

3.1 PROGRAMMING USING C#

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RATIONALE:

This is an introductory programming course using the C# language. It does not assume any prior programming experience. This course will prepare students for intermediate C# courses. We will also cover Object Oriented Architecture, design, performance, security, content managements systems and deployment issues encountered in building multi-tier distributed applications.

Unit -1 (12 Periods)
Execution of C# program on command line, C# Data Types, Literals, and Variables, **Namespaces**, C# keyword, Type conversion and Casting, difference between C# and C++, Operators, Methods, Command line arguments, Classes and objects.

Unit -2 (20 Periods)
Program Control Statements, Operators, Generic collection, List, Arrays and Strings, Operator Overloading, Method overloading and overriding, Abstraction, Inheritance, Polymorphism, Constructor, Garbage collection and destructors, static and this keywords.

Unit -3 (12 Periods)
Introduction of Interfaces, Implementing Interfaces, Properties, References, Interface inheritance, Structures, Enumerations.

Unit -4 (12 Periods)
Errors and exceptions, commonly used exceptions, Try and catch, multiple catch, Nested try, throwing exception, Using finally, Threads, Thread life cycle ,Thread control methods, Multithreading, thread priorities, synchronization.

Unit -5 (08 Periods)
Files and streams, classes file and directory, reading and writing sequential access file.

RECOMMENDED BOOKS

- 1- Beginning C# Object-Oriented Programming Authors: Clark, Dan
- 2- C# 4.0 The Complete Reference by Herbert Schildt Tata Mc Graw Hill
- 3- Learn C# in one day by Jamie Chan

LIST OF PRACTICALS

1. Program to convert from Celsius degrees to Kelvin and Fahrenheit
2. Programs using array, string and all objects oriented features.
3. Program that takes a number as input and then displays a rectangle of 3 columns wide and 5 rows tall using that digit.
4. Program to find the largest and lowest values from three integer values

5. Programs using Error handling
6. Programs to create file, delete file , read data from file and write data in file
7. Programs of database connectivity.

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Hrs)	Marks Allotted
1	12	20
2	20	26
3	12	12
4	12	12
5	08	10
Total	64	80

3.2 .NET USING C#

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RATIONALE:

This course will cover the practical aspects of multi-tier application development using the .NET framework. The goal of this course is to introduce the students to the basics of distributed application development. We will introduce the students to Web Service development. Technologies covered include the Common Language Runtime (CLR), .NET framework classes, C#, ASP.NET, and ADO.NET.

UNIT - 1 (14 Periods)
Introduction to client server architecture, Introduction to .NET framework, feature of .Net framework, architecture and component of .Net, elements of .Net. Common Language Runtime (CLR), Common Type System (CTS), Common Language Specifications (CLS), Microsoft Intermediate Language (MSIL), Just In Time Compiler.

UNIT - 2 (16 Periods)
Windows forms, Control Properties and Layout, Using common Dialogs, Event Handling: mouse and Keyboard, Labels, Textboxes, Buttons, Group Boxes, Panels, Check Boxes and Radio Buttons , Picture Boxes , tooltips, Menus Control, Month Calendar , Date Time Picker , List Box , Checked List Box, Combo Box, Tree View, List View, data grid, Grid View, Tab control, Multiple Document Interface(MDI) Window.

UNIT – 3 (08 Periods)
Drawing classes and the coordinate system , graphics context and graphics objects ,color and font control, drawing lines, rectangle, ovals ,Arcs , Loading , Displaying and scaling images , animating a series of images, introduction to WPF, Animation and Media using WPF.

UNIT – 4 (12 Periods)
Data access techniques, XML, LINQ, SQL , ADO.NET object Model ,LINQ to SQL, ADO.NET and LINQ, LINQ to XML.

