3.1 VB .Net Programming

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Rationale

Visual programminglanguage, which enables a programmer to write programs and develop application packages to produce solution to live problems. This subject will give the students an in-depth understanding the features of .NET. The practical exercise of VB.NET during the course of study will reinforce the understanding of the subject.

DETAILED CONTENTS

Unit –1 **16 Periods**

Introduction to .NET, NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies andclass libraries. Introduction to Visual studio, Project basics, types of project in . Net, IDE of VB.NET-Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser. The environment: Editor tab, format tab, general tab, docking tab. visual development & event driven Programming - Methods and events.

Unit –2 **16 Periods**

The VB.NET Language- Variables -Declaring variables, Data Type of variables, Forcing variables declarations, Scope & lifetime of a variable, Constants, Arrays, types of array, control array, Collections, Subroutines, Functions, Passing variable, Number of Argument, Optional Argument, Returning value from function. Control flow statements:
conditional statement, loop statement. Msgbox & Inputbox.

Unit –3 **16 Periods**

Working with Forms: Loading, showing and hiding forms, controlling One form within another.GUI Programming with Windows Form: Textbox, Label, Button, Listbox, Combobox, Checkbox, PictureBox, Radio Button, Panel,Scroll bar, Timer, List View, Tree View, Toolbar, Status Bar. Their Properties, Methods and Events. OpenFileDilog, Save File Dialog, FontDialog, Color Dialog, Print Dialog. Link Label. Designing menus : Context Menu, access & shortcut keys.

Unit –4 **08 Periods**

Object Oriented Programming: Classes & objects, fields properties Methods & Events, constructor, inheritance. Access Specifiers: Public, Private, Protected. Overloading, My Base & My class keywords. Overview of OLE.

Unit –5 **08 Periods**

Database programming with ADO.NET - Overview of ADO, from ADO to ADO.NET, Accessing Data using Server Explorer. Creating Connection, Command, Data Adapter and Data Set with OLEDB and SQLDB. Display Data on data bound controls, display data on data grid.

LIST OF PRACTICALS

1. Exercise on all basic controls
2. Exercise on form designing
3. Exercise on small application using appropriate commands
4. Writing programs using arrays
5. Developing a mini p

RECOMMENDED BOOKS

1.VB.NET PROGRAMMING BLACK BOOK BY STEVEN HOLZNER-

2. *DREAMTECH PUBLICATIONS*
3. *MASTERING VB.NET BY EVANGELOS PETROUTSOS - BPB PUBLICATIONS*
4. *INTRODUCTION TO.NET FRAMEWORK -WORX PUBLICATION*
5. *MSDN. MICROSOFT. COM/ NET/*
6. *WWW.GOTDOTNET.COM*

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Hrs)	Marks Allotted
1	**16**	**20**
2	**16**	**20**
3	**16**	**20**
4	**08**	**10**
5	**08**	**10**
Total	**64**	**80**

3.2 Multimedia Systems

L	T	P
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Rationale

Multimedia is a new concept emerged in the recent times. This technology is currently being widely used in web pages, motion pictures and interactive presentations, animation etc. Multimedia has made a significant impact in training/education, business presentations, public information access etc. This course intends to introduce and expose multimedia technology and various factors and features of authoring software. It will also help in making the internet application richer in content and presentation.

DETAILED CONTENTS

Unit –1 **20 Periods**

Introduction to Multimedia, Multimedia Information, Multimedia Objects, Multimedia inbusiness and work. Convergence of Computer, Communication and Entertainment products

Stages of Multimedia Projects: Multimedia hardware, Memory & storage devices, Communication devices, Multimediasoftware's, presentation tools, tools for object generations, video, sound, image capturing,authoring tools, card and page based authoring tools.

Unit –2 **16Periods**

Multimedia Building Blocks: Text, Sound MIDI, Digital Audio, audio file formats, MIDI under windows environment Audio& Video Capture.

Unit –3 **16 Periods**

Data Compression

Huffman Coding, Shannon Fano Algorithm, Huffman Algorithms, Adaptive Coding, LZ77, LZW compression, Compression, Compression ratio lossless & lossy compression.

Unit –4 **12 Periods**

Speech Compression & Synthesis: Digital Audio concepts, Sampling Variables, Loss less compression of sound, loss compression& silence compression.

