**GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT**

**COURSE CURRICULUM**
**COURSE TITLE: JAVA PROGRAMMING**
**(COURSE CODE: 3350703)**

| Diploma Programme in which this course is offered | Semester in which offered |
|---|---|
| Computer Engineering/ Information Technology | 5th Semester |

## 1. RATIONALE:

Open source platforms play significant role in the corporate world and are gaining popularity because these are freeware and ease of access. Java is a simple, portable, distributive, robust, secure, dynamic, architecture neutral, object oriented programming language. This technology allows the software designed and developed once for an idealized 'virtual machine' and run on various computing platforms. Companies of all sizes are using Java as the main programming platform to develop various applications/projects worldwide. The aim of this course is that student should learn platform independent object oriented programming and java as base language for advanced technology like three tier architecture applications, cloud computing and web development. Many commercial applications as well as developing mission critical applications are using Java Technologies. This necessitates the corporate sectors to hire highly skilled Java developers. So, after learning this course, student can float themselves as Java developer in the software industry as well this course works as foundation course for advance Java programming for the forthcoming semester.

## 2. LIST OF COMPETENCY:

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

- **Develop software applications using object oriented concept in an Java SDK environment**

## 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. Explain object oriented programming concepts of java.
ii. Comprehend building blocks of OOPs language, inheritance, package and interfaces.
iii. Identify exception handling methods.
iv. Develop multithreading object oriented programs.
v. Develop an object oriented program handling data file.

## 4. TEACHING AND EXAMINATION SCHEME

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

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

## 5. COURSE CONTENT DETAILS

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics |
|---|---|---|
| **Unit – I Introduction to Java** | 1a. Describe Internet role, advantages and, environment setup of Java. | 1.1 Basics of Java, Background/History of Java, Java and the Internet, Advantages of Java<br>1.2 Java Virtual Machine & Byte Code<br>1.3 Java Environment Setup<br>1.4 Java Program Structure |
| | 1b.Differentiate between POP and OOP | 1.5 Procedure-Oriented vs. Object-Oriented Programming concept |
| | 1c. List important OOP fundamentals | 1.6 Basics of OOP: Abstraction, Inheritance, Encapsulation, Classes, subclasses and super classes, Polymorphism and Overloading, message communication |
| | 1d. Write simple programs using java | 1.7 Compiling and running a simple "Hello World" program: Setting Up Your Computer, Writing a Program, Compiling, Interpreting and Running the program, Common Errors |
| **Unit – II Building Blocks of the Language** | 2a. Explain Data types: constant and variables | 2.1 Primitive Data Types : Integers, Floating Point type, Characters, Booleans etc<br>2.2 User Defined Data Type<br>2.3 Identifiers & Literals<br>2.4 Declarations of constants & variables<br>2.5 Type Conversion and Casting<br>2.6 Scope of variables & default values of variables declared<br>2.7 Wrapper classes<br>2.8 Comment Syntax<br>2.9 Garbage Collection |
| | 2b. State the steps to implement programs for Arrays and String Handling | 2.10 Arrays of Primitive Data Types<br>2.11 Types of Arrays<br>2.12 Creation, concatenation and conversion of a string, changing case of string, character extraction, String |

| | | |
|---|---|---|
| | | Comparison, String Buffer |
| | 2c. List different types of operators | 2.13 Different Operators: Arithmetic, Bitwise, Rational, Logical, Assignment, Conditional, Ternary, Increment and Decrement, Mathematical Functions |
| | 2d. State the steps to implement small programs using Decision & Control Structures | 2.14 Decision & Control Statements: Selection Statement (if, if...else, switch), Loops (while, do-while, for), Jump statements (break, continue, return & exit) |
| **Unit – III Object Oriented Programming Concepts** | 3a.Define Objects and Classes and methods | 3.1 Defining classes, fields and methods, creating objects, accessing rules, this keyword, static keyword, method overloading, final keyword, |
| | 3b.Explain Constructors & its types, Object as a parameter, constructor overloading | 3.2 Constructors: Default constructors, Parameterized constructors, Copy constructors, Passing object as a parameter, constructor overloading |
| **Unit– IV Inheritance, Packages & Interfaces** | 4a. Describe Inheritance and method overriding<br>4b. List the types of Inheritance | 4.1 Basics of Inheritance, Types of inheritance: single, multiple, multilevel, hierarchical and hybrid inheritance, concepts of method overriding, extending class, super class, subclass, dynamic method dispatch & Object class |
| | 4c. Describe Creating package, importing package, access rules for packages, class hiding rules in a package<br>4d. Define interface.<br>4e. Explain inheritance on interfaces, implementing interface, multiple inheritance using interface | 4.2 Creating package, importing package, access rules for packages, class hiding rules in a package.<br>4.3 Defining interface, inheritance on interfaces, implementing interface, multiple inheritance using interface |
| | 4f.Describe Abstract & final classes | 4.4 Abstract class and final class |
| **Unit – V Exception Handling & Multithreaded** | 5a. Explain errors, & exceptions<br>5b. List types of errors | 5.1 Types of errors, exceptions, try..catch statement, multiple catch blocks, throw and throws keywords, finally clause, uses of exceptions, user defined exceptions |

| | | |
|---|---|---|
| **Programming** | 5c. Define thread, creating threads, multithreading, thread priority & synchronization | 5.2 Creating thread, extending Thread class, implementing Runnable interface, life cycle of a thread, Thread priority & thread synchronization, exception handing in threads |
| **Unit – VI File Handling** | 6a. Explain basics of streams, stream classes, creation, reading and writing files in context to file handling | 6.1 Stream classes, class hierarchy, useful I/O classes, creation of text file, reading and writing text files |

