Course Code	Course Name	Load Distribution (LT P C)
DTCS-401	Computer Architecture and Maintenance	4 0 0 4

Learning Outcome:

1. Understand various components of motherboard and their organization and various Processor types.

2. Understand various kind of storage devices in the computer and their interfacing.

3. Comprehend the interfacing and organization and working of Display devices like CRT and LCD.

4. Comprehend the working and construction of various input and output devices.

5. Understanding various power related devices and issues in computer and handlng different power failures

Unit 1. **8 hours**

Motherboard And Its Components:

Chipset basic, chipset Architecture: North / South Bridge,architecture and Hub architecture, ,Architecture of Intel chipset 915 G & 945 G, Overview and features of ISA, PCI-X, PCI-X press, AGP, PCMCIA,AGP, Processor BUS (no pin description) PCI versus PCI Express.Logical memory organization: Conventional memory, Extended memory, Extended memory, upper memory (No memory map).Concept of cache memory : Internal cache, External cache (L1, L2,L3 cache)Overview and features of SDRAM, DDR, DDR2, DDR3.**Features of Intel processors** : P3, P4, Pentium D and AMD processors ,Processor Modes : Real mode, Protected mode, Virtual real mode,64 bit extension mode (AMD 64, EM 64).Bios Basics, main functions,Motherboard Selection criteria

Unit 2. **9 hours**

Storage Devices And Its Interfacing:

Recording Technique : FM, MFM, RLL Perpendicular magnetic recording,Hard disk construction and working,Srevo Techniques : Wedge servo, Embedded servo, dedicated servo, Terms related to Hard Disk : Track, Sector cylinder, cluster, landing,zone, MBR, Zone recording, write precompensation,Formatting, Low level formatting, High level formatting,partitioning. FAT basics, Introduction to file system FAT 16, FAT 32, NTFS.

Hard disk drive interface : features of parallel AT attachment (PATA), Serial ATA (SATA), ATA devices jumper selections : Master,slave, cable select, ATA cables.ATA RAID : RAID 0, RAID, CDROM drive : Construction, Recording, DVD : Construction, RecordingBlu-ray disk specification.

Unit 3. **9 hours**

Display Devices & Interfacing:

CRT colourmonitor : Block diagram and function of each block, Characteristics of CRT monitor : Dot pitch, Resolution, Video bandwidth, Horizontal scanning frequency, vertical scanning frequency, Interlaced versus non interlaced monitor. Advantages of CRT display related to LCD display**LCD monitor :** functional block diagram of LCD monitor, working principal, advantages and disadvantages Types : Passive matrix and Active matrix, Important characteristics : Resolution, Refresh rate, Response time, Basic block diagram of a video accelerator care. Multiplexing and Spreading, Type of Multiplexing (TDM, FDM, WDM), Spread Spectrum – FHSS, DSSS, Switching Techniques – Circuit Switching and Packet Switching.

Unit 4:

Input & Output Devices: **10 hours**

Construction and Working: Keyboard : Types of keyswitches , Membrane, Mechanical,Rubber dome, Capacitive and interfaceMouse : Mechanical, Optomechanical, optical (New design),Scanner : Flat bed, sheetfed, Handheld : Block diagram and specifications, OCR, TWAIN, Resolution,

Interpolation,Modem : Internal and External : Block diagram and specifications,Printer: Dot matrix, Inkjet, Laser : Block diagram and specifications.

Unit 5: **10 hours**

Power Supplies:

Block diagram and working of SMPS. Signal description and pinout diagram of AT and ATX connectors.Power supply characteristics : Rated wattage, Efficiency,Regulation, Ripple, Load regulation, Line regulation,Power problems : Blackout, Brownout, surges and spikes,Symptoms of power problems,Protection devices: circuit breaker, Surge suppressor: working UPS: Block diagram, working, Types, Ratings.**Interfaces:**USB features, Rs 232 : (voltages and 9 pin description), Centronics (interface diagram, important signals and timing waveform),Firewire features.

