultaneous equation in two or three unknown by Elementary Transformation Method
i) Rank of Matrix

(4) Co-ordinate Geometry : [8]

a) Introduction
b) Line Quadrants and co-ordinates
c) Distance formula between two points
d) Midpoint formula
e) Section formula
f) Area of a triangle
g) Colinerarity of three points
h) Equations of a Straight Line
i) General Equation of a straight line
j) Angle between two straight line

(5) Set Theory : [6]

a) Introduction
b) Representation
c) Operations
d) Properties on operations
e) Venn diagrams

f) Cartesian Product

(6) Functions [6]

a) Definition, Domain and RangeLinear, Quadratic, Polynomial, Rational, Constant, Identity, Periodic, Power, monotonic, Even & odd , Modulus, Reciprocal Functions
b) Representation of functions
c) Graph of functions
d) One- one functions and its Graph
e) Invertiable function and its Graph
f) Exponential function and its Graph
g) Logarithmic function and its Graph
h) Trigonometric function and its Graph

Reference Books: -

1) Elementary Engineering Mathematics - B. S. Grewal
2) Co-ordinate Geometry - Shantinarayan
3) Mathematics (G. S.) - 11^{th} & 12^{th} Science

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA -105 Computer Fundamental and Applications

Teaching scheme (Hr./W)			Exam. Scheme (Marks)				
L	Tu	Pr	Th	Ss	Pr	Tw	Total
4	-	2	60	40	25	25	150

UNIT I BASIC OF COMPUTER (PART I)

Introduction to computer [2]

Introduction, Digital and Analog computer, Characteristics of computer, History of Computer, Generation of Computer, Classification of Computer, The Computer System
Application of Computers

The Computer System Hardware [1]

Introduction, Central Processing Unit, Memory Unit, Microprocessor, Interconnecting the Units of a Computer, Performance of a Computer, Inside a Computer Cabinet, Introduction to Emerging Technologies

UNIT II USER-COMPUTER INTERFACE

Interaction of User and Computer [1]

Introduction, Types of Software, System Software, Application Software, Software Acquisition

Operating System [5]

Introduction, Objectives of Operating System, Types of OS, Functions of OS
User Interface, Examples of Operating Systems
MS-DOS
File naming rules, Wild card characters, Internal & External commands
dir, mkdir, chdir, type, copy, xcopy, delete, rename, format, sys, label, scandisk, attrib, path, prompt, date, time, tree, deltree, defrag, edit, etc.
File Allocation Table (FAT), autoexec.bat & Config.sys

Window XP [2]

Introduction, Features of Windows XP, The Desktop, Structure of Windows, Windows XP Explorer, The Search, The Recycle Bin, Configuring the Screen, Configuring the Mouse, Adding or Removing Programs, Adding New Hardware, System Tools, The Scandisk, Windows XP Media Player, Windows XP Help, Windows Vista, Windows 7

UNIT III APPLICATIONS AND SECURITY

Introduction to Multimedia [1]

Introduction, Multimedia : Definition, Characteristics of Multimedia System Elements of Multimedia, Multimedia System, Multimedia Applications,

Introduction to Computer Security [1]

Introduction, Security Threat and Security Attack, Malicious Software, Hacking
Users Identifications and Authentication

UNIT IV COMPUTER PRACTICAL

Ms-Word [10]

Features of Word
Word window
Create, edit, store documents, print high quality documents, Navigating documents, Cursor movement commands, Spell checking, cut & paste, Find & replace, word-wrap Alignment, formatting the document using font dialog box, Inserting tables, pictures, hyperlinks, Macros, Mail merge 2003, Template, Overview of Index and Tables dialog box etc .

Ms-Power Point [6]

Features of PowerPoint, Power Point window, Creating / editing slides
Using text, drawings, tables, pictures, charts and other objects in slide, Creating and running slide show, animator & slide transition, Effects:, Macros, templates; packing a presentation

Ms-Excel [11]

Features of excel, Concept of worksheet, Excel window, Navigating worksheet, entering & editing data into cells, Insert/delete/hide/show rows/columns, Change column width/row right. Formatting data, Formulas & operators Range of cells, moving – copying data, Spell checking, Various types of addressing, Protecting & hiding data, sorting data, Searching & replacing data., Multiple worksheets & operations on them, Built-in functions, Look up tables, Pivot table, Data organization- what-if analysis, Charts, pictures, file operations, Macros, Circular reference, Goal seek etc.

Text Book:

1. "PC SOFTWARE For Windows 98 Made Simple" by- R.K.TAXALI (Tata Mc-Graw Hill Publication)

Reference Books:

1. Computer Fundamentals by Anita Goel
2. DOS 6.2 : By Robert M.Thomas (BPB Publication)
3. The Complete Reference Windows XP Professional (Tata Mcgraw Hill)
4. The complete reference office 2000,Stephen L. Nelson, TMH

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-106 Programming in 'C'

Teaching scheme (H/W)			Exam. Scheme (Marks)				
L	Tu	Pr	Th	Ss	Pr	Tw	Total
4	1	3	60	40	25	25	150

Unit-1 Introduction to C

- Introduction to C : (Middle level language, Multipurpose) [1]
- History of C ,
- Features of C (Robust, Fast & Efficient ,Portable ,Extendable, Structured Programming)
- Program characteristics(Lowercase, Free form ,Function based)
- Basic structure of C program [1]
  (Documentation, Link Section, Definition section ,Global declaration ,Main function, Subprogram section)
- Character set (letters, digits, special characters, white spaces) [1]
- C tokens(Keywords, identifiers, constants, strings, special symbols, operators)
- Constants(Primary and User defined data types), Symbolic constants
- Operators (Arithmetic,Relational,Logical,Assignment,Increment/Decrement , Conditional ,Bitwise ,Special operators) [2]
- Expressions
- Implicit and Explicit Type Casting
- Operators precedence and Associativity

Unit-2 I/O operators , Control statements, array and string handling

- I/O operation (getchar ,putchar , printf & scanf functions) [1]
- Formatted input and output [1]
- Control statements
  - Decision-making and branching statements [2]
    if statement and various types of if statements,
    switch-case statements
    conditional operator statement
  - Decision making and looping [3]
    while statement,
    do – while statement
    for statement
- Jump in loops – break and continue statement
- Arrays [2]
  Introduction to array
  One-dimensional arrays, two-dimensional arrays
- String handling [2]
  Reading ,Writing ,Combining ,Copying ,Comparing ,Extracting strings
  In-built string functions (strcat ,strcmp ,strcpy ,strlen)

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

Unit - 3 User-defined functions and storage class

-User-defined functions [1]
- Introduction
- Need for user-defined functions
- The form of C functions [1]
- Return values and their types
- Calling a function
- Category of functions [1]
    - Functions with no arguments and no return types
    - Functions with arguments and no return types
    - Functions with arguments and return types
- Nesting of functions
- Recursion [1]
- Call by value and call by reference
- Function with array

- Storage classes (Storage, default value, scope, life) [1]
- Static storage class
- Automatic storage class
- Extern storage class
- Register storage class

Unit-4 Structures and Unions

- Introduction [2]
- Structure definition, structure initialization, giving values to members
- Comparison of structure variables
- Arrays of structures [1]
- Arrays within structures
- Nested structures
- Structures and functions [1]
- Unions
- Bit fields

Unit -5 Pointers

- Introduction [2]
- Understanding pointers
- Declaring & Initializing pointers , Accessing a variable and address of a variable
- Pointer expressions [2]
- Pointer increments and scale factor
- Pointers and arrays [1]
- Pointers and character strings
- Pointer and functions [2]
- Pointers and structures
- Void pointers

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

Unit – 6 File management in C

- Introduction
- Why we need file [1]
- Defining and opening a file (fopen) [1]
- Closing a file (fclose)
- Input/Output operations on files (getc, putc, getw, putw, fprintf, fscanf) [1]
- Error handling during I/O operations
- Random access to files (ftell, fseek and rewind) [1]
- Command line arguments

Unit 7 - The preprocessor

- Introduction [1]
- Categories of preprocessor
- Macro substitution
- File inclusion [1]
- Compiler control directives [2]
- #pragma and #error directives
- stringizing and token-pasting operator

Text Book:

1. Programming in ANSI C, Balagurusamy, Tata McGraw-Hill

Reference Books:

1. Let us C, Kanitkar, BPB.
2. Programming with C, Gottfried, McGraw-Hill International
3. Programming with C , Venugopal & Prasad , Tata McGraw-Hill

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-107 Digital Computer Organization

Teaching scheme (H/W)		Exam. Scheme (Marks)			
L	Tu	Th	Ss	Tw	Total
4	-	60	40	25	125

1. Representation of Information

Number systems: binary, octal, hexadecimal [1]
Positive and negative number, integers and real [1]
Characters and codes ASCII, EBCDIC [1]
Redundant coding for error detection and correction. [1]

2. Basic Logic Design

Truth tables, Boolean algebra [2]
Combination circuit design with AND, OR [2]
NOT, NAND NOR gates [2]
Multiplexers [2]
Decoder and encoder [2]
Full adder and full sub tractor [2]
Look ahead carry generator with binary adder [2]
Flip-flops : R-S F/F, J-K F/F, [2]
Toggle F/F, D F/F, Master-Slave F/F [2]
Shift registars [2]
counters [3]
Simple arithmetic and logic circuits. [1]

3. Memory Devices [3]

Computer Memory Introduction, Memory Representation, Memory Hierarchy, CPU Registers, Cache Memory, Primary Memory, Secondary Memory, Access Types of Storage Devices Magnetic Tape, Magnetic Disk, Optical Disk, Magneto-Optical Disk, Using the Computer Memory, Random access, Serial accesses, Directs access memories and their specifications.