## 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 |
| 1. | Introduction to Java | 04 | 4 | 3 | 0 | 7 |
| 2. | Building blocks of the Language | 08 | 4 | 4 | 6 | 14 |
| 3. | Object Oriented Programming Concepts | 06 | 4 | 4 | 6 | 14 |
| 4. | Inheritance, Packages and Interfaces | 10 | 4 | 4 | 6 | 14 |
| 5. | Exception Handling, Multithreaded Programming | 10 | 4 | 4 | 6 | 14 |
| 6. | File Handling | 04 | 0 | 3 | 4 | 07 |
| | **Total** | **42** | **20** | **22** | **28** | **70** |

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

**Note:** This specification table shall be treated as 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 are designed to develop different types of skills of the competency. Following is the list of practical problems.

| Sr. No | Unit No. | Exercise/Practical (Outcomes in Psychomotor Domain) | Approximate Hrs. |
|---|---|---|---|
| 1 | 1 | Install JDK, write a simple "Hello World" or similar java program, compilation, debugging, executing using java compiler and interpreter. | 2 |
| 2 | 2 | Write a program in Java to generate first n prime numbers. | 2 |
| 3 | 2 | Write a program in Java to find maximum of three numbers using conditional operator | 1 |
| 4 | 2 | Write a program in Java to find second maximum of n numbers without using arrays | 2 |
| 5 | 2 | Write a program in Java to reverse the digits of a number using while loop | 1 |
| 6 | 2 | Write a program in Java to convert number into words & print it | 2 |
| 7 | 2 | Write programs in Java to use Wrapper class of each primitive data types | 4 |
| 8 | 2 | Write a program in Java to multiply two matrix | 2 |
| 9 | 3 | Write a static block which will be executed before main( ) method in a class. | 1 |
| 10 | 3 | Write a program in Java to demonstrate use of **this** keyword. Check whether **this** can access the private members of the class or not. | 1 |
| 11 | 3 | Write a program in Java to develop overloaded constructor. Also develop the copy constructor to create a new object with the state of the existing object. | 2 |
| 12 | 3 | Write a program in Java to demonstrate the use of private constructor and also write a method which will count the number of instances created using default constructor only. | 2 |
| 13 | 3 | Write a program in Java to demonstrate the use of **'final'** keyword in the field declaration. How it is accessed using the objects. | 1 |
| 14 | 3 | Develop minimum 4 program based on variation in methods i.e. passing by value, passing by reference, returning values and returning objects from methods. | 2 |
| 15 | 4 | Write a program in Java to demonstrate single inheritance, multilevel inheritance and hierarchical inheritance. | 3 |
| 16 | 4 | Create a class to find out whether the given year is leap year or not. (Use inheritance for this program) | 2 |
| 17 | 4 | Write an application that illustrates how to access a hidden variable. Class **A** declares a static variable **x**. The class **B** extends **A** and declares an instance variable **x**. **display( )** method in **B** displays both of these variables. | 2 |
| 18 | 4 | Write a program in Java in which a subclass constructor invokes the constructor of the super class and instantiate the values. | 2 |
| 19 | 4 | Write a program that illustrates interface inheritance. Interface **P12** inherits from both **P1** and **P2**. Each interface declares one constant and | 4 |

| | | | |
|---|---|---|---|
| | | one method. The class **Q** implements **P12**. Instantiate **Q** and invoke each of its methods. Each method displays one of the constants. | |
| 20 | 4 | Write an application that illustrates method overriding in the same package and different packages. Also demonstrate accessibility rules in inside and outside packages. | 4 |
| 21 | 4 | Describe **abstract** class called **Shape** which has three subclasses say **Triangle**, **Rectangle**, **Circle**. Define one method **area()**in the abstract class and override this **area()** in these three subclasses to calculate for specific object i.e. area() of Triangle subclass should calculate area of triangle etc. Same for **Rectangle** and **Circle** | 2 |
| 22 | 4 | Write a program in Java to demonstrate implementation of multiple inheritance using interfaces. | 2 |
| 23 | 4 | Write a program in Java to demonstrate use of final class. | 1 |
| 24 | 5 | Write a program in Java to develop user defined exception for 'Divide by Zero' error. | 2 |
| 25 | 5 | Write a program in Java to demonstrate multiple try block and multiple catch exception | 1 |
| 26 | 5 | Write an small application in Java to develop Banking Application in which user deposits the amount Rs 1000.00 and then start withdrawing of Rs 400.00, Rs 300.00 and it throws exception "Not Sufficient Fund" when user withdraws Rs. 500 thereafter. | 2 |
| 27 | 5 | Write a program that executes two threads. One thread displays “Thread1” every 2,000 milliseconds, and the other displays “Thread2” every 4,000 milliseconds. Create the threads by extending the **Thread** class | 2 |
| 28 | 5 | Write a program that executes two threads. One thread will print the even numbers and the another thread will print odd numbers from 1 to 50. | 2 |
| 29 | 5 | Write a program in Java to demonstrate use of synchronization of threads when multiple threads are trying to update common variable. | 2 |
| 30 | 6 | Write a program in Java to create, write, modify, read operations on a Text file. | 2 |
| **Total** | | | 60 |

## 8. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities like:

i. Study available small Java application on internet and reuse in your application
ii. Develop Java object oriented application programs
iii. Present the application developed

## 9. SUGGESTED LEARNING RESOURCES

### (A) List of Books:

| Sr.No | Authors | Title of Books | Publication |
|---|---|---|---|
| **1** | Herbert Schildt | Java: The Complete Reference, Seventh Edition | Tata McGraw Hill |
| **2** | E Balagurusamy | Programming with Java | Tata McGraw Hill |
| **3** | Cay S. Horstmann, Gray Cornell | Core Java, Vol I-Fundamentals | Java Series, Sun MicroSystem |

| Sr.No | Authors | Title of Books | Publication |
|---|---|---|---|
| 4 | Sachin Malhotra & Saurabh Choudhary | Programming in JAVA, Second Edition | Oxford |

