-: પરિપત્ર :-

બી.સી.એ./ બી.એસસી.(કોમ્પ્યુટર સાયન્સ) તથા એમ.એસસી.(કોમ્પ્યુટર એપ્લીકેશન)તથા એમ.સી.એ.નો અભ્યાસક્રમ ચલાવતી સંલગ્ન કોલેજોના આચાર્યશ્રીઓને તથા ડીપાર્ટમેન્ટના વડાશ્રીઓને જણાવવાનું કે, શૈક્ષણિક વર્ષ ૨૦૨૧–૨૨ થી અમલમાં આવનાર B.C.A. (2nd Year), B.Sc.(Computer Science) દ્વિતિય વર્ષ , M.Sc.(C A) દ્વિતિય વર્ષ, M.C.A. દ્વિતિય વર્ષના અભ્યાસક્રમ અંગે તા.૦૭/૦૧/૨૦૨૧ની સભામાં નીમેલ પેટાસમિતિએ તૈયાર કરેલ અભ્યાસક્રમ કોમ્પ્યુટર સાયન્સ અભ્યાસસમિતિ તથા કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખાની તા.૧૦/૦૫/૨૦૨૧ની સભાનાં ઠરાવ ક્રમાંક:૨ અન્વયે સ્વીકારી તે મંજૂર કરવા એકેડેમિક કાઉન્સિલને કરેલ ભલામણ એકેડેમિક કાઉન્સિલે તેની તા. ૨૧/૦૫/૨૦૨૧ ની સભાના ઠરાવ ક્રમાંક : ૦૨ અન્વયે મંજૂર કરેલ છે. તેની જાણ સંબંધકર્તા શિક્ષકો અને વિદ્યાર્થીઓને કરવી, તદ્ઉપરાંત તેનો અમલ કરવો.

કોમ્પ્યુટર સાયન્સ વિષયની અભ્યાસસમિતિ તથા કોમ્પ્યુટર સાયન્સ વિદ્યાશાખાની તા.૧૦/૦૫/૨૦૨૧ની સભાનાં ઠરાવ ક્રમાંક: ૨

:: આથી ઠરાવવામાં આવે છે કે, કોમ્પ્યુટર સાયન્સ વિષયની અભ્યાસસમિતિની તા.૭/૦૧/૨૧ની સભામાં નીમેલ પેટાસમિતિએ તૈયાર કરેલ નીચે મુજબ નાં નવા અભ્યાસક્રમ મંજૂર કરી તે મંજૂર કરવા એકેડેમિક કાઉન્સિલને ભલામણ કરવામાં આવે છે.

(૧) B.C.A. (2nd Year) નો અભ્યાસક્રમ સબકમીટીએ તૈયાર કરેલ અભ્યાસક્રમને સ્વીકારી ફેકલ્ટીને ભલામણ કરવામાં આવે છે.

(૨) B.Sc. (Computer Science) દ્વિતિય વર્ષનો અભ્યાસક્રમ સબકમીટીએ તૈયાર કરેલ અભ્યાસક્રમને સ્વીકારી ફેકલ્ટીને ભલામણ કરવામાં આવે છે.

(૩) M.Sc. (CA) દ્વિતિય વર્ષનો અભ્યાસક્રમ સબકમીટીએ તૈયાર કરેલ અભ્યાસક્રમને સ્વીકારી ફેકલ્ટીને ભલામણ કરવામાં આવે છે.

(૪) M.C.A. દ્વિતિય વર્ષના અભ્યાસક્રમ સબકમીટીએ તૈયાર કરેલ અભ્યાસક્રમને સ્વીકારી ફેકલ્ટીને ભલામણ કરવામાં આવે છે.

એકેડેમિક કાઉન્સિલની તા.૨૧/૦૫/૨૦૨૧ની ઠરાવ ક્રમાંક:૦૨

:: આથી ઠરાવવામાં આવે છે કે, કોમ્પ્યુટર સાયન્સ વિષયની અભ્યાસસમિતિ તથા કોમ્પ્યુટર સાયન્સ વિદ્યાશાખાએ તેની તા. ૧૦/૦૫/૨૦૨૧ ની સભાના ઠરાવ ક્રમાંક : ૨ અન્વયે સ્વીકારેલ નીચે મુજબનાં અભ્યાસક્રમો મંજૂર કરવામાં આવે છે.

(૧) B.C.A. (2nd Year) નો અભ્યાસક્રમ
(૨) B.Sc. (Computer Science) દ્વિતિય વર્ષનો અભ્યાસક્રમ
(૩) M.Sc. (CA) દ્વિતિય વર્ષનો અભ્યાસક્રમ
(૪) M.C.A. દ્વિતિય વર્ષના અભ્યાસક્રમ

બિડાણ: ઉપર મુજબ

ક્રમાંક : એકે./પરિપત્ર/૭૦૧૫/૨૧
તા.૨૮/૦૫/૨૦૨૧

ઈ.ચા.કુલસચિવ

પ્રતિ,
૧) બી.સી.એ./ બી.એસસી.(કોમ્પ્યુટર સાયન્સ) તથા એમ.એસસી.(કોમ્પ્યુટર એપ્લીકેશન) નો અભ્યાસક્રમ ચલાવતી સંલગ્ન કોલેજોના આચાર્યશ્રીઓ તથા ડિપાર્ટમેન્ટના વડાશ્રીઓ.
૨) ડીનશ્રી, કોમ્પ્યુટર સાયન્સ એન્ડ ઈન્ફોર્મેશન ટેકનોલોજી વિદ્યાશાખા
૩) પરીક્ષા નિયામકશ્રી, પરીક્ષા વિભાગ, વીર નર્મદ દ. ગુ. યુનિવર્સિટી, સુરત.

