V – SEMESTER

	V – SEMESTER	L	T	P	C
A1CIT211	COMPILER DESIGN	4	-	-	4
	Total Contact Hours - 56				
	Pre-requisites: Formal Languages & Automata Theory, Programming Language				

Course Objectives	
COBJ1	To make the student to understand the process involved in a compiler, create an overall view of various types of translators and phases of a compiler.
COBJ2	To make the student understand what is syntax analysis, various types of parsers especially the top down approach, awareness among students the various types of bottom up parsers.
COBJ3	To make the student understand the semantic analysis and, intermediate code generation, type checking.
COBJ4	To make the student understand the role of symbol table and its organization, Code generation. dataflow analysis and object code generation.

SYLLABUS

UNIT – I:
Overview of Compilation: Phases of Compilation – Lexical Analysis, Regular Grammar and regular expression for common programming language features, pass and Phases of translation, interpretation, bootstrapping, data structures in compilation – LEX lexical analyzer generator.

UNIT – II:
Top-down Parsing: Context-free grammars, Top down parsing – Backtracking, LL (1), recursive descent parsing, Predictive parsing, Preprocessing steps required for predictive parsing.

UNIT – III:
Bottom-up parsing: Shift Reduce parsing, LR and LALR parsing, Error recovery in parsing, handling ambiguous grammar, YACC – automatic parser generator.

UNIT – IV:
Semantic analysis: Intermediate forms of source Programs – abstract syntax tree, polish notation and three address codes. Attributed grammars, Syntax directed translation, Conversion of popular Programming languages language Constructs into Intermediate code forms, Type checker.

UNIT – V:
Symbol Tables: Symbol table format, organization for block structures languages, hashing, tree structures representation of scope information. Block structures and non-block structure

storage allocation: static, Runtime stack and heap storage allocation, storage allocation for arrays, strings and records.

Code optimization: Consideration for Optimization, Scope of Optimization, local optimization, loop optimization, frequency reduction, folding, DAG representation.

UNIT – VI:

Data flow analysis: Flow graph, data flow equation, global optimization, redundant sub expression elimination, Induction variable elements, Live variable analysis, Copy propagation.

Object code generation: Object code forms, machine dependent code optimization, register allocation and assignment generic code generation algorithms, DAG for register allocation.

TEXT BOOKS:

1. Principles of compiler design -A.V. Aho, J.D.Ullman, Pearson Education.
2. Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.
3. lex&yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly

	V – SEMESTER	L	T	P	C
A1CIT212	**COMPUTER NETWORKS**	4	-	-	4
	Total Contact Hours - 56				
	Pre-requisites: Data Communications				

Course Objectives	
COBJ1	Build an understanding of the fundamental concepts of computer Networking
COBJ2	Familiarize the students with the basic taxonomy and terminology of networking area
COBJ3	Introduce the student to advanced networking concepts
COBJ4	Preparing the students for entry Advanced courses in computer networks

SYLLABUS

UNIT - I: (Ethernet)
IEEE standards, data link layer, physical layer, Standard Ethernet, MAC sub layer, physical layer, Changes in the standard, bridged, switched, full-duplex Ethernet, Fast Ethernet, MAC sub layer, physical layer, Gigabit Ethernet, MAC sub layer, physical layer, connecting devices, backbone networks, virtual LANs.

UNIT-II: (Network Layer)
IPv4 address, class-full, classless, NAT, IPv6 address, Internetworking, IPv4 and IPv6, transition from IPv4 to IPv6.

UNIT-III:
Address mapping(ARP, RARP, BOOTP, DHCP), ICMP, IGMP, ICMPv6, delivery, forwarding, unicast routing protocols (Intra and Inter domain routing, distance vector routing, link state routing, path vector routing).

UNIT-IV: (Transport Layer)
Process-to-Process delivery, UDP, TCP, Congestion control and quality of service: data traffic, congestion, congestion control, congestion control in TCP, quality of service, integrated services, differentiated services, QoS in switched networks

Unit-V: (Application Layer)
Name space, domain name space, distribution of name space, DNS in the Internet, resolution, DNS messages, types of records, registrars, encapsulation. Remote logging, Electronic mail

Unit-VI:
File transfer (FTP), Anonymous FTP, WWW and HTTP: architecture, client server, uniform resource locator, cookies, web documents, static, dynamic, active documents, HTTP, transaction, persistent, non-persistent, proxy server. Network Management System, configuration management, fault management, performance management, security management, accounting management, components of SNMP.

	V – SEMESTER	L	T	P	C
A1CIT213	**MICRO PROCESSORS & INTERFACING**	4	-	-	4
	Total Contact Hours - 56				
	Pre-requisites: Computer Organization, Basics of Programming				

Course Objectives	
COBJ1	A handful of additional and less complex chips connected to the microprocessor enable a complete microcomputer to be built.
COBJ2	This course provides a comprehensive coverage of the Intel 8086 microprocessor, and major functional components
COBJ3	Concepts like memory structure, register structure, instruction set, external interfaces, modes of operation
COBJ4	introduces architectural concepts and programming of 8086, microcontroller.

SYLLABUS

UNIT-I:

An over view of 8085, Architecture of 8086 Microprocessor, Special functions of General purpose registers. 8086 flag register and function of 8086 Flags, Pin diagram of 8086- Minimum mode and maximum mode of operation, Timing diagram.

UNIT-II

Addressing modes of 8086, Data transfer instructions, Arithmetic instructions, Logical instructions, and related assembly language programs

UNIT-III

String manipulation instructions, unconditional Branch instructions, Conditional Branch instructions, Flag manipulation and processor control instructions, Assembler directions and Operators, Programming with the assembler, editing, assembling, linking, debugging, assembly language program examples, Introduction to stack, stack structure of 8086, Push, Pop, programming for the stack

UNIT-IV

Interrupt structure of 8086. Vector interrupt table. Interrupt service routines. Introduction to DOS and BIOS interrupts. 8259 PIC Architecture and interfacing cascading of interrupt controller and its importance.

UNIT-V

Memory interfacing to 8086 (Static RAM & EPROM), Need for DMA, DMA data transfer Method, Interfacing with 8237/8257.

UNIT-VI

8255 PPI – various modes of operation and interfacing to 8086, Interfacing Keyboard, Displays, 8279, Stepper Motor and actuators, Digital to Analog and Analog to Digital converter interfacing.

	V – SEMESTER	L	T	P	C
	WEB TECHNOLOGIES	4	-	-	4
A1CIT214	**Total Contact Hours - 56**				
	Pre-requisites: Basic Mathematics & Shell Programming & Basics of Programming, Basics of Networks				

Course Objectives	
COBJ1	Students will study the design and development of web pages by using the HTML, Javascript and CSS.
COBJ2	Students will gain the understanding of PHP and XML to develop the web application using the XML concepts.
COBJ3	Students will gain the knowledge of java bean technology and the usage of java beans in the servlets and JSPs.
COBJ4	Students will be able to develop a web application with a database and web services.

SYLLABUS

UNIT-I:
HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets; Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script
CGI: CGI, CGI-encoding, Get & Post Methods, Fast-CGI, Server Side Scripts with PHP Basics.

UNIT-II:
XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX
Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Java Beans API.

UNIT-III:
Web Servers and Servlets: Tomcat web server, Introduction to Servlets: Lifecycle of a servlet, JSDK, The Servlet API, The javax.servlet Package, Reading Servlet parameters, reading Initialization parameters. The javax.servlet HTTP package, Handling Http Request & Responses, Using Cookies- Session Tracking, Security Issues

UNIT-IV: Introduction to JSP: The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat
UNIT-V:
JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations
UNIT VI:
Database Access: Database Programming using JDBC, Studying Javax.sql.* package, accessing a Database from a JSP Page, PHP: Basic building blocks, database connectivity.

	V – SEMESTER (Core Elective – I)	L	T	P	C
A1CIT311	**DATA WAREHOUSING & DATA MINING**	3	-	-	3
	Total Contact Hours – 42				
	Prerequisite :				

COURSE OBJECTIVES

COBJ1.	Students will be enabled to understand and implement classical models and algorithms in data warehousing and data mining.
COBJ2.	Students will learn how to analyze the data, identify the problems, and choose the relevant models and algorithms to apply.
COBJ3.	Students will further be able to assess the strengths and weaknesses of various methods and algorithms and to analyze their behavior.
COBJ4.	Students will learn mining frequent patterns, associations and cluster analysis.

SYLLABUS

UNIT – I:
INTRODUCTION TO DATA MINING
why data mining-What is Data Mining-what kinds of data can be Mined-Major issues in Data Mining-Data mining query language-Architectures of data mining systems

UNIT – II:
DATA PREPROCESSING
Data objects and attribute Types-Basic Statistical description of data-Measuring data Similarity and Dissimilarity-Why Preprocess the Data?-Data Cleaning-Data Integration-Data Reduction-Data Transformation and Data Discretization

UNIT - III
DATA WAREHOUSING AND ONLINE ANALYTICAL PROCESSING
Data Warehouse: Basic Concepts-Data Warehouse Modeling: Data Cube and OLAP -Data Warehouse Design and Usage-Data Warehouse Implementation-Data Cube Computation: Preliminary Concepts -Data Cube Computation Methods-Multidimensional Data Analysis in Cube Space

UNIT - IV
MINING FREQUENT PATTERNS, ASSOCIATIONS, AND CORRELATIONS
Basic concepts-Frequent Item set Mining Methods-Pattern evaluation methods-pattern mining in Multilevel; Multidimensional space-constraint based frequent pattern mining-Mining High dimensional data and colossal pattern-Mining Compressed or Approximate Patterns -Pattern Exploration and Application

UNIT - V
CLASSIFICATION
Basic Concepts and Issues-Classification by Decision Tree Induction-Bayesian Classification-Rule based classification-classification by back propagation-support vector machines-Lazy Learners-genetic algorithms-Rough Set approach-Fuzzy set approaches-Model evaluation and Selection

UNIT - VI
CLUSTER ANALYSIS

Cluster Analysis-partitioning methods-hierarchical methods-Density based methods-grid based methods-evaluation of clustering

TEXT BOOK

Data Mining Concepts and Techniques, Jiawei Han and Micheline Kamber, Morgan Kaufman Publications

Reference:

1. Data Mining Concepts and Techniques, Han, Morgan Kaufmann Publishers.

2. Data Mining: Practical Machine Learning Tools and Techniques2010, by Ian H. Witten and Eibe Frank, Morgan Kaufmann Publishers.

	V – SEMESTER (Core Elective – I)	L	T	P	C
A1CIT322	**ROUTING & SWITCHING CONCEPTS**	3	-	-	3
	Total Contact Hours – 42				
	Prerequisite : None				

COURSE OBJECTIVES

COBJ1.	Students will get exposure to the basics of internetworking, theoretical and practical models.
COBJ2.	Students will understand static and dynamic routing protocols, and will be able to configure routers for routing protocols, and also will be able use routers as basic packet filters.
COBJ3.	Students will get exposure to LAN Switching basics and will be able to configure advanced switches to implement LAN switching services including layer 2 security.
COBJ4.	Students will get exposure to WAN technologies and IPv6addressing scheme in detail.

SYLLABUS

Unit.1:
Inside the router, CLI configuration and addressing, Building the routing table, Path determination and switching, static route with next hop, static route with exit interface, summary and default static route, managing and troubleshooting static route. (Refer Ch1 and Ch2 of Text Book.1) (8Hrs)

Unit.2:
Introduction to dynamic routing protocols, classifying dynamic routing protocols, metrics, administrative distance, Introduction to distance vector routing protocols, network discovery, route table maintenance, routing loops, RIPv1, Bsic RIPv1 configuration, verification and trouble shooting, automatic summarization, default route and RIPv1. (Refer Chapters 3,4,5 of TextBook.1) (9 Hrs.)

Unit.3:
Classful and Classless addressing, VLSM, CIDR, RIPv1 Limitations, Configuring RIPv2, The Routing table structure, Introduction to EIGRP, Basic EIGRP configuration, EIGRP Metric calculation, DUAL, More EIGRP configurations. (Text Book-1) (9Hrs)

Unit.4:
Link state protocols; Link state routing, implementing link state routing, Introduction to OSPF, Basic OSPF configuration, The OSPF metric, OSPF and multiclass networks, More OSPF configuration. (Text Book.1) (9Hrs)

Unit.5:
Switched LAN architecture, Matching Switches to Specific LAN Functions, Introduction to Ethernet/802.3 LANs, Forwarding Frames Using a Switch, Switch Management Configuration, Configuring Switch Security. (Text Book.2)(10Hrs)

Unit.6:
Introducing VLANs, VLAN trunking, Configuring VLANs and Trunks, VTP Concepts, VTP Operation, Configuring VTP, Inter VLAN Routing, Configuring Inter VLAN Routing. (Text Book.2) (9Hrs)

V – SEMESTER (Core Elective – I)	L	T	P	C
SERVICE ORIENTED ARCHITECTURE	3	-	-	3
Total Contact Hours - 42				
Pre-requisites: None				

A1CIT332

Course Objectives

COBJ1	Expose students to component architecture & service orientation
COBJ2	Expose students to architectural paradigms of service oriented architecture.
COBJ3	Expose students to different technologies that make dynamic service oriented architecture applications possible.

SYLLABUS

UNIT I
Software Architecture: Need for Software Architecture, Objectives of Software architecture, Types of IT Architecture, Architectural patterns and styles
Service-Oriented Architecture: Service orientation in daily life, Evolution of SOA, Drivers for SOA, Dimensions of SOA, Key components of SOA, Perspectives of SOA.

UNIT II
Enterprise wide SOA: Considerations for Enterprise wide SOA, Strawman architecture, Enterprise SOA layers, Application development process, SOA methodology for enterprise.
Enterprise Applications: Architectural considerations, Solution architecture for enterprise Applications, solution architecture for enterprise.

UNIT III
Web services Overview: Heterogeneity problem, XML, SOAP, WSDL, UDDI registry, WS-1 Basic profile
Enterprise Service Bus : Routing and Scalable connectivity, Protocol transformation, Data/message transformation, core functionalities, optional features, logical components, deployment configurations, types of ESBs, Practical usage scenarios.

UNIT IV
Service Oriented Analysis and Design: Need for models, principles of service design, design of activity services, design of data, client and business process services
SOA Governance, Security and Implementation: SOA governance, SOA security, approach for enterprise wide SOA implementation

UNIT V
Technologies for SOA:
XML: Namespaces, schemas, processing/passing models
SOAP: messages, elements, attributes and processing model, message exchange types ,HTTP binding
WSDL: containment structure, elements of abstract description, elements of the implementation part, logical relationships, SOAP binding
UDDI Registry: Basic data model, tmodel, categorization and identification schemes, binding template, use of WSDL in the UDDI registry

UNIT VI

Web Services Implementation: Implementation Choices, Building Web Service Clients, Building Web Services, Bottom- Up Approach, Commercial Tools

TEXTBOOKS:

1. SOA Based Enterprise Integration: A step by step guide to services based application integration – WaseemRoshen, Tata Mc-Graw Hill Edition.
2. Service Oriented Architecture for Enterprise and Cloud applications – Second edition – Shankar Kambhampaty- Wiley India

REFERENCES:

1. "Introduction to service oriented modeling"-Service oriented Modeling: Service analysis, design and architecture – Wiley & Sons.
2. Service Oriented Architecture : Concepts, technology and design-Thomas Erl-Pearson Education 2005
3. SOA and Cloud computing: Practices,patterns and technologies – Anthony Assi,TouficBobez, Nitin Gandhi-Prentice Hall/Pearson PTR