Unit –5 **16 Periods**

Images: Multiple monitors, bitmaps, Vector drawing, lossy graphic compression, image file formats, animations, Images standards.

Unit –6 **16 Periods**

Video: Video representation, Colors, Video file formats,Compression, MPEG standards, MHEG Standard Video Streaming on net, Video Conferencing,Multimedia Broadcast Services, Indexing and retrieval of Video Database, recent development inMultimedia.

RECOMMENDED BOOKS

1. Tay Vaughan, “Multimedia, Making IT Work”, McGraw Hill.
2. Buford, “Multimedia Systems”, Addison Wesley.
3. Mark Nelson, “Data Compression Hand Book”, BPB.
4. Sleinreitz, “Multimedia System”, Addison Wesley.

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Hrs)	Marks Allotted
1	20	20
2	16	15
3	16	15
4	12	10
5	16	10
6	16	10
Total	96	80

3.3Computer Communication Network

L	T	P
4	-	4

Rationale

Virtually every computer is connected, or has the potential to be connected, to other computers. When connected locally, they provide vital services such as print servers, file servers, CPU servers and when connected externally, offer access to the Internet, world-wide-web and electronic mail. Millions of people world wide have been exposed to the World Wide Web of computers and the information they provide. The explosion in the use of such technologies and the long established use of local area networks has made the study of computer networks and the underlying communication technology as important as the more traditional foundations of computer science such as computer architecture, operating systems and programming.

DETAILED CONTENTS

Unit –1 **20 Periods**

Historical perspective, theoretical and practical models of network architecture particularly the ISO OSI seven layer model and the TCP/IP protocol stack. Example networks and services including prototype new technologies. These would include Frame Relay, ISDN, ATM, WiFi, xDSL, WiMAX, 2G and 3G.

Unit –2 **12 Periods**

Physical properties of copper media, fibre optics, radio communication, and data communication standards. Maximum data rates (theoretical and practical) for different media including some simple analysis of signals. Data encoding of digital signals. The distinction between, and analysis of, physical media and wireless media properties. The difference between narrow band and broad band technologies with particular reference to ISDN and xDSL.

Unit –3 **08 Periods**

Local Area Networks: Types of LAN covering standards, topology and performance. Example architectures such as ethernet and fast ethernet, ATM, and WiFi. The operation of LAN switches and the configuration of virtual LANs.

Unit –4 **08 Periods**

Wide Area Networks: Circuit versus packet switching and associated routing and flow control. Detailed examples of existing architectures such as Frame Relay, ISDN, ATM, Multi-protocol Label Switching (MPLS) and Virtual Private Networks (VPN).

Unit –5 **06 Periods**

Inter Network: Principles of inter-networking, architectures, addressing and protocols. Particular reference to IPv4, IPv6, TCP and UDP.

Unit –6 **10 Periods**

Errors: The main causes of errors and their effects on transmission. Single bit and burst errors. Various error detection and correction strategies including parity, block sum, Hamming Codes, Cyclic Redundancy Checks and Forward versus Backward error control. Statistical analysis of the effectiveness of error detection and correction code. Quality of Service:A definition of quality of service and the main parameters that define network performance.

LIST OF PRACTICALS

1. Recognize the physical topology and cabling (coaxial, OFC, UTP, STP) of a network.
2. Recognition and use of various types of connectors RJ-45, RJ-11,BNC and SCST
3. Recognition of network devices (Switches, Hub, Routers of access points for Wifi
4. Making of cross cable and straight cable
5. Install and configure a network interface card in a workstation.
6. Study and Demonstration of sub netting of IP address
7. Connectivity troubleshooting using PING, IPCONFIG, IFCONFIG
8. Visit to nearby industry for latest networking techniques

RECOMMENDED BOOKS

1. Halsall, Fred, Computer Networking and the Internet, Addison Wesley (5th Ed), 2005, ISBN: 0321263588
2. Stallings, William, Data and Computer Communications, Prentice Hall Int. (8th Ed), 2007, ISBN: 0132433109
3. Stallings, William, Wireless Communications and Networks (2nd Edition), 2004, ISBN: 0131967908
4. Tanenbaum, Andrew, Computer Networks (International Edition) (4th Edition), 2002, ISBN: 0130384887
5. Data Communications and Networking by Forouzan, (Edition 2nd and 4th), Tata McGraw Hill Education Pvt Ltd , New Delhi

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Hrs)	Marks Allotted
1	20	25
2	12	15
3	08	10
4	08	10
5	06	10
6	10	10
Total	64	80

3.4 Software Testing

L T P

4 - 4

Rationale

The Course is aimed at teaching different techniques of testing a software after it is developedand to Develop the skills necessary to find bugs in any types of software.After completion of the course ,the students Use new testing skills to test not just the software , but also the product specification the raw code,and even the user's manual.