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
Syllabus for S. Y. B. Sc 3rd Semester (Computer Science)
with effect from June 2021

Name of Program	Bachelor in Computer Science
Abbreviation	B.Sc.(Computer Science)
Duration	3 Years (Full Time – Regular Course)
Eligibility	Candidate must have passed standard 12th (H.S.C.) Examination in Science stream through Gujarat Higher Secondary Board (G.H.S.E.B.) or any other equivalent board (C.B.S.E. / I.C.S.E.) with English subject. Students passed with vocational stream in 12th(H.Sc.) are also eligible. Candidate passed ITI and Diploma are eligible as per the norms of Gujarat Government.
Objective of the Program	The basic objective of the program is to open a channel of admission for computing courses for students, who have done the 10+2 and are interested in taking computing/IT as a career. The program caters to the needs of the students aspiring to excel in the fields of computers. The program is designed to develop computer professionals versatile in almost all field of computer application .The main emphasis of the course is preparing students in the field of computer science and application areas of computer science including software development skills.
Program Outcome	It will open field for the aspiring students to opt further career or masters' level study in the fields of Research, Design, Architecture and software development. It is also preparing aspiring students to work in companies at entry levels and also independently.
Medium of Instruction	English
Program Structure	Three years of Graduate level course comprises of six semesters.

Course Structure for Second Year B.Sc.(Computer Science) Semester-III

Course	Paper Code	Paper Title	Theory (Marks)		Practical (Marks)		Total Credits
			Internal	External	Internal	External	
Core Compulsory	301	Object Oriented Programming: C++	20	50	10	20	3
	302	System Development using c# .Net	20	50	10	20	3
	303	Relational Database Management System - 1	20	50	10	20	3
IDS: Can course	ID-01 ID-02 ID-03	E-Commerce and Cyber Security Computerized Accounting Business Systems	20	50	-	-	2
Foundation Elective (to be selected from NCC / NSS / Saptadhara)			NIL	-	-	-	2
Total:							**13**

For Practical:

1. Batch Size – 25 Maximum

2. The journal should be certified by the concerned faculty and also by the Head of the Department, failing which the student should not be allowed to appear for External Practical Examination.

3. P.N.: In case of Generic Elective Paper available in both semesters, it can be opted only during one semester. The same title cannot be repeated in another semester.

Course Code	Theory		Practical		University Examination (Theory + Practical)		Internal Marks	Total Marks
	Credit	Hours	Credit	Hours	Duration	Marks		
301	2	2	1	2	2	50+20	20+10	100
302	2	2	1	2	2	50+20	20+10	100
303	2	2	1	2	2	50+20	20+10	100
IDS: Can course	2	2	-	-	2	50	20	70
Total:	**8**	**8**	**3**	**6**	**8**			

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
S Y B. Sc. (Computer Science)
Syllabus for S. Y. B. Sc. Semester-III
Effective From: June 2021
Course: 301: Object Oriented Programming: C++

Course Code	301
Course Title	Object Oriented Programming : C++
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2018
Purpose of Course	This course imparts the knowledge of Object Oriented Programming Language. The concepts of class, objects and related features of OOPs are covered in this course. The course is aimed to give inner depth of Object oriented programming language concepts.
Course Objective	To make students understand concepts of Class and Objects. To make students understand concepts of Inheritance, Polymorphism. To make students understand the basic concepts of Constructors/Destructors. To make students understand function overloading, operator overloading, virtual functions. To make students understand concepts of arrays, pointers, dynamic memory allocation
Pre-requisite	Concepts of C programming Language.
Course Out come	At the end of the course, student is expected to have clear concepts about the Class, Objects and related terminologies. Students can apply object oriented concepts which is essential for further studies.
Course Content	**Unit 1: Introduction to OOP** 1.1 Introduction to OOP, Features of OOP, Advantages of OOP 1.2 Difference between OOP and Procedural programming 1.3 Class, Object, Data member, member function 1.4 Access specifier - private, public, protected 1.5 Constructor and destructor, parameterized constructor, copy constructor, default constructor 1.6 Nested classes. 1.7 Inline function, default arguments 1.8 Friend functions, friend classes 1.9 Array of objects 1.10 new, delete operators and this pointer **Unit 2: Inheritance** 2.1 Base and derived class 2.2 Single inheritance 2.3 Multilevel and Multiple inheritance 2.4 Hybrid inheritance 2.5 Using constructor in inheritance 2.6 Abstract base class

	Unit : 3 Polymorphism
	    3.1 Overloading and overriding
	    3.2 Function overloading
	    3.3 Operator overloading rules and implementation
	    3.4 Virtual function
	    3.5 Early binding and late binding, runtime polymorphism
	    3.6 pure virtual function and its benefits
	
	Unit 4: File handling and Template
	    4.1 File - input and output - file opening modes
	    4.2 text and binary files
	    4.3 read, write operations
	    4.4 Benefits of text and binary files.