**(B) List of Major Equipment/Materials**

i. Computer System with latest configuration and memory
ii. Multimedia projector
iii. Internet Access
iv. Access to library resources

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

i. Java Development Kit: http://www.oracle.com/technetwork/java/javase/downloads/index.html
ii. http://docs.oracle.com/javase/specs/jls/se7/html/index.html
iii. http://docs.oracle.com/javase/tutorial/java/index.html
iv. http://www.tutorialspoint.com/java/
v. http://www.learnjavaonline.org/
vi. http://www.c4learn.com/javaprogramming/
vii. http://www.learn-java-tutorial.com/
viii. http://www.tutorialspoint.com/javaexamples/

## 10. SPECIAL INSTRUCTIONAL STRETEGIES (If Any)

The course activities include Lectures and Practical Exercises as per teaching scheme.

i. Conceptual knowledge will be shared interactively using multimedia projector.
ii. Student should be given environment to develop sample applications using JAVA under guidance of Teachers.

## 11. COURSE CURRICULUM DEVELOPMENT COMMITTEE

**Faculty members from Polytechnics**

- **Prof. R. M. Shaikh**, H.O.D Computer Department, K. D. Polytechnic, Patan
- **Prof. K. N. Raval**, H.O.D Computer Department, R. C. Technical Institute, Ahmedabad
- **Prof. M. P. Mehta**, Sr. Lecturer in Computer Technology, K. D. Polytechnic, Patan
- **Prof. H. P. Chauhan**, Lecturer(IT), Government Polytechnic, Himmatnagar
- **Prof A. S. Galathiya**, Lecturer in Computer Department, R. C. Technical Institute, Ahmedabad
- **Prof. H.J. Prajapati,** Lecturer(IT), Government Polytechnic, Himmatnagar
- **Prof. J. S. Upadhyay,** Lecturer and Head, IT, K P T I T, Viramgam

**Coordinator and Faculty Members from NITTTR Bhopal**

- **Dr. Shailendra Singh,** Professor & Head, Dept. of Computer Engineering and Applications.
- **Dr. James K. Mathai**, Associate Professor, Dept. of Computer Engineering and Applications.

**GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT**

**COURSE CURRICULUM**
**COURSE TITLE: INFORMATION COMMUNICATION NETWORKS**
**(COURSE CODE: 3351601)**

| Diploma Program in which this course is offered | Semester in which offered |
|---|---|
| Information Technology | 5th Semester |

## 1. RATIONALE

This course is to make students learn about the advances in Information Communication Networks. It covers the basic underlying concepts and techniques recently used in the IT industry. After going through this course student will be able to understand digital communication and fundamentals of wireless technologies. They will also learn about various wireless networking architectures, its modulation, multiplexing and other important parameters. They will go through significantly latest wireless technologies.

## 2. LIST OF COMPETENCY:

The course content should be taught and implemented with the aim to develop required skills in the students so that they are able to acquire following competencies:

- **Explain architecture and functioning of various wireless networks.**
- **Test and verify various parameters such as modulation, multiplexing etc. of a wireless network/ Wireless Communication Technologies.**

## 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 wireless information communication technology.
ii. Explain basic concept of digital communication.
iii. Test and verify various parameters of a wireless network.
iv. Explain latest trends in wireless networks.

## 4. TEACHING AND EXAMINATION SCHEME

| Teaching Scheme (In Hours) | | | Total Credits (L+T+P) | Examination Scheme | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | Theory Marks | | Practical Marks | | Total Marks |
| L | T | P | 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 CONTENT DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics |
|---|---|---|
| **Unit – I**<br><br>**Advances in Information Communication Networks** | 1a. Describe various concepts of digital communication Networks required for ICN. | 1.0 Various concepts of digital communication.<br>1.1 Digital modulation techniques (ASK,FSK,PSK)<br>1.2 Linear digital modulation techniques (QPSK, OQPSK, QAM)<br>1.3 Continuous envelope modulation(MSK,GMSK)<br>1.4 choice of digital modulation technique<br>1.5 PCM<br>1.6 Various digital coding methods<br>( ON-OFF,BIPOLAR,MANCHESTER ) |
| | 1b. Describe wireless communication fundamentals used in ICN. | **Wireless communication fundamentals.**<br>1.7 Advantages and disadvantages of wireless communication<br>1.8 Wireless network generations<br>1.9 applications of wireless communication<br>1.10 Radio path (Direct, Line Of Site and obstructive) |
| **Unit – II**<br><br>**Wireless cellular communication.** | 2a. Describe network Computing model for wireless cellular communication required in ICN | **Network Computing model for wireless cellular communication used in ICN**<br>2.1 Cell, cluster and coverage area<br>2.2 Frequency Reuse principal<br>2.3 frequency reuse distance<br>2.4 frequency management<br>2.5 channel assignment (fixed, dynamic, hybrid)<br>2.6 system parameters to increase cell coverage<br>2.7 cell spiting, sectoring etc.<br>2.8 interleaving<br>2.9 speech and channel coding |
| **Unit – III**<br><br>**Global System for Mobile Communications (GSM)** | 3a. Describe GSM architecture and related concepts. | 3.1GSM Architecture<br>3.2Frequency allocation<br>3.3GSM Identifiers: IMEI, IMSI, MSISDN, LAI, MSRN, TMSI, LMSI<br>3.4 GSM Entities<br>• Mobile Stations • Base Station Subsystem • Network and Switching Subsystem • Operation and Support Subsystem |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics |
|---|---|---|
| | 3b. Describe GSM call management and related operations. | 3.5Roaming<br>3.6 Handoff<br>3.7 mobile originated and mobile terminated call<br>3.7 SMS Features<br>3.8 SMS architecture<br>3.9 Operator centric push and push SMS.<br>3.10Operator independent push and pull SMS. |
| **Unit – IV**<br><br>**Third generation communication** | 4a. Comprehend GPRS and EDGE technologies. | 4.1 GPRS<br>4.1.1 Architecture<br>4.1.2 Protocol Stack<br>4.1.3 Quality of Service Parameters<br>4.1.4 Types of GPRS handsets<br>4.1.5 Mobility Management<br>4.1.6 GPRS service Parameters<br>4.2 EDGE<br>4.2.1 Architecture<br>4.2.2 Evolved EDGE<br>4.2.3 Advantages |
| | 4b. Explain 3G communications. | 4.3 UMTS<br>4.3.1 Architecture<br>4.3.2 Air Interface<br>4.3.3 Handoff and its types<br>4.3.4 Advantages<br>4.4 WCDMA<br>4.4.1 Architecture<br>4.4.2 Advantages<br>4.5 TD-SCDMA<br>4.5.1 Specification<br>4.5.2 Comparison with WCDMA |
| **Unit - V Latest trends in ICN.** | 5a. Describe Components , their applications of RFID and Bluetooth in ICN<br>5b. State Protocols Stack , Security Issues of Bluetooth in ICN | 5.1 Radio Frequency Identification(RFID)<br>5.1.1 Specifications<br>5.1.2 Components of RFID system<br>5.1.3 Classification of RFID tags<br>5.1.4 Advantages and Disadvantages<br>5.1.5 Applications<br>5.2 Bluetooth<br>5.2.1 Specifications<br>5.2.2 Protocols Stack<br>5.2.3 Security Issues<br>5.2.4 Advantages and Disadvantages<br>5.2.5 Applications |
| | 5b. Describe upcoming wireless technologies in brief | **The upcoming wireless technologies.**<br>5.3 IEEE 802.1 WLAN technology<br>5.3.1 Architecture<br>5.3.2 Types |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics |
|---|---|---|
| | | 5.3.3 Security Issues<br>5.3.4 Roaming<br>5.3.5 Advantages and ,Limitations<br>5.4 IEEE 802.15 WPAN technology<br>5.4.1 Bluetooth(Same as 5.2)<br>5.4.2 Brief introduction ZigBee<br>5.4.3 Brief Introduction UWB<br>5.4.4 Comparison between WPAN technologies<br><br>5.5 LTE<br>5.5.1 Architecture<br>5.5.2 Features<br>5.5.3 Security Issues<br>5.5.4 Advantages and limitations<br><br>5.6 MANET technology<br>5.6.1 Architecture<br>5.6.2 Features<br>5.6.3 Deployment Issues<br>5.6.4 Advantages and ,Limitations<br>5.6.5 Applications |

