

## SEMESTER: FOURTH TEACHING SCHEME

SR. NO	SEMESTER COURSE CODE	NAME OF COURSE	TEACHING SCHEME			CREDITS	EXAMINATION MARKS				TOTAL MARKS
			THEORY	TUTORIAL	PRACTICAL		THEORY		PRACTICAL		
							ESE	PA	ESE	PA	
1	3341601	INFORMATION COMMUNICATION TECHNOLOGY	4	0	2	6	70	30	20	30	150
2	3341602	OBJECT ORIENTED PROGRAMMING	3	0	4	7	70	30	40	60	200
3	3341603	FUNDAMENTS OF SOFTWARE DEVELOPMENT	3	0	2	5	70	30	20	30	150
4	3341604	INTERNET TECHNOLOGY	3	0	4	7	70	30	40	60	200
5	3341605	DATA MANAGEMENT	3	0	4	7	70	30	40	60	200

**GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT**

**COURSE CURRICULUM**

**COURSE TITLE: INFORMATION COMMUNICATION TECHNOLOGY  
(Code: 3341601)**

Diploma Program in which this course is offered	Semester in which offered
Information Technology	4 <sup>th</sup> Semester

**1. RATIONALE**

The objective of Information Communication Technology is to make students clear over how communication and Information Technology is inseparable. This course covers basic underlying concepts and techniques used most recently. After going through this course student will be able to differentiate between analogue and digital data techniques in communication technology. They will learn about traditional communication structure, its modulation, multiplexing and other important parameters. They will also learn significance of various network topologies, hardware and protocols deployed at each OSI model layer.

**2. COMPETENCIES**

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

- **Explain basics of Information communication Technology and IT Ethics.**
- **Identify and explain functioning of various networks technologies, servers and protocols.**

**3. COURSE OUTCOMES:**

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

- i. Describe importance of information and information communication technology.
- ii. Explain basic concept of analog communication.
- iii. Identify network, servers, topologies and networking component
- iv. Explain protocols and IEEE standards

**4. TEACHING AND EXAMINATION SCHEME**

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
L	T	P		Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	
4	0	2	6	70	30	20	30	<b>150</b>

**Legends:** **L** - Lecture; **T** - Tutorial/Teacher Guided Student Activity; **P** - Practical; **C** - Credit; **ESE** - End Semester Examination; **PA** - Progressive Assessment

## 5. COURSE DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
<b>Unit – I</b> <b>ICT Fundamentals</b>	1a.Explain various concepts related to Information Technology	1.1 Information Technology philosophy 1.1.1 Need of information technology 1.1.2 Logic of Information 1.1.3 Cybernetics 1.1.4 Definitions(Peirce, Shannon-Weaver, Bateson) 1.2 Information and society 1.2.1 Information Processing cycle 1.2.2 Impact of information on the society 1.2.3 IT act of India ( Just Introduction ) 1.3 ICT models (brief) 1.3.1 Analog Communication 1.3.2 Digital Communication 1.3.3 Data Communication
	1b.Describe basic of communication	1.4 Structure of Communication 1.5 Transmission modes(Simplex, half duplex, Full duplex) 1.6 Synchronous and Asynchronous transmission 1.7 Serial and Parallel communication.
	1c. Understand analog communication	1.8 Need of Modulation 1.8.1 Antenna Height/length 1.8.2 Energy 1.8.3 Band-Edge Ratio 1.8.4 Multiplexing 1.9 Amplitude modulation 1.9.1 Definition 1.9.2 Mathematical derivation and calculation of modulation index, power 1.9.3 Frequency spectrum 1.10 Frequency modulation 1.10.1 Definition 1.10.2 Mathematical Derivation and calculation of frequency deviation Frequency spectrum
<b>Unit – II</b> <b>Data Networks</b>	2a. Explain network Computing model	2.1 Models of Network Computing (Centralize Computing, distributed Computing, collaborative Computing) 2.2 Client Server Network and Peer to Peer Network
	2b. Explain topologies and types of network	2.3 Network Topologies (Bus, Mesh, Star, Ring), 2.4 Various types of computer Network (LAN, MAN, WAN) 2.5 Types of switching network(Circuit and Packet)

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
	2c. Explain layered structure of communication	2.6 Need of layered mechanism 2.7 OSI Model(brief description of each layer) 2.8 TCP/IP Model(brief description of each layer)
<b>Unit – III</b> <b>Physical View of ICT</b>	3a. Describe multiplexing and its types	3.1 Multiplexing 3.1.1 Definition and need 3.1.2 Time Division Multiplexing 3.1.3 Frequency Division Multiplexing 3.1.4 Code Division Multiplexing 3.1.5 Orthogonal Frequency Division Multiplexing
	3b. Describe media and standards of transmission of signals	3.2 Identification of various transmission media 3.2.1 Wired media ( Coaxial, Twisted Paid cable and their connectors) 3.2.2 Wireless media ( Microwave, Radio) 3.2.3 Application of wireless media in satellite Communication, block diagram, important Definitions. 3.3 Network Connecting devices(Switch,Router, Repeater, Bridges, Gateway) 3.4 IEEE standards for LAN(Introduction only)
<b>Unit – IV</b> <b>Network Addressing</b>	4a. Explain IPv4 addressing	4.1 IPv4 addressing 4.1.1 Need of IP address 4.1.2 IPv4 addressing scheme 4.1.3 Address space and notations 4.1.4 Mask, netid, hostid 4.1.5 Sub-netting and super-netting 4.1.6 Classful and classless notations 4.1.7 Network address translations
	4b. Explain IPv6 addressing	4.2 IPv6 addressing 4.2.1 Need for IPv6 migration 4.2.2 IPv6 addressing scheme 4.2.3 Hexadecimal column notation 4.2.4 Uni-cast addresses, multicast addresses, anycast addresses Reserved addresses and local addresses
	4c. Use of Ping and Trace route to troubleshoot network	4.3 Address mapping(logical to physical, physical to logical) 4.4 Ping and trace-route commands
<b>Unit - V</b> <b>Protocols and Data</b>	5a. Explain UDP and TCP protocols	5.1 UDP and TCP protocols 5.1.1 Connectionless and connection oriented communication 5.1.2 Reliable and Unreliable communication

