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Shri Vaishnav Institute of Computer Applications

Name of Program: MCA
(For Regular and Lateral Entry Students)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCCA511	Elective	Data Analytics	3	1	0	4	60	20	20	0	0

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
Q/A – Quiz/Assignment/Attendance, MST - Mid Sem Test.
***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Educational Objectives (CEOs):

- To familiarize the students with the need and scope of the subject.
- Provide an exposure giving a strong foundation to the data analytics practices.
- create a basis for the use of advanced investigative and computational methods to convert information to useful knowledge.
- To develop an understanding of how business analytics is actually performed
- covers foundational techniques and tools required for data science and big data analytics.

Course Outcomes (Cos): After the completion of the course the student will be able to

- Explain the information lifecycle from events in the real world to business actions,
- Recognize the types of events and characteristics that are often used in business analytics,
- Use the data is captured by source systems and stored using both traditional and emergent technologies,
- Gain a high-level familiarity with relational databases and learn how to use a simple but powerful language called SQL to extract analytical data sets of interest,
- Appreciate the spectrum of roles involved in the data lifecycle, and gain exposure to the various ways that organizations structure analytical functions,
- Summarize some of the key ideas around data quality, data governance, and data privacy
- function on multi-disciplinary teams
- understand the professional and ethical responsibility
- present you with a and is structured around the broad contours of the different types of data analytics, namely, descriptive, inferential, predictive, and prescriptive analytics.
- to produce the good decision makers who can use empirical approaches, wide range of data analytic techniques to problem solving.

PRE- REQUISITES:

This course requires the familiarity with linear algebra, calculus, matrix operations, probability theory, statistics, programming, Database Management System

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Syllabus

Unit I: Measures of Central Tendency: Mean, Median, Range, Mode, Variance, Standard deviation.

Correlation and Regression: Linear Correlation, Correlation and Causality, Linear Regression, Linear Regression with Nonlinear Substitution.

Statistical Concepts: Population, Sample, Sampled data, Sample space, Random sample, Sampling distribution, Variable, Variation, Frequency, Random variable, Uniform and Exponential random variable

Unit-II Big Data: Introduction and basics, Evolution of Data Management, Definition, Importance, Big Data Types, Structured and unstructured Data, Sources of big structured data and unstructured data, Architecture of Big Data Management System, Stages of Big Data Management,

Big Data Technology Foundations: Technology Components, virtualization, distributed computing, Cloud and Big Data, Integration of data types into a big data environment.

Unit-III Big Data and operational Databases: relational, non relational, key-value pair, document, column oriented, graph, spatial databases, MapReduce, Hadoop, Hadoop Foundation and Ecosystem, Appliances and Big Data Warehouse, Big data Implementation, Big Data Applications.

Unit –IV Big Data Analytics: Introduction, Basic and Advanced Analytics, Drivers, Pillars of Analytics: descriptive, predictive and prescriptive. Core Components of analytical data architecture, Performance issues, Parallel vs. distributed processing, Shared nothing data architecture and Massive parallel processing, Elastic scalability, Data loading patterns.

Data Analytics lifecycle: Discovery, Data Preparation, Model Planning, Model Building, Communicating results and findings.

Unit-V Machine Learning, supervised and unsupervised learning, Classification, Classification Criteria, Naive Bayes Classifier, use of regression and classification, Support Vector Machine, Unsupervised Learning and Challenges for Big Data Analytics, Clustering, Association Rule Mining.

Data Science Tools- Cluster Architecture vs. Traditional Architecture, Introduction to R, Data Manipulation and Statistical Analysis with R, Basics, Simple manipulations, Numbers and vectors, Input/ Output, Arrays and Matrices, Loops and conditional execution, functions, Data

Structures, Data transformations, Strings and dates, Graphics.

Text Books:

1. "Big Data For Dummies" by Judith Hurwitz, Alan Nugent, Fern Halper, Marcia Kaufman, Wiley, ISBN: 978-1- 118-50422-2, 2013
2. "Data Analytics, Models and Algorithms for Intelligent Data Analysis" by Runkler, Thomas A., Springer Vieweg , ISBN 978-3-8348-2589-6, 2013
3. "Big Data Analytics with R and Hadoop", by Vignesh Prajapati, Packt Publication, ISBN 978-1-78216-328-2, 201
4. "The Elements of Statistical Learning" by Hastie, Trevor, et al. Vol. 2. No. 1. New York: springer, 2009.
5. "Applied Statistics and Probability for Engineers" by Montgomery, Douglas C., and George C. Runger, John Wiley & Sons, 2010
6. "Data Science and Big Data Analytics Student Guide" distributed by EMC Education Services, I Edition, 2015.

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							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCCA521	Elective	Soft Computing Techniques	3	1	0	4	60	20	20	0	0

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
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***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall exceed 10 Marks)

Course Educational Objectives (CEOs):

- To familiarize with soft computing concepts.
- To introduce the ideas of Neural networks, fuzzy logic and use of heuristics based on human experience.
- To introduce the concepts of Genetic algorithm and its applications to soft computing using some applications.

Course Outcomes (Cos): After the successful completion of this course students will be able to

- Identify and describe soft computing techniques and their roles in building intelligent systems
- Recognize the feasibility of applying a soft computing methodology for a particular problem
- Apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems
- Apply genetic algorithms to combinatorial optimization problems
- Apply neural networks to pattern classification and regression problems
- Effectively use existing software tools to solve real problems using a soft computing approach
- Evaluate and compare solutions by various soft computing approaches for a given problem

UNIT – I

Introduction to soft computing, types of soft computing techniques, applications of soft computing, hard computing, Introduction to Artificial Intelligence, types and characteristics of production systems, breadth first search, depth first search techniques,

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UNIT – II

Introduction to Neural Networks, Artificial Neural Networks: Basic Models & Terminologies, Models of a Neuron, Topology, Multi-Layer Feed Forward Network (MLFFN), Radial Basis Function Network (RBFN), Recurring Neural Network (RNN), applications of neural networks

UNIT-III

Introduction to Classical Sets and Fuzzy sets, Basic definition and terminology, set-theoretic operations, Fuzzy Sets, Operations on Fuzzy Sets, Fuzzy Relations, Membership Functions, Fuzzy Rules & Fuzzy Reasoning, Fuzzy Inference Systems, Fuzzy Expert Systems, Fuzzy Decision Making, introduction and Applications of neuro-fuzzy modeling

UNIT-IV

Genetic Algorithms: Introduction, Representation and Terminology, Traditional Algorithm vs. Genetic Algorithm, Operators in Genetic Algorithms, data structures, fitness function, applications, Simple Genetic Algorithms, steady state Genetic Algorithms

UNIT-V

Counter propagation network: introduction, structure, functioning and characteristics, Implementation of Adaptive Resonance Theory, Hopfield v/s Boltzman machine, Neuro-fuzzy hybrid systems,soft computing based hybrid fuzzy controllers,Introduction to Fuzzy Neural systems, Genetic Fuzzy systems and Genetic Neural systems

Text Books:

1. S, Rajasekaran& G.A. Vijayalakshmi Pai, “Neural Networks, Fuzzy Logic & Genetic Algorithms, Synthesis &Applications”, PHI Publication, 2012
2. J.S.R.Jang, C.T.Sun and E.Mizutani, “Neuro-Fuzzy and Soft Computing”, Pearson Education2015
3. S.N. Sivanandan and S.N. Deepa, “Principles of Soft Computing”, Wiley India, 2011
4. J.M. Zurada, “Introduction to artificial neural systems”, Jaico Publishers, 1994
5. George J. Klir and Bo Yuan, “Fuzzy Sets and Fuzzy Logic-Theory and Applications”, Prentice Hall, 1995
6. Mitchell Melanie, “An Introduction to Genetic Algorithm”, Prentice Hall, 1998

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							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCCA531	Elective	Theory of Computation	3	1	0	4	60	20	20	0	0

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Course Educational Objectives (CEOs):
The goal of this course is to provide students with an understanding of basic concepts in the theory of computation.

Course Educational Objectives (CEOs): Students will

- Be able to construct finite state machines and the equivalent regular expressions.
- Be able to prove the equivalence of languages described by finite state machines and regular expressions.
- Be able to construct pushdown automata and the equivalent context free grammars.
- Be able to prove the equivalence of languages described by pushdown automata and context free grammars.
- Be able to construct Turing machines and Post machines.
- Be able to prove the equivalence of languages described by Turing machines and Post machines
- Students will learn about a variety of issues in the mathematical development of computer science theory, particularly finite representations for languages and machines, as well as gain a more formal understanding of algorithms and procedures.

UNIT-I
Preliminaries: Set, Relations and functions, Graphs and trees, string, alphabets and languages. Principle of induction, predicates and propositional calculus.
Theory of Automation : Definition, description, DFA,NFA, Transition systems,2DFA, equivalence of DFA & NDFA, Regular expressions, regular grammar Mealy & Moore machines, minimization of finite automata, Two-way finite automata.

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UNIT-II

Formal Languages: Definition & description, Phase structured grammars & their classification, Chomsky classification of languages, closure properties of families of language, regular grammar, regular set & their closure properties, finite automata, equivalence of FA and regular expression.

UNIT -III

Context-Free grammar: Properties unrestricted grammar & their equivalence, Introduction to CFG, Regular Grammars, Derivation trees and Ambiguity, Simplification of Context free grammars, Normal Forms.

PDA

Definition of PDA Determinism & Non determinism in PDA & related theorems, parsing and pushdown automata, CFG corresponding to a given PDA. Context Free Languages: The pumping lemma for CFL's, Closure properties of CFL's, Decision problems involving CFL's.

UNIT-IV

Turing Machine : Introduction, TM model , design, representation of TM, language accepted by TM, universal Turing machine, determine & non-determinism in TM, TM as acceptor/generator/algorithms, multi- dimensional, multitracks, multitape, Properties of recursive & recursively enumerable languages, Universal Turing machine.

UNIT-V

Computability: Concepts, Introduction to complexity theory, Introduction to undecidaibility, recursively enumerable sets, primitive recursive functions, recursive set, partial recursive sets, concepts of linear bounded Automata, Tractable and Untractable Problems: P, NP, NP complete and NP hard problems, Hamiltonian path problem, traveling sales man problem, etc.

Text Books:

1. 1.Hopcroft& Ullman, "Introduction to Automata theory, languages & Computation", Narosha Publishing house. I st edition, 1997.
2. Lewis Papadimitriou, "Theory of Computation" , Prentice Hall of India, New Delhi. II nd edition, 1997.
3. Peterlinz, "An Introduction to formal language and automata", Fourthedition, Narosa publication.
4. Marvin L. Minsky "Computation: Finite & Infinite Machines", PHI,1962.
5. K.L.P. Mishra & Chander Shekharan, "Theory of Computer Science (Automate, Language & Computations), PHI.III rd edition, 2012.M
6. ichael Sipser, "Introduction to the Theory of Computation", Third Edition.2012.
7. Bernard M Moret "The Theory of Computation" I st edition, 1997.

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							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCCA502	Compulsory	Internals of OS and Network Programming	3	1	4	6	60	20	20	30	20

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***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class activities, given that no component shall exceed more than 10 marks

Course Education Objectives (CEOs):

In this course students should understand how the operating system effectively manages system resources.

To enable the students to develop the necessary skills for developing robust & scalable network applications and to build necessary basic knowledge for managing networks

Course Outcomes (COs):

After successful completion of this course the students will be able to:

- Understand the concept of Distributed Operating System and the related algorithms.
- Understand the resource sharing among the processes in the distributed system.
- Understand how to deadlocks, Fault tolerance and recovery algorithms.
- Learn the basics of Networking and Sockets.
- Learn the basics of Socket programming TCP/IP and UDP.
- Understand the concept of Client-Server programming.