## 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 | Advances in Information Communication Networks | 9 | 7 | 6 | 3 | 16 |
| II | Wireless cellular communication | 8 | 6 | 6 | 2 | 14 |
| III | Global System for Mobile Communications (GSM) | 8 | 4 | 6 | 4 | 14 |
| IV | Third generation communication. | 8 | 2 | 4 | 4 | 10 |
| V | Latest trends in ICN. | 9 | 4 | 6 | 6 | 16 |
| | **Total** | **42** | **23** | **28** | **19** | **70** |

**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.*

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx Hrs. required |
|---|---|---|---|
| 1 | I | Test and verify Amplitude Shift Keying.( Modulation and Demodulation) | 2 |
| 2 | | Test and verify Frequency Shift Keying. ( Modulation and Demodulation) | 2 |
| 3 | | Test and verify Phase Shift Keying. ( Modulation and Demodulation) | 2 |
| 4 | | Test and verify QPSK. ( Modulation and Demodulation) | 4 |
| 5 | | Test and verify QAM. ( Modulation and Demodulation) | 2 |
| 6 | | Test and verify PCM. ( Modulation and Demodulation) | 2 |
| 7 | | Test and verify MSK. ( Modulation and Demodulation) | 2 |
| 8 | | Test and verify GMSK. ( Modulation and Demodulation) | 2 |
| 9 | | Test and verify ON-OFF coding method. | 2 |
| 10 | | Test and verify BIPOLAR coding method. | 2 |
| 11 | | Test and verify MANCHESTER coding method. | 2 |
| 12 | II | Test the basic parameters of wireless communication using GSM trainer. | 4 |
| 13 | III | Test and Verify various GSM identifier using GSM Trainer | 4 |
| 14 | | Test and Verify GSM Base station using GSM Trainer | 2 |
| 15 | | Test and Verify GSM mobile station using GSM Trainer | 4 |
| 17 | | Test and Verify various GSM identifier , GSM Base station, mobile station using GSM Trainer | 2 |
| 18 | IV | Test and verify working of GPRS. | 2 |
| 19 | | Test and verify working of EDGE. | 2 |
| 20 | | Test and verify working of UMTS. | 3 |
| 21 | | Test and verify working of CDMA. | 3 |
| 22 | V | Test and verify working of RFID. | 3 |
| 23 | | Test and verify working of Bluetooth. | 3 |
| | | **Total Practical Hours** | **56** |

## 8. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities such as:

- Group Discussion
- Seminar
- Power Point Presentation

## 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 | Wireless communication | T. L. Singal | McGraw Hill,4th edition 2012 |
| 2 | Wireless communication | U. D. Dalal | Oxford University Press |
| 3 | Wireless Networking | Price | TMH Edition-2012 |