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
Transportation		UDP and TCP protocols
	5b. Explain data traffic	5.2 Data traffic and congestion management
	5c.Explain domain Name System	5.5 DNS 5.3.1 Domain, domain name, domain zone, root server 5.3.2 Domain types 5.3.3 Address resolution 5.3.4 Address mapping 5.4 Address, mapping address to names, recursive resolution, iterative resolution, caching)
	5d.Explain Various TCP/IP Protocols	5.5 Protocols(introduction only) 5.6 Data link layer protocols 5.6.1 ARP,RARP,ICMP protocols (only brief explanation) 5.7 Routing (brief explanation) 5.7.1 Routing table, Uni-cast routing protocols and multicast routing protocols) 5.8 SMTP, POP, IMAP 5.9 WWW and HTTP

## 6. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	ICT Fundamentals	10	2	4	4	10
II	Data Networks	10	2	4	6	12
III	Physical View of ICT	10	4	6	6	16
IV	Network Addressing	12	4	5	6	15
V	Protocols and Data Transportation	14	4	5	8	17
	<b>Total</b>	<b>56</b>	<b>16</b>	<b>24</b>	<b>30</b>	<b>70</b>

**Legends:** R = Remembrance; U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 7. SUGGESTED LIST OF EXERCISES/PRACTICAL

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills (**outcomes in psychomotor and affective domain**) so that students are able to acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

**Note:** Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of certain outcomes in affective domain which would in turn lead to development of **Course Outcomes** related to affective domain. Thus over all development of **Programme Outcomes** (as given in a common list at the beginning of curriculum document for this programme) would be assured.

Faculty should refer to that common list and should ensure that students also acquire outcomes in affective domain which are required for overall achievement of Programme Outcomes/Course Outcomes.

Sr. No.	Unit No.	Practical Exercises (Outcomes in Psychomotor Domain)	Hrs. required
1	I	Measurement of modulation index of amplitude modulation.	2
2		Measurement of Frequency deviation of F.M.	2
3		Test and Simulate AM using hardware kit or software	2
4		Test and Simulate FM using hardware kit or software	2
5	II	Test and implement Peer to Peer model.	2
6		Test and implement Client –Server	2
7		Test and implement BUS Topology	2
8		Test and implement STAR Topology	2
9			2
10	III	Build and Test circuit of T.D.M.	2
11		Build and Test circuit of F.D.M.	2
12	III	To Configure and test working of switch	2
13		To Demonstrate working of router configuration.	2
14		To Build small LAN using various network components.	2
15		To Prepare CAT-5, CAT-6 cable for network using crimping tool	2
14		Identify and compare different transmission media	2
15	IV	Demonstration of FTP, HTTP Protocols	2
16		Test of Ping and trace out commands.	2
17	V	Simulation of Data traffic and congestion	4
18		Identification of IP address	2
Total Hours (practical for 28 hours from above representing each unit may be selected)			36

## 8. SUGGESTED LIST OF STUDENT ACTIVITIES

- Following is the list of proposed student activities such as:
- i. Study LAN setup in the institute
  - ii. Understanding configuration of LAN and H/w and S/w required for the same
  - iii. Understanding of Indian IT act

**9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)**

- i. Application for practical will be assigned to the students by the subject faculty and students will work in a group of 3 maximum
- ii. Assignment can be given based on above topics.

**10. SUGGESTED LEARNING RESOURCES****A) List of Books**

S. No.	Title of Book	Author	Publication
1	Data Communications and Networking	Behrouz Forouzan	TMH
2	Computer Networks	Bhushan Trivedi	OXFORD
3	Data communication and computer networks	ISRD group	TMH

**B) List of Major Equipment/ Instrument with Broad Specifications**

- a. Modulation trainer kit
- b. Multiplexing trainer kit
- c. DCN trainer kit
- d. LAN trainer
- e. RJ-45 connector, LAN cables, media and crimping tools

**B) List of Software/Learning Websites**

- a. NetSys simulator
- b. Multisim

**11. COURSE CURRICULUM DEVELOPMENT COMMITTEE****Faculty Members from Polytechnics**

- **Prof. Manoj Parmar**, Incharge Head Department of IT , Government Polytechnic, Ahmadabad.
- **Prof. Nandu Fatak**, Lecturer (IT), Government Polytechnic, Ahmedabad.

**Coordinator and Faculty Members from NITTTR Bhopal**

- **Dr. M. A. Rizvi**, Associate Professor, Dept. of Computer Engineering and Applications.
- **Dr. R. K. Kapoor**, Associate Professor, Dept. of Computer Engineering and Applications, NITTTR.

**GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT****COURSE CURRICULUM****COURSE TITLE: OBJECT ORIENTED PROGRAMMING  
(Code:3341602)**

<b>Diploma Programme in which this course is offered</b>	<b>Semester in which offered</b>
Information Technology	4 <sup>th</sup> Semester

**3. RATIONALE**

Large programs are very complex to write and to understand and prone to errors which can prove to be expensive in software development and maintenance process. Object-oriented programming offers a powerful way to cope with this complexity. Its goal is to develop clearer, more reliable, more easily maintained programs.

This course is designed to help students developing the basic understanding of object oriented paradigm and its advantages. By the end of this course, students will be able to understand the Object Oriented Programming and able to write C++ programs using the Object oriented design, and use the standard C++ library. The programming skills thus acquired using C++ language can be used in developing programs for the scientific, and business purposes. This course may also act as backbone to all other courses that are based on Object Oriented concept.

**5. COMPETENCY**

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

- **Design and Develop program following Object Oriented concept in C++ to solve given problem.**

**3. COURSE OUTCOMES**

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning outcomes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

- Explain Object Oriented Programming concepts.
- Use the basic programming constructs of C++
- Apply object-oriented approaches to software problems in C++
- Develop small scale programs in 'C++'.
- Debug and fix common errors in C++ programs



#### 4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
L	T	P		Theory Marks		Practical Marks		Total Marks
			C	ESE	PA	ESE	PA	
3	0	4	7	70	30	40	60	200

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit; ESE - End Semester Examination; PA - Progressive Assessment