Reference Books:	1. The complete reference C++ : Herbert Schildt, TMH. 2. Object Oriented Programming in C++ : Robert Lafore - Galgotia Publication. 3. C++ : Effective Object Oriented Software Construction - Kayshav Dattari. 4. Object Oriented Programming using C++ - Addition Wesley. 5. Object Oriented Programming in C++ - Balaguruswamy.
Teaching Methodology	Discussion, Independent study, Seminars and Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on end semester written examination

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
S Y B. Sc. (Computer Science)
Syllabus for S. Y. B. Sc. Semester-III
Effective From: June 2021
Course: 302: System Development using C#.Net

Course Code	302
Course Title	System Development using C#.Net
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2018
Purpose of Course	This course imparts the knowledge of primarily an integrated, interactive development environment ("IDE"). The visual studio-IDE has been highly optimized to support rapid application development ("RAD"). It is particularly easy to develop graphical user interfaces and to connect them to handler functions provided by the application.
Course Objective	To make students understand concepts of GUI and .NET Framework. To make students able to develop desktop based applications along with databases.
Pre-requisite	Concepts of GUI.
Course Out come	At the end of the course, student is expected to have clear concepts about the GUI, IDE, CLR and Rapid Application development Tool. Students can understand the concept of front-end tool as a base for developing interactive project.

Course Content	**Unit-1: OVERVIEW OF MICROSOFT .NET FRAMEWORK**
	    1.1. What is .net framework & its benefits
	    1.2. The Common Language Runtime(CLR), Purpose of CLR
	    1.3. Managed/Unmanaged code, Compilation & Exception
	    1.4. Memory Management, Garbage Collection
	    1.5. The .Net Framework Class Library.
	    1.6. Introduction to MS Visual Studio .NET
	
	Unit-2: C#.NET PROGRAMMING LANGUAGE
	    2.1 Data Types, Types Conversion Functions, Operator & Exceptions
	    2.2 Variable Declaration : Level, Lifetime, Scope & Accessibility
	    2.3 Decisions Structures
	    2.4 Loop Statements: While, Do…. Loop, For…Next, For Each…Next
	    2.5 Nested Control Statements, Exit Statement
	    2.6 Exception Handling
	        2.6.1 Exception Handling Overview ,
	        2.6.2 Structures Exception Handling, Debugging

	Unit-3: Designing Using Interface 3.1 Working with Forms 3.2 Basic Windows Controls 3.3 Menus, Timer, Common dialog control, Rich Textbox 3.4 Treeview & Listview controls, Toolbar, Statusbar 3.5 SDI & MDI Application **Unit-4: Data Access** 4.1 History of Microsoft Data Access Technologies 4.2 Overview of ADO.NET 4.3 The Server Explorer & Query Builder 4.4 ADO.NET Object Model 4.5 Programming ADO.NET-provider, Adapter, Reader, command objects 4.6 Disconnected Architecture
Reference Books:	1. Beginning c# by wrox publication 2. Programming in c# by E. Balaguruswami TMH 3. Visual C#.Net Black book by Kogent Learnig Solutions 4. Professional C# by wrox Publication
Teaching Methodology	Discussion, Independent study, Seminars and Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on end semester written examination

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
S Y B. Sc. (Computer Science)
Syllabus for S. Y. B. Sc. Semester-III
Effective From: June 2021
Course: 303: Relational Database Management System -I

Course Code	303
Course Title	Relational Database Management System –I
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2018
Purpose of Course	This course imparts the knowledge of Database Management System, Entity Relationship model, Relational Model, SQL (DDL, DML and DCL).
Course Objective	To make students understand concepts of Database. To make students understand concepts of Entity Relationship Management. To make students understand the basic concepts of Relational Model. To make students able to work with various SQL statements.
Pre-requisite	Concepts of Data and Data storage.
Course Out come	At the end of the course, student is expected to have clear Concepts about database, storage of data, database models, Entity and relationship, various keys and SQL.
Course Content	**Unit-1: Introduction to DBMS** 1.1 Concepts of Database and Database System 1.2 Requirement of database system.(data integrity, data isolation, data consistency, Data redundancy, Concurrency) 1.3 Data models and data independence 1.4 DDL, DML 1.5 Database Manager, Database Administrator. **Unit-2: Entity Relationship Models** 2.1 Entities and Entity sets 2.2 Relationship and relationship sets 2.3 Mapping constrains 2.4 Super Key, Candidate Key, Primary keys, Foreign Key, Unique Key 2.5 Integrity constraints-Domain, Entity and Referential 2.6 Entity Relationship diagram and reducing it to tables. 2.7 Structure of relational database. **Unit-3: SQL-1 : DDL and DML statements** 3.1 Overview of SQL and Database system (mySQL / SQLServer / PostgreSQL / Oracle etc), Loading and Dumping a Database. 3.2 Various data types and operators: logical, wildcard operators 3.3 DDL Statements: 3.3.1. CREATE TABLE command - Declaring Constraints,