Text Books:

1. Mike Meyers,Scott Jernigan, Managing & Troubleshooting PCs, Tata McGraw Hill.
2. Mark Minasi, The Complete PC Upgrade & Maintenance Guide, Tata McGraw Hill.
3. D. Balasubramanian, Computer Installation & Servicing, Tata McGraw Hill.

Reference Books:

1. Stephen J. Bigelow, Bigelow's PC Hardware Desk Reference, Second edition,McGraw-Hill Osborne Media.

Course Code	Course Name	Load Distribution (LT P C)
DTCS-402	Python Programming	3 0 0 3

Learning Outcomes:

1. Understand the features of Python as a language and using python shell to run programs.
2. Understand and implement data structures and looping constructs in python .
3. Implementation and comprehension of use of functions in python with functional paradigm.
4. Design of Classes and Objects in python with use of inheritance and polymorphism.
5. Understanding and implementation of famous and useful python libraries for various purposes

Unit 1: 8 hours

Introduction to Python

The Python Philosophy , programming paradigms, imperative, procedural, functional, object orientedprogramming, Fundamentals of python language,Applications of python,python 2 and python 3. writing python script in python shell, interpreting python source code.

Unit 2: 8 hours

Language Features of Python

Basic Data Types in python, Data Structures in python - Lists, Tuples, Dictionaries, Sets, Strings. Operators in python ,Branching Statements – if, else, elif. Looping statements- while, for.List and set comprehensions, built-in functions related to data structures and strings.

Unit 3: 9 hours

Functions in python:

Functions in Python, defining and using lambdas, defining and using generators and iterators in python. Decorators. Map, reduce and filter in python.Modules and Packages: Using and Creating .

Unit 4: 8 hours

Object-Oriented Programming :

Object-Oriented Programming (OOP) with Python , Overview of Object-oriented programming Objects, Instances and classes, Encapsulation, constructors in python, Inheritance and the type hierarchy,Polymorphism

Unit 5: 9 hours

Python Libraries:

Introduction to NumPy, Scipy, Matplotlib in python, Python GUIs with Tkinter (creating buttons, frames, labels etc). File handling in python.

Text Books:

1. Core Python Programming Paperback – 2018 ,R.Nageshwara Rao, Dreamtech Press.

Reference Books:

1. Learn Python 3 The Hard Way Textbook Binding – 2017 , by Zed A.Shaw.

2. Python : The Complete Beginners Guide - Step By Step Instructions (The Black Book),Kindle edition

Course Code	Course Name	Load Distribution (LT P C)
DTCS-403	Computer Networks	3 0 0 3

Learning Outcomes:

1. Understand the basic network concepts and network architectures.
2. Understand the implementation of various network topologies and several network devices .
3. Understand several kind of transmission media and communication techniques.
4. Understand both of the OSI and TCP/IP network reference models.
5. Understanding the implementation of various tcp constructs and protocols.

Unit 1: 8 hours

Basic Network Concepts:

Understanding Network - Human Networks; Computer Networks;Identifying the Benefits of Network - Sharing Information; Sharing Resources; Facilitating Centralized Management – ManagingSoftware, Maintaining the Network, Backing Up Data.Distinguishing Between Network classifications – Classifying Networks by their Geography – LAN, MAN, WAN; Classifying Networks by their Component Role - Peer to Peer, Server based Network.
Network Features - File Sharing; Printer Sharing; Application Services; E-Mail; Remote Access.

Unit 2: 8 hours

Network Topologies and Networking Devices:

Type of Topology - Bus Topology; Ring Topology; Star Topology;Mesh Topology; Tree Topology; Hybrid Topology. IP Addressing - IP Address Assignments; IP Address Classes; Subnet Masking; Registered and unregistered Addresses.TCP/IP Configuration - Installing the TCP/IP Protocol; Configuring TCP/IP - Configuring Basic TCP/IP Properties, Configuring Advanced TCP/IP PropertiesNetwork Control Devices -Hubs; Switches; Routers; Bridges;Repeaters; Gateways; Modems.