#### 5. COURSE DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
<b>Unit – I</b> <b>Introduction of object oriented programming</b>	1a.Explain concepts of Object oriented Paradigm and Object Oriented programming	1.1 Introduction of Object Oriented Design 1.2 Object oriented programming and procedure oriented programming 1.3 Basic concept of Object oriented programming 1.4 Advantages of Object oriented programming 1.5 Application of Object oriented programming
	1b. Explain Basic of C++ programme	1.6 Basic structure of C++ 1.7 Library files in C++ 1.6.1 ios, conio, math, stdlib 1.8 Input /Output operators
	1c.Use C++ Data types and Variables	1.9 Data types 1.8.1 Basic data type 1.8.2 User defined data type 1.8.3 Derived data type 1.10 Declaration of variable with memory concept 1.11 Variables 1.10.1 Reference variable 1.10.2 Dynamic variable
	1d. Use different types of operators in C++	1.12 Basic operators in C++ 1.13 Scope resolution operator 1.14 Memory management operator and manipulators 1.15 Memory reference operator 1.16 Type casting
<b>Unit – II</b> <b>Class and Object</b>	2a. Explain concept of class and object	2.1 Difference between class and structure 2.2 Implementation of class 2.3 Creating object of class 2.4 Memory allocation for object 2.5 Data member and member function

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
		2.6 Access modifier 2.6.1 Public 2.6.2 Private 2.6.3 Protected 2.7 Static data member and function 2.8 Array of object 2.9 'this' keyword 2.10 Namespaces
	2b. Use Functions in C++	2.11 Function Return type 2.12 Function prototype 2.13 Call by value 2.14 Call by reference 2.15 Call by address 2.16 Different types of function 2.16.1 Inline function 2.16.2 Recursive function 2.16.3 Friend function 2.17 Types of argument 2.17.1 Default argument 2.17.2 Constant value as a argument
<b>Unit – III</b>  <b>Constructor and destructor</b>	3a. Use constructor and destructor	3.1 Constructor with its characteristic 3.2 Types of constructor 3.2.1 Parameterized constructor 3.2.2 Copy constructor 3.4 Implement destructor 3.5 Comparison between constructor and destructor
<b>Unit – IV</b>  <b>Inheritance</b>	4a. Use Inheritance to create re-usable codes in C++	4.1 Concept of Inheritance 4.2 Utilities of Inheritance 4.3 Declaration of inheritance 4.4 Protected Access Specifier 4.5 Types of inheritance 4.5.1 Single Inheritance 4.5.2 Multiple Inheritance 4.5.3 Multi level Inheritance 4.5.4 Hirerchical Inheritance 4.5.5 Hybrid Inheritance 4.6 Function overriding
	4b Create and use abstract class	4.7 Concept of constructor in sub class 4.8 Virtual base class 4.9 Abstract class
<b>Unit – V</b>	5a. Understand	5.1 Concept of polymorphism

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
<b>Polymorphism and Virtual function</b>	Polymorphism	5.2 Use of polymorphism 5.3 Types of polymorphism 5.3.1 Function overloading 5.3.2 Operator overloading
	5b. Describe the Virtual function	5.4 Utility of Virtual function 5.5 Virtual function characteristics 5.6 Pure virtual function.
<b>Unit – VI Managing Input/Output Stream</b>	6a. Use file stream in C++	6.1 File stream classes 6.2 Formatted Input/Output operations 6.3 Unformatted Input/Output operations 6.4 Managing output with manipulators

## 6. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Unit	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Introduction of object oriented programming	11	4	8	2	14
II	Class and Object	8	2	4	8	14
III	Constructor and destructor	4	2	2	4	08
IV	Inheritance	8	4	4	8	16
V	Polymorphism and Virtual function	7	2	4	4	10
VI	Managing Input /Output stream	4	2	2	4	08
<b>Total</b>		<b>42</b>	<b>16</b>	<b>24</b>	<b>30</b>	<b>70</b>

**Legends:** R = Remember; U = Understand; A = Apply and above levels (Bloom's revised taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 7. SUGGESTED LIST OF EXERCISES/PRACTICAL

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills (**outcomes in psychomotor and affective domain**) so that students are able to acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

*Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of certain outcomes in affective domain which would in turn lead to development of **Course Outcomes** related to affective domain. Thus over all development of **Programme Outcomes** (as given in a common list at the beginning of curriculum document for this programme) would be assured.*

*Faculty should refer to that common list and should ensure that students also acquire outcomes in affective domain which are required for overall achievement of Programme Outcomes/Course Outcomes.*

Sr. No.	Unit No.	Practical/Exercise (outcomes in psychomotor domain)	Apprx. Hrs. Required
1	I	Develop programs using Input/Output operators.	2
2	I	Develop programs using Control structure.	4
3	I	Develop programs using array of object.	4
4	II	Develop programs using call by value ,call by reference and function overloading	4
5	II	Develop programs on default arguments, constant arguments	4
6	II	Develop programs on function overloading	4
7	II	Develop programs using different classes such as student, distance, shape, employee, feet, time, data etc. with data member & member functions.	4
8	II	Develop Programs using array of objects and static member functions.	4
9	II	Develop programs using Friend function.	2
10	III	Develop programs using various types of constructors and destructor.	4
11	IV	Develop programs using single, multilevel, multiple Inheritance	2
12	IV	Develop programs using inheritance and constructors.	2
13	IV	Develop programs using Virtual base class.	2
14	V	Develop programs using 'this' key word.	4
15	V	Develop programs using virtual function.	2
16	VI	Develop programs using unformatted input/output functions.	4
17	VI	Develop programs using formatted input/output functions.	4
Total Hours			56

## 8. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities such as:

- i. Develop program with real life applications
- ii. Develop Mini Projects

## 9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

Supervised Practical Exercises should be carried out as above and student group size should be as minimum as possible for effective learning.