	Table level Constraints, attribute level constraints, PRIMARY KEY constraint, FOREIGN KEY constraint, Limitation of Foreign key , On Delete Cascade 3.3.2 Altering a table, Dropping a table. 3.4. DML Statements: 3.4.1. INSERT statement, INSERT FROM statement. 3.4.2 UPDATE, UPDATE with multiple columns, Updating to NULL values, using sub queries with UPDATE command, 3.4.3 DELETE statement **UNIT 4 SQL-2: DQL statements** 4.1. SELECT statement- FROM and WHERE clause, ORDER BY, with NULL 4.2 Formatting Query output : Ordering output by fields, multiple columns, Aggregate Group, Column number, String and expressions , functions in query 4.3 Use of operators: Use of relational operators, use of Boolean operators, IN, BETWEEN, LIKE, NOT IN , 4. 4 Use of Table and Column Alias 4. 5 Retrieval of information from tables: GROUP BY clause, HAVING clause 4.6 Use of aggregate functions: avg(), max(), min(), sum(), count()
Reference Books:	1. Henry Kroth & Silbershats, Database System Concept. 2. C.J. Date, Introduction to Database Design, Addition Wesley, Nasora. 3. Martin Gruber, Understanding SQL, BPB Pub., New Delhi. 4. Ivan Bayross, SQL, PL/SQL The Programming Language of ORACLE, BPB Pub., New Delhi. 5. SQL / PLSQL programming By P.S. Despande wiley Dream Tech Pub. 6. J Ullman, Principles of Database Systems, Galgotia Pub., New Delhi. 7. ORACLE Manuals. 8. SQL Manuals 9. ORACLE 10g The Complete Reference, ORACLE Press, TMH, Delhi. 10. Oracle PL/SQL programming - Oracle press - Tata McGraw hill.
Teaching Methodology	Discussion, Independent study, Seminars and Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on end semester written examination

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
Syllabus for S. Y. B. Sc (Computer Science)
with effect from June 2021

Name of Program	Bachelor in Computer Science
Abbreviation	B.Sc.(Computer Science)
Duration	3 Years (Full Time – Regular Course)
Eligibility	Candidate must have passed standard 12th (H.S.C.) Examination in Science stream through Gujarat Higher Secondary Board (G.H.S.E.B.) or any other equivalent board (C.B.S.E. / I.C.S.E.) with English subject. Students passed with vocational stream in 12th(H.Sc.) are also eligible. Candidate passed ITI and Diploma are eligible as per the norms of Gujarat Government.
Objective of the Program	The basic objective of the program is to open a channel of admission for computing courses for students, who have done the 10+2 and are interested in taking computing/IT as a career. The program caters to the needs of the students aspiring to excel in the fields of computers. The program is designed to develop computer professionals versatile in almost all field of computer application .The main emphasis of the course is preparing students in the field of computer science and application areas of computer science including software development skills.
Program Outcome	It will open field for the aspiring students to opt further career or masters' level study in the fields of Research, Design, Architecture and software development. It is also preparing aspiring students to work in companies at entry levels and also independently.
Medium of Instruction	English
Program Structure	Three years of Graduate level course comprises of six semesters.

Course Structure for Second Year B.Sc.(Computer Science) Semester-IV

Course	Paper Code	Paper Title	Theory (Marks)		Practical (Marks)		Total Credits
			Internal	External	Internal	External	
Core Compulsory	401	Data Structure using C++	20	50	10	20	3
	402	Web Development using C#.Net	20	50	10	20	3
	403	Relational Database Management System - 2	20	50	10	20	3
IDS: Can course	ID-01 ID-02 ID-03	E-Commerce and Cyber Security Computerized Accounting	20	50	_	_	2
Foundation Elective (to be selected from NCC / NSS / Saptadhara)			NIL	-	-	-	2
Total:							**13**

For Practical:

1. Batch Size – 25 Maximum
2. The journal should be certified by the concerned faculty and also by the Head of the Department, failing which the student should not be allowed to appear for External Practical Examination.
3. P.N.: In case of Generic Elective Paper available in both semesters, it can be opted only during one semester. The same title cannot be repeated in another semester.