Unit 3: 9 hours

Transmission Media: Guided Media -Twisted Pair -UPT, STP; Coaxial Cable; Optical Fiber - Optical Fiber Structure, Light Source for Fiber, Propagation Mode, Advantages of optical fiber, Disadvantages of optical fiber. Un-Guided Media: Wireless Communication – Communication Band;Microwave Communication; Satellite Communication – Access Method; Cellular (Mobile) Telephone – Band in Cellular Telephony, Calls Using Mobile Phones, Transmitting receiving operations; NewDevelopments.

Unit 4: 8 hours

Network Reference Model:

OSI Reference Model - Interlayer Communication – Data Encapsulation, Horizontal Communication, Vertical Communication, Encapsulation Terminology; Physical layer; Data link layer; Network layer; Transport layer; Session layer; Presentation layer; Application layer.

TCP/IP Reference Model – Link; Internet; Transport; Application layer. Comparison of the OSI and TCP/IP reference models.

Unit 5: **10 hours**

TCP/IP Fundamentals:

TCP/IP Protocols - SLIP and PPP; ARP; IP; ICMP; TCP and UDP.IP Addressing - IP Address Assignments; IP Address Classes; Subnet Masking; Registered and unregistered Addresses. TCP/IP Configuration - Installing the TCP/IP Protocol; Configuring TCP/IP - Configuring Basic TCP/IP Properties, Configuring Advanced TCP/IP Properties.

Text Books:

1. Introduction to Networking, Richard A. McMohan, Sir, Tata McGraw-Hill Edition.
2. Complete Reference Networking, Craig Zacker, Tata McGraw-Hill Edition.

Reference Books:

1. A.S.Tanenbaum, Computer networks, third edition, PHI.

Course Code	Course Name	Load Distribution (LT P C)
DTCS-404	Data Structures	3 0 0 3

Learning Outcomes:

1. Understand different types of data types and various algorithm analysis terminology.
2. Comprehend and implement certain sorting techniques.
3. Comprehend and design certain kinds of linear and static kind of data structures.
4. Understand and design dynamic data structures and tree based data structures.
5. Understand and design graph based data structures and hashing techniques.

Unit 1: **8 hours**

Introduction to data structure:

Data Representation, Abstract data Types, Data Structure and Structured Types,Atomic Type.Difference between Abstract Data Types, Data Types And Data Structures,Data Types: Linear data type, Non- Linear data type, Primitive data type, Non primitive data type.**Principles of programming and Analysis of Algorithms:**Algorithms, Different approaches for designing an algorithm, Complexity, Big 'O' Notation,Algorithm analysis.

Unit 2: **9 hours**

Searching & Sorting:

Sorting-An Introduction,Efficiency of Sorting Algorithms, Bubble Sort, Selection Sort, Quick Sort, Insertion Sort, Merge Sort, Binary Tree Sort, Searching-An Introduction,Binary Search.

Unit 3: **9 hours**

Stacks:

Introduction to Stacks, Stacks as an Abstract Data Type, Primitive operations of stacks,Representation of Stacks through Arrays, Representation of Stacks through Linked List, Application of Stacks, Stack and Recursion.

Queues:

Introduction, Queue as an Abstract Data Type, Representation of Queues, Operations on queue: Searching ,Insertion, Deletion. Circular Queues, Priority Queue, Application of Queues.

Unit 4:

Linked List: **10 hours**

Introduction, Terminologies Node, Address, Pointer, Information, Next, Null pointer, Empty list etc. Operations on list Searching, Insertion and Deletion , Types of lists Linked list and Circular list, Array stacks, queues, implementation using list.**Trees:**Introduction to Binary Trees, Types of Trees, Basic Definition of Binary Trees, Operations on Binary Search Tree, Type of tree Binary, Height balanced and Weight balanced tree.Operations on trees, Searching Depth-first search and Breadth-first search. Traversing Pre-order, In-order and Post-order. Insertion,Deletion.

Unit 5: **9 hours**

Graphs:

Introduction to Graphs, Terms Associated with Graphs, Terminology graph, node (vertices), arcs (edge), directed graph, in-degree, out-degree, adjacent, successor, predecessor, relation, Weight, path, length.

Sequential Representation of Graphs, