Madhav Institute of Technology & Science, Gwalior- 474 005

Department :			Information Technology
Year	2018-2022		
			Course Outcome
Semester I	100203:Basic Computer Engineering	CO1	Define the fundamentals of computer system.
		CO2	Outline the various components of computer system.
		CO3	Design, implement, test and debug the computer programs using programming language.
		CO4	Analyze the usage of various system & application softwares to manage computer system and data.
		CO5	Develop the ability to design computer programs to solve real world problems.
		CO6	Elaborate the working of Internet.
			100203:Basic Computer Engineering
	100203: Basic Computer Engineering LAB	CO1	Demonstrate the fundamentals of computer programming
		CO2	Read, understand and trace the execution of program
		CO3	Develop Conditional and Iterative Statements
		CO4	Design the program using functions
		CO5	Implement the programs using Derived and User defined data types
		CO6	Design program for a given problem using computer programming
			100203: Basic Computer Engineering LAB
	s and gy	CO1	Relate the concepts and significance of OOPs in real world.
		CO2	Demonstrate adeptness of object oriented programming to solve problems using Object oriented concepts

160304: OOPs methodolo	CO3	Apply object oriented programming to develop solutions of problems using standard language constructs.
	CO4	Analyze data flow diagrams and flow charts for small/ moderate problems
	CO5	Determine how to simulate the problem in field of Operating system, Computer networks and real world problems.
	CO6	Develop software using concepts of objects, associations and integrity constraint.
		160304: OOPs and methodology
160303: Computer Graphics and Multimedia	CO1	Illustrate the fundamental concepts of Computer Graphics, hardware & software components and its applications.
	CO2	Explain various graphical image genration & manipulation methods and algorithms.
	CO3	Apply various methods of generation & manipulation of images for creating graphical images and color models.
	CO4	Explain various rendering, illumination and color models of realistic image or pictures using image processing techniques.
	CO5	Discuss various methods to create natural seen & realistic images in 2D &3D space.
	CO6	Design & analysis of various graphical image processing techniques and animation.
		160303: Computer Graphics and Multimedia
160302: Data Structure LAB	CO1	Outline the basics of algorithms and their performance criteria.
	CO2	Explain the working of linear and non-linear data structures.
	CO3	Identify the appropriate data structure to solve the specific problems.
	CO4	Analyse the performance of various data structures and their applications.
	CO5	Evaluate the time and space complexities of various data structures and their applications.
	CO6	Design the optimal algorithmic solutions for various problems
		160302: Data Structure LAB
r	CO1	Demonstrates the fundamental concepts of Computer Graphics and its applications.

Semester III			
	160303: Computer Graphics LAB	CO2	Explain and use hardware's and software's component of computer graphics
		CO3	Apply various image generation, manipulations and color model techniques in coding.
		CO4	Implement algorithms for create and manipulate image in programs.
		CO5	Develop the ability to write computer programs for create image and animation using graphics concepts.
		CO6	Develop application programs and projects in terms of image and animation using computer graphics.
			160303: Computer Graphics LAB
	160304: Object Oriented Programming LAB	CO1	Select proper arithmetic, logical, relational, and string manipulation expressions to process data.
		CO2	Demonstrate the use of various OOPs concepts with the help of programs.
		CO3	Apply validation techniques to build a reliable solution to a given problem.
		CO4	Analyze and write programs to solve more complicated problems using the concepts of Object Oriented Methodology.
		CO5	Choose appropriate programming concepts as and when required in the future application development.
		CO6	Construct a complete class definition with in the class definition, write class and instance methods including the constructor and overloaded methods.
			160304: Object Oriented Programming LAB
	160305: Hardware LAB	CO1	Explain basics of different computer peripherals and interfaces.
		CO2	Demonstrate architecture of various computer hardware devices and their functioning.
		CO3	Demonstrate the details of system buses, memory system, and I/O interfaces.
		CO4	Identify the existing configuration of the computers peripherals and creating wireless network through the access point.
		CO5	Analyze progress in contemporary peripherals and bus systems.
		CO6	construct a networking based on IPv4 address scheme.
			160305: Hardware LAB

	160301: Digital Electronics	CO1	Illustrate various number systems, Binay codes and its application in digital design.
		CO2	Identify the logic functions, circuits, truth tables and also apply the laws of Boolean algebra to simplify circuits and expressions.
		CO3	Develop the formal procedures for the analysis and design of combinational circuits.
		CO4	Analyse sequential circuit's components and their usability in digital circuits.
		CO5	Compare the concept of memories, programmable devices and digital ICs.
		CO6	Design and analyze circuits for digital arithmetic.
			160301: Digital Electronics
	160302: Data Structures	CO1	Outline the basics of algorithms and their performance criteria.
		CO2	Explain the working of linear and non-linear data structures.
		CO3	Identify the appropriate data structure to solve the specific problems.
		CO4	Analyse the performance of various data structures and their applications.
		CO5	Evaluate the time and space complexities of various data structures and their applications.
		CO6	Design the optimal algorithmic solutions for various problems
			160302: Data Structures
	160401: Design and Analysis of Algorithm	CO1	Tell the basic features of an Algorithms
		CO2	Demonstrate a familiarity with major Algorithms and Data Structures
		CO3	Apply important algorithmic design paradigms and methods of analysis
		CO4	Analyze the asymptotic performance of Algorithms
		CO5	Compare different design techniques to develop algorithms for computational problems.
		CO6	Design algorithms using greedy strategy, divide and conquer approach, dynamic programming, backtracking, branch and bound approach.

Semester IV			
			160401: Design and Analysis of Algorithm
	160402: Database management system	**CO1**	Demonstrate the concepts of different type of database system.
		CO2	Apply Relational algebra concepts to design database system.
		CO3	Make use of queries to design and access database system.
		CO4	Analyze the evaluation of transaction processing and concurrency control.
		CO5	Determine the optimize database for real world applications.
		CO6	Design a database system for a real world application.
			160402: Database management system
	160403: Operating system	**CO1**	Outline the basic concept of operating systems
		CO2	Analyze the working of operating system
		CO3	Examine the working of various scheduling/allocation approaches
		CO4	Measure the performance of various scheduling/allocation approaches
		CO5	Compare the various operating system problems/issues
		CO6	Develop the Solution of various operating system problems/issues
			160403: Operating system
	404: Computer System Organization	**CO1**	Demonstrate the computer architecture for defining basic component and functional unit.
		CO2	Recall different number system and solve the basic arithmetic operations of signed and unsigned numbers.
		CO3	Develop the fundamental concept to understand the working of microprocessor.
		CO4	Explain the basic concept of input output organization.
		CO5	Compare various memory and mapping techniques.

	160	CO6	Develop the skill of writing assembly language programming.
			160404: Computer System Organization
	100004: Cyber Security	CO1	Tell the basic terminologies of cyber security
		CO2	Explain the basic concepts of Networking and Internet
		CO3	Apply various methods used to protect data in the internet environment in real world situations
		CO4	Discover the Concepts of IP security and Architecture
		CO5	Compare various types of Cyber Security Threats/ Vulnerabilities
		CO6	Develop the understanding of Cyber Crime Investigation and IT Act 2000
			100004: Cyber Security
	160501: Discrete Structures	CO1	understand the basic concepts of set theory, propositional logic, graph theory, discrete numeric function and algebraic structure.
		CO2	Illustrate the knowledge of course content and distinguish between them in terms of their applications.
		CO3	Implement the course content to solve the problems.
		CO4	Apply the concept of studied topics with suitable technique faced in engineering problems.
		CO5	Analyze the basic concepts of set theory, propositional logic, graph theory, discrete numeric function and algebraic structure to examine the real world problems
		CO6	Design the analytical skill and interpret applications of engineering beneficial in real time troubleshooting.
			160501: Discrete Structures
	03: Theory of putation LAB	CO1	Judge various model of computation.
		CO2	Construct abstract models of computing.
		CO3	Infer the power of abstract models in computing to recognize the languages.
		CO4	Demonstrate analytical thinking and intuition for problem solving situations in related areas of theory of computation.

Semester V	1605 Com	CO5	Explain the limitations of computation in solving problems.
		CO6	Define set of rules for syntax verification
			160503: Theory of Computation LAB
	160502: Software Engineering LAB	CO1	Define basic concepts of UML.
		CO2	Illustrate the software development process using different tools.
		CO3	Apply the UML to solve different common modeling problems.
		CO4	Utilize the knowledge of Software engineering and project management.
		CO5	Analyze the vocabulary, rules, and idioms of the UML and learn how to model it effectively.
		CO6	Design the systems, from concept to executable artifact, using object oriented techniques.
			160502: Software Engineering LAB
	160504: Microprocessor and interfacing LAB	CO1	Explain types of instructions and addressing modes.
		CO2	Make use of Hex code needed in assembly language
		CO3	Experiment with various peripheral devices to interface with microprocessor.
		CO4	Simplify the arithmetic, Logical, etc. problems using instruction set of 8086/8051 microprocessor.
		CO5	Determine the process required in interfacing with 8086/8051.
		CO6	Develop the assembly language programs in 8086/8051 to solve a real world problem.
			160504: Microprocessor and interfacing LAB
	Theory of utation	CO1	Explain the basic concepts of switching and finite automata theory and languages.
		CO2	Relate practical problems to languages, automata, computability, and complexity.
		CO3	Construct abstract models of computing and analyse their power to recognize the languages.

	160503: T Compi	CO4	Construct and analyze the grammar.
		CO5	Apply mathematical models and descriptors in various computing theories
		CO6	Solve problems in computer science using mathematical and formal techniques.
			160503: Theory of Computation
	160502: Software Engineering	CO1	List various software models with respect to their accuracy and needs of the customer requirement.
		CO2	Explain the real world problems using software engineering concepts.
		CO3	Develop the technique and results with customer expectations.
		CO4	Identify and how to use various cost estimation techniques used in software engineering.
		CO5	Compare design of a system, component, or process to meet desired needs within realistic constraints
		CO6	Develop the techniques, skills and software engineering tools necessary for engineering domain.
			160502: Software Engineering
	160504: Microprocessor & Interfacing	CO1	Classify the concepts of different advanced microprocessors and microcontroller.
		CO2	Illustrate the various peripheral interfaces, controllers and bus standards.
		CO3	Build a system using peripheral devices and controllers for 8086 microprocessor.
		CO4	Distinguish the interface with various devices to the microprocessor.
		CO5	Design an interface for various devices on 8086/8051 based systems.
		CO6	Develops skills in assembly language programming for 8051 & 8086 applications.
			160504: Microprocessor & Interfacing
	piler	CO1	Recall the concepts of finite automata and context free grammar
		CO2	Build the concept of working of compiler

Semester VI	160601: Compiler Design	CO3	Examine various parsing techniques and their comparison
		CO4	Compare various code generation and code optimization techniques.
		CO5	Analyze different tools and techniques for designing a compiler
		CO6	Design various phases of compiler
			160601: Compiler Design
	160602: Computer Networks	CO1	Define Security and its requirement at different levels & in different cases.
		CO2	What are security principles and how they can be achieved.
		CO3	Outline the characteristics and working of infected/ malicious system or person.
		CO4	Analyze the different attacks and perform security algorithm/ solution accordingly.
		CO5	Explain the mechanisms/ techniques for various attacks against security or more specifically principles of security.
		CO6	Justify the role of Government and thirty party in security.
			160602: Computer Networks
	160602: Agile Methodology	CO1	Demonstrate Scrum Release Planning and Scrum Sprint Planning
		CO2	Apply user stories into tasks and ideal day estimates.
		CO3	Classify a Sprint with Sprint Reviews and Sprint Retrospectives
		CO4	Examine the Scrum with multiple team or distributed project teams.
		CO5	Design test driven and agile principle based software.
		CO6	Develop any application using agile methodology.
			160602: Agile Methodology
	nd	CO1	Explain cryptographic algorithms, hash algorithms and authentication mechanisms.

	160611: Network ar Web security	CO2	Illustrate fundamentals of number theory, attacks and security principles.
		CO3	Apply number theory and various algorithms to achieve principles of security.
		CO4	Analyze the cause for various existing network attacks and describe the working of available security controls
		CO5	Examine the vulnerabilities in IT infrastructure.
		CO6	Predict the attacks and controls associated with IP, transport-level, web and e-mail security.
			160611: Network and Web security
	160716: Mobile Computing	CO1	explain the basic concepts of mobile telecommunications system
		CO2	demonstrate the infrastructure to develop mobile communications system
		CO3	classify the different generations and technology for mobile communications
		CO4	examine the working of different protocols of wireless mobile communication technology.
		CO5	determine the importance of each technology suitable for different situation of mobile and wireless communications
		CO6	develop protocols for adhoc and infrastructure based wireless networks.
			160716: Mobile Computing
	900208: Soft Computing	CO1	define basic concepts of neural network and fuzzy systems
		CO2	compare solutions by applying various soft computing approaches on a given problem.
		CO3	develop and train different supervised and unsupervised learning
		CO4	classify various nature inspired algorithms according to their application aspect.
		CO5	compare the efficiency of various hybrid systems.
		CO6	design a soft computing model for solving real world problems
			900208: Soft Computing

Semester VII			
	900209: Network Security	CO1	define various aspects of network security
		CO2	illustrate fundamentals of number theory and cryptography
		CO3	apply security mechanisms to achieve principles of network security
		CO4	analyze the cause for various existing network attacks
		CO5	examine the vulnerabilities in applications over internet.
		CO6	develop a secure protocol for achieving various network security services.
			900209: Network Security
	900220: R Programming	CO1	define basic programming constructs used in R.
		CO2	explain the various commands used in R.
		CO3	apply various concept of programming for controlling the flow of data using R.
		CO4	analyze the concept of concept of object oriented programming in R.
		CO5	choose appropriate packages of R programming for dealing various tasks.
		CO6	predict results from the datasets using R commands.
			900220: R Programming
	900222: Computer Networks	CO1	I am able to explain the fundamental concepts of computer network.
		CO2	I am able to illustrate the basic taxonomy & terminologies of computer network.
		CO3	I am able to identify various parameter for affecting the performance of computer network.
		CO4	I am able analyze the concepts of communication using various layer of OSI model.
		CO5	I am able to evaluate the performance of computer network in congestion and Internet.
		CO6	I am able to design the network environment and applications for implementation of computer networking concept.
			900222: Computer Networks