## 10. SUGGESTED LEARNING RESOURCES

### (A) List of Books:

Sr.No.	Title of Books	Author	Publication
1	Object Oriented Programming with C++ ( Second edition)	Sourav Sahay	Oxford
2	Object Oriented Programming with C++	E.Balagurusamy	McGrawHill
3	Object Oriented Programming in C++	Robert Lafore	SAMS
4	Mastering C++	Venugopal	Tata McGrawHill
5	Programming in c++	Ashok Kamthane	Pearson

### (B) List of Major Equipment/Materials with Major Specifications.

**Hardware :** Desktop Computer P-IV processor or higher

**Software :** Turbo C++/ Borland C++/ any other C++ compiler with integrated GUI Environment.

### A List of Learning Websites.

- a C++ Fundamentals:<http://www.oupinheonline.com>
- b C++ Tutorials:  
[http://www.tutorialspoint.com/cplusplus/cpp\\_overview.htm](http://www.tutorialspoint.com/cplusplus/cpp_overview.htm)
- c Video tutorials :  
<http://nptel.iitm.ac.in/video.php?subjectId=106106093>

## COURSE CURRICULUM DEVELOPMENT

### COMMITTEE Faculty Members from Polytechnics

**Prof. Priti.N.Parikh**, Lecturer (I.T), Government Polytechnic,Ahmedabad  
**Prof. Sandeep Modi**, Lecturer (I.T), K.P.T.I.T. Sokali

**Coordinator and Faculty Members from NITTTR Bhopal**

- **Dr. Priyanka Tripathi**, Associate Professor, Dept. of Computer Engineering and Applications.
- **Dr. R. K. Kapoor**, Associate Professor, Dept. of Computer Engineering and Applications.

**GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT**

**COURSE CURRICULUM**

**COURSE TITLE: FUNDAMENTALS OF SOFTWARE DEVELOPMENT  
(Code: 3341603)**

Diploma Programmes in which this course is offered	Semester in which offered
Information Technology, Computer Engineering	4 <sup>th</sup> Semester

#### 4. RATIONALE

Software is the single most important technology on the world stage. Software's are used by almost all peoples for various purposes such as withdrawing payments from ATM machines, paying bills of electricity, telephone using ECS systems. Airline, railway tickets reservation online etc. People can work with computers flawlessly over a long period of time. One can also easily modify, upgrade the software without any problem or error. This course helps the students to develop, design, analyze, test & implement the software project during the courses in higher semesters of diploma programme.

#### 6. COMPETENCY

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

๓1. Identify and analyze problems in the field of S/W development

#### 4. COURSE OUTCOMES:

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

Explain Software and Software Engineering

Distinguish various Software Process Models (Approach of Software Development).

Analyze gather and prepare Software Requirement Specification for given project.

Draw use case diagrams for given modules and design user interface

Apply code standard and Identify Software Testing Techniques.

#### ii. Teaching and Examination Scheme

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				Total Marks
L	T	P		Theory Marks		Practical Marks		
L	T	P	C	ESE	PA	ESE	PA	150
3	0	2	5	70	30	20	30	

**Legends:** L-Lecture; T – Tutorial/Teacher Guided Theory Practice; P - Practical; C – Credit ESE - End Semester Examination; PA - Progressive Assessment.

## 5. COURSE DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
<b>Unit-I</b> <b>Software Development Process</b>	1a Explain Software and Software Engineering.	1.1 Software <ul style="list-style-type: none"> <li>• Definition</li> <li>• Characteristics</li> </ul> 1.2 Software Myths 1.3 Software Engineering – <ul style="list-style-type: none"> <li>• A layered Technology approach</li> <li>• Definition</li> <li>• Need</li> </ul> 1.4 Software development 1.5 Generic Framework activities, Umbrella activities
	1b Compare various project process models and use in project planning.	1.6 Software Development Models <ul style="list-style-type: none"> <li>• Waterfall Model</li> <li>• Incremental Model</li> <li>• RAD Model</li> <li>• Prototyping Model</li> <li>• Spiral Model</li> </ul>
<b>Unit-II</b> <b>Software Analysis and Design</b>	2a Identify software requirement	2.1 Requirement Gathering and Analysis 2.2 Software Requirement Specification(SRS) <ul style="list-style-type: none"> <li>• Characteristic</li> <li>• Customer requirement</li> <li>• Functional Requirement</li> </ul>
	2b Analyze and design requirement	2.3 Design Process <ul style="list-style-type: none"> <li>• Classification of Design Activities</li> <li>• Classification of Design Methodology</li> </ul> 2.4 Cohesion and Coupling 2.5 Data Modeling Concepts <ul style="list-style-type: none"> <li>• Data Objects</li> <li>• Data Attributes</li> <li>• Relationships</li> <li>• Cardinality and Modality</li> </ul> 2.6 Data-Flow Diagrams <ul style="list-style-type: none"> <li>• Primitive Symbols of DFD</li> <li>• Develop DFD Model of System</li> <li>• Shortcoming of DFD Model</li> </ul>
	2c Develop Activity and use-case diagram	2.7 Scenario-Based Modeling <ul style="list-style-type: none"> <li>• Writing Use-Cases</li> <li>• Developing an Activity Diagram</li> </ul> 2.8 Architectural design decisions <ul style="list-style-type: none"> <li>• Architectural views</li> </ul>



		<ul style="list-style-type: none"> <li>• Architectural patterns</li> <li>• Application architectures</li> </ul>
<b>Unit-III</b> <b>Software Project Management</b>	3a Prepare and manage Schedule for different software development activities	<p>3.1 Responsibility of software project Manager</p> <ul style="list-style-type: none"> <li>• Job responsibility</li> <li>• Required skill to manage software project</li> </ul> <p>3.2 Metrics for Size Estimation</p> <ul style="list-style-type: none"> <li>• Line of Code</li> <li>• Function Points</li> </ul> <p>3.3 Project Estimation Technique</p> <ul style="list-style-type: none"> <li>• Empirical Estimation Technique</li> <li>• Heuristic Technique</li> <li>• Analytical Estimation Technique</li> </ul> <p>3.4 Scheduling</p> <ul style="list-style-type: none"> <li>• Work breakdown structure</li> <li>• Activity network and critical path Method</li> <li>• Gantt Chart</li> <li>• Project Monitoring and control</li> </ul> <p>3.5 Risk Management</p> <ul style="list-style-type: none"> <li>• Risk Identification</li> <li>• Risk Assessment</li> <li>• Risk Containment</li> </ul>
<b>Unit-IV</b> <b>Software Coding and testing</b>	4a Prepare software Documentation	<p>4.1 Code review</p> <ul style="list-style-type: none"> <li>• Code Work through</li> <li>• Code Inspection</li> </ul> <p>4.2 Software Documentation</p> <ul style="list-style-type: none"> <li>• Internal Documentation</li> <li>• External Documentation</li> </ul>
	4b Prepare test cases and test the software	<p>4.3 Testing</p> <ul style="list-style-type: none"> <li>• Unit Testing</li> <li>• Black-box Testing</li> <li>• White-box testing</li> </ul> <p>4.4 Test Documentation</p>