UNIT – 5 (14 Periods)
Describing WCF, advantage over Web services, Interoperability with Applications Built on Other Technologies creating WCF implementing service class, selecting host defining endpoint creating WCF client, messaging Options, Controlling Local Behaviour, Security, transaction in WCF, Restful communication, communication with POX RSS and ATOM, Queuing, creating workflow services

RECOMMENDED BOOKS

- Mastering C# and .NET Framework by Marino Posadas Packt Publishing
- Beginning ASP.NET 4.5 in C# and VB, Wrox, 2012, ISBN-10: 1118311809
- Beginning ASP.NET 4.5 in C#, Apress, 2012, ISBN-10: 1430242515
- Pro C# with .NET 3.0, Andrew Troelsen, Apress, 2007, ISBN 978-1-59059-823-8

- Microsoft Windows SharePoint Services 3.0 Step by Step, Olga Londer, Todd Bleeker, Penelope Coventry, James Edelen, Microsoft Press, 2005, ISBN-10: 0735623635
- Microsoft .NET XML Web Services: Step by Step, Adam Freeman, Allen Jones, Microsoft Press, 2003, ISBN 0-7356-1720-1
- Microsoft .NET Distributed Applications: Integrating XML Web Services and .NET Remoting, Matthew MacDonald, ISBN 0-7356-1933-6,

LIST OF PRACTICALS

1. Program to implement date and time.
2. Program to implement Speed synthesis.
3. Program to implement data gridview.
4. Program to create crystal report using database connectivity.
5. Program to create form and connectivity using SQL server database.
6. Program to implement print dialog box.
7. Program to implement mask text box and numeric up down.
8. Program to implement menus and tabs.

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Hrs)	Marks Allotted
1	14	20
2	16	25
3	08	10
4	12	12
5	14	13
Total	64	80

3.3 COMPUTER COMMUNICATION NETWORK

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RATIONALE:

The future of computer technology is in data communication and networks. Global connectivity can be achieved through computer networks. A diploma holder in computer engineering should therefore understand the function of networks. Knowledge about hardware and software requirements of networks is essential.

UNIT- 1 15 Periods
Introduction: Communication concept and type, Communication media, Concept and type of Modems, modem standards, need of modulation, AM,FM, PM, PAM and PCM Modulation. Example of networks and services including prototype new technologies. These would include Frame Relay, ISDN, ATM, WiFi, xDSL, WiMAX, 2G and 3G.

UNIT- 2 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.

UNIT- 3 18 Periods
Computer Network and its types, Network Topologies, Definition of Protocol, Circuit and Packet Switching, Delays: Processing, Queuing, Transmission and Propagation delay. Layered Architecture, The OSI Reference Model and the TCP/IP model, Difference between OSI and TCP/IP Model.

UNIT- 4. 12 Periods
Medium Access sub layer: Channel Allocations, LAN protocols- ALOHA protocols - Overview of IEEE standards. Data Link Layer - Elementary Data Link Protocols, Sliding Window protocols, Error Handling.

UNIT- 5. 12 Periods
Network Layer : Network Layer, Point – to- Point Networks, routing, Congestion Control, Internetworking, TCP / IP, IP packet, IP address, IPv6.

UNIT- 6. 08 Periods
Transport Layer : Transport Layer - Design issues, connection management session Layer- Design issues, remote procedure call., Presentation Layer, Design issues, Cryptography.

UNIT- 7. 05 Periods

Application Layer : Application Layer: File Transfer, Access and Management, Electronic mail, Virtual Terminals,

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 Wi-Fi).
4. Making of cross cable and straight cable.
5. Install and configure a network interface card in a workstation.
6. Identify the IP address of a workstation and the class of the address and configure the IP Address on a workstation.
7. Managing user accounts in windows.
8. Study and Demonstration of sub netting of IP address.
9. Connectivity troubleshooting using PING, IPCONFIG, IFCONFIG.