Course Code	Theory		Practical		University Examination (Theory + Practical)		Internal Marks	Total Marks
	Credit	Hours	Credit	Hours	Duration	Marks		
401	2	2	1	2	2	50+20	20+10	100
402	2	2	1	2	2	50+20	20+10	100
403	2	2	1	2	2	50+20	20+10	100
IDS: Can course	2	2	-	-	2	50	20	70
Total	8	8	3	6	8			

VEER NARMAD SOUTH GUJARAT UNIVERSITY - SURAT

Course Code	401
Course Title	Data Structure using C++
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2018
Purpose of Course	This course imparts the knowledge of Data Structure. The concepts of Primitive and non-primitive data structures are covered in this course. It covers concepts of Arrays, Stack, Queue, Link list and sorting searching methods. The course is aimed to give inner depth and practical implementation of non-primitive data structures and its related applications.
Course Objective	To make students understand concepts of Primitive and non-primitive Data structure. To make students understand concepts of stack, queue and types of queues. To make students understand the implementation of Link-list and related applications. To make students understand concept of polish notation. To make students work with searching and sorting techniques.
Pr-requisite	C++ programming Language.
Course Out come	At the end of the course, student is expected to have clear concepts about the primitive and non-primitive data structure. Implementation of non-primitive data structure. Application implementation using stack, queue, link list.

Course Content	**Unit 1: Introduction**
	    1.1 Introduction data structure and its types
	    1.2 Array, structure, union, self referential structure
	    1.3 Concept of Algorithm analysis
	    1.4 Algorithm performance Analysis criteria (Time / Space)
	    1.5 Average case / Best Case / Worst case
	
	Unit 2: Linear Data Structures
	    2.1 Stack data structure, operations on stack (Push, Pop, Peep)
	    2.2 Applications of stack(Recursion, Evaluation of postfix, converting infix to postfix)
	    2.3 Simple Queue data structure and its operations (insert, delete and view)
	    2.4 Circular queue, Dequeue and Priority queue
	    2.5 Applications of queue (printer queue simulation, round robin Algorithm, Simulation)

	Unit 3: Non-linear data structures 　　3.1 Linked list - representation, advantages and disadvantages 　　3.2 Various operations on one way (singly) linked list 　　3.3 Various operations on two way (doubly) linked list 　　3.4 Various operations on circular linked list 　　3.5 Introduction to Tree and Binary tree 　　3.6 Tree traversal methods 　　3.7 Concept and Applications of Binary Search Tree (No practical implementation) **Unit 4: Searching and Sorting** 　　4.1 Searching Techniques- linear search, Binary search 　　4.2 Sorting - Internal and external sort 　　4.3 Quick sort 　　4.4 Merge sort 　　4.5 Insertion sort 　　4.6 Selection sort
Reference Books:	1. An Introduction to Data Structure with Applications : Trembley & Sorenson – McGraw Hill 2. Data Structures Using C & C++ - Langsam, Augenstein & Tanenbaum - PHI 3. Wirth, Niclaus, Algorith+Data Structure Programs, Prentice Hall. 4. Horwith E and Sahni S, Fundamental of Data Structure, Computer Science Press. 5. Aho A.V., Hopcrott and Ullman, Data Structure and Algorithms , Addition – Wesslely.
Teaching Methodology	Discussion, Independent study, Seminars and Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on end semester written examination

Note: Practical should be done using C++

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
S Y B. Sc. (Computer Science)
Syllabus for S. Y. B. Sc. Semester-IV
Effective From:June 2021
Course: 402: Web Development using C#.Net

Course Code	402
Course Title	Web Development using C#.Net
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2018
Purpose of Course	This course imparts the knowledge of web programming based on .NET technology. It covers the concepts of ASP.NET server controls, Client server communication, ADO .NET technology, Web Service Development etc. The course is aimed to give inner depth of ASP .NET technology.
Course Objective	To make students understand concepts of ASP .NET. To make students understand concepts of Server controls. To make students understand the basic concepts of client server communication. To make students understand of ADO .NET technology. To make students understand concepts of web config.
Pre-requisite	Concepts of .NET technology Framework and CLR.
Course Out come	At the end of the course, student is expected to have clear concepts about the ASP .NET. Students can apply .NET technology for implementing applications.

Course Content	**Unit 1: Introduction ASP.Net Web development**
	    1.1 Introduction to ASP.Net
	    1.2 Structure of ASP.Net Application
	    1.3 ASP.Net Application Life Cycle
	    1.4 ASP.Net Page Life Cycle
	    1.5 Request Object & Response Object
	    1.6 Page Class
	    1.7 web.config & global.asax file
	    1.8 Introduction to ASP.NET Core Framework and MVC architecture
	
	Unit 2: Application Designing
	    2.1 Basic Standard Controls
	    2.2 Master Page in ASP.NET
	    2.3 Navigation Control: Treeview, Menu & SiteMapPath
	    2.4 CSS, Theme & Skin file in ASP.NET
	    2.5 Validation Controls
	    2.6 AdRotator Control