UNIT-I

Distributed Operating Systems:

Introduction Primitives – Inherent Limitations - Lamport's Logical Clock; Vector Clock; Causal Ordering; Global State; Cuts; Termination Detection. Distributed Mutual Exclusion – Non-

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Token Based Algorithms – Lamport's Algorithm - Token-Based Algorithms – Suzuki-Kasami's Broadcast Algorithm – Distributed Deadlock Detection – Issues –Centralized Deadlock-Detection Algorithms - Distributed Deadlock-Detection Algorithms.

UNIT-II

Failure Recovery and Fault Tolerance:

Basic Concepts: Classification of Failures – Basic Approaches to Recovery, Recovery in Concurrent System; Synchronous and Asynchronous Check pointing and Recovery, Check pointing in Distributed Database Systems, Fault Tolerance, Issues - Two-phase and No blocking Commit Protocols, Voting Protocols,Dynamic Voting Protocols.

UNIT-III

Real Time and Mobile Operating System:

Basic model of Real Time operating system, characteristics, Application of Real Time system, Handing and Scheduling for Resource sharing, Classification of Real Time Operating Systems, Services, structure, goal and feature of RTOS, Architecture of RTOS, micro kernels and monolithic kernels, tasks inRTOS, task management, inter task communication, applications of various RTOS.

UNIT-IV

Introduction to Network Programming:

OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

Client Server Programming:

Client side programming: Implementing generic network client, Parsing data using String Tokenizer, Retrieving file from an HTTP server, Retrieving web documents by using the URL class. Server side programming: Steps for creating server, Accepting connection from browsers, creating an HTTP server, adding multithreading to an HTTP server.

UNIT-V

Socket Programming: Creating sockets, Socket addresses, Assigning address to a socket, Berkeley Sockets: Overview, socket address structures, byte manipulation & address conversion functions Elementary TCP sockets – Socket, connect, bind, listen, accept, fork andexec function,

concurrent servers. Close function and related function.

List of Experiments:

1. Understanding and using of commands like ifconfig, netstat, ping, arp, telnet, ftp, finger, traceroute, whoisetc. Usage of elementary socket system calls (socket(), bind(), listen(), accept(),connect(),send(),recv(),sendto(),recvfrom()).
2. Write an echo program with client and iterative server using TCP.
3. Write an echo program with client and concurrent server using TCP.
4. Write an echo program with client and concurrent server using UDP.
5. Write a client and server program for chatting.
6. Write a program to retrieve date and time using TCP.
7. Write a program to retrieve date and time using UDP.
8. Write an echo client and server program using Unix domain stream socket.
9. Write an echo client and server program using Unix domain Datagram socket.
10. Write a client and server program to implement file transfer.

Text Books:

1. M Singhal and NG Sivaratri, Advanced Concepts in Operating Systems, Tata McGraw HillInc.,2001
2. A.S. Tanenbaum, Distributed Operating system, Pearson Education Asia, 2001.
3. Real Time Operating System, Barr M.
4. W. Richard Stevens, “Unix Network Programming Vol-I”, Second Edition, Pearson Education, 1998.
5. Mani Subramaniam, “Network Management: Principles and Practice“, Addison Wesley”, First Edition, 2001.

Reference Books:

1. Silberschatz and P. Galvin, Operating System Concepts, VIedition, AddisonWesley 2004.

2. Andrew S Tanenbaum,”Modern Operating Systems”, 3rd edition, Prentice Hall, 2007.

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COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCCA513	Elective	Multimedia and Web Technology	4	0	0	4	60	20	20	0	0

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Course Educational Objectives (CEOs):

- To provides an introduction and application of the fundamentals of multimedia development.
- To covers the basics of WWW, client side technologies like HTML using JavaScript

Course Outcomes (COs):

- Identify, describe, and apply the major skills and tools involved in the typical multimedia development process
- Experience the application of multimedia theory, tools, and techniques to a project in technical communication.
- Use JavaScript to develop the dynamic web pages.
- Develop the modern Web applications using the client and server side technologies and the web design fundamentals.

UNIT I:

Multimedia: Needs and areas of use, Development platforms for multimedia – DOS and Windows. Introduction of 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 formats with their features and limitations like BMP, JPG,

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PNG and TIF format.

UNIT-II:

Sound: Sound and it Attributes, Mono V/s Stereo sound, Sound channels, Sound and its effect in multimedia, Analog V/s Digital sound, Basics of digital sound - Sampling, Frequency, Sound Depth, Channels, Overview of various sound file formats like WAV, MP3, MP4 etc

Video: Basics of Video – Analog and Digital Video. Introduction to graphics accelerator cards, digitization of analog video to digital video. Introduction to video capturing Media & instrument – Videodisk, DVCAM, Camcorder, Introduction to digital video compression techniques and various file formats like AVI and MPEG.

UNIT-III :
Animation: Basics of animation, Principle and use of animation in multimedia. Overview of 2-D and 3-D animation techniques. Animation on the Web – features and limitations.

UNIT-IV: Multimedia on the Web: Broadband technologies, Text in the web – Dynamic and embedded font technology, Audio on the Web – Real Audio and MP3/MP4, Audio support in HTML, Graphics – HTML safe color palate, Graphics support in HTML, Video on the Web – Streaming video, Real Video, MPEG and SMIL.

UNIT-V Scripting: Languages Java Script (JS) in Web Page, Advantage of Java Script, JS object model and hierarchy, Operators and syntax of JS, Function, Client side JS Vs Server side JS, JS security.

Text Books:

1. Thomas Powell,"HTML & CSS: The Complete Reference", Fifth Edition , 1 July 2017
2. Hirdesh Bhardwaj, "Web Designing", Pothi.com; first edition , 2016.
3. Satish Jain,"Web Designing and Development: Training", BPB Publication; First edition (2015)
4. Vikas Gupta," Comdex Multimedia and Web Design Course Kit", Dreamtech Press; Hindi edition, 1 January 2006.

Reference Book:

1. Navneet Mehra, Bunny Mehra,"Website Development Using HTML and CSS" Unicorn Books, 2012.

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MCCA523	Elective	Simulation and Modeling	4	0	0	4	60	20	20	0	0

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Course Educational Objectives (CEOs)

- Introduce students to the simulation and modeling techniques
- Provide students with opportunities to develop basic simulation and modeling skills with respect to carrying out research projects using any simulation method on the computer.

Course Outcomes (COs)

Upon successful completion of this course, the student will be able to perform:

(Knowledge based)

- Problem formulation
- System definition
- Model translation
- Verification, validation
- Experimental design
- Analysis(Skills)
- use the simulation software to:
  - carry out simulation tasks;
  - use graphs to present their results;
- Write scripting languages to generate other reports.

UNIT - I

System & Models - concepts, environment, continuous & discrete system, modeling type of

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models, static & dynamic, physical and mathematical models.

UNIT - II

System simulation techniques, Monte Carlo method, simulation and analytical methods. Continuous model, analogue, digital, hybrid computer, System dynamics, growth and decay models, modified exponential and generalization of growth models.

Unit -III

Probability concepts in simulation, stochastic variables, discrete and continuous probability function, continuous uniform and computer generation of random numbers, uniform random number generator.

UNIT- IV

Discrete System Simulation, discrete event representation of time generation of arrival patterns, simulation of telephone systems, delayed calls, discrete simulation languages (A Brief Overview).

UNIT-V

Continuous System Simulation : Continuous system models, differential equation, analog computer, analog methods, digital analog simulators, CSSLS, CSMPIII language.System Dynamics : Historical background, exponential, Growth and decay models, modified exponential growth models, logistic curves and generalization of growth models, system dynamics diagrams.

Text Books:

1. G.Gordan “System Simulation” , 2nd Ed, 2002 PHI.
2. T.A. Payer “Introduction to Simulation”, McGraw Hill.
3. W.A. Spriet “Computer Oriented Modeling and Simulation”.
4. NarsinghDeo “System Simulation with Digital Computers”, PHI.
5. V. Rajaraman “Analog Simulation”, PHI.
6. Law and Kelton, “Simulation Modeling and Analysis”, McGraw-Hill.