## 6. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Software Development Process	10	10	08	00	18
II	Software Analysis and Design	14	04	08	10	22
III	Software Project Management	10	04	08	06	18
IV	Software Coding and testing	08	02	02	08	12

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
	<b>Total</b>	<b>42</b>	<b>20</b>	<b>26</b>	<b>24</b>	<b>70</b>

**Legends:** R = Remembrance; U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 7. SUGGESTED LIST OF EXERCISES/PRACTICALS

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills (**outcomes in psychomotor and affective domain**) so that students are able to acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

*Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of certain outcomes in affective domain which would in turn lead to development of **Course Outcomes** related to affective domain. Thus over all development of **Programme Outcomes** (as given in a common list at the beginning of curriculum document for this programme) would be assured.*

*Faculty should refer to that common list and should ensure that students also acquire outcomes in affective domain which are required for overall achievement of Programme Outcomes/Course Outcomes.*

S. No.	Unit No.	Practical Exercises (Outcomes' in Psychomotor Domain)	Hrs. required
1	I	Identify the development model for software with proper explanation	02
2	II	Gather requirement for software.	04
3	II	Prepare SRS Document for Software	04
4	II	Design Activity Diagram for system	02
5	II	Design Use-case Diagram for system	02
6	II	Design Data Dictionary of system	04
7	II	Prepare E-R Diagram of System	02
8	II	Design Data Flow Diagram of system	04
9	III	Prepare Gantt chart of system	02
10	IV	Prepare suitable test case for system testing.	02
<b>Total</b>			<b>28</b>

## 2 SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities like:

- i. Prepare charts for various models, SDLC life cycles, UML notations etc.
- ii. Prepare SRS documents based on case study.
- iii. Discuss various case studies available on internet.

**(C) SPECIAL INSTRUCTIONAL STRATEGIES (if any)**

Application for practical will be assigned to the students by the subject faculty and students will work in a group of 3 – 5

**(D) SUGGESTED LEARNING RESOURCES****12. List of Books**

S. No.	Title of Book	Author	Publication
1.	Software Engineering: A Practitioner's Approach	Roger S. Pressman	Tata McGraw Hill,
2.	Software Engineering	Ian Somerville	Pearson education PHI
3.	Fundamentals of Software Engineering	Rajib Mall	PHI
4.	Structured System analysis and Design	Madhulika JAin	Bph Publication
5.	Object Oriented Modeling and design with UML, second edition	Michael R Blaha and James R Rambaugh	Pearson Prentice Hall

**B) List of Major Equipment/ Instrument with Broad Specifications**

Sufficient number of PCs are required according to number of students in the class for practicing development and maintenance of different software.

**C) List of Software/Learning Websites**

- i. <http://nptel.iitm.ac.in/>
- ii. <http://www.mhhe.com/engcs/compsci/pressman/student/olc/cases.mhtml>
- iii. [http://forum.jntuworld.com/showthread.php?3841-SOFTWARE-ENGINEERING-\(SE\)-Notes-All-8-Units](http://forum.jntuworld.com/showthread.php?3841-SOFTWARE-ENGINEERING-(SE)-Notes-All-8-Units)
- iv. Ppts: [www.facweb.iitkgp.ernet.in/~spp/LECT1.ppt](http://www.facweb.iitkgp.ernet.in/~spp/LECT1.ppt)
- v. Ppts: <http://www.phindia.com/rajibmall/chapters/>

**11. COURSE CURRICULUM DEVELOPMENT COMMITTEE****Faculty Members from Polytechnics**

- **Prof. Sunil K. Paryani**, Lecturer IT, Govt. Polytechnic, Ahmadabad
- **Prof. Bhadresh G. Prajapati**, Lecturer IT, Govt. Polytechnic, Himatnagar

**Coordinator and Faculty Members from NITTTR Bhopal**

- **Dr. Shailendra Singh**, HOD, Department of Computer Engineering and Application
- **Dr.K.J.Mathai**, Associate Professor, Department of Computer Engineering and Application

**GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT**

**COURSE CURRICULUM**

**COURSE TITLE: INTERNET TECHNOLOGY**

**(Code: 3341604)**

<b>Diploma Programmes in which this course is offered</b>	<b>Semester in which offered</b>
Information Technology	4 <sup>th</sup> Semester

**5. RATIONALE**

Internet technology is widely used client-server technology for development of applications in industry and commerce. This course provides students the requisite knowledge and skills of different internet technologies like, HTML, Cascading Style Sheets, VB Script, Active Server Pages 3.0 and Active-x Data Object to create dynamic Websites/ Web based Applications. This course will also serve as a pre requisite for the ASP.NET technology, which students may learn in the next semester as an elective course.

**7. COMPETENCY**

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

- **Develop commercial and real life web based application.**

**5. COURSE OUTCOMES**

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

- i. Explain the terminologies of Internet Technology.
- ii. Design interactive webpage using basic concepts of the HTML and CSS.
- iii. Explain concepts of Active Server Pages.
- iv. Write server side logic and script using VB Script.
- v. Apply methods and properties of various objects and components of ASP in dynamic website.
- vi. Develop Dynamic real life website using the concept of ADO and ASP.

**6. Teaching and Examination Scheme**

<b>Teaching Scheme (In Hours)</b>			<b>Total Credits (L+T+P)</b>	<b>Examination Scheme</b>				
				<b>Theory Marks</b>		<b>Practical Marks</b>		<b>Total Marks</b>
<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>ESE</b>	<b>PA</b>	<b>ESE</b>	<b>PA</b>	
3	0	4	7	70	30	40	60	200

**Legend:** L-Lecture; T – Tutorial/Teacher Guided Theory Practice; P - Practical; C – Credit ESE - End Semester Examination; PA - Progressive Assessment.

## 5. COURSE DETAILS

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
<b>Unit – I</b> <b>Introduction to Internet technology</b>	1a. Explain Internet technology.	1.1 Introduction to Internet 1.2 History of Internet 1.3 Internet Service Provider 1.4 Client/Server Architecture 1.5 Domain Name System 1.6 Web Server
<b>Unit – II</b> <b>Basics of HTML</b>	2a. Create static webpage using HTML tags.	2.1 Introduction to HTML 2.2 Syntax – Tags and Attributes 2.3 Formatting Text (Head and Body Tag ,Text Styles-Bold, Italic, Underline ; Fonts-color, size, face; Paragraph; Heading; List tags ) 2.4 Image Tag 2.5 Hyper linking using Anchor Tag 2.6 Creating and Formatting Tables 2.7 Frames 2.8 HTML Form 2.8.1 Form Object 2.8.2 Form Elements and its methods, properties and events (Text, Text Area, Password, Button, Radio, Checkbox, List box, Reset and Submit buttons)
	2b. Apply CSS into webpage.	2.9 Introducing CSS 2.10 CSS Types (Inline Style, Embedded Style, Linked Style)
<b>Unit – III</b> <b>Active Server Pages 3.0</b>	3a. Explain concepts of ASP.	3.1 Introduction to ASP 3.2 Benefits of ASP 3.3 Advantages of ASP over HTML 3.4 Using scripting language 3.5 Setting primary scripting language 3.6 Including other files

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
		3.7.1 Using virtual keyword and File keyword 3.7.2 Including Files 3.7 Transferring data using GET and POST methods 3.8 Introduction to IIS
<b>Unit – IV</b>  <b>Server side coding with VBScript and XML</b>	4a. Use VBScript for server side coding in ASP.	4.1 VBScript Variables 4.2 Subroutines and Functions 4.3 Built-In Functions and Methods 4.4 String Handling functions 4.5 Logical Structures 4.5.1 If-then, Select Case 4.6.1 Boolean Logic AND, OR, XOR, NOT 4.7 Looping; For-Next, While-Wend, Do- While
	4b. Use XML and XSL script.	4.8 Introduction to XML 4.8.1 Difference between HTML and XML 4.8.2 Use of XML, elements, tags and attributes 4.9 Introduction to XSL 4.9.1 Use of XSL
<b>Unit – V</b>  <b>ASP Objects and Components</b>	5a. Use different objects of ASP.	5.1 ASP Objects 5.2 Response Object 5.2.1 Sending text with response object and embedded quotes 5.2.2 Response. Cookies collection 5.2.3 Response.AddHeader method and Redirect method 5.2.4 Properties of the response object(Expires, Expires absolute) 5.2.5 Methods of the Response object (Clear, Create Object, HTML_ Encode, MapPath,URLEncode)

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
	5b. Transfer values from one ASP web form to other web form using methods of objects of ASP.	5.3 Request Object Collections 5.3.1 Request. Server Variables 5.3.2 Request. Cookies 5.3.3 Request.QueryString 5.3.4 HTML Forms 5.3.5 Request. Form 5.3.6 Request. Client Certificate
	5c. Use methods and properties of application and server objects of ASP.	5.4 Application and Server Objects 5.4.1 Application variables 5.4.2 Application Lock/Unlock methods 5.4.3 Server Objects properties and Methods (Script Timeout, HTML Encode, URL Encode, Create Object, Execute, Include directive, Transfer, MapPath, GetLastError )
	5d. Manage session using session objects properties and methods.	5.5 Session Object 5.5.1 SessionID Cookie 5.5.2 global.asa file - session. Timeout Property - session. Abandon Method 5.5.3 Session variables
	5e. Apply Adrotator and Browser capability components in ASP web page.	5.6 Browser Capabilities Component 5.7 Ad Rotator Component
<b>Unit – VI</b>  <b>Accessing databases with ASP and ADO</b>	6a. Explain different objects of ADO.	6.1 What is ADO? 6.2 Connection Object 6.2.1 Creating connections with OLEdb and ODBC 6.2.2 Creating System DSN, FileDSN 6.2.3 Opening and Closing connections 6.3 Recordset Object (Cursors, Locks using recordset) 6.4 Disconnected Recordset 1.4 Field Object

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
	6b. Develop Database driven web application using ASP.	6.5 Command Object 6.6 Reading from, writing into and updating database.

## 6. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Introduction to Internet technology	2	3	3	0	6
II	Basics of HTML and CSS	6	0	4	6	10
III	Active Server Pages 3.0	6	4	6	2	12
IV	Server side coding with VBScript and XML	8	2	4	8	14
V	ASP Objects and Components	10	4	4	6	14
VI	Accessing databases with ASP and ADO	10	4	4	6	14
	<b>Total</b>	<b>42</b>	<b>17</b>	<b>27</b>	<b>28</b>	<b>70</b>

**Legends:** R = Remember; U = Understand; A = Apply and above levels (Bloom's revised taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 7. SUGGESTED LIST OF EXERCISES/PRACTICALS

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills (**outcomes in psychomotor and affective domain**) so that students are able to acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

*Note: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of certain outcomes in affective domain which would in turn lead to development of **Course Outcomes** related to affective domain. Thus over all development of **Programme Outcomes** (as given in a common list at the beginning of curriculum document for this programme) would be assured.*

*Faculty should refer to that common list and should ensure that students also acquire outcomes in affective domain which are required for overall achievement of Programme Outcomes/Course Outcomes.*

S. No.	Unit No.	Practical/Exercises (outcomes in psychomotor domain)	Hrs. required
1	II	Create webpage using text formatting tags of HTML.	02
2	II	Create webpage using table tags and list tags of HTML.	02
3	II	Create webpage using HTML Hyper linking	02
4	II	Create webpage to include image using HTML tag.	02



5	II	Create employee registration webpage using HTML form objects.	02
6	II	Apply style sheet in Web page.	03
7	IV	Create web page in which XML tags are used.	02
8	IV & V	Create web page to display simple text message using VBScript in ASP.	02
9	IV & V	Create web page to generate grade sheet of student using VBScript in ASP.	04
10	V	Create web page to demonstrate use of different ASP objects.	03
11	V	Create webpage to transfer data filled through various HTML form controls and collection of the same in ASP.	06
12	V	Create webpage to Send text with response object and embedded quotes in ASP.	02
13	V	Create webpage to Send text using AddHeader method of Response object in ASP.	02
14	V	Create webpage to Send text using Request method of Response object in ASP.	02
15	V	Create webpage to transfer data using Request. Cookie collection of in ASP.	02
16	V	Create webpage to transfer data using Request.QueryString collection of in ASP.	02
17	V	Create webpage for Student Registration and validate data using Request. Form collection in ASP.	02
18	V	Create webpage to demonstrate use of Browser Capability and AdRotator components in ASP.	02
19	VI	Create webpage to add, update, delete records form database using objects of ADO.	04
20	V & VI	Develop small module of any real life application using ASP and ADO.	08
<b>Total</b>			<b>56</b>

## 8. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities such as:

- iii. Develop programs related with unit wise topics in computer laboratory.
- iv. Develop a module related to an application useful in real life.
- v. Presentation of module developed by students.