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

i. Dual Trace Oscilloscope - 30 MHz
ii. Digital Storage Oscilloscope 100 MHz, Color Display , 1GS/s, 2MB memory with USB Port for PC connection with 32 Measurement.
iii. C.R.O. Attenuator probe - 10:1
iv. RF Signal Generator - 100 KHz - 50 MHz (Digital) with AM
v. Advanced AM/FM Signal Generator - 250 MHz (Digital)
vi. Advance Function Generator - 20 MHz (Digital)
vii. ASK Modulation Trainer
viii. ASK Demodulation Trainer
ix. FSK Modulation Trainer
x. FSK Modulation Trainer
xi. PSK Modulation Trainer
xii. PSK Demodulation Trainer
xiii. ASK-FSK-PSK Modulation/Demodulation Trainer
xiv. Digital Line Coding-Decoding Trainer ((NRZ-L,NRZ-M,NRZ-S)
xv. Bipolar Transmission Trainer
xvi. Manchester Coding Trainer
xvii. GSM Trainer
xviii. GSM Application Module
xix. CDMA Mobile Phone Trainer

xx. Wireless Communication System Trainer
xxi. Wireless USB LAN Networking Trainer
xxii. Wireless LAN Demonstrator
xxiii. RFID Trainer (Radio Frequency Identification)
xxiv. GRPS (Global Radio Packet System) Trainer
xxv. Bluetooth Networking Trainer

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

**Electronic Teaching Slides (Power Point Slides)- CD/DVD**

i. GSM
ii. CDMA
iii. Bluetooth
iv. Wireless Communication - Wifi, Bluetooth, WLL, RFID
v. Communication Networks - GSM, CDMA, GPS, GPRS

**Laboratory Charts**

i. Amplitude Shift Keying
ii. Frequency Shift Keying
iii. Phase Shift Keying
iv. Quadrature Phase Shift Keying
v. PCM
vi. CDMA

## 11. COURSE CURRICULUM DEVELOPMENT COMMITTEE

**Faculty Members from Polytechnics**

- **Prof. Nandu Ashokbhai Fatak,** Lecturer ( IT ), B P T I Bhavnagar
- **Prof. Manoj P. Parmar,** In charge Head ( IT ), Government Polytechnic Himatnagar**.**

**Coordinator and Faculty Members from NITTTR Bhopal**

- **Dr. K. James Mathai,** Associate Professor, Dept. of Computer Engineering and Applications

**GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT**

**COURSE CURRICULUM**
**COURSE TITLE: ESSENTIALS OF NETWORK SECURITY**
**(COURSE CODE: 3351602)**

| Diploma Program in which this course is offered | Semester in which offered |
|---|---|
| Information Technology | 5th Semester |

## 1. RATIONALE

The objective of Information Security is to upgrade fundamentals of security over network. This course covers basic cryptography concepts, techniques and encryption algorithms. After going through this course student will be able to configure security policy in OS.

## 2. LIST OF COMPETENCY

The course content should be taught and implemented with the aim to develop required f skills in students so that they are able to acquire following competencies:

- **Explain basics of Information Security.**
- **Identify and explain functioning of various Encryption Algorithms.**
- **Apply the security techniques for information protection.**

## 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 Security in Communication.
ii. Explain basic concept of Encryption Algorithm.
iii. Elaborate Firewall Techniques.
iv. Explain latest trends in OS Security Assessment Tools.
v. Install various firewalls for information security.
vi. Apply/Use anti malware and Cleanup Tools for betterment of information security.
vii. Apply/Use antivirus effectively for the security of OS.

## 4. TEACHING AND EXAMINATION SCHEME

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

**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 |
|---|---|---|
| **Unit – I**<br><br>**Introduction of Information Security** | 1a. Explain basic concepts related to Information Security | 1.1 Need of Information Security<br>1.2 Security Trends<br>1.3 What is Information Security<br>1.4 Overview of Information Security<br>1.5 Security Services<br>1.6 Security Mechanism<br>1.7 Security Attacks<br>1.8 The OSI Security Architecture<br>1.9 A Model for Network Security |
| **Unit – II**<br><br>**System Security** | 2a. Define Symmetric Key and Cryptography | 2.1 Symmetric Cipher Model<br>2.2 Cryptography<br>2.3 Cryptanalysis |
| | 2b. Define Classical Encryption Techniques.<br>2c. Identify various ciphers techniques available.<br>2d. Define steganography along with its usage. | 2.4 Substitution Techniques<br>2.4.1 Caesar Cipher<br>2.4.2 Monoalphabetic Cipher<br>2.4.3 Polyalphabetic Cipher<br>2.4.4 Playfair Cipher<br>2.4.5 Hill Cipher<br>2.5 Problems with Symmetric Cipher Algorithms<br>2.6 Diffie-Hellman Key exchange algorithm<br>2.5 Transposition Techniques<br>2.6 Steganography |
| **Unit – III Basic Arithmetics in Encryption** | 3a. Describe basic concept in Number theory and finite fields | 3.1 Divisibility and The Division Algorithm<br>3.2 The Euclidean Algorithm<br>3.3 Modular Arithmetic<br>3.4 Random Number<br>3.4 Groups, Rings, and Fields<br>3.5 Finite Fields of the Form GF(p) |
| **Unit – IV Symmetric Encryption Algorithm** | 4a. Discuss Block Cipher principle. | 4.1 Block Cipher Principal |
| | 4b. Define data encryption standards commonly used.<br>4c. Identify Block cipher modes of | 4.2 The Data Encryption Standard<br>4.3 Fiestel Structure<br>4.4 First Round of DES<br>4.5 Strength of DES<br>4.5.1 Double DES<br>4.5.2 Man in the Middle Attack |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics |
|---|---|---|
| | operations available. | 4.6 Block Cipher Modes of Operation<br>4.6.1 Electronic Code Book<br>4.6.2 Cipher Block Chaining Mode<br>4.6.3 Cipher Feedback Mode<br>4.6.4 Output Feedback Mode<br>4.6.5 Counter Mode |
| **Unit - V Asymmetric Key Encryption** | 5a. State the limitations of symmetric encryption | 5.1 Limitations of Symmetric Key Encryption |
| | 5b. Describe asymmetric key encryption.<br>5c. Identify confidentiality and authentication. | 5.2 Asymmetric Key Encryption<br>5.2.1 Maintaining Confidentiality<br>5.2.2 Maintaining Authentication<br>5.2.3 Managing confidentiality and authentication together |
| **Unit- VI Operating System Security** | 6a. Configure different firewalls for OS security. | 6.1 Windows OS Hardening<br>6.1.1 Configure Security Policy<br>6.1.2 Configure Firewall (Win XP, Win 7) |
| | 6b. Describe antivirus approaches available.<br>6c. Use antivirus available for the information security. | 6.2 Anti Malware and Cleanup Tools<br>6.2.1 Windows AVG<br>6.2.2 ClamAV (Open source)<br>6.2.3 Avast |
| | 6d. Use the security assessment tools on different OS viz. Windows, Linux. | 6.3 OS Security Assessment Tools<br>6.3.1 Nessus (Windows, Linux)<br>6.3.2 SAINT (Linux, Open Source) |
| | 6e. Describe the importance of OS updates.<br>6f. Use updates available in open source for different operation systems. | 6.4 OS Updates<br>6.4.1 Windows Patches<br>6.4.2 Windows Upgrades<br>6.4.3 Linux Updates, upgrades |

## 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 of Information Security | 05 | 4 | 4 | 2 | 10 |
| II | System Security | 12 | 4 | 6 | 6 | 16 |
| III | Basic Arithmetic in Encryption | 05 | 2 | 2 | 4 | 08 |
| IV | Symmetric Encryption Algorithm | 10 | 4 | 4 | 8 | 16 |
| V | Asymmetric Key Encryption | 05 | 2 | 4 | 4 | 10 |
| VI | Operating System Security | 05 | 2 | 4 | 4 | 10 |
| | **Total** | **42** | **18** | **24** | **28** | **70** |

**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 Exercises (Outcomes in Psychomotor Domain) | Hrs. required |
|---|---|---|---|
| 1 | I | Prepare report on various security trends and security services. | 4 |
| 2 | | Prepare report on various security attacks and security mechanism. | 2 |
| 3 | | Prepare report on OSI Security Architecture. | 2 |
| 4 | II | Prepare report on various cryptographic technique. | 4 |
| 5 | | Prepare report on cryptanalysis. | 4 |
| 6 | III | Perform encryption of a plain text and decryption of cipher text using one time pad method | 4 |
| 7 | | Perform encryption of plain text and decryption of cipher text of a using caesar cipher. | 4 |

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Hrs. required |
|---|---|---|---|
| 8 | | Perform encryption of a plain text and decryption of cipher text using Monoaplhabetic cipher. | 4 |
| 9 | | Perform encryption of a plain text and decryption of cipher text using play fair cipher. | 2 |
| 10 | | Perform decryption of a cipher text using polyalphabetic cipher | 2 |
| 11 | | Perform encryption of a plain text and decryption of cipher text using rectangular cipher | 4 |
| 12 | | Perform encryption of a plain text and decryption of cipher text using columnar cipher | 4 |
| 13 | | Perform encryption of a plain text and decryption of cipher text using Hill cipher | 4 |
| 14 | IV | Prepare report on block cipher modes of operation. | 2 |
| 15 | | Prepare report on single round of DES. | 2 |
| 16 | V | Prepare report on Asymmetric encryption. | 2 |
| 17 | VI | Configure Security in OS (Win XP / Win 7) | 4 |
| 18 | | Configure firewall of (Winx XP/ Win 7) | 4 |
| Total Hours | | | 58 |

## 8. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities such as:

i. Seminar with power point presentation

ii. Configure firewall on a network.

iii. Design a model of Network Security

## 9. SPECIAL INSTRUCTIONAL STRATEGIES (if any)

Assignment can be given based on above topics. Students should be allowed to work on their own and show their creativity, faculty should provide help only when students have tried their best.

## 10. SUGGESTED LEARNING RESOURCES

### A) List of Books

| S. No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Cryptography and Network Security: Principles and Practice | William Stallings | Prentice Hall |
| 2 | Cryptography: An Introduction | Nigel Smart | Mcgraw-Hill College |
| 3 | Cryptography and Network Security | Forouzan | McGraw Hill |
| 4 | Network Security Essentials | William Stallings | Pearson |
| 5 | Network Security Tools: Writing, Hacking, and Modifying Security Tools | Justin Clarke, Nitesh Dhanjani | O'Reilly Media; |

| | | | |
|---|---|---|---|
| | - See more | | |
| 6 | Network Security | Atul Kahate | Tata McGraw Hill |
| 7 | Cryptography and Security in Computing | Jaydip Sen | In Tech |

**B) List of major equipment with major Specification**

- Desktop computer P-IV processor or higher
- LINUX

Electronic Teaching Slides (Power Point Slides)- CD/DVD

- Data Encryption Standard
- Feistel Structure
- Block cipher modes of Opeartion

Laboratory Charts

- Security Attacks
- Security Mechanisms
- OSI Security Architecture

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

i. www.**cryptography**.com
ii. **http://searchsecurity.techtarget.com**
iii. cse.iitkgp.ac.in/

## 11. COURSE CURRICULUM DEVELOPMENT COMMITTEE

**Faculty Members from Polytechnics**

- **Prof Parvez K. Faruki,** In charge Head ( IT ), BPTI, Bhavnagar
- **Prof Manoj P. Parmar,** In charge Head ( IT ), G. P. Himatnagar.
- **Prof. Manish D. Patel ,** In charge Head ( IT ), R C T I Ahmedabad
- **Prof Sunil Paryani,** Lecturer , IT , G P Himatnagar
- **Prof (Ms.) Darshana Trivedi,** Lecturer, IT, RCTI, Ahmedabad

**Coordinator and Faculty Members from NITTTR Bhopal**

- **Dr. M. A. Rizvi,** Associate Professor, Dept. of Computer Engineering and Applications.
- **Dr. Priyanka Tripathi**, Associate Professor, Dept. of Computer Engineering and Applications, NITTTR.

**GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT**

# COURSE CURRICULUM
## COURSE TITLE: WEB PROGRAMMING USING ASP.NET
## (COURSE CODE: 3351603)

| Diploma Program in which this course is offered | Semester in which offered |
|---|---|
| Information Technology | 5th Semester |

## 1. RATIONALE

The .NET has become a platform of choice for the development of web based data driven pages among webpage developer community due to its potential and strong features available to develop virtually all kind of dynamic web sites. It is a popular platform for development of robust desktop and web based applications. In this course Diploma in Information Technology students will be able to use ASP.NET platform for developing web based application with database support. Aim of this course is to enable students to develop dynamic and data driven web applications utilizing the power of .NET Technology.

## 2. LIST OF COMPETENCY

The course content should be taught and implemented with an aim to develop required skills in students to enable them to acquire following competency:

- **Design, develop and deploy Web based applications using ASP.net**

## 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. Explain the architecture of Dot Net platform
ii. Develop Simple Web form using various controls and implement the concept of master page
iii. Develop interaction of front end with database using facilities of .NET platform
iv. Deploy .Net Web Applications

## 4. TEACHING AND EXAMINATION SCHEME

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

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

## 5. COURSE CONTENT DETAILS

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics |
|---|---|---|
| **Unit – I**<br><br>**Introduction to .NET Framework and ASP.NET** | 1a. State the components of Framework and describe CLR | 1.1 Microsoft .NET framework Overview<br>1.1.1. .Net framework Architecture<br>1.1.2. .Net Framework components: (CLR, CLS, CTS, MSIL, NameSpace, JIT, Metadata, FCL, Assembly, GAC, GC, Memory Management) |
| | 1b.Explain benefits of ASP.NET over Classic ASP and also the Client-Server architecture. | 1.2 Basics of ASP.NET<br>1.2.1 Features of ASP.NET<br>1.2.2 Differences between ASP.NET and Classic ASP<br>1.2.3 Web Applications and Webpage<br>1.2.4 Client Server Architecture<br>1.2.5 Parts Of website (HTML, XHTML, CSS, Client side and Server Side Scripting, Database) |
| | 1c. Develop applications using ASP.NET IDE | 1.3 Creating simple Web Application in ASP.NET<br>1.3.1 Introduction to Visual Studio 2008<br>1.3.2 Creating a New Web Project (ASP.NET)<br>1.3.3 Opening an Existing Web Site<br>1.3.4 Building Web Sites<br>1.3.5 Set up of work environment, start page, the menu system, toolbars, the new project dialog box, graphical designer, code designer. |
| **Unit – II**<br><br>**ASP.NET Web Forms** | 2. Develop simple web page using built in Objects | 2.1. Adding Controls to the Web Page<br>2.2. Types of ASP.NET Files<br>2.3. Page Life Cycle<br>2.4. Web Form Processing Stages(Roundtrip)<br>2.5. ASP.Net In-Built Objects (Response, Request, Server, Trace Objects) |
| **Unit – III**<br><br>**ASP.NET** | 3. Use controls available with the IDE platform of ASP.NET for given purpose. | 3.1 Web Server Controls (Button, Check Box, Check Box List, Drop Down List, HyperLink, Image, |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics |
|---|---|---|
| **Controls** | | Image Button, Label, Link Button, List Box, List Item, Panel, Place Holder, Radio Button, Radio Button List, Text Box)<br>3.2 Working with Control Properties and Events<br>3.3 Validation Controls (Required Field Validator, RangeValidator Control, Compare Validator, RegularExpression Validator, CustomValidator, Validation Summary) |
| **Unit – IV**<br><br>**Styles, Themes and Master pages** | 4. Apply Styles, themes and Master pages in ASP.NET Web applications. | 4.1. Styles<br>4.1.1. Creating Style Sheets<br>4.1.2. Applying Style Sheet Rules<br>4.2. Themes<br>4.2.1. How Themes Work<br>4.2.2. Handling Theme Conflicts<br>4.2.3. Creating Multiple Skins for the Same Control<br>4.3. Master Page<br>4.3.1 Basics of Master page<br>4.3.2 How Master page and Content pages are connected<br>4.3.3 Nesting Master Pages |
| **Unit - V**<br><br>**ASP.NET State Management** | 5. Develop programs using session management and user's preference in ASP.NET | 5.1 State Management<br>**5**.1.1 View State<br>5.1.2 The Query String<br>5.1.3 Cross-Page Posting and Validation<br>5.1.4 Cookies (create, set, add and expire cookie)<br>5.1.5 Session State<br>5.1.6 Application State<br>5.2 The Global.asax application file<br>5.2.1 Application Events<br>5.3 ASP.NET Configuration<br>5.3.1 The Web.config File<br>5.3.2 Storing Custom Settings in the web.config File |
| **Unit - VI Connecting Database Using ADO.NET** | 6a. Describe Objects of ADO.NET<br><br>6b. Describe the use of Data Binding to bind different | 6.1 ADO.NET Architecture<br>6.1.1 DataProvider<br>6.1.2 Connection Object<br>6.1.3 Command Object<br>6.1.4 DataReader Object |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics |
|---|---|---|
| | controls<br>6c. Differentiate between single value and repeated value types of data binding. | 6.1.5 DataAdapter Object<br>6.1.6 DataSet<br>6.1.7 DataView<br>6.2 Data Binding<br>6.2.1 Types of data binding (Single Value, Repeated Value)<br>6.3 SQL Data Source<br>6.3.1 Selecting, Updating and Deleting Records |

## 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 .NET Framework and ASP.NET | 04 | 4 | 4 | 2 | 10 |
| II | ASP.NET Web Forms | 06 | 2 | 4 | 4 | 10 |
| III | ASP.NET Controls | 08 | 4 | 4 | 6 | 14 |
| IV | Styles, Themes and Master pages | 05 | 2 | 2 | 4 | 08 |
| V | ASP.NET State Management | 07 | 2 | 4 | 6 | 12 |
| VI | Connecting Database with ADO.NET | 12 | 2 | 4 | 10 | 16 |
| | **Total** | **42** | **16** | **22** | **32** | **70** |