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MCCA504	Compulsory	Dot Net Technology	3	1	4	6	60	20	20	30	20

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***Teacher Assessment** shall be based on following components: Quiz/Assignment/Project/Participation in class (Given that no component shall be exceed 10 Marks)

Course Educational Objectives (CEOs):

- To provide object oriented development framework with .NET technology
- To provide consistent programming model and direct support for security, simplified development efforts and easy application deployment and maintenance
- To learn building multi-tier enterprise applications
- To teach both client and server side programming
- To understand .NET remoting, web services and web service security
- To understand software as a service

Course Outcomes (Cos): After the successful completion of this course students will be able to

- Understand the development and deployment cycles of enterprise applications.
- Utilize the .NET framework to build distributed enterprise applications.
- Develop ASP.NET Web Services, secure web services, and .NET remoting applications.
- Understand the protocols behind web services including: SOAP, DISCO, and UDDI.
- Understand the 3-tier software architecture (presentation/client tier, application tier, data tier) and develop multi-tier applications.
- Understand and experiment with the deployment of enterprise applications.
- Develop web applications using a combination of client-side (JavaScript, HTML, XML,

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WML) and server-side technologies (ASP.NET, ADO.NET).

- Develop network applications using state-of-the-art RPC technologies including: .NET remoting, and Web Services (SOAP).

UNIT – I

Dot Net Framework: Introduction, characteristics and applications, Dot Net Paradigm, introduction to web services, Components of Dot Net Framework, Common Language Runtime, Common Type System, Common Language Specification, Microsoft Intermediate Language, Just–in–time Compilation, Framework Base Classes, Differentiate Between Interface- and Inheritance-Based Polymorphism, Assemblies Common Language Implementation, Garbage Collection, End to DLL Hell - Managed Execution.

UNIT-II

Introduction and evolution of C#.NET, features, C# fundamentals, console applications, data types, boxing & unboxing, decision making, loops, array and strings, constructor and destructors, namespaces, object and classes, inheritance, polymorphism, function overloading, operator overloading, methods, delegates and events, attributes & reflection API, interfaces.

UNIT-III

Creating C#.NET projects, windows forms, input, output, and serialization, processes, application domains, contexts, threading, debugging and error handling exploring assemblies and namespaces, string manipulation ,files and I/O collections, windows forms model, creation of controls and forms, menus, dialog boxes, tooltips.

UNIT – IV

Introduction to ADO.NET, ADO.NET component object model, features of ADO.NET, connected and disconnected mode, accessing data with ADO.NET, Differentiate between ADO.NET and classic ADO, introducing data source controls, data binding controls, read and write data using SQL data source control.

UNIT-V

Introduction to ASP.NET, working with web and HTML controls, using rich server controls, login controls, overview of ASP.NET validation controls, using the complex validators accessing data using ADO.NET, server controls, control events and event handlers, LINQ, ASP.NET – security, data caching, multi-threading, configuration, introduction to windows presentation foundation (WPF), window communication foundation and its application.

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List of Experiments:

1) Write a program to check whether empty query string is entered in Asp .net
2) Write a program to change color of Label text control programmatically in Asp .Net
3) Write a program to Enable-Disable Textbox and change width of TextBox programmatically in Asp .Net
4) Write a program to increase and decrease font size programmatically.
5) Write C# code to display the asterisk pattern as shown below:

   *****

   *****

   *****

   *****

   *****

6) Write C# code to prompt a user to input his/her name and country name and then the output will be shown as an example below:

   Hello from ShriVaishnavVidyapeethVishwavidyalayaIndia!

7) Write C# code to do the following
   - Convert binary to decimal
   - Convert decimal to hexadecimal
   - Convert decimal to binary
   - Convert decimal to octal

8) Write C# code to convert infix notation to postfix notation.
9) Write a C# code to convert digits to words
10) Write a C# code to convert following currency conversion. Rupees to dollar, frank, euro.
11) Write a C# code for Celsiusto Fahrenheitand Fahrenheit to Celsius conversion.
12) Write ASP.Net program to Store Objects in Session State and Storing Session State in SQL Server.

Projects:

1) Design and development of a minor project in .NET.