## 7. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

- i. Sessions should be conducted in interactive mode by way of Demonstration using projector and PC
- ii. Exercise, practical carried out by Students should be closely observed and guided by faculty members.

## 10. SUGGESTED LEARNING RESOURCES

### A) List of Books

S. No.	Title of Book	Author	Publication
1.	Mastering Active Server Pages 3	A. Russell Jones	BPB Publication
2.	Practical ASP	Ivan Bayross	BPB Publication
3.	Web Enabled commercial application development using HTML, DHTML, JavaScript, Perl, CGI	Ivan Bayross	BPB Publication

### B) List of Major Equipment/ Instrument with Broad Specifications

- i. Computer with adequate configuration to serve and run ASP based applications.
- ii. Multimedia Projector

### C) List of Software/Learning Websites

- i. ASP Tutorial - W3Schools  
[www.w3schools.com/asp/](http://www.w3schools.com/asp/)
- ii. Classic ASP Tutorials & Articles - Web Wiz [www.webwiz.co.uk](http://www.webwiz.co.uk) › *Knowledgebase*  
HTML Tutorial - W3Schools  
[www.w3schools.com/html/](http://www.w3schools.com/html/)  
CSS Tutorial  
[www.csstutorial.net/](http://www.csstutorial.net/)  
VBScript Tutorial - Tutorials Point  
[www.tutorialspoint.com/vbscript/index.htm](http://www.tutorialspoint.com/vbscript/index.htm)  
ADO Tutorial - W3Schools  
[www.w3schools.com/ADO/default.asp](http://www.w3schools.com/ADO/default.asp)

## 11. COURSE CURRICULUM DEVELOPMENT COMMITTEE Faculty Members from Polytechnics

- **Prof. Parvez Faruki**, Lecturer in Information Technology, Government Polytechnic, Ahmedabad
- **Prof. (Mrs.) Rikita D. Parekh**, Lecturer in Information Technology, Government Polytechnic for Girls, Ahmedabad

### **Co-ordinator and Faculty Members from NITTTR Bhopal**

- **Dr. R. K. Kapoor**, Associate Professor, Dept. of Computer Engineering and Applications.
- **Dr. M. A. Rizvi**, Associate Professor, Dept. of Computer Engineering and Applications.

**GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT**

**COURSE CURRICULUM  
COURSE TITLE: DATABASE MANAGEMENT  
(Code: 3341605 )**

<b>Diploma Programme in which this course is offered</b>	<b>Semester in which offered</b>
Information Technology	4 <sup>th</sup> semester

**6. RATIONALE**

Data management course prepares student to design data base using various models, sql commands, techniques and operation which are introduced in this course. This creates strong foundation for application of data design. Student will be able to learn basic need of database in industry, the various noramalization concepts and queries performance.

**8. COMPETENCY**

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

- i. **Develop simple data base management system and retrieve the required information from database.**

**6. COURSE OUTCOMES**

The theory should be taught and practical should be carried out in such a manner that students are able to acquire different learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

Explain Database concept and its utilities.

Uses of Structure Query Language(SQL) commands.

Perform Query operations.

**iii. TEACHING AND EXAMINATION SCHEME**

<b>Teaching Scheme (In Hours)</b>			<b>Total Credits (L+T+P)</b>	<b>Examination Scheme</b>				
				<b>Theory Marks</b>		<b>Practical Marks</b>		<b>Total Marks</b>
<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>	<b>ESE</b>	<b>PA</b>	<b>ESE</b>	<b>PA</b>	
3	0	4	7	70	30	40	60	<b>200</b>

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit; ESE - End Semester Examination; PA - Progressive Assessment

## 6. COURSE DETAIL

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
<b>Unit – I</b> <b>Data Management Concepts</b>	1a. Describe the basic aspects of Data base Management System	1.1 Introduction 1.1.1 Data and Information 1.1.2 Metadata 1.1.3 Data items or fields 1.1.4 Records 1.1.5 Files 1.1.6 Data Dictionary 1.1.7 Database 1.2 Purpose of Database System 1.3 File oriented System versus database system 1.4 Application of DBMS 1.5 Database Administrator 1.5.1 Roles of DBA 1.5.2 Responsibilities of DBA
	1b. Explain concepts of data abstraction 1c. Describe various types of database Architecture	1.6 Schema, Sub-Schema, Instances 1.7 Data Abstraction 1.7.1 Internal Level 1.7.2 Conceptual Level 1.7.3 External Level 1.8 Database Architecture 1.8.1 Centralized 1.8.2 Client-server 1.8.3 Parallel 1.8.4 Distributed
<b>Unit – II</b> <b>Integrity Constraints and Ms-Access</b>	2.a Describe various database constraints	2.1 Need of Constraints 2.2 Domain Integrity constraints 2.2.1 Not null 2.2.2 Check 2.3 Entity Integrity constraints 2.3.1 Unique 2.3.2 Primary key 2.4 Referential integrity Constraints 2.4.1 Foreign key 2.4.2 Reference key

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
	2b. Create database for an application using MS- Access 2c. Manage tables and set relations	2.5 Introduction to MS Access 2.6 Creation of Data sheet 2.7 Field and Records 2.8 Table 2.9 Queries 2.10 Realtions
<b>Unit – III</b>  <b>Relational Algebra and E-R Model</b>	3a. Explain Relational Algebra and its notations in relation to database management	3.1 Algebra 3.2 Queries 3.3 Domains 3.4 Relations 3.5 Operator and Syntax
	3b. Explain the concept of E-R diagrams 3c. Design E –R diagrams for an application.	3.6 Basic concepts of E-R 3.6.1 Entity 3.6.2 Relationship 3.6.3 Attributes (single,composite,multivalued,Derive) 3.7 Mapping cardinality 3.8 Keys 3.8.1 Primary 3.8.2 Foreign 3.8.3 Super 3.8.4 Candidate 3.9 Design issues 3.10 weak entity set 3.11 E-R Diagrams 3.12 Features 3.12.1 generalization 3.12.2 specialization 3.12.3 aggregation
<b>Unit – IV</b>  <b>Structure Query Language</b>	4a. Retrieve data/information using Structured Query Language	4.1 SQL Data types 4.2 DDL Commands 4.2.1 create 4.2.2 alter 4.2.3 truncate 4.2.4 drop 4.3 DML Commands 4.3.1 insert 4.3.2 select