	Unit 3: Accessing data using ADO.Net
	3.1 Introduction to ADO.Net [Data Provider, Data Set]
	3.2 Connection Object, Command Object, Data Adapter Object
	3.3 Data Binding [Binding data to control Combo Box, List Box]
	3.4 Data Control: Grid view control, Form view control, Listview control , Repeater control
	Unit 4: State Management and Web services in ASP.NET
	4.1 Client-side State Management Technique
	4.1.1 View State
	4.1.2 hidden Fields
	4.1.3 Query String
	4.1.4 Cookies
	4.2 Server-side State Management Technique
	4.2.1 Session State
	4.2.2 Application State
	4.3 Web Services:
	4.3.1 Introduction to web service-Architecture
	4.3.2 Integration-Web Service Description Language – Accessing web service using different Clients.
Reference Books:	1. Beginning ASP.NET 4.0 in C# and VB by Imar Spaanjaars Wrox Pubs. 2. ASP.NET 4.0 – Black Book - Dream Tech 3. Professional ASP.NET in C# and VB Wrox Pubs. 4. Pro ASP .NET 4.5 in C# (Professional Apress) by Mario Szpuszta Adam Freeman, Matthew MacDonald (Author) 5. ASP.NET Core in Action by Andrew Lock Web References: http://www.asp.net http://www.w3cschool.com for ASP.NET http://www.tutorialspoint.com for ASP.NET
Teaching Methodology	Discussion, Independent study, Seminars and Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on end semester written examination

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
S Y B. Sc. (Computer Science)
Syllabus for S. Y. B. Sc. Semester-IV
Effective From:June 2021
Course: 403: Relational Database Management System - II

Course Code	403
Course Title	Relational Database Management System – II
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June 2018
Purpose of Course	This course imparts the knowledge of Relational Database Management System, specifically database normalization. Understanding of PL/SQL blocks structure. Exception handling mechanism and concept of package is covered. The course is aimed to give inner depth of Relational Database Management system using.
Course Objective	To make students understand and carryout Database Normalization. To make students understand concepts of PL/SQL . To make students understand the basic concepts of cursors and their types. To make students understand concepts of functions, procedures, triggers and package.
Pre-requisite	Concepts of Database management System and SQL.
Course Out come	At the end of the course, student is expected to have clear concepts about the Transaction concepts, Concurrency control, PL/SQL block structure, Error Handling , Exception handling and package
	.

Course Content	**Unit-1: Relational Database Design**
	 1.1 Functional Dependencies
	 1.2 Need for Normalization
	 1.3 Normal forms (1NF, 2NF, 3NF and B.C.N.F.)
	 1.4 Data Dictionary
	 1.5 Tables, Table spaces & Data files, Views.
	
	 Unit 2 :Advanced SQL
	 2.1 Join Queries :
	    2.1.1. Basic concept of Joining table
	    2.1.2 Inner Join, Outer Join (Left, Right, Full),self Join
	 2.2 Subqueries : DISTINCT with subqueries, Predicates with subqueries, Aggregate Functions in subqueries, Correlated subqueries, Correlating tables to itself, Correlated subqueries in HAVING, UNION, INTERSECT,NOT IN.
	 2.3 CREAT VIEW Command : Updating views, Group views and Joins, Views and sub queries, Changing values through views,
	 2.4 Grant command, using ALL and PUBLIC arguments, GRANT and REVOKE OPTION.

	2.5 Introduction to Transactions, Commit, Rollback, Savepoint
	Unit-3:PL/SQL:
	3.1. PL/SQL Block Structure
	3.2 Using Variables,, Constants and Data Type
	3.3 User Defined Record
	3.4 Assigning Values to Variables
	3.5. Control Statements (IF…THEN statement, Loop, FOR...Loop, While Loop)
	3.6 Exception handling
	3.7 User-Defined RECORD and TABLE data types.
	3.8 Concepts of Cursor
	3.8.1 Types of Cursors
	3.8.2 Handling Cursors
	Unit 4 :PL/SQL Programs
	4.1 Anonymous PL/SQL Blocks
	4.2 Procedures and Functions,
	4.3 Triggers
	4.4 Packages
Reference Books:	1. Henry Kroth & Silbershats, Database System Concept.
	2. C.J. Date, Introduction to Database Design, Addition Wesley, Nasora.
	3. Martin Gruber, Understanding SQL, BPB Pub., New Delhi.
	4. Ivan Baross, SQL, PL/SQL The Programming Language of ORACLE, BPB Pub., New Delhi.
	5. James Martin, Computer Database Organization, PHI, New Delhi.
	6. J Ullman, Principles of Database Systems, Galgotia Pub., New Delhi.
	7. ORACLE Manuals.
	8. SQL Manuals
	9. George Koch and Kevin Loney, ORACLE 8 The Complete Reference, ORACLE Press, TMH, Delhi.
	10. Oracle PL/SQL programming - Oracle press - Tata McGrawHill.
Teaching Methodology	Discussion, Independent study, Seminars and Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on end semester written examination

The Enclosed papers are to be included as IDS CAN course for S.Y.B.Sc.(Computer Science) along with the existing CAN courses. Students are supposed to select one IDS in 3rd semester and one in 4th semester.

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
S Y B. Sc. (Computer Science)
Syllabus for S. Y. B. Sc.(Computer Science) – CAN course.
Effective From: June-2021
Course: ID-01: E-Commerce and Cyber Security

Course Code	ID-01
Course Title	E-Commerce and Cyber Security
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2018
Purpose of Course	This course imparts the knowledge of Electronic commerce, online order processing concepts and related threats. The concepts of electronic transactions, e-commerce framework, related security issues and threats are covered in this course. It also highlights the issues related to cyber crime, types of possible cyber crimes and related issues. The course is aimed to give e-commerce related issues and concepts.
Course Objective	To make students understand concepts of e-commerce framework. To make students understand concepts of types of online transactions. To make students understand the basic concepts of security issues pertaining to e-commerce. To make students understand various possible cyber crimes and its related laws.
Pre-requisite	Concepts of electronic commerce and online transactions.
Course Out come	At the end of the course, student is expected to have clear concepts about the e-commerce, types of e-commerce, e-commerce framework, security issues pertaining to e-commerce, cyber crimes and related cyber laws.