RECOMMENDED BOOKS

1. Computer Networks by Tanenbaum; Prentice Hall of India, New Delhi
2. Data Communications and Networking by Forouzan, (Edition 2nd and 4th); Tata McGraw Hill Education Pvt Ltd , New Delhi
3. Data and Computer Communication by William Stallings; Pearson Education, New Delhi
4. Networking Essentials; BPB Publications New Delhi
5. Data Communication and Computer Networks by ISRD group; Tata McGraw Hill Education Pvt Ltd Publications, New Delhi.

SUGGESTED DISTRIBUTION OF MARKS

Unit No.	Time Allotted (Hrs)	Marks Allotted
1	15	15
2	10	15
3	18	15
4	12	10
5	12	10
6	8	10
7	5	5
Total	80	80

3.4 MANAGEMENT INFORMATION SYSTEM

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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 of Management, 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, Types of 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, and Marketing Management), Applications in Service sector (Airlines, Hotels, Hospitals, Banking, Insurance, Utilities, and Finance.).
- Unit –3 20 Periods
Decision Support System: Characteristics of decision making process, Decision Support System (Concept, Components, Development, Risk), Concept of Artificial Intelligence & Expert System. Data warehouse (Concept, Design, Organization and Management, Architecture, Implementation), Data Mining.
- Unit –4 20 Periods
Integration of Information: Enterprise Resource Planning (ERP)-ERP (Basic features, Benefits, selection, implementation), Enterprise Management System (EMS) ,Customer Relationship Management (CRM) (Concept , Three Phases of CRM, Benefits , (Challenges & Trends), Business Process Outsourcing (BPO) -BPO, Voice BPO i.e. Call Centre, Non-Voice BPO, Challenges in BPO Management.

Unit –5

16 Periods

Security & Ethical challenges: Security Risks, 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.,Hughton 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 Wesley, 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

3.5 ENVIRONMENTAL SCIENCE

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Rationale

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A diploma holder must have knowledge of different types of pollution caused due to industries and constructional activities so that he may help in balancing the eco system and controlling pollution by pollution control measures. He should also be aware of environmental laws related to the control of pollution.

DETAILED CONTENTS

Unit1. Basics of ecology, eco system and sustainable development	06 Periods
Unit 2. Natural Disasters - Causes, Types and Disaster management.	08 Periods
Unit 3. Pollution - Air, Water and Noise Pollution. Causes, effects and measures to control these pollutions.	14 Periods
Unit 4. Solid waste management; classification of refuse material, types, sources and properties of solid wastes.	08 Periods
Unit 5. Mining, blasting, deforestation and their effects	06 Periods

Unit 6.	06 Periods
Legislation to control environment	
Unit 7.	08 Periods
Global Warming –causes , effects and preventions.	
Unit 8.	08 Periods
Current issues in environmental pollution and its control, role of non-conventional sources of energy in environmental protection.	

RECOMMENDED BOOKS

1. Environmental and Pollution Awareness by Sharma BR; Satya Prakashan, NewDelhi.
2. Environmental Protection Lqw and Policy in India by Thakur Kailash; Deep and Deep Publications, New Delhi.
3. Environmental Engineering and Management by Suresh K Dhamija; SK Kataria and Sons, New Delhi.
4. Environmental Science by Deswal and Deswal; Dhanpat Rai andCo. (P) Ltd. Delhi.

SUGGESTED DISTRIBUTION OF MARKS

Topic No.	Time Allotted for Lectures (Periods)	Marks Allotted
1	06	6
2	08	10
3	14	20
4	08	12
5	06	04
6	06	08
7	08	08
8	08	12
Total	64	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 students during middle of the course may visit/contact to different industries / Offices depending upon the interest of students.:

Areas/interest of the students in Minor Projects are to be developed:-

- 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) Designing of dynamic website.
- 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.
- 11) Create the Projects based on Inventory control, online attendance system, Payroll , Banking, Hotel Industry, Tourism, Reservation , Games and quiz.

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. 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)	Coordination	15%
(d)	Report Writing	40%