**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 Exercises (Outcomes in Psychomotor Domain) | Hrs. required |
|---|---|---|---|
| 1 | I | Getting acquainted with Visual Studio environment. (create new web project, open existing web project, building website, and study of toolbars, menu etc.) | 02 |
| 2 | | Develop simple application using .net facility | 02 |
| 3 | II | Develop simple web page using built in Objects. | 04 |
| 4 | | Design a web form to allow user to enter following details in his Resume using Web Server Controls. Set validations using properties. When data is submitted it must be viewed in the panel below the form. Fields of Resume are<br>FirstName, Surname, Gender, Address, City, Pincode, Phone, Qualification (Diploma, Bachelor, Master), Specialization subject, Percentage. | 04 |
| 5 | III | Create a web form where user enters following marks.<br>ASP.NET, JAVA, ISS, Project (All out of 100). When user submits the marks, numeric value validation must be done. On entering marks, the grade should be displayed in message box .<br>% > 90 and <<=100 AA<br>> 80 and <<=90 AB<br>> 70 and <<=80 BB<br>> 60 and <<=67 BC<br>>50 and <<=60 CC<br>>40 and <= 50 DD<br>Else Fail | 02 |
| 6 | III | Create a Simple calculator with validations and details | 02 |
| 7 | IV | Create a web page using the concept of cascading style sheets in ASP.NET | 02 |
| 8 | | Create a web page using the concept of Theme & Skin in ASP.NET | 02 |
| 9 | | Create Home page of your website using master page concept | 02 |
| 10 | | Create a simple web application to illustrate the concept of nesting master page in ASP.NET | 02 |
| 11 | V | Develop a web page to implement the concept of state management using Cookies | 02 |
| 12 | | Develop a web page to implement the concept of state management using Session and Application | 02 |
| 13 | | Develop a web page to implement the concept of state management using ViewState and QueryString | 02 |
| 14 | | Create a web application using **Global.asax** file which will count the number of visitors on web page. | 02 |
| 15 | | Use various tags in Web.config file for ASP.NET configuration. | 02 |
| 16 | | Write sample application to connect to database (connection object), Fetching and inserting data from database (command object) and using Data Reader | 02 |

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Hrs. required |
|---|---|---|---|
| 17 | VI | Create a Web page and test the connectivity of your database with biodata form in exercise 1. If connected, display the message that connection with database is successful, and redirect the user to his homepage | 02 |
| 18 | | Create a login page in your web application. Login page must have user name and password fields. If user enters correct ID, Password, he must be redirected to the homepage of your website. | 02 |
| 19 | | Create a web page to insert user biodata information with all validations in to the database | 02 |
| 20 | | Create a webpage, that allows user to add a new username if user doesn't exist in the database. Also create a forgot password link, to redirect user to set up his new password on authentication | 04 |
| 21 | | Create a webpage to display the information about user on his homepage once he has logged in through the login form | 02 |
| 22 | | Write an exercise, to allow the user to ADD, UPDATE, MODIFY his profile once he has logged into the website using Bound and Unbound Controls | 06 |
| 23 | | Create a webpage to bind the user data from database into a gridview dynamically. | 02 |
| 24 | | Create a simple web application that integrates the above concepts of ASP.NET into your application. Suggestive web application can be your own Personal website and host on free domain, Your department website etc, | 02 |
| Total Hours (practical for 56 hours from above representing each unit may be selected) | | | 58 |

## 8. SUGGESTED LIST OF STUDENT ACTIVITIES

Following is the list of proposed student activities such as:

i. Demonstration of potential and features of .NET Environment through seminar
ii. Develop sample Web Application such as University website/Student profile system/ holiday destination booking etc.

## 9. SPECIAL INSTRUCTIONAL STRETEGIES (If Any)

The course activities include Lectures and Practical Exercises as per teaching scheme.

i. Conceptual knowledge will be shared interactively using multimedia projector.

ii. Student should be given environment to develop sample dynamic websites using ASP.net Students should be allowed to work on their own and use their creativity. Teachers should intervene only when help is asked for.

## 10. SUGGESTED LEARNING RESOURCES

### A) List of Books

| S. No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | ASP.NET: The Complete Reference Books | Matthew Macdonald | McGraw Hill education |
| 2 | Programming in Visual Basic. NET | Julia Case Bradley, Anita C. Millspaugh | McGraw Hill, latest edition |
| 3 | Visual Basic .net Comprehensive Concepts and Techniques | Shelly, cashman, Quasney | Cengage learning, 2012 |

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

i. Computer System with latest configuration and memory
ii. Multimedia projector
iii. Internet Access

### C) List of Software/Learning Websites

i. Software: Microsoft Visual Studio latest express edition
ii. http://www.homeandlearn.co.uk/NET/vbNet.html
iii. http://msdn.microsoft.com/en-us/beginner/default.aspx
iv. Videos : http://www.youtube.com/ http://www.learnvisualstudio.net/

## 11. COURSE CURRICULUM DEVELOPMENT COMMITTEE

**Faculty Members from Polytechnics**

- **Prof. Rikita Parekh**, Lecturer, IT , Government Polytechnic for Girls, Ahmedabad
- **Prof. Vipul G. Gajjar**, Lecturer IT, R. C. Technical Institute, Ahmedabad
- **Prof. Krunal K Prajapati**, Lecturer IT, R. C. Technical Institute, Ahmedabad
- **Prof. Divya.K.Patel**. Lecturer IT, Government Polytechnic, Himatnagar.

**Coordinator and Faculty Members from NITTTR Bhopal**

- **Prof. R. K. Kapoor**, Associate Professor, Dept. of Computer Engineering and Applications.
- **Prof. Sanjay Agrawal,** Professor, Dept. of Computer Engineering and Applications.