Text Books:

1. Professional ASP.NET 4.5 in C# and VB (WROX) by Jason N Gaylord, Christian Wenz and Pranav Rastogy.
2. ASP. NET 4.5 IN Simple Steps by Kogent Learning Solutions,2013
3. Programming in C# by E Balaguruswamy, 1July 2017

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4. Let us C# by Yashwant P Kanetkar,1 January 2010
5. C#4.0 The Complete Reference by Herbert Schildt.

Reference Books:

1. Christian Nagel, "Professional C# .Net", Wrox Publication
2. Matthew Macdonald, Robert Standefer, "ASP.NET Complete Reference",TMH,1 July 2017
3. Vijay Mukhi, "C# The Basics", BPB Publications
4. Pankaj Agarwal, "Principles Of Net Framework",Vayu Publication
5. Marino Posadas, "Mastering C# and .NET Framework", Packet Publishing Limited
6. Andrew Troelsen, Philip Japikse,"C# 6.0 and the .NET 4.6 Framework" , Kindle Edition
7. Chappell David,"Understanding .NET", Pearson Education
8. Dino Esposito, Andrea Saltarello, "Microsoft .NET: Architecting Applications for the Enterprise", Microsoft Press

Shri Vaishnav Vidhyapeeth Vishvavidhyalaya, Indore
Shri Vaishnav Institute of Computer Applications

Name of Program: MCA
(For Regular and Lateral Entry Students)

COURSE CODE	CATEGORY	COURSE NAME	L	T	P	CREDITS	TEACHING & EVALUATION SCHEME				
							THEORY			PRACTICAL	
							END SEM University Exam	Two Term Exam	Teachers Assessment*	END SEM University Exam	Teachers Assessment*
MCCA505	Compulsory	Artificial Intelligence and Applications	4	0	0	4	60	20	20	0	0

Legends: L – Lecture; T – Tutorial/Teacher Guided Student Activity; P – Practical; Q/A – Quiz/Assignment/Attendance; MST – Mid Semester Test.
***Teacher Assessment** shall be based on following components:
Quiz/Assignment/Project/Participation in class activities, given that no component shall exceed more than 10 marks

Course Educational Objectives (CEOs):

- Gain a historical perspective of AI and its foundations.
- Become familiar with basic principles of AI toward problem solving, inference, perception, knowledge representation, and learning.
- Investigate applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
- Experience AI development tools such as an 'AI language', expert system shell, and/or data mining tool.
- Experiment with a machine learning model for simulation and analysis.
- Explore the current scope, potential, limitations, and implications of intelligent systems.

Course Outcomes (Cos): Upon successful completion of this course, the student shall be able to:

- Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
- Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
- Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
- Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool.

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- Demonstrate proficiency in applying scientific method to models of machine learning.
- Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications.

UNIT-I

Overview of AI: The AI problems, what is an AI technique, Characteristics of AI applications.

LISP: Introduction to LISP programming: Syntax and numeric functions, Basic list manipulation functions, predicates and conditionals, input output and local variables, iteration and recursion.

UNIT-II

Problem Solving General problem solving, production systems, control strategies forward and backward chaining, exhaustive searches depth first breadth first search.

Hill climbing, branch and bound technique, best first search, constraint satisfaction problems.

UNIT-III

Knowledge Representations: First order predicate calculus, skolemization, resolution principle & unification, interface mechanisms, semantic networks, frame systems and value inheritance, scripts, conceptual dependency.

UNIT-IV

Natural Language processing Parsing techniques, context free grammar, case and logic grammars, semantic analysis. Game playing Minimax search procedure, alpha-beta cutoffs.

UNIT-V

Expert Systems Introduction to expert system and application of expert systems, various expert system shells, knowledge acquisition, case studies, MYCIN

Text Books:

1. Elaine Rich and Kevin Knight "Artificial Intelligence" - Tata McGraw Hill, Third Edition,2017.
2. Nilsson N.J., "Principles of Artificial Intelligence", Springer Verlag, Berlin, Second Edition, 1982.
3. Dan W. Patterson "Introduction to Artificial Intelligence and Expert Systems", Prentice India, Third Edition, 2008.
4. Clocksin & C.S.Melish "Programming in PROLOG", Narosa Publishing House, Fifth

Edition, 2008.

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