DETAILED CONTENTS

Unit –1 **10 Periods**

Fundamentals of Testing

Human and errors, Testing and Debugging, Software Quality, Requirement Behavior and Correctness, Fundamentals of Test Process, Psychology of Testing, General Principles of Testing, Test Metrics

Unit –2 **10 Periods**

Role of Testing in SDLC

Review of software development models (Waterfall Models, Spiral Model, W Model, V Model) Agile Methodology and Its Impact on testing, Test Levels (Unit, Component, Module, Integration, System, Acceptance, Generic)

Unit –3 **16 Periods**

Static Testing :Structured Group Examinations **,**Static Analysis **,**Control flow & Data flow, Determining Metrics

Dynamic Testing : Black Box Testing -Equivalence Class Partitioning, Boundary Value Analysis, State Transition Test, Cause Effect Graphing and Decision Table Technique and Used Case Testing and Advanced black box techniques

White Box Testing- Statement Coverage, Branch Coverage, Test of Conditions, Path Coverage, Advanced White Box Techniques, Instrumentation and Tool Support Gray Box Testing, Intuitive and Experience Based Testing

Unit –4 **10 Periods**

Test Management : Test Organization ,Test teams, tasks and Qualifications ,Test Planning , Quality Assurance Plan, Test Plan, Prioritization Plan, Test Exit Criteria ,Cost and economy, Aspects ,Test Strategies ,Preventive versus Reactive Approach, Analytical versus heuristic Approach ,Test Activity Management, Incident Management, Configuration Management ,Test Progress Monitoring and Control ,Specialized Testing: Performance, Load, Stress & Security Testing

Unit –5 **10 Periods**

Testing Tools : Automation of Test Execution, Requirement tracker, High Level Review ,Types of test Tools ,Tools for test management and Control, Test Specification, Static Testing, Dynamic Testing, Non-functional testing ,Selection and Introduction of Test Tools, Cost Effectiveness of Tool Introduction

Unit –6 **08 Periods**

Testing Object Oriented Software : Introduction to OO testing concepts, Differences in OO testing

LIST OF PRACTICALS

1. Study of open source quality assurance and software testing tools.
2. Use of software testing tools like CPPUnit, JUnit.
3. Use of configuration management tools like CVS, VSS.
4. Applying white box testing techniques to programs involving the use of control structures, pointers, arrays, structures, files etc.
5. Applying white box testing techniques to programs involving the use of object oriented concepts like encapsulation, abstraction, inheritance, polymorphism etc.
6. Applying black box testing techniques to programs involving the use of control structures, pointers, arrays, structures, files etc.
7. Applying black box testing techniques to programs involving the use of object oriented concepts like encapsulation, abstraction, inheritance, polymorphism etc.

RECOMMENDED BOOKS

1. Software Testing Foundations, Andreas Spillner, Tilo Linz, Hans Schaefer, Shoff Publishers and Distributors

2. Software Testing: Principles and Practices by Srinivasan D and Gopalswamy R, PearsonEd, 2006

3. Foundations of Software Testing by Aditya P. Mathur – Pearson Education custom edition 2000

4. Testing Object Oriented Systems: models, patterns and tools, Robert V Binder, Addison Wesley, 1996

5. Software Engineering – A practitioner's approach by Roger S. Pressman, 5th Edition, McGraw Hill

6. The art of software testing by GJ Myers, Wiley.

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Hrs)	Marks Allotted
1	10	10
2	10	10
3	16	20
4	10	15
5	10	15
6	08	10
Total	64	80

3.4 Management Information System

L T P

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Rationale

This subject makes students aware of organization structure and role of each individual working at various levels. It is also intended to apprise the students of latest technological advancement in the field.