Unit	Major Learning Outcomes (in cognitive domain)	Topics and Sub-topics
		4.3.3 update 4.3.4 delete 4.4 Privilege command 4.4.1 grant 4.4.2 revoke 4.5 SQL views
	4.b Use SQL Functions for different operations 4.c Write queries to use various SQL functions.	4.6 Single row function 4.7 Date functions 4.8 Numeric functions 4.9 Character function 4.10 Conversion function 4.11 Miscellaneous function 4.12 Group function
<b>Unit – V</b>  <b>Relational Database design</b>	5a Describe the concept of Normalization of a database 5b Design database table at different levels of normalizations.	4.13 Operators 4.14 Arithmetic 4.15 Comparison 4.16 Logical Group by 4.17 Having and order by clause 4.18 Set operators 4.18.1 Union 4.18.2 union all 4.18.3 intersect 4.18.4 minus 4.19 Joins 4.19.1 simple join 4.19.2 equi join 4.19.3 non equi join 4.19.4 self join 4.19.5 outer join  5.1 Functional Dependencies 5.2 Importance of Normalization 5.3 Different Normalization 5.3.1 1NF 5.3.2 2NF 5.3.3 BCNF 5.3.4 3NF 5.4 Comparison of BCNF and 3NF

## 8. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Unit	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Data Management Concepts	08	2	4	4	10
II	Integrity Constraints and Ms-Access	08	2	4	6	12
III	Relational Algebra and E-R Model	08	4	6	6	16
IV	Structure Query Language	12	4	7	8	19
V	Relational Database Design	06	4	3	6	13
<b>Total</b>		<b>42</b>	<b>16</b>	<b>24</b>	<b>30</b>	<b>70</b>

**Legends:** R = Remember; U = Understand; A = Apply and above levels (Bloom's revised taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 8. SUGGESTED LIST OF EXERCISES/PRACTICAL

The practical/exercises should be properly designed and implemented with an attempt to develop different types of skills (**outcomes in psychomotor and affective domain**) so that students are able to acquire the competencies/programme outcomes. Following is the list of practical exercises for guidance.

**Note:** Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of certain outcomes in affective domain which would in turn lead to development of **Course Outcomes** related to affective domain. Thus over all development of **Programme Outcomes** (as given in a common list at the beginning of curriculum document for this programme) would be assured.

Faculty should refer to that common list and should ensure that students also acquire outcomes in affective domain which are required for overall achievement of Programme Outcomes/Course Outcomes.

Sr. No.	Unit No.	Practical/Exercise (outcomes in Psychomotor Domain)	Apprx. Hrs. Required
1	II	Create MS Access database having two tables, insert 10 records in it and show all the records of it.	2
2		Create MS Access database having three table show the relation among them,perform insert delete operation in it.	2
3		Create MS Access database having multiple table change the size and type of a field.and show the updated records	2
4		Create MS Access database ,use various queries on it to modify.	2



Sr. No.	Unit No.	Practical/Exercise (outcomes in Psychomotor Domain)	Apprx. Hrs. Required
5		Create MS Access database using access ,use multiple table join related tables.	4
6		Create access database,sort the data on specific field.	2
7	III	Write sql query to create table and insert 10 records.	2
8		Write sql query to update the records on specific field.	2
9		Write sql query to delete the particular table.	2
10		Write sql queries to use various date functions.	2
11		Write sql queries to use various numeric functions	2
12		Write sql queries to use various character functions	2
13		Write sql queries to use various operators.	2
14		Write sql queries to use various conversion functions	2
15		Write sql queries to use various group functions	2
16		Write SQL queries using Group by, Having and Order by clause	4
17	IV	Write SQL queries to create a table	2
18		Write SQL queries to insert a value in to a table	2
19		Write SQL queries to show the record in the table	2
20		Write SQL queries to show the one field of the table	2
21		. Write SQL queries to delete the record in the table	2
22	V	Write SQL queries to show some records.	2
23		Write SQL queries using Set operators.	2
24		Write SQL queries using join operation.	2
25		Write SQL queries to retrieve data from maultiple tables.	2
26		Write SQL queries to show all the records and modify some data	2
Total Hours			56

### 3 SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities like:

- Seminar with Power point Presentations.
- Design a Model for any real time system.

### 9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

Prepared database like student information , banking, library, insurance etc.

### 10. SUGGESTED LEARNING RESOURCES

#### (A) List of Books

Sr. No.	Title of Books	Author	Publication
1	Database System Concepts	Henry Korth	MGH
2	Microsoft Access Fundamentals	Rudy LeCorps	RGL Learning
3	Sql/ Pl-SQL	Ivan Bayross	BPB
4	An Introduction to Database	C. J. Date	Pearson

	Systems		Education
5	Beginners Guide	ORACLE PRESS	THM
6	Oracle – The complete reference	ORACLE PRESS	TMH

**(B) List of Major Equipment with Major Specifications.**

**Hardware :** Desktop Computer P-IV processor or higher

**Software :** Microsoft 2003 /any higher version  
Oracle, SQL Server, MySQL

**(C) List of Learning Websites.**

Ms-Access Tutorial : [http://www.quackit.com/microsoft\\_access/tutorial/](http://www.quackit.com/microsoft_access/tutorial/)

SQL Basic Concepts: <http://www.w3schools.com/sql/>

SQL Tutorial : <http://beginner-sql-tutorial.com/sql.htm>

DBMS:<http://nptel.iitm.ac.in/video.php?subjectId=106106093>

**□ COURSE CURRICULUM DEVELOPMENT COMMITTEE**

**Faculty Members from Polytechnics**

- **Prof. Priti.N.Parikh** , Lecturer (I.T), Government Polytechnic,Ahmedabad
- **Prof. Darshana Trivedi**, Lecturer (I.T), R.C.T.I Ahmedabad.

**Coordinator and Faculty Members from NITTTR Bhopal**

- **Dr.Shailendra Singh**, HOD, Department of Computer Engineering and Applications.
- **Dr.K.J.Mathai**, Associate Professor, Department of Computer Engineering and Applications.