4. CPU Architecture

Instruction format [1]
Addressing modes-direct, indirect, immediate, relative, indexed
Addressing formats: Zero, single, double, register etc.
Instruction set selection [1]
Instruction execution
Fetch and execution cycles
Microprogramming concept [1]
Speed mismatch between CPU and memory and methods of alleviating it.

5. I/O Architecture **[3]**

Introduction, Input-Output Unit, Input Devices, Human Data Entry Devices, Pointing Devices, Pick Devices, Source Data Entry Devices, Output Devices, Hard Copy Devices, Soft Copy Devices, I/O Port, Working of I/O System, Properties of simple I/O devices and their Controllers, Transfer of information between I/O devices, CPU and memory
Program controlled and interrupt controlled information transfer,
Alleviating speed mismatch between I/O units and memory
DMA control
I/O channels
Peripheral processors.

6. Case Study of a Micro-Processor

- Study of 8086 Micro-Processor:
o Register Structure [1]
o Buses [1]
o Instruction Set: [1]

MOV, PUSH, POP, IN, OUT, ADD, ADC, INC, SUB, SBB, DEC,CMP, MUL, DIV, NOT, AND, OR, XOR, JMP, LOOP, INT, STC, CLC, CMC, HLT, WAIT, ESC

Text Book :

1. Digital Logic and Computer Design
M. Morris Mano(PHI)

Reference Book :

1. Computer System Architecture
M. Morris Mano (PHI)
2. Microprocessor and Interfacing Programming and Hardware
Douglas V. Hall (TMH) Second Edition
3. Computer Fundamentals by Anita Goel

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-202 Advanced Mathematics – II

Teaching scheme		Exam. Scheme (Marks)			
L	**Tu**	**Th**	**Ss**	**Tw**	**Total**
4	**1**	**60**	**40**	**25**	**125**

Elements of Differential Calculus [6]

- Real numbers and functions
- Limits and Continuity of functions
  (Trigonometric functions are ommited for limit and continuity)
  a) Methods to find the limit of a function
  b) Limits of some standard functions
- Differentitation [7]
  a) Derivative of a function
  b) Derivatives of Trigonometirc function
  c) Derivatives of some standard function
  d) (Exponential , logarithmic, Polynomial , etc)
  e) Derivatives of composite function
  f) Differentiation of Implicit function
  g) Differentiation of Parametric functions
  h) Logarithmic differentitaion
  i) Higher order derivatives till order II
- Application of Derivatives : [7]
  ** Arithmetic Aplications.
  a) Use of Derivative in Rectilinear motion
  b) Use of Derivative as Rate – Measurer.
  c) Use of Derivative in Approximation
  ** Geometrical Applications of the derivatives
  a) Tangent, Normal, Subtangent, Subnormal
  b) Length of Tangent, Subtangent, Normal, Subnormal
  c) Maxima and Minima of a function [10]
- Integral Calculus :
  a) Concept of Integration
  b) Indefinite integration
  c) Methods of integration
  d) (Subtitution, by parts, Partial fractions)
  (Inverse Trignometric functions are ommited)
  e) Integral of Type $\int \sin^m x \cos^n x$
  f) Definite integrals
  g) Rules of Definite integration
  h) Reduction formula $\int_0^{n/2} \sin^n(x)\,dx$, $\int_0^{n/2} \cos^n(x)\,dx$

- Application of Integration [4]
  a) Area and Volume under a curve
- Differential Equations [6]
  b) Idea of differential and differential euqations
  c) Degree and order of differential equation
  d) Formation of a differential equation
  e) Solution of a differential euqation
  f) (General and perticular solution)
  g) Differential equations of the first order and first degree
  h) Equations where variables are seperable and its solution.
  i) Exact differential equation and its solution
  j) Linear differen equation and its solution.

Reference Books :

1) Differential Calculus - Shantinarayan
2) Integral Calculus - Shantinarayan
3) Mathematics (G. S.B.) - 11^{th} and 12^{th} science Book.

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-203 Introduction to Internet & HTML Scripting

Teaching scheme (H/W)			Exam. Scheme (Marks)				
L	**Tu**	**Pr**	**Th**	**Ss**	**Pr**	**Tw**	**Total**
4	**-**	**2**	**60**	**40**	**25**	**25**	**150**

Internet Concepts: **[22 hr.]**

- Brief history of Internet. [1]
- Internet:
  - Basic concept of network [1]
  - Different types of Network [1]
    - LAN-MAN-WAN
  - Terminologies related to Internet [2]
  - Interconnection of various networks [2]
  - Various devices used to form Internet [1]
  - Methods of connecting to Internet. [2]
  - Protocols [1]
  - Packet switching [1]
  - Domain names [2]
  - IP address
  - URL.
- Various Services available on Internet-
  - World Wide Web [1]
  - E-mail [2]
  - FTP [2]
  - Telnet [1]
  - Chat [2]
  - Instant Messaging.

Static Web Page Development- **[18hr.]**

- Tools available for Static Web Page Development [1]
- Use of tools for Web Page Development [1]

- HTML Scripting
  - Hypertext [1]
  - HTML Document Structure and elements [2]
  - HTML tags and attributes for-
    - ♦ Formatting the web page [1]
    - ♦ Various types of lists. [1]
    - ♦ Tables [2]
    - ♦ Forms [1]
    - ♦ Frames [2]

- Logical Styles and Physical Styles [2]
- Inserting Special Characters
- Adding Images [2]
- Sound and animation.
- Linking -Various web pages, within the same page. [2]
- HTML editors.

Text Book:

1) HTML 4.0 (No Experience Required),By-E.Stephen Mack, Janan Platt. (BPB Publication)

Reference Books:

1) Internet an introduction', Compiled by Tata McGraw-Hill. (Cistems, Tata McGraw-Hill publication)

2) The Internet,By –Douglas E.Comer (Prentice Hall of India publication)

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-204 Business Data Processing

Teaching scheme (H/W)			Exam. Scheme (Marks)				
L	Tu	Pr	Th	Ss	Pr	Tw	Total
4	-	2	60	40	25	25	150

1. Introduction: [2]
-Data and information
-Difference between data and information with proper examples
-Data processing, Need of data processing, data structure,
-Database, Data processing cycle
-Methods of data processing [2]
- Manual data processing system
- Semi Manual data processing method
- Electro mechanical data processing method
- Electronic data processing method.

-Application of data processing, System development, MIS
-advantages and disadvantages of EDP. [2]

2.Electronic Data Processing System:-
-Online processing, Time sharing system [1]
-Real time system, Batch system
-Multiprogramming, Multiprocessing [1]
-SPOOLING, Distributed data processing.

3.File organization:-
-Elements of computer file, Types of files (master, transaction, audit, backup, work) [2]
-File processing activities (File updation, File referencing, File maintenance, File enquiry), File design factors [1]
-Sequential access method, random access method, Index sequential access method, [1]
-merits and demerits of file organisation, database management system, components of DBMS, ADBMS. [2]

Application of computer in business organization
Computer application in financial accounting, Computer application in payroll, Computer application in inventory control [1]

Management Information System [2]
-Concept and Importance of MIS
-Definition
-Information Technology and MIS
-Nature and scope of MIS
-MIS Characteristics and Function

Designing Outputs. [2]

- Output devices,
- objectives of output design,
- Design of o/p reports,
- Design of screen,
- Use of Business graphics.