DETAILED CONTENTS

Unit –1 **24 Periods**

Foundation of Information System

Information Systems (Concept, Resources and Products, Activities), Management Information System (Definition, Role, Features) Importance ofManagement, Process of Management (Planning, Organizing, Staffing,Coordinating, Directing), Organizational Structure – Basic model of organization structure,Organizational Behaviour, Management Information System Organization, Strategic Management of Business – Concept of corporate planning,Essentiality of Strategic planning, Development of Business Strategy, Typesof strategies, Tools of planning, MIS Business planning

Unit –2 **16 Periods**

Application of MIS

Applications in manufacturing sector (Personal Management, Financial Management, Production Management, Materials Management, andMarketing Management), Applications in Service sector (Airlines, Hotels, Hospitals, Banking, Insurance, Utilities, and Finance.)

Unit –3 **20Periods**

Decision Support System

Characteristics of decision making process, Decision Support System (Concept, Components, Development, Risk) Management Information System and Decision Support System, Concept ofArtificial Intelligence & Expert System. Data warehouse (Concept, Design, Organization and Management,Architecture, Implementation), Data in data warehouse, Data Mining

Unit –4 **20 Periods**

Integration of Information

Enterprise Resource Planning (ERP)-ERP (Basic features, Benefits,selection, implementation) Enterprise Management System (EMS) &Management Information System (MIS), Customer Relationship Management (CRM) (Concept , Three Phases ofCRM, Benefits , Challenges & Trends), Business Process Outsourcing (BPO) -BPO, Voice BPO i.e. Call Centre, Non-Voice BPO, Challenges in BPO Management.Electronic Commerce Systems (E-Commerce) – Concept, Scope, B2C, B2B, C2C, E-Commerce Applications.

Unit –5 **16 Periods**

Security & Ethical challenges

Viewing Versus SecurityRisks, Threats & Vulnerability, Assessing Risks.Common Controls (Physical, Electronic, Software, Management Controls), Common Threats (Natural Disasters Employee Errors, Computer Crime,Fraud, Abuse, Program Bugs)
Ethical & Contractual Behaviours, Privacy, Access & Accuracy Issues,Property Issues.

RECOMMENDED BOOKS

1. MIS, organization and Technology, Prentice Hall Landon & Landon
2. MIS, THM Publication Zed Jawadekar
3. MIS, Managerial perspective, Macmillan Publications By D.P. Goyal
4. Management information system, Davis G.B.and Olson, M.H.McGraw Hill,1984.
5. Computers and information systems in Business, Brabo,G.L.,Hunghton Mifflin, 1976.
6. information system for Modern Management, Murdick,r.G. and Ross, J.E., Prentice Hall, India
7. Decision support systems current practice and continuing challengers, Alter C., Addison Wesely, 1980.
8. Structured system analysis tools and techniques, Prentice Hall, 1979.

9. The mythical Man-month, Brooks F.R.Addison Wesley,1982.

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Hrs)	Marks Allotted
1	24	20
2	16	15
3	20	15
4	20	15
5	16	15
Total	96	80

3.6 MINOR PROJECT

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Minor project work aims at exposing the students to the various industries dealing with computers. It is expected from them to get acquainted with computer environment possess desired attitudes. For this purpose student during middle of the course are required to be sent for a period of two to four weeks at a stretch in different establishments. Depending upon the interest of students they are sent for exposure to:

1) Industrial practices in installation and maintenance of computers and computer networks
2) Fabrication of computers
3) Fault diagnosis and testing of computers
4) Industrial practices in respect of documentation and fabrication
5) A variety of computers and peripherals in assembly organizations
6) Software package development organizations
7) Maintenance of database

8) Write be stored procedure or functions which can be attached as the library objects to the main projects
9) Write a procedure function to convert number of words.
10) Write a procedure function to convert all data function (create your own) Database connectivity, (SQL server, Oracle, Access), use of graphics, Encryption decryption program.

Note: The teachers may guide /help students to identify their minor project work and chalk out their plan of action well in advance.

As a minor project activity each student is supposed to study the operations at site and prepare a detail project report of the observations/processes/activities by him/her. The students should be guided by the respective subject teachers; each teacher may guide a group of 4 to 5 students.

The teachers along with field supervisors/engineers will conduct performance assessment of students. Criteria for assessment will be as follows:

	Criteria	**Weightage**
(a)	Attendance and Punctuality	15%
(b)	Initiative in performing tasks/creating new things	30%
(c)	Relation with people	15%
(d)	Report Writing	40%