Course Content	**Unit-1:**
	1.1 Introduction to E-commerce
	   1.1.1 What is E-commerce
	   1.1.2 E-commerce frame work
	1.2. E-commerce consumer applications
	   1.2.1 E-commerce organization applications
	   1.2.2 Network for E-commerce
	   1.2.3 what is information way

Unit-2:E-commerce and World wide web

2.1 E-commerce application services

2.2 Consumer to Business Transaction

2.3 Business to Business Transaction

2.4 Security on the web

2.5 Categories of Internet data and transactions

Unit-3: E-commerce security Issues

3.1 Secure Socket layer

3.2 Types of Electronic payment systems

3.2.1 E-cash

3.2.2 Electronic checks

3.2.3 Smart cards and electronic payment systems

3.2.4 Credit card and debit cards payment and their authentication

Unit-4: Introduction to Cyber Crimes

4.1 Category of cyber crimes

4.2 Technical aspects of cyber crimes

4.2.1 Unauthorized access & Hacking

4.2.2 Trojan , virus and Worm attacks

4.3 E-mail & IRC related crimes

4.3.1 Email spoofing and Spamming

4.3.2 Email bombing

4.3.2.1 Sending threatening emails

4.3.2.2 Defamatory emails

4..3.2.3 Email frauds , IRC related

4.3.2.4 Denial of Service attacks

4.3.2.5 A distributed denial of service attack

Unit-5: Prohibited actions on Cyber

5.1 Pornography

5.2 IPR violation , software piracy , copyright infringement, trademarks violation, theft of computer source code, patent violations

5.3 Cyber Squatting

5.4 Cyber terrorism

5.5 Banking/Credit card related crimes

5.6 E-commerce/Investment Frauds- Sales and investment frauds

	5.7 Sales of Illegal articles 5.8 Defamation(Cyber smearing) 5.9 Cyber stalking
Reference Books:	1. E-commerce Stategies --- Charle s Trepper 2. E- Commerce an Indian Perspective—Joseph- PHI 3. Electronics Commerce : A Managerial Prespective – Efraim Turban, Jae Lee 4. Cyber Crime in India ---- Dr M Dasgupta 5. Cyber Law and Crimes – BarkhaU, Rama Mohan 6. Cyber Laws Law---Dr Sarla Gupta 7. Email Hacking - Ankit Fadia 8. Ethical hacking Guide to Corporate Security—Ankit Fadia
Teaching Methodology	Discussion, Independent study, Seminars and Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on end semester written examination

Course Code	ID-02
Course Title	Computerised Accounting
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June, 2018
Purpose of Course	This course imparts the knowledge of Introduction to Accounting System, Accounting Concepts, Accounting Equation & Transaction Analysis, Concepts of Book-Keeping and accounting package. The course is aimed to give inner depth of Accounting and Book keeping concepts.
Course Objective	To make students understand concepts of Accounting system. To make students understand concepts of Book Keeping. To make students understand the basic concepts of Accounting Equations & Transaction Analysis. To make students understand computerized accounting package.
Pre-requisite	Concepts of Accounts and basic knowledge of computerized application package.
Course Out come	At the end of the course, student is expected to have clear concepts about the Accounting System, Accounting Concepts, Accounting Equation & Transaction Analysis, Concepts of Book-Keeping and accounting package. Students can apply Accounting and Book Keeping concepts which are to understand commercial accounting packages.

Course Content	**Unit-1: Fundamentals of Accounting**
	    1.1.Introduction to Accounting System
	        1.1.1 Meaning & Definition of Accounting
	        1.1.2 Objectives of Accounting
	        1.1.3 Concepts and Features of Book Keeping
	        1.1.4 Branches of Accounting (Financial Management, Cust)
	        1.1.5 Basis of Accounting (Accrual Bases, Cash Bases)
	    1.2. Accounting Concepts
	        1.2.1 Accounting Concept

	1.2.2 Accounting Equation Concept
	1.2.3 Accounting Period Concept
	1.2.4 Concept of Matching Realization Accrual

Unit-2: Accounting Equation & Transaction Analysis
    2.1 Accounting Equation & Transaction Analysis
        2.1.1 Introduction to Assets, Liabilities, Equities
        2.1.2 Concepts of Transaction Analysis
        2.1.3 Classification of Accounts (Real Account, Personal Account, Nominal Account)
    2.2 Concepts of Book-Keeping
        2.2.1 Introduction of Single Entry System and its advantages/disadvantages
        2.2.2 Introduction of Double Entry System and its advantages
        2.2.3 Types of Business Transaction
            2.2.3.1 Cash Transaction
            2.2.3.2 Credit Transaction
            2.2.3.3 Barter Transaction