Data input methods. [2]

- Data input,
- coding techniques,
- modulus-11 code for detection of errors,
- validations of input data,
- Interactive data input techniques (menus, templates, commands)

5.Introduction to Access:-

- Various data-types available in access, Introduction to various objects available in access. [1]
-Designing of tables (Design and data sheet view of the table), primary key [1]
-Various field properties (Field size, Format, Default value, Allow zero length,
-Required, indexes, Validation rule & text, input mask, Caption properties and look up wizard) [2]
-Working with database entering, editing, updating data, datasheet view of table,
working with columns, find tool, freeze and unfreeze, hide and unhide column. [1]
Operators and expressions, expression builder, various functions of access [2]

6.Query:-

- Types of queries, Dynaset, Design grid, uses of expression in query [1]

7. Forms :-

-Introduction to Forms, form wizard, designing, controls used in form, components of form. [2]

8. Reports :-

-Introduction to Reports, Components of report, ideal report, types of report,
-Designing of report (tabular and columnar), mailing label. [2]

9.Relationship:-

- Concept of Normalization, Entity, Entity set, Entity schema,
-binary and ternary relationship
  - one to one relationship
  - one to many relationship
  - many to one relationship
  - many to many relationship with suitable examples [2]

-Master table and transaction table. Join property, various join options
(Cascade, Delete and Referential Integrity) available in access [1]

10.Advanced Query:-

- select query.
- Action query.
- parameter query.
- crosstab query.
- summary query. [2]

11.Other features of access:-

Macro, page, and utilities for managing access database, indexing and its advantages. [2]

Text Book:

1) Teach yourself Access. : Sieglel, BPB
2) Introduction to Computer Data Processing and System Analysis: V K Kapoor (Sultan Chand and Sons)

Reference Books:

1) Management Information system by D.P. Goyal (Macmillan India Ltd.)
   System Analysis & design by V. Rajaraman

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-205 Communicative English - II

Teaching scheme (H/W)			Exam. Scheme (Marks)			
L	**Tu**	**Pr**	**Th**	**Ss**	**Tw**	**Total**
4	**-**	**-**	**60**	**40**	**-**	**100**

Looking at the diverse backgrounds & abilities of the thresh hold students, this syllabus aims at

1. Importing the basic communication competency of the learners.
2. Familiarize them with the basic contents necessary for English communication during their studies.
3. Facilitate them in LSRW skills. &
4. Enable them to use English language for communicational needs.

So the syllabus is need base & it has a tentativeness, to facilitate the various learners of various competencies:

I) Oral Communication [6]
- Hard Skills and Soft Skills
- Dyadic Communication
- Presentation
- 5Cs of Communication

II) Comprehension and Précis [6]

III) Essays & Paragraph writing. [8]

IV) Letter writing
- (i) Personal & Social letters [3]
- (ii) Business letters. [5]
- (iii) Applications. [3]

V) Developing dialogues [3]

VI) Group Discussion. [3]

VII) Self – Presentation. [3]

Text : / Source :

The major source of studies for the students is the classroom, Which will be very interactive & full of activities related to their syllabus. They must participate actively in their classes. The faculty will be a guide, helper, motivator & facilitator for the learners, but not the traditional teacher. So the learner's evaluation will be based on the class work only. The tests & exams will be based entirely on the class work & the participation of the learners in the classroom activities.

--- Prof. Rajanikant Jain.
Co - ordinator English Communication.

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-206 Data Structure

Teaching scheme (H/W)			Exam. Scheme (Marks)				
L	**Tu**	**Pr**	**Th**	**Ss**	**Pr**	**Tw**	**Total**
4	**1**	**3**	**60**	**40**	**25**	**25**	**150**

Unit-1 Linear Data Structures and Their Sequential Storage Representation

Why we study data structure? [2]

- Primitive Data Structures

Operations on Data Structure

Integers, Real Number, Character Information, logical Information, pointer Information.

- Nonprimitive data Structure

1. Array [2]
   (a) Definition of array
   (b) Calculate address of elements of the array
   (c) Row major order and column major order
   (d) Application of array
2. Stacks [5]
   (a) Definition of Stack
   (b) Operations on Stack
   Ex. Push, PoP, Emptystack, Underflow, Overflow.
   (c) Implementation of stack
   i. Using static allocation (array & record representation)
   ii. Using linked list (by using pointer data type)
   (d) Application of Stack
   i. Conversion from infix expression to postfix expression
   ii. Evaluation of the given postfix expression by using stack
   (Assuming single operand) (e.g 421*+# ---→ Equivalent infix is 4+2*1)
   e) Advantages and Disadvantages of using stack.

Queue [6]

a) Definition of Queue
b) Operations like insert, remove, empty, underflow , overflow of Queue.
c) Implementation of linear queue by:
   i. Using array representation (static allocation)
   ii. Using linked- list representation (by using pointer data type)
d) Circular Queue & Priority Queue
   i. Definition, operations
   ii. Implementation by array representation.
   e) Advantages and Disadvantages of using different types of queue.

Unit – 2 Linear Data Structures and their Linked Storage Representation.

1) Linked List [8]
   (a) Definitions. Advantages over sequential – allocation list
   (b) Operations on linked list
   i. Insert new element in front.
   ii. Insert new element in last

iii. Insert new element in sorted list
iv. Insert new element after the given location
v. Delete from front
vi. Delete from a particular node form list.

(c) Implementation of singly list by using pointer Data type (dynamic allocation)
(d) Implementation of Circular Singly – Linked List with header node by using pointer Data type.
(e) Implementation of Doubly Linked – list by using pointer Data type.
(f) Advantages and Disadvantages of using different types of lists.

Unit – 3 Non-linear Data Structures

1) Binary Tree : [6]

(a) Definition (Tree, Binary Tree , Binary Search Tree, Complete Binary Tree, Edge , Path)
(b) Operations
i) Insert new item into Binary Search Tree.
ii) Delete given item from binary search tree.
iii)Inorder, Preorder, Postorder Traversals

2) Graphs : [4]

(a) Definitions (Graph, loop, cycle, acyclic graph, directed graph, forest, path, mixed graph)
(b) Operations on graph
i) Insert new node into graph
ii) Insert new edge into graph.
iii) Graph Traversals - BFS, DFS Traversals

Unit – 4 Sorting and Searching Methods

1) Sorting Methods [5]

(a) Exchange Sort
i) Bubble Sort
ii) Quick Sort (partition Exchange sort)
(b) Selection Sort
i) Straight selection sort
ii) Heap Sort
(c) Insertion Sort
i) Simple insertion Sort
ii) Binary insertion sort
iii)Address calculation sort
(d) Merge Sort
(e) Radix Sort.
(f) Comparison of all the sorting techniques.

2) Searching Methods [2]
Sequential Search, Binary Search

Text Book: 1) Data Structure using C
By Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein.

Reference Book: 2) An Introduction to Data structures with applications
By Jean-Paul Tremblay and Paul Sorenson.

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-303 Mathematical Foundation of Computer Science - I

Teaching scheme		Exam. Scheme (Marks)			
L	**Tu**	**Th**	**Ss**	**Tw**	**Total**
4	**-**	**60**	**40**	**25**	**125**

(Discrete Mathematics)

1. Sets And Propositions **[6]**

* Mathematical Logic
  → Statements and Notation
  → **Connectives:** Negation, conjunction, Disjunction, Statement Formulas and Truth Tables.
* Basic Concepts of Set Theory :
  → Notation, Inclusion and Equality of sets, Power Set
* Operations and Properties on operations.
* Venn Diagrams
* Ordered Pairs and n tuples
* Cartesian products of two and three sets

2. **Relations And Functions** **[8]**

* **Relations**
  → Properties of Binary Relations in a set
  → Relation matrix and the graph of a relation
  → Partition and Covering of a set
  → Equivalence Relations
  → Compatibility relations
  → Composition of Binary Relations.
  → Partial Ordering
  → Partially ordered set
* **Functions**
  → Definition and Introduction
  → Composition of Functions
  → Inverse functions
  → Binary and n-ary- operations
  → Characteristic function of a set
  → Hashing functions
  → Natural numbers
  → Peano Axioms and Mathematical Induction

3. Permutations & Combinations **[6]**

→ Basic Definitions & Examples
→ Restricted Permutation

4. Lattices & Boolean Algebras **[8]**

→ Lattices as Partially ordered sets
→ Properties of Lattices
→ Lattices as algebraic systems

→ Sub lattices, Direct Product and Homomorphism
→ Some special Lattices
→ **Boolean Algebra**
→ Subboolean Algebra, Direct Product and Homomorphism
→ Boolean Functions

5. Algebraic Structures **[8]**

* **Algebraic Systems :** Examples and General Properties Lattices as Partially ordered sets
→ Definitions and Examples
→ Some simple algebraic systems and General Properties

* **Semigroups and Monoids**
→ Definitions and Examples
→ Homomorphism of Semigroups and Monoids
→ Subsemigroups and Submonoids

* **Groups**
→ Definitions and Examples
→ Order of a group and order of an element , Cyclic group
→ Permutation groups and properties
→ Subgroups and Homomorphism
→ Cosets, Normal Subgroups, Kernal of a group

* **Rings : -** Definitions and Examples

6. Graph Theory **[4]**
→ Basic concepts of Graph Theory
→ Basic Definitions
→ Paths, Reachability and Connectedness
→ Matrix Representation of Graphs

* **Trees:** Trees and some examples
→ Representation and operation of trees.

