JHARKHAND UNIVERSITY OF TECHNOLOGY
Jharkhand, Ranchi

Syllabus for

BACHELOR OF COMPUTER APPICATION
(B.C.A) Programme

Fifth Semester

Subject Code	Course Type	Subject Name	Load Allocation			Marks distribution		Total Marks	Credit
			L	T	P	Internal Marks	External Marks		
5CR01	Core	Dot Net Programming	3	0	0	30	70	100	4
5OE02	Elective- IV	Open Elective – IV	4	0	0	30	70	100	4
5OE03	Elective- V	Open Elective – V	4	0	0	30	70	100	4
5SK01	Skill Enhancement	Programming in PHP	4	0	0	30	70	100	3
5AE01	Ability Enhancement	Mini Project	0	0	2	25	25	50	2
5CR01-L	Computer Lab-1	Dot Net Lab	0	0	2	25	25	50	2
5SE02-L	Skill Enhancement Lab- 2	PHP Lab	0	0	2	25	25	50	2
Semester Total			18	0	4	195	355	550	21

Open Elective – IV

1. Internet of Things
2. Artificial Intelligence

Open Elective – V

1. Multimedia & E-Commerce
2. Computer Network Security

Course Code: 5CR01
Course Name: Dot Net Programming

Objective: To gain knowledge about the methodologies behind VB.Net and ASP.Net and helps the students to develop Dot Net based application using ADO.NET and SQL Managed Provider-OLEDB Managed Provider.

Unit I

Introduction to . NET Framework, Introducing VB.NET:

New Object Oriented Capabilities- Inheritance- Parameterized Constructors- Overriding- Overloading- Shared Members- Events- Exception Handling-.NET Framework Class Hierarchy-The System Namespace. File I/O: Using the System.IO Hierarchy- Streaming text in and out of TextFiles- Object Serialization and Deserialization.

Unit II

Introduction to ADO.NET:

Comparison between ADO & ADO.NET—The difference between Connection Model & Disconnected Model – difference between the Data Set andRecord Set- The Dataset Model. Accessing Data using ADO.NET: dataset- Data Adapter Data Relation. The two Managed Providers: SQL Managed Provider-OLEDBManaged Provider.
The ADO.NET Object Model: OleDbConnection /SQLConnectionOleDbCommand/SQLCommand-OleDbDataReader/SQLDataReaderOleDbDataAdapter/SQLDataAdapter-The Data Set. Using the Binding Manager to bind controls to the data - Working with Master-Detail relationship.

Unit III

Differences between ASP and ASP.NET. ASP.NET Web Forms:

The code behind Web Form-Separations of content & Business logic-Life Cycle of a Web Form Page-Stages inWeb Form Processing.

Unit IV

ASP.NET Server Controls. Web Forms Server Controls

Recommendation:

Validation Controls-Controls that incorporate logic to validate user inputs like a required field, between ranges, or pattern matching. ASP.NET Data Access: Data Binding Server Controls-Viewing Data Collections in a Grid. ASP.NET Caching Mechanism for caching Dynamic response data. Page Output Caching.

Unit V

Web Services: Introduction to web service-Architecture of Web service: Universal Discovery Description and Integration-Web Service Description Language –Accessingweb service using different Clients.

Recommended Text Books:

1. Chris Ullman, John Kauffman, Beginning ASP.NET
2. ADO.NET Professional, Wrox Publication
3. Alex Homer, Dave Sussman, Professional ASP.NET
4. .NET Framework, OREILY Publication.

Reference books:

1. Crouch, ASP.NET and VB.NET Web Programming, Pearson Education
2. Richard Blair, Mathew Renolds, Beginning VB.NET 2003, 3rd edition, Wrox Publication
3. Bill Evjen, Billy, Hollis, et al, Professional VB.NET 2003, 3rd edition, Wrox Publication
4. Deitel and Deitel, Visual Basic.NET How to Program, Pearson Education,2nd edition Greg Buczek, ASP.NET Developer's Guide, Tata McGraw-Hill, 2002.

Course Code: 5OE02
Course Name: Internet of Things

Pre-Requisite: Basic understanding of electronics and microprocessors. Course Objectives: 1. The Internet of Things (IoT) is aimed at enabling the interconnection and integration of the physical world and the cyber space. 2. To learn about SoC architectures, programming Raspberry Pi and implementation of internet of things and protocols.

Expected Learning Outcomes:

1. Enable learners to understand System On Chip Architectures.
2. Introduction and preparing Raspberry Pi with hardware and installation.
3. Learn physical interfaces and electronics of Raspberry Pi and program them using

practical‟s

4. Learn how to design IoT based prototypes.

Unit 1

System on Chip (SoC) and Internet of Things (IoT) Overview - System on Chip: What is System on chip? Structure of System on Chip. - SoC products: Field Programmable Gate Array (FPGA), General Purpose Graphics Processing Units (GPU), Accelerated Processing Unit (APU), Compute Units. -The IoT paradigm giving overview of IoT supported Hardware platforms such as: Raspberry pi, SoC on ARM 8 Processors, Arduino and Intel Galileo boards. -Network Fundamentals: Wired Networking(Router, Switches), Wireless Networking(Access Points) - Introduction to Raspberry Pi: Introduction to Raspberry Pi, Raspberry Pi Hardware, Preparing your raspberry Pi. -Raspberry Pi Boot: Learn how this small SoC boots without BIOS. Configuring boot sequences and hardware. - Introduction toIoT: What is IoT? IoT examples, Simple IoT LED Program. - IoT and Protocols -IoT Security: HTTP, UPnp, CoAP, MQTT, XMPP. -IoT Service as a Platform: Clayster, Thinger.io, SenseIoT, carriots and Node RED. -IoT Security and Interoperability: Risks, Modes of Attacks, Tools for Security and Interoperability.

Unit 2

Programming Raspberry Pi Raspberry Pi and Linux: About Raspbian, Linux Commands, Configuring Raspberry Pi with Linux Commands Programing interfaces: Introduction to Node.js, Python. Raspberry Pi Interfaces: UART,

GPIO, I2C, SPI Useful Implementations: Cross Compilation, Pulse Width Modulation, SPI for Camera.

Unit 3

Case Study & advanced IoT Applications: IoT applications in home, infrastructures, buildings, security, Industries, Home appliances, other IoT electronic equipments. Use of Big Data and Visualization in IoT, Industry 4.0 concepts. Sensors and sensor Node and interfacing using any Embedded target boards (Raspberry Pi / Intel Galileo/ARM Cortex/ Arduino)

Unit 4

Internet of Things Privacy, Security and Governance Introduction, Overview of Governance, Privacy and Security Issues, Contribution from FP7 Projects, Security, Privacy and Trust in IoT-Data-Platforms for Smart Cities, First Steps Towards a Secure Platform, Smartie Approach. Data Aggregation for the IoT in Smart Cities, Security

TEXT BOOKS:

1. 6LoWPAN: The Wireless Embedded Internet, Zach Shelby, Carsten Bormann, Wiley
2. Internet of Things: Converging Technologies for Smart Environments and Integrated Ecosystems, Dr.Ovidiu Vermesan, Dr. Peter Friess, River Publishers
3. Interconnecting Smart Objects with IP: The Next Internet, Jean-Philippe Vasseur, Adam Dunkels,Morgan Kuffmann
4. Internet of Things : A hands- on Approach by Arshdeep Bahga, Vijay Madisetti
5. IoT Programming: A Simple and Fast Way of Learning IOT by David Etter

REFERENCES:

1. The Internet of Things: From RFID to the Next-Generation Pervasive Networked Lu Yan, Yan Zhang,Laurence T. Yang, Huansheng Ning
2. Internet of Things (A Hands-on-Approach) , Vijay Madisetti , Arshdeep Bahga
3. Designing the Internet of Things , Adrian McEwen (Author), Hakim Cassimally
4. “Mobile Computing,” Tata McGraw Hill, Asoke K Talukder and Roopa R Yavagal, 2010.

Course Code: 5OE02
Course Name: Artificial Intelligence

Unit I

Introduction: Intelligent Agents, Agents and environments, Good behaviour, The nature ofenvironments, structure of agents, Problem Solving, problem solving agents, example problems, searching for solutions, uniformed search strategies, avoiding repeated states, searching with partial information.

Unit II

Searching Technique: Informed search and exploration, Informed search strategies, heuristic function, local search algorithms and optimistic problems, local search in
continuous spaces, online search agents and unknown environments, Constraint satisfaction problems (CSP), Backtracking search and Local search for CSP, Structure of problems, Adversarial Search, Games, Optimal decisions in games, Alpha, Beta Pruning, imperfect real-time decision.

Unit III

Knowledge Representation: First order logic – representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic - Inference in First order logic – prepositional versus first order logic – unification and lifting – forward chaining – backward chaining - Resolution - Knowledge representation - Ontological Engineering - Categories and objects – Actions - Simulation and events - Mental events and mental objects.

Unit IV

Learning: Learning from observations - forms of learning - Inductive learning - Learning decision trees - Ensemble learning - Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming - Statistical learning methods - Learning with complete data - Learningwith hidden variable - EM algorithm - Instance based learning - Neural networks - Reinforcement learning – Passive reinforcement learning - Active reinforcement learning -Generalization in reinforcement learning.

Unit V

Applications: Communication ,Communication as action, Formal grammar for a fragment of English, Syntactic analysis, Augmented grammars, Semantic interpretation, Ambiguity and disambiguation, Discourse understanding, Grammar induction, Probabilistic language processing, Probabilistic language models, Information retrieval, Information Extraction, Machine Translation.

TEXT BOOK

1. Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", 2nd Edition, Pearson Education / Prentice Hall of India, 2004

Course Code: 5OE03
Course Name: Multimedia and E-Commerce

UNIT–I

Multimedia: Needs and areas of use, Development platforms for multimedia – DOS, Windows, Linux. Identifying Multimedia elements – Text, Images, Sound, Animation and Video. Text – Concepts of plain & formatted text, RTF & HTML texts, Conversion to and from of various text formats, Text compression principles, Source Encoder and Destination Decoder. Images – Importance of graphics in multimedia, Vector and Raster graphics, image capturing methods – scanner, digital camera etc. various attributes of Images – size, color, depth etc, Various Image file format – BMP, DIB, EPS, CIF, PEX, PIC, JPG, TGA, PNG and TIF format – their features and limitations.

UNIT–II

Animation: Basics of animation, Principle and use of animation in multimedia, Effect of resolutions, pixel depth, Images size on quality and storage. Overview of 2-D and 3-D animation techniques and software. Animation on the Web – features and limitations, Software for animation.

UNIT III:

INTRODUCTION (14 Hrs) Meaning, Concepts, Features, Functions, Categories of E-Commerce, Scope, Advantages and Limitation of E-Commerce, E-Commerce practices v/s Traditional practices, E-Commerce and the Trade Cycle.

UNIT IV:

FUNDAMENTAL OF E-COMMERCE (14 Hrs) Types of e-commerce- B2B, B2C, C2C and P2P, B2B service provider, e-distributor, Procurement, Importance of E-Commerce, Internet and its role in e-commerce, procedure of registering Internet domain, Tools and Services of Internet.

UNIT V:

E-COMMERCE IN INDIA (13 Hrs) State of e-commerce in India, Problems and Opportunities in e-commerce in India, Legal Issues, Future of e-commerce, Applications inE-Commerce: E-commerce applications in Manufacturing, Wholesale, Retail and Service sector.

TEXT BOOKS

1. Multimedia: Making It Work (4 th Edition) – by Tay Vaughan, Tata Mcgraw Hills.
2. Fundamentals of Multimedia – Ze-Nian Li and Mark S. Drew, Pearson Prentice Hall.
3. Daniel Amor: “E Business R(Evolution)” Pearson Edude.
4. Krishnamurthy: “E-Commerce Management” Vikas Publishing House.

Course Code: 5OE03
Course Name: Computer Network Security

UNIT-I

Introduction: Attack, Services and Mechanism, Model for Internetwork Security. Cryptography: Notion of Plain Text, Encryption, Key, Cipher Text, Decryption and cryptanalysis; Public Key Encryption, digital Signatures and Authentication.

UNIT-II

Network Security: Authentication Application: Kerberos, X.509, Directory AuthenticationService, Pretty Good Privacy, S/Mime.

UNIT-III

IP security Architecture: Overview, Authentication header, Encapsulating Security PayLoad combining Security Associations, Key Management.

UNIT-IV

Web Security: Requirement, Secure Sockets Layer, Transport Layer Security, and SecureElectronic Transactions.

UNIT-V

Network Management Security: Overview of SNMP Architecutre-SMMPVI1 Communication Facility, SNMPV3.

UNIT-VI

System Security: Intruders, Viruses and Related Threats, Firewall Design Principles. Comprehensive examples using available software platforms/case tools, ConfigurationManagement

Reference Books:

1. W. Stallings, Networks Security Essentials: Application & Standards, Pearson Education, 2000.
2. W.Stallings, Cryptography and Network Security, Principles and Practice, Pearson Education, 2000.

Course Code: 5SK01
Course Name: Programming In PHP

Objective To understand the concepts of PHP and MySQL.

UNIT-I 12 hours Introduction: What is PHP? – History of PHP – Installing PHP – Language Basics: Lexical Structure – Data types – What's a Variable?– PHP variable andvalue types – Using PHP Variables – Expression and Operators – #Flow Control statements#.

UNIT-II 12 hours Functions: Calling a function – Defining a function – Introduction to Strings – Comparing Strings – Manipulating and Searching strings – #Arrays: Types ofArrays# – Array functions – Storing data in Arrays.

UNIT-III 12 hours Form Handling – Form Validation – $_GET variable – $_ POST variable – $_REQUEST variable – Creating the Form –#Creating the Upload script# –Using your File system: File paths and permissions – Displaying directory contents – Working with fopen( ) and fclose( ).

UNIT-IV 12 hours Using Cookies: What are Cookies? – Setting Cookies – Using Cookie variables – Session Basics: What's a session? – Understanding Session variables – Managing User preferences with Sessions – Graphics: Drawing functions – #Creating andDrawing images#.

UNIT-V 12 hours Installing and Configuring MySQL – Establishing a connection and poking around – Creating a database table – Inserting data into the table – #Selecting anddisplaying data3

Text Book

Julie Meloni and Matt Telles, PHP 6, Course Technology, CENGAGE Learning, India Edition, 2008. UNIT I : Chapters - 3, 5 UNIT II: Chapter 6 UNIT III: Chapters – 9,10 UNIT IV: Chapters 16, 17 UNIT V:Chapters 1,11,12,13,14 Books for Reference Kevin Tatroe, Peter MacIntyre and RasmusLerdorf, Programming PHP, O'REILLY media , 3rd edition, 2013. SEMESTER – VI :COR

Course Code: 5AE01
Course Name: Mint Project

COURSE OBJECTIVES:

To introduce the students to the methodology of solving a problem and preparing a report using the steps of software engineering.

LEARNING OUTCOMES:

Students understand the methodology of solving a problem and submit a report on completion of the same.

Creation of a Database and performing the operations given below using a Menu DrivenProgram to perform

a) Insertion

b) Deletion

c) Modification

d) Generating a simple Report for the following

PHP LAB (5CR01-L)

1. Write a PHP program to find the factorial of a number. 2 hours
2. Write a PHP program using Conditional Statements. 2 hours
3. Write a PHP program to find the maximum value in a given multi dimensional array. 2hours
4. Write a PHP program to find the GCD of two numbers using user-defined functions. 2 hours
5. Design a simple web page to generate multiplication table for a given number usingPHP. 3 hours
6. Design a web page that should compute one's age on a given date using PHP. 2 hours
7. Write a PHP program to download a file from the server. 2 hours
8. Write a PHP program to store the current date and time in a COOKIE and display the 'Last Visited' date and time on the web page. 2 hours
9. Write a PHP program to store page views count in SESSION, to increment the count oneach refresh and to show the count on web page. 3 hours
10. Write a PHP program to draw the human face. 3hours
11. Write a PHP program to design a simple calculator. 4 hours
12. Design an authentication web page in PHP with MySQL to check username andpassword. 3hours

NET PROGRAMMING LAB (5CR02-L)

1. Dynamic Polymorphism
2. Exception Handling
3. File Handling
4. Serialization
5. Array list
6. Fetch data from database using disconnected architecture
7. Fetch data from database using data binding and navigation
8. Fetch data from database using active connection
9. Login page
10. Display number of bits
11. Register page
12. Combo box
13. Output caching
14. Fetch data from XML
15. Web service to perform calculations
16. Client application connected to web services to perform calculation
17. Web service to display data structure
18. Web application using web service data