Unit-3: Journal & Subsidiary Books (With Preliminary examples)
    3.1 Meaning of Journal
    3.2 Format of Journal
    3.3 Concept and format of cash Book
    3.4 Concept and format of Petty cash Book

Unit-4: Concept of Accounting Mechanism
    4.1 Meaning and Definition of Ledger
    4.2 Types of Ledger
    4.3 Concepts of posting Bank Reconciliation Statement
    4.4 Trial Balance and its objectives
    4.5 Concepts of Suspense Account

Unit-5 Application of Accounting Using Accounting Package
    5.1 Creation of Company
    5.2 Voucher Printing Entry
    5.3 Alteration, Deletion of Vouchers
    5.4 Types of Voucher entry (Receipt, Payment, Contra, Purchase, Sales, Journal, Physical Stock, Reversing Journal)
    5.5 Generating Trial Balance
    5.6 Maintaining Account Books & Reports

	5.6.1 Cash Book, Bank Book, Ledger 5.6.2 Sales Register, Purchase Register 5.6.3 Day Book, Inventory Book, Stock Summary 5.6.4 Balance Sheet
Reference Books:	1. Accounting for Management – By Dr. Hawaharlal 2. Financial Management - By Dr. S.N. Maheshwari 3. Accounting for Management – By S.K. Bhattacharya & John Deardon 4. Advanced Accountancy – By S.P. Jain & K.I. Narang 5. Implementing Tally 6.3 – By K.K. Nathani – BPB Publication 6. Implementing Tally 7.2 – By A.K. Nathani & K.K. Nathani BPB Publication
Teaching Methodology	Discussion, Independent study, Seminars and Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on end semester written examination

VEER NARMAD SOUTH GUJARAT UNIVERSITY – SURAT
S Y B. Sc. (Computer Science)
Syllabus for S. Y. B. Sc.(Computer Science) – CAN course.
Effective From: June-2021
Course: ID-03: Business Systems

Course Code	ID-03
Course Title	Business Systems
Credit	2
Teaching per Week	2 Hrs
Minimum weeks per Semester	15 (Including Class work, examination, preparation, holidays etc.)
Last Review / Revision	June-2018
Purpose of Course	This course imparts the knowledge of various business information systems needed to be model, design and program as software engineer.
Course Objective	To provide comprehensive knowledge of concepts related to various business information systems To provide basics for system and data modelling. To provide insight into business operations and their significance in information system
Pre-requisite	Concept of information system
Course Out come	At the end of the course, student will be able to 1. Understand business operations and related information systems. 2. Perform system and data modelling for given business information system

Course Content	**Unit 1 Introduction**
	     1.1 Introduction to Business Data Processing
	     1.2 Overview of Business systems
	     1.3 Management Functions, Levels of Management
	     1.4 Sources of Information, Applications like Payroll, Accounting, Inventory, MIS, DSS
	
	 2. Inventory Control System
	     2.1 Objectives of good inventory control system
	     2.2 Transaction for an inventory system (Purchase, Issue, Purchase Return and Issue Return)
	     2.3 Creation of transaction file, Item master file for purchase, issue, purchase return and sales return.
	     2.4 Consumption analysis, A B C analysis, Year-end processing and Periodic housekeeping

	3. Payroll System
	    3.1 Objectives of payroll systems
	    3.2 Classification of employees based on payment of wages
	        3.2.1 Monthly dated employees
	        3.2.2 Daily rated employees (Time rated employees, Piece rate employees)
	    3.3 Leave entitlements, Overtime wages, bonus, provident fund contribution and other deductions
	    3.4 Computerizing a Payroll system: Case Study
	
	4. Banking System
	    4.1 Objectives of banking systems
	    4.2 Present level of computerization
	    4.3 IT packages and services in India
	    4.4 Core modules and reports
	    4.5 Internet Banking
	    4.6 e-Banking in India
	    4.7 Business payment solutions
	5. Services Oriented Business System & ERP
	    5.1 Service Definition, Types of Services
	    5.2 Process of Services, Effects of Services, Software as a Service
	    5.3 Evolution of ERP, Definition of ERP, Various Modules of ERP, Advantage of ERP.
	    5.4 Case study based on ERP.

Reference Books:	1. Business applications using computers Ramachandran Nambissan T.M BPB publications 2. Enterprise resource planning Alexis Leon Tata McGrawhill 3. Services Marketing People, Technology, Strategy: Chrestopper Lovelock and Jochen Wirtz - Pearson Education. 4. Production And Operations Management: K. Aswathappa And Shrddhara Bhat, Himalaya Publishing House. 5. Retailing Management: Levy writz - TMH. **6.** Logistics And Distributed Management: Alan Rushton, John Oxley Phil Croucher -Kogan Page.
Teaching Methodology	Discussion, Independent study, Seminars and Assignment
Evaluation Method	30% Internal assessment is based on class attendance, participation, class test, quiz, assignment, seminar, internal examination etc. 70% assessment is based on end semester written examination