Books :

1. Elements Of Discrete Mathematics
-C.L.Liu. Second Edition.
2. Discrete Mathematical Structure With Applications To Computer Science.
-J.P.Tremblay & R. Manohar

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-304 Self Development

Teaching scheme		Exam. Scheme (Marks)			
L	**Tu**	**Th**	**Ss**	**TW**	**Total**
2	**-**	**60**	**40**	**-**	**125**

Total: 20 Hrs

1. Introduction to Personality Development:
   a) The basic traits of a developed personality
   b) The Pleasing Personality
2. Health, Hygiene & High Spirit :
   a) Physical fitness
   b) Positive thinking
3. Proper use of Language:
   a) The Communication Skills
   b) The effective Speech
4. Goal Setting.
   a) How to set goal?
   b) Advantages of setting a goal
5. Leader ship & Team Spirit:
   a) Effective Leadership qualities
   b) How to mobilize the team
6. Effective self-presentation & facing interview.
   a) The interview process & preparing for it
   b) The presentation skills

Scheme: Each topic will be covered in TWO sessions / Lectures, so 12 topics in 24 sessions.

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-305 Object Oriented Methods & Programming

Teaching scheme (H/W)			Exam. Scheme (Marks)				
L	Tu	Pr	Th	Ss	Pr	Tw	Total
4	1	3	60	40	25	25	150

- Object Oriented Programming Concepts [3]
  - Procedural Language and Object Oriented approach
  - Characteristics of OOP

- C++ Programming Basics
  - Loops and Decision [1]
  - Structure
  - Function [3]
  - Inline function
  - Default argument
  - Variables [2]
  - Array

- Pointers [2]

- Object and Classes
  - Simple Class and Object [2]
  - C++ object as physical object and as Data type [1]
  - Constructor and Destructor [2]
  - Copy constructor, Overloaded constructor [1]
  - Object as function argument and returning object from function [1]
  - Static class data [1]

- Overloading
  - Unary and Binary operator overloading [1]
  - Function Overloading [3]
  - Data Conversion

- Inheritance and Polymorphism
  - Derived Class and Base Class [2]
  - Different types of Inheritance
  - Constructor
  - Overriding member function [2]
  - Abstract Class
  - Public and Private Inheritance [2]
  - Ambiguity in Multiple inheritance [2]
  - Containership

- Virtual function and other subtitles
  - Virtual function [2]
  - Friend function
  - Static function
  - Assignment and copy initialization [1]
  - 'this' Pointer

- File Stream and I/O Operator
  - Stream [1]
  - String I/O and Object I/O
  - File Pointers [2]
    - Specifying the position
    - Specifying the offset
  - Closing file
  - Error handling [1]

- Common Library Functions [2]

Text Book **:** Turbo C++
-Robert Lafore

Reference Book **:** Object Oriented Programming in C++
-E. Balaguruswami

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA - 306 Yoga

Teaching scheme (H/W)			Exam. Scheme (Marks)				
L	Tu	Pr	Th	Ss	Pr	Tw	Total
1	-	1	50	-	50	-	100

Part -1 Training in Yogic Asanas, Pranayams and Mudras:

1. Kapalbhati, Anulom Vilom Pranayam, Omkar Pranayam, Shavasan, Suryanamskar, Body Rotations.

2. Asanas for Meditation.
   - Padmasan, Swastikasan, Sidhdhasan, Bhadrasan, Vajrasan, Sukhasan, Savasan

3. Asanas to be performed in standing position
   - Triconasan, Pervatasan, Utlatukasan, Hastapadasan.

4. Asanas to be performed while lying in supine position.
   - Servangasan, Halasan, Savasan, Kosthavishramasan, Matshendrasan, Suptavajrasan.

5. Asanas to be performed lying in prone position.
   - Uttanapadasan, Uttanadhadasan, Sarpasan, Bhujasan, Salabhasan, Dhanurasan, Makarasan.

6. Asanas to be performed in sitting position.
   - Pavanmuktasan, Hastapadasan, Vajrasan, Ardhamatshyendrasan, Shishuasan, Saptamudrasan, Gomukhasan.

7. Yoga Mudras (seven Types)

8. Pranayams (seven Types)

Part -2 Rajyoga Meditation – Theory and Practice:

1. The True Concept of Yoga
2. Science of Consciousness & Dynamics of Mind
3. Concept of God & True Secularism
4. Principles of Spiritual Science
5. Practical Meditation

Part -3 Moral, Ethical and Spiritual dimensions in development of inner personality:

1. Holistic Health
2. Stress Management and Relaxation Techniques
   Addiction, Cure and Remedies to get rid of them

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-308 Financial Accounting & Management

Teaching scheme		Exam. Scheme (Marks)			
L	Tu	Th	Ss	Tw	Total
4	-	60	40	-	125

(1) Financial Accounting – Concepts of Accounting principles and convictions, accounting equation, accounting definition, accounting mechanism, preparation of Journal Entries, Ledger, trial balance and Final Accounts (excluding company). Format of Final Accounts of Company Accounts, Manufacturing Accounts.

(2) Management Accounting – Ratio analysis (Ratio based on P&L A/C and Balance sheet), estimation of working capital, simple presentation of Funds flow analysis. Ratio analysis only following ratios are to be worked out Current ratio, Liquid ratio, all turnover ratio, Debt-equity ratio, profitability ratio, Average collection period and Average Payment period, criticisms of ratio are not expected.

(3) Budgetary Control – Operational Budget – fixed and flexible purchase sales, production, expenses, and cash budget. Preparation of Flexible budget.
Procedure of Budget – Budget Committee, Budget manual, Zero base budget etc.

(4) Capital Budget – Method of Evaluation of Capital Budget like Accounting Rate of Return, Payback, Net present value, Profitability index, Internal rate of return, some simple aspects of project finance. Risk analysis is not expected.

(5) Cost accounting – Concepts of elements of cost product cost sheet, Marginal Costing (problem on BEP, Margin of Safety etc), decision making based on Marginal costing not expected.
Standard Costing – Material Lab. and overhead practical problem of level C (i.e. Cost, Price, Usage, Rate, Efficiency, Volume etc).
General knowledge of Costing Methods and techniques.

(6) Finance Management. Meaning of Finance Management and roll of Finance Manager.
→ Level – Exposure to the topics and working knowledge of practical problems required so students can design system when they have to work in practical field.

Reference Book:

(1) Financial Accounting - Advanced Accounting
By R. L. Gupta (Sultanchand & Co.)

(2) Financial Accounting – Advanced Accounting
By M. C. Shukla & T. S. Grewal (S. Chand & Co.)

(3) Cost Accounting. - By B. K. Bhar (Academic Publisher.)

(4) Management Accounting. – By Ravi M. Kishor (Taxman Publisher).

(5) Cost Accounting. – By Ravi M. Kishor (Taxman Publisher).

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-309 System Analysis And Design

Teaching scheme (H/W)			Exam. Scheme (Marks)				
L	Tu	Prac	Th	Ss	Tw	Viva	Total
4	-	2	60	40	25	25	150

1. **Information and management** [4]
   - Data, Information, system - definition and examples,
   - types of information
   - Why CBIS ? (computer based information system),
   - management structure
   - Qualities of information,
   - Classifications or varieties of CBIS - TPS, MIS, DSS, OAS
2. **Information system analysis.** [6]
   - What is system analysis ?
   - what is system design ?
   - What is system analysis and design?
   - Characteristics of system - organization, interaction, interdependence, integration, central objective.
   - Elements of system analysis - output, input, files, processes
   - System approaches :
   i. System development Life cycle (SDLC) When and Why ?
   ii. Structured Analysis (The Paris model)
   iii. Prototyping, When and why prototyping ?
   -The role of system analysts,
   - Attributes of system analyst,
   - tools used by system analyst.(data dictionary, decision trees, decision tables, structured English)
   - The waterfall model (Classic life cycle or linear sequential model)
   - Boehm's Spiral model
3. **Information gathering (Fact finding)** [3]
   - Communication with people
   - Strategy to gather information, information sources (inside and outside of org.)
   - Methods of searching information - Interviewing, Questionnaires, System observations, Determinations of DFDs, New system
4. **Requirements specifications.** [2]
   - Data dictionary,
   - major symbols,
   - four rules,
   - Why data dictionary ?
5. **Feasibility Analysis.** [4]
   - Different types of Feasibility,
   - Cost-benefit Analysis (Present value of benefits),
   - Payback method, Examples.

6. Data flow diagrams. [3]
- What is DFDs ? ,
- Context diagram,
- Symbols used to construct DFDs,
- Rules to construct DFDs,
- Leveling of DFDs,
- Logical DFDs,
- Physical DFDs, Examples

7. Process Specifications. [5]
- Tools used in structured analysis
  i. Structured English (types of structured used, examples)
  ii. Decision tables (types of decision tables, examples)
  iii. Decision Trees (Examples)

8. Control, audit and security of information systems [2]
- Controls in information system,
- Audit of information systems,
- Security of information (computer virus)

9. System implementation. [2]
- Coding and unit test
- Employing programmers to write code,
- Using code Generator
- Testing : ensuring the quality,
- data takeon and conversion,
- User training,
- Going live
- The maintenance cycle.

10. Object Oriented Design. [9]
- Introduction
- Introduction to UML
- Relationship, Aggregation, Composites, Interfaces, Realization
- Components of UML
  - Use Cases, Use Case Diagrams, State Diagrams, Sequence Diagrams, Activity Diagrams

Practicals:
System Requirement Specification, Feasibility Study, DFD, Data Dictionary, System Analysis & Designing Case Study, UML Diagrams

Text-Books:
1. Analysis And Design of Information Systems.
   By V Rajaraman.
2. Sams Teach Yourself UML in 24 Hours
   By Joseph Schmuller

Reference Books:
1. Analysis and Design of Information Systems
   By James A. Senn
2. Systems Analysis And Design
   By Don Yeates, Maura Shields and David Helmy

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-401 Data Communication & Network

Teaching scheme (H/W)		Exam. Scheme (Marks)			
L	**Tu**	**Th**	**Ss**	**Tw**	**Total**
4	**-**	**60**	**40**	**25**	**125**

INTRODUCTION :

1). **Communication**, Block diagram of communication system, Types of communication, Telecommunication, Use of communication (TB1) [2]

2). **Communication channels**, Wavepropogation modes, TE, TM, TEM mode Frequency, Wavelength, Electromagnetic waves, serial and parallel data transmission, Wireless communication, types of noise, Wireless communication, Fiberoptics, coaxial cable, channel capacity, Frequency spectrum, Facsimile. (TB1) [4]

3). Design issues of **Modulation**, Amplitude modulation, Frequency modulation, Phase modulation, Base band system, Total power, carrier power, Digital communication, ASK, FSK, PSK, Line codes, Synchronous and Asynchronous modulation, Demodulation, Phase Locked Loop. (TB1) [3]

4). **Multiplexing**, SDM, FDM, TDM, Combined Multiplexing, TDM designing with counter, decoder and switches. (TB1) [3]

5). **RS 232**C standard, Voltage loop, positive and negative logic, Data bits, Slew rate, baud value, RS232 errors, Different lines of RS232 and functions, RS232 applications. (TB1) [3]

6). **Use of computer network**, open loop and closed loop network, Network topology, Mesh, Star, Ring, Tree, Bus, Tree topology, LAN, MAN, WAN. (TB1) [3]

7). **OSI model**, Introduction to each layers of OSI model. (TB1) [3]

8). **Physical layer, Transmission media**, Geostationary satellites, circuit switching and packet switching, N-ISDN, N-ISDN channels, N-ISDN interface, Functioning of each parts of ISDN, ISDN services, Broad band ISDN, B-ISDN and ATM reference model. (TB2). [3]

9). **Design issues of Data Link Layer**, Elementary data link protocols, UTOPIA protocol, Stop and Wait protocol. (TB2). [3]

10). **The Medium Access Sub Layer**, The channel allocation problem, ALOHA and CSMA protocols, IEEE Standard 802.3(Ethernet), 802.4(Token Bus), 802.5 (Token Ring), Comparison of 802.3, 802.4 and 802.5, ARP, arp command, RARP Setting hostname, using ifconfig, netsate command, ping tracing a connection, Gateway and routing protocols (TB2) [5]

11). **The Network Layer**, Network layer design issues, The Optimality principle, Shortest path routing, How Network Differ, The IP protocol, IP address, Internet Protocol (IP), Primary function of IP, Data delivery by IP, IP header (TB2). [5]

12). **The Transport Layer**, Ports, TCP architecture, UDP architecture, The Transport Service, Elements of Transport Protocol. (TB2) [4]

13). **The Application Layer**, Network Security, DNS Domain Name System. (TB2). [2]

TEXTBOOKS :-

1) Data Communication By W.L, Schweber.

2) Computer Networks By A.S.Tanenbaum. (Third Edition)

REF. BOOK :-

1) Data Communication and Networking By BehrouzForouzan.

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-402 Visual Programming

Teaching scheme (H/W)			Exam. Scheme (Marks)				
L	Tu	Pr	Th	Ss	Pr	Tw	Total
4	1	3	60	40	25	25	150

I **Introduction to Visual Basic. NET**

a. Integrated Development Environment [2]
- Understanding the IDE Components
- Creating VB Application
- Building a Console Application

b. Variables and Data Types [3]
- Types of Variable
- Variables as Objects
- Formatting Numbers
- Converting Variable types
- Scope & Lifte Time
- Operators
- Constant
- Arrays

II **Programming Fundamentals**

a. Flow Control Statements. [2]
- Decision Statements
- Loop Statments

b. Procedures [2]
- Subroutines and Functions
- Arguments passing
- Overloading

III **GUI Design & Event Driven Programming**

a. Designing windows Application [1]
- Designing the user interface
- Validating the data
- Exception Handling

b. Basic Windows Controls [4]
- Textbox, Label, ListBox, CheckedListBox, ComboBox, Scrollbar, Trackbar
- PictureBox, TabStrip, StatusBar, ProgressBar, Timer

c. Working with forms [2]
- Properties of forms
- Forms events
- Loading and showing forms
- Creating MDI Forms
- Building dynamic forms at runtime
- Designing Menus

d. Interacting With User [1]
   - MessageBox, InputBox
   - Custom Dialogbox
   - Interacting with keyboards
   - Common Mouse Events

e. More Windows Controls [4]
   - Common dialog controls
   - RichTextBox Control
   - Treeview, Listview, Imagelist, Toolbar controls

f. Handling Strings, Characters and Dates [1]

g. Storing data in Collection [1]

IV **Object Oriented Programming.**

a. Building Custom Classes [2]
   - Classes and Objects
   - Building the minimal Class
   - Operator Overloading

b. Working with Objects. [2]
   - Object Oriented Programming
   - Inheritance
   - Polymorphism
   - Keywords used with Inheritance

c. Building custom windows Controls. [1]

V **Accessing folders and files** **[2]**

a. IO Namespace and FileSystem component
b. Manipulating Folders and files
c. Accessing Files

VI **Programming with ADO.NET.**

a. Basic Data-Access Classes [1]
b. Storing data in datasets [1]
c. Update Operation with DataAdapter [1]
d. Building Data Bound Application [5]
   - Working with Typed Dataset
   - Data Binding
   - Navigating Records
   - DataGridView Control

e. Creating Reports [2]

Text Book : **Mastering Visual Basic 2008 (Wiley India Edition - Sybex)**
By- Evangelos Petroutsos

Reference Book: **Visual Basic 2008 - Sams Publication**
By – James Foxall
Programming Visual Basic 2008 – O'reilly
By – Tim Patrick

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-403 Mathematical Foundation of Computer Science - II

Teaching scheme :		Examination Scheme			
L	**Tu**	**Th**	**Ss**	**Tw**	**Total**
4	**-**	**60**	**40**	**25**	**125**

(Linear Algebra & Numerical Methods)

*** Linear Algebra ***

1. Vector Space [6]

→ Definitions and Examples
→ Vector Subspaces
→ Algebra of Subspaces
→ Linear Combination of Vectors, Linear span
→ Linear sum of two subspaces
→ Linear dependence and Linear independence of vectors
→ Basis of a vector space
→ Finite dimensional vector spaces
→ Dimension of a vector space
→ Dimension of a subspace
→ Homomorphism of vector spaces
→ Isomorphism of vector spaces
→ Direct sum of spaces

2. Linear Transformation [6]

→ Linear Transformations
→ Linear operator
→ Range and null space of a linear transformation
→ Rank and nullity of a linear transformation
→ Linear transformations as vectors
→ Product of linear transformations
→ Algebra of linear transformations
→ Invertible linear transformations
→ Singular and Non singular transformations

3.Matrices [6]

→ Basic Definitions
→ Algebra of Matrices (Addition, Subtraction, Multiplication)
→ Computation of Inverse (By Matrix method)
→ Row and Column Transformation (Elementary Transformation)
→ Computation of Inverse (By Elementary Transformation)
→ Rank of Matrix

4. Numerical Methods [10]

* **Solution of transcendental equations**
  - → Bisection Method
  - → Method of False-Position (Regula Falsi Method)
  - → Newton-Raphson Methods
* **Solution of Linear simultaneous equations**
  - → Gauss Elimination Method
  - → Gauss Jordan methods
  - → Jacobi's iteration method
  - → Gauss-Seidal iterative methods.

5. Interpolation [10]

- → Polynomial interpolation
- → Finite differences & difference tables
- → Gauss's forward and backward interpolation formula
- → Newton's Forward and Backward Interpolation Formula
- → Stirling, Bessels and Lagranges formula
- → Divided Differences and Newton's Divided Difference formula.

6. Numerical Integration [2]

- → Trapezoidal rule
- → Simpson's 1/3 Rule.
- → Simpson's 3/8 Rule.

Text Books:

1) Linear Algebra by J.N. Sharma & A. R. Vasishtha , Krishna Prakasan
2) Higher Engineering Mathematics By B. S. Grewal.

Ref. Book: Numerical Methods By S. S. Sastry

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-404 Database Management System

Teaching scheme (H/W)			Exam. Scheme (Marks)				
L	Tu	Pr	Th	Ss	Pr	Tw	Total
4	-	2	60	40	25	25	150

1. **Overview of Database System** [3]
   - Introduction Data, Database
   - Entities and relationships, properties,
   - Data and Data model, DBA,
   - Data independence.
2. **Database system Architecture** [2]
   - Three level of Architecture:
     - Internal level
     - External level
     - Conceptual level
   - DBMS and its functions
   - Data Communication Manager,
   - Client –Server Architecture
   - Utilities to help DBA
3. **Introduction to Relational Database** [2]
   - Informal look at relational model,
   - Relations and Relvars and what relations mean.
   - Optimization
   - Catalog
4. **Structured Query Language:** [9]
   - Data Definition Language
   - Data Manipulation Language
   - Transaction Control Language
5. **Domains, Relations and Base Relvars** [3]
   - Introduction
   - Domains
   - Relation values:
     - Attributes
     - Cardinality, Degree,
     - Properties of relations.
   - Relation Variables
6. **Relational Algebra** [3]

- Overview of the Original Algebra
  - Relational expressions
  - Operators:
    - Restrict, Project, Product, Union, Intersect, Divide, Difference, Join.
  - Additional Operators:
    - Semijoin, Semidifference, Extend, Summarize
  - Grouping and ungrouping.
  - Relational Comparisons

7. Relational Calculus [2]
- Tuple calculus
- Domain calculus.

8. Integrity [2]
- Keys: Candidate key, Foreign key, Primary key, Alternate key
- Domain constraints, Base table Constraints, General Constraints,
- Referential Action: Cascade, Restrict.

9. Views [2]
- Introduction
- What are views for?
    - Logical data independence
- View Retrievals
- View Updates.

10. Functional Dependencies [2]
- Basic Definitions
- Trivial and nontrivial dependencies
- Closure of a set of Dependencies
- Closure of a set of attributes
- Irreducible set of dependencies.

11. Normalization [3]
- Introduction
- Nonloss decomposition and functional dependencies
- First, Second and Third Normal Forms, **BCNF**
- Dependency preservation
- Denormalization.

12. Semantic Modeling [3]
- Introduction and overall approach
- E/R Model &E/R Diagrams
    - Entities, properties, relationships,
    - Entity subtypes and supertypes

13. Recovery [2]
- Introduction
- Transactions
- Transaction Recovery
    - The ACID Properties
- System Recovery
- Media Recovery
- Two Phase Commit.

14. Concurrency [2]
- Introduction
- Three concurrency problems
    - The lost update problem
    - The Uncommitted dependency problem
    - The Inconsistent Analysis Problem
- Locking
- Three concurrency problems revisited
- Deadlock, Serializability, Intent locking.

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

Practical Based Topics:

1. Data types: CHAR, VARCHAR2, DATE, NUMBER, LONG, RAW/ LONG ROW
2. CREATE TABLE, Creating a table from another table
3. INSERT, Inserting data into a table from another table
4. SELECT with WHERE, DISTINCT and ORDER BY clause
5. DELETE with WHERE clause, Deleting specific rows based on the data held by the other table
6. UPDATE with WHERE clause
7. ALTER TABLE with ADD, DROP COLUMN and MODIFY keyword
8. RENAME, TRUNCATE TABLE, DROP TABLE
9. CRATE SYNONYM
10. DROP SYNONYM
11. DESCRIBE
12. SELECT * FROM TAB;
13. **CONSTRAINTS:**
    - PRIMARY KEY
    - FOREIGN KEY WITH ON DELETE CASCADE and ON DELETE SET NULL
    - Assigning User Defined names to Constraints
    - UNIQUE
    - CHECK
    - NULL
    - NOT NULL
    - The USER_CONSTRAINTS Table
    - Applying and Dropping Constraints with ALTER TABLE Command
14. DEFAULTE value
15. Arithmetic Operators
    - Addition
    - Subtraction
    - Multiplication
    - Division
    - Exponentiation
    - Enclosed Operation
16. **Logical Operators:** AND, OR, NOT
17. BETWEEN… AND….
18. LIKE Predicate with Wildcard Characters
19. IN and NOT IN Predicates
20. DUAL Table
21. SYSDATE
22. **Aggregate Functions:** MIN, COUNT, MAX, SUM
23. **Numeric Functions:** ABS, POWER, ROUND, SQRT, EXP, EXTRACT, GREATEST, LEAST, MOD, TRUNC, FLOOR, CEIL.

24. **String Functions:** LOWER, INITCAP, UPPER, SUBSTR, ASCII, COMPOSE, DECOMPOSE, INSTR, TRANSLATE, LENGTH, LTRIM, RTRIM, TRIM, LPAD, RPAD, VSIZE.
25. **Conversion Functions:** TO_NUMBER, TO_CHAR, TO_DATE
26. **Date Functions:** ADD_MONTHS, LAST_DAY, MONTHS_BETWEEN, NEXT_DAY, ROUND, NEW_TIME
27. Manipulations on Date
28. Group By
29. Having with DISTINCT keyword
30. Subqueries, subquery in FROM clause, Correlated subqueries, multi column subqueries, with ORDER BY keyword, with EXIST and NOT EXIST keyword
31. JOIN, equi join, inner join, outer join, cross join, self join, left join, right join
32. Concatenating data from table columns
33. UNION, INTERSECT AND MINUS clauseDFGDFG

Text Book:

Database Management System
By: C. J. Date (Seventh Edition)

Reference Books:

Fundamentals of Database System
By: Navathe

Text Book for Practicals:

SQL, PL / SQL The Programing language of Oracle
Ivan Bayross

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-405 Java Programming

Teaching scheme (H/W)			Exam. Scheme (Marks)				
L	**Tu**	**Pr**	**Th**	**Ss**	**Pr**	**Tw**	**Total**
4	**1**	**3**	**60**	**40**	**25**	**25**	**150**

1. Introduction to Java [6]
   - History of Java
   - Features of Java
   - Difference between with C and C++
   - JDK tools
   - Anatomy of Application and Applet
   - Anatomy and structure of Java Program

2. Java Program Building elements [7]
   - Character set, keywords, identifiers
   - Structure of java program
   - Variables
   - Scope of variables
   - Blocks
   - Statements
   - Data Types
   - Operators and expressions
   - Programming style
   - Control Structure
   - Oops, Object, class and instance variables, methods, scope modifiers
   - Abstract class
   - Interfaces: How to create, implementation rules, partial implementation rules, extending interface
   - Packages

3. Arrays, String and Vector [3]
   - Arrays
   - String manipulation
   - String class and methods
   - Wrapper classes
   - Utility classes : Hashtable, StringTokenizer, Vector, Date, Calendar, Enumeration, ArrayList, Random, Timer

4. GUI (awt package, Font, Color, Image, Button, Label, TextField, TextArea, Choice, List, Scrollbar, Checkbox, CheckboxGroup, Dialog, Menus, Windows) [9]
   Layouts, awt package GUI Components

5. Event -Driven programming [4]
   - Applet Programming and GUI
   - Event-Delegation Model, Difference with event model
   - All Listeners and Event Objects

6. Exception Handling [2]
   - Exception types
   - How to use try, catch, throw, throws and finally clauses
   - Nested try, Multiple catch, Java's built-in Exceptions

7. Multithreading [2]
   - Java thread model
   - Creating threads
   - Thread priorities
   - Interthread communication
   - Synchronization
   - Blocking thread

8. Streams and IO [3]
   - The Stream classes
   - Byte Streams
     InputStream, OutputStream, FileInputStream, FileOutputStream, ByteArrayInputStream, ByteArrayOutputStream, BufferedByteStreams, RandomAccessFile
   - Character Streams
     Reader, Writer, FileReader, FileWriter, CharArrayReader, CharArrayWriter, BufferedReader, BufferedWriter

9. Graphics [2]
   - Drawing oval, arc, polygon, ractangle….
   - Font (Excluding FontMetrix)

10. Template [2]
    - Templates and its usefulness
    - How to create your own template
    - Advantages of using template
    - Examples

Text Book : 1. The Complete Reference JAVA 2.0
- By Patrick Naughton , Herbert Schildt (TMH)

Reference Books: 1. Programming in JAVA
- By Sachin Malhotra, Saurabh Choudhary (OXFORD)

2. Java Primer
- By E. Balagurusamy (TMH).

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-501 Internet Technologies & Programming

Teaching scheme (H/W)			Exam. Scheme (Marks)				
L	**Tu**	**Pr**	**Th**	**Ss**	**Tw**	**Pr**	**Total**
4	**1**	**3**	**60**	**40**	**25**	**25**	**150**

[Advanced JAVA]

1. Networking with Java [TB1] **[5]**
   - Sockets in Java
   - Java Net API
     - InetAddress Factory Methods & Instance Methods
     - Socket class & ServerSocket class
     - URL, URLConnection,
   - Working with Datagram
     - DatagramPacket, DatagramSocket class
   - Handling Multiple Clients Communication
   - Implementation using Java API

2. JFC & Adv. JFC [TB1] **[7]**
   - Java Foundation Classes
   - Swing Classes & Features
   - Graphics Programming using Panes
   - MVC Architecture
   - JApplet, Painting in Swing vs. AWT, Displaying Controls in Swing vs. AWT
   - JPanel, JFrame
   - Jcomponent, Jlabel, Jbutton, Tooltips and icons, JTextField, JPasswordField, JCheckBox, ButtonGroup, JRadioButton, JScrollPane, JSlider, JList, JComboBox JProgressBar, JTabbedPane, Overview of JTree & JTable
   - BoxLayout
   - Pluggable look and feel
   - Menus and toolbars, Popup Menus
   - Locales
   - Number Formats
   - Date & Time
   - Implementation using Java API

3. Object Serialization [TB1] **[1]**
   - Overview
   - How it works?
   - Creating Object Serialization based applications
   - Implementation using Java API

4. RMI [TB1] **[3]**
   - Introduction to RMI
   - RMI Architecture
   - Stub-skeleton Layer, Remote Reference Layer, Transport Layer
   - Sample RMI application, Deploying the RMI application ~~and its architecture~~
   - Implementation using Java API

5. JDBC [TB1] **[4]**
   - Overview
   - Different types of driver
   - JDBC classes overview
   - Metadata functions: Database Metadata and Resultset Metadata
   - Statement, Prepared Statement, CallableStatements (Excluding practical implementation of Callable Statement)
   - Enterprise Architecture Types
   - Implementation using Java API

6. Servlets [TB2] **[3]**
   - Introduction to dynamic pages
   - Features of Servlet
   - Servlet Engines
   - Lifecycle of servlet, Servlet API
   - Working with HttpServletRequest, HttpServletResponse
   - Deploying Servlet Application
   - Session Handling
   - Implementation using Java API

7. JSP [TB2] **[4]**
   - Introduction to JSP
   - JSP syntax and structure
   - JSP life cycle
   - JSP elements
     - Standard actions, Directives, Scripting elements, comments
   - JSP implicit objects & its methods
   - Implementation using Java API

8. Introduction to XML [TB1 & TB2] **[5]**
   - Introduction of XML
   - Use of XML
   - XML Parsers
   - Creating XML Documents
   - Creating Document Type Definition (DTD)
   - Creating XML Schema
   - Creating an XSLT
   - XHTML
   - Parsing XML using DOM & SAX Parser

9. Introduction to Web based Visual Programming [TB3] **[8]**
   - Introduction to ASP.NET
   - Visual Web Developer (IDE)
   - Web Form, Master pages
   - Web Controls
   - State Management
   - Website Navigation
   - Working with Data & Data Controls

Text Books:

1. Java 6 Programming Black Book
   DreamTech Press
2. Java Server Programming Java EE 5 Black Book
   DreamTech Press
3. Beginning Asp.Net 3.5 with VB 2008 From Novice to Professional
   Metthew MacDonald, Published by Apress.

Ref. Books:

1. Core Java 2 Volume II, Sun Microsystems
2. Java 2 Enterprise Edition Bible
3. J2EE Complete Reference
   Tata McGraw Hill

Tools for practical:

1. Eclipse Editor
2. Tomcat Server
3. JSDK
4. Visual Studio 2008

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-502 Operating System

Teaching scheme (H/W)			Exam. Scheme (Marks)				
L	Tu	Pr	Th	Ss	Tw	Pr	Total
4	-	2	60	40	25	25	150

1. Introduction to Operating System [4]

- Introduction
- OS as an extended machine & as a resource manager
- Single user OS
- Types of OS
- History of OS
- OS concepts (processes, files, system calls, shell)
- OS structure (monolithic systems, layered systems, virtual machines, client server model)
- Assembly language

2. Process Management: [7]

- Introduction to processor manager
- Process Model, process hierarchies, Interprocess communication,
- Process Scheduler (High level, Low level & Middle level)
- Process scheduling policies
- Process scheduling Algorithms
  - FIFO
  - SJN
  - Priority
  - SRT
  - RR
  - Multiple level queues
- Cache memory
- Parallel processing
- Typical Multiprocessing configurations
  - Master/slave
  - Loosely coupled
  - Symmetric
- Process Synchronisation software
  - Test –and-Set
  - Wait and Signal
  - Semaphores
- Process Cooperation
  - Producers and consumers
  - Readers and writers
- Explicit and Implicit parallelism

3. Memory management: [8]

- Introduction to memory manager
- Early memory allocation schemes
  - Single user contiguous scheme
  - Fixed partitions scheme
  - Dynamic partitions scheme, Best Fit vs. First Fit allocation, Deallocation
  - Relocatable dynamic partitions scheme
- Recent memory allocation schemes
  - Paged memory allocation
  - Demand paging allocation
  - Segmented memory allocation
  - Segmented / Demand paged allocation
  - Page replacement policies (FIFO, LRU, working set)
  - Virtual memory

4. Device Management: [6]

- Introduction to device manager
- System devices(dedicated ,shared and virtual)
- Sequential Access Storage Media (Magnetic tape, IRG ,IBG and blocking)
- Direct Access Storage Devices
  - Fixed head devices (magnetic recordable drum) and its Access time
  - Movable head devices (disk & disk packs) and its Access time
  - Optical disk storage
- Components of the I/O subsystem
- Communication among devices
  - Polling
  - Interrupts
  - DMA
  - Buffering & double Buffering
- Management of I/O Requests
  - I/O traffic controller, I/O scheduler & I/O device handler
  - Device handler seek strategies (FCFS ,SSTF ,SCAN ,C-SCAN ,LOOK , C-LOOK)
  - Search strategies(Rotational Ordering)
- RAID.

5. File Management **[6]**

- Introduction to file manager
- Definitions: field ,file ,database ,program files ,directories
- Device independence, Typical volume configuration, File dir tree structure ,File naming convention
- File organization
  - Record format(fixed length & variable length records)
  - Physical file organization (sequential record organization, direct record organization , Indexed sequential record organization)
- Physical storage allocation
  - Contiguous storage
  - Non contiguous storage
  - Indexed storage
- Data compression
- Access methods (Sequential and Direct access)

- Levels in file management
- Access control verification module (access control matrix, access control lists, capability lists and lockwords)

6. Deadlocks [5]

- Introduction to deadlock
- Seven cases of deadlock
  - Deadlock in file requests
  - Deadlock in databases
  - Deadlock in dedicated device allocation
  - Deadlock in multiple device allocation
  - Deadlock in spooling
  - Deadlock in disk sharing
  - Deadlock in network
- Conditions for Deadlock
  - Mutual exclusion
  - Hold and wait
  - No preemption
  - Circular wait
- Deadlock handling strategies
  - Deadlock Prevention
  - Deadlock Avoidance
  - Deadlock Detection and recovery
- Starvation

7. <u>Case study: LINUX Operating System.</u> [4]

- Process Management
- Device Management
- File Management
- Memory Management

<u>Practical Based Topics:</u>

- **List of Commands**: date ,clear ,pwd ,who ,who am I , cal ,mkdir, ls ,cd / cd .., touch , cat ,mv , rm, rmdir, wc , ps, | and > operator ,cp ,ln ,dir ,echo ,uname ,logname ,id ,tty , bc ,grep ,fgrep ,vi, cmp ,comm.,diff ,sort, unique ,ed ,cut ,paste ,split ,nl ,pr ,od ,chmod , head ,tail ,zip ,gunzip ,zcat ,zcomm ,sh ,bsh ,csh ,ksh ,alias, unalias
- Basic Shell scripts.

Text Book : 1.Understanding Operating Systems (3rd Edition)
By Ida M. Flynn and Ann McIver McHoes
(Thomson Learning Publication**)**

Reference Books :

1.Dhamdhere "Structured Programming and Operating Systems",
TMH
2. Andrew S. Tanenbaum "Modern Operating Systems" Prentice-Hall

For Practical:

3. Unix Operating System, Sumitabha Das.

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-503 Statistical Computing

Teaching scheme (H/W)		Exam. Scheme (Marks)			
L	**Tu**	**Th**	**Ss**	**Tw**	**Total**
4	**-**	**60**	**40**	**25**	**125**

1) **Statistical-Methods:** **[1]**
   Introduction: Statistical methods
   Collection and Classification of data
   Frequency Distribution (F.D.)
   Graphical Representation of F.D.

2) **Measures of Central Tendency:** **[5]**
   Arithmetic Mean, Median, Mode, Geometric Mean, Harmonic Mean, Relation between the measures of central tendency.

3) **Measures of Dispersion:** **[5]**
   Range, Quartile Deviation or semi-interquartile range, Mean Deviation, Standard Deviation, Relation between the measures of dispersion, Coefficient of variation.

4) **Moments, Skewness and Kurtosis:** **[7]**
   rth moment about mean and rth moment about any other point, relation between both these rth moments
   Skewness, types of skewness,
   Coefficient of skewness :: Pearson's Coefficient of skewness, Quartile Coefficient of skewness, Moment Coefficient of skewness
   Kurtosis, types of Kurtosis, Coefficient of Kurtosis

5) **Correlation** **[2]**
   Correlation, Types of Correlation, Coefficient of Correlation

6) **Probability:** **[6]**
   Definition of probability
   Events: Mutually exclusive events
   Independent events
   Compound events
   Permutation and Combination
   Addition and Multiplication law of Probability for independent events
   Conditional Probability.
   Compound Probability theorem
   Inverse Probability theorem. (Bay's Theorem)

7) Random Variable & Probability Distribution : **[6]**

Random variables,
Discrete and continuous probability distribution
Discrete and continuous probability functions
Expectation, Variance, S.D., Q.D., M.D.
r^{th} moment about mean, Skewness, kurtosis of both the probability distribution
Moment generating function.

8) Repeated Trials & Theoretical Distributions: **[5]**

(a) Binominal Distribution: Constant and applications
(b) Poisson Distribution: Constant and applications
(c) Normal Distribution: Properties and applications
(d) Some other Distributions: Uniform or Rectangle Distribution,Geometric Distribution, Negative Distribution, Hyper geometric Distribution, Exponential Distribution, Weibull Distribution

9) Sampling and sampling Distribution: **[3]**

Testing a hypothesis, Test of significance for large samples.
(a) Students-t-Distribution: Properties, significance test of a sample mean,significance test of difference between sample means.
(b) CHI-SQUARE(X2) Test:
Chi-Square Distribution, Properties and significance test of X2 distribution.
(c) Fisher' Z Distribution and F-Distribution: Significance test and properties of F-distribution.

Text book : 1. Higher Engineering Mathematics By Dr. B. S. Grewal.

Reference books: 1. Engineering mathematics Part-I By Shantinarayan
2. Quatitative techniques in management By N D Vohra

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-506 Software Verification & Validation

Teaching scheme (H/W)			Exam. Scheme (Marks)				
L	Tu	Pr	Th	Ss	Tw	Pr	Total
4	-	2	60	40	25	25	150

1. **Principles of Testing:-**
   - -Context of testing in producing software [1]
   - -Dijkstra's Doctrine
   - -Test in Time [1]
   - -Test the Tests first

2. **Software Development Life Cycle Models (Introduction):-**
   - -Phases of Software Project [1]
   - -Quality Assurance and Quality Control
   - -Testing, Verification and validation concepts
   - -Life Cycle Models [2]
     - o Waterfall
     - o Prototype
     - o Spiral
     - o V Model and Modified V Model

3. **White Box Testing:-**
   - -What is White Box Testing? [2]
   - -Static testing by Humans
   - -Static Analysis Tools [1]
   - -Structural Testing
     - o Unit/ Code Functional Testing
     - o Code Coverage Testing [1]
     - o Code Complexity Testing [1]
   - -Challenges in White Box Testing

4. **Black Box Testing:-**
   - -What is Black Bok Testing and what is its importance? [2]
   - -When to do Black Box Testing?
   - -How to do Black Box Testing?
     - o Requirement based testing [1]
     - o Positive and Negative testing
     - o Boundary Value Analysis [1]
     - o Decision Tables [1]
     - o Equivalence Partitioning
     - o Graph based Testing [1]
     - o Compatibility Testing

5. **Integration Testing:-**
   -Introduction [1]
   -Top-Down Integration
   -Bottom-Up Integration [1]
   -Bi-Directional Integration [1]
   -System Integration

6. **System and Acceptance Testing:-**
   -System Testing Overview [2]
   -Functional System Testing
      - Beta Testing
   -Non-Functional System Testing [1]
      - Stress Testing
      - Interpretability Testing
   -Acceptance Testing [1]
      - Acceptance Criteria, Selecting Test Cases
      - Executing Acceptance Tests
      -

7. **Performance Testing:-**
   -Introduction [1]
   -Factors governing performance testing
   -Methodology for performance testing
      - Collecting Requirement [1]
      - Writing Test Cases
      - Executing and Analyzing Performance test case [1]
      - Performance Tuning
      -

8. **Regression Testing:-**
   -Introduction [1]
   -Types of Regression Testing
   -Understanding the Criteria for selecting Test Case [1]
   -Classifying Test Cases
   -Methodology for selecting Test Case

9. **Test Planning, Management, Execution and Reporting:-**
   -Test Planning
      - Preparing a Test Plan [1]
      - Deciding Features to be tested/ Not Tested [1]
      - Deciding Test Approach/ Strategy [1]
      - Setting up Criteria for Testing [1]
      - Identify Resource Requirement [1]
      - Activity Breakdown and Scheduling Process
      - Test Case Specification [1]
      - Update of Traceability Matrix
      - Developing and Executing Test Cases [1]
      - Collecting and Analyzing Metrics [1]
      - Test Summary Report

10. Static Verification:-

-Introduction [1]
-Design and Code Reviews [1]
-Program Inspection and checklist [1]
-Mathematically based verification [1]

Text Book: **Software Testing Principles and Practices**
By: Srinivasan Desikan and Gopalaswamy Ramesh
Publisher: Pearson Education

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-507 E-Commerce & Web Technologies

Teaching scheme (H/W)			Exam. Scheme (Marks)				
L	Tu	Pr	Th	Ss	Pr	Tw	Total
4	-	2	60	40	25	25	150

1. **Introduction to E-Commerce** [4]
   - E-Commerce & Physical Commerce
   - Types of E-Commerce & Examples
   - Advantages & Myths

2. **Client side Programming** [2]
   - Important factors in client-side or web programming
   - Web page design and production
     - Define the audiences and the information requirements
     - Develop the logical design of the web site
     - Develop the perceptual design
     - Content creation
     - Programming
   - Posting and hosting the site

3. **Server side Programming** [10]
   - Introduction of Server Side Programming
   - Building Blocks of PHP
   - Flow Controls functions in PHP
   - Functions
   - Arrays
   - Including Files
   - Object Oriented PHP
   - Overview of MySQL
   - Features of MySQL
   - Database Connectivity with MySQL
   - Working with Forms
   - Session Handling
     - Traditional session tracking techniques
     - Hidden form field
     - URL rewriting
     - H'ITP user authentication
     - Cookies
     - Comparison of the above session tracking methods
   - Session Handling with PHP

4. Basic cryptography for enabling e-commerce [3]

- Security concerns
- Security requirements
- Encryption
- Two basic principles for private key encryption
  - Data encryption standard
  - Other symmetric key encryption algorithm
- Public key encryption
- RSA encryption
- Hybrid encryption
- Stream cipher and block cipher
- Message digest
- Digital signature
- Authentication
  - Digital certificate
- Note: Exclude all algorithms

5. Internet Security [3]

- Firewalls
- Different types of firewalls
  - Packet filtering router
  - Application gatewaylproxy server
  - Circuit level gateway
- Examples of firewall systems
- Overview of Secure socket layer (SSL)

6. Advanced Technologies for E-Commerce [5]

- WAP: the enabling technology for mobile commerce
  - The WAP model
  - WAP architecture
  - Benefits of WAP to e-commerce
  - WML
  - M-Commerce Payment Systems
  - M-Commerce Applications

7. Internet Payment Systems [3]

- Characteristics of Payment Systems
- 4C Payment Methods
- SET Protocol for Credit Card Payment
- Ecash
- Echeck
- Micropayment System

8. Consumer Oriented E-Commerce [3]

- Introduction
- Traditional retailing & E-retailing
- Benefits of E-Ratailing
- Key Success Factors
- Models of E-Retailing
- Features of E-Retailing

9. Business Oriented E-Commerce [3]

- Features of B2B E-Commerce
- Business Model

10. E-Services [4]

- Categories of E-Services
- WebEnabled Services
- Matchmaking Services
- Information-Selling on the Web
- E-Entertainment
- Auctions and Other Specialized Services

Practical Based Topics:

Practical based on PHP and MySQL & minor project
Minor Project should be documented in term-work along with lab practical.

Text Book:

1. E Commerce Fundamentals & Applications
   By: Wiley India Edition

Reference Books:

1. E Commerece Framework Technologies & Application
   Tata McGraw Hill, By Bharat Bhasker

Text Book for Practicals:

1. Sams Teach Yourself PHP, MySQL & Apache All in one

DHARMSINH DESAI UNIVERSITY, NADIAD
FACULTY OF INFORMATION SCIENCE

BCA-601 Project Industrial Training

Exam. Scheme (Marks)

Practical	Term-Work	Total
300	100	400

BCA-602 Seminar

Exam. Scheme (Marks)

Term-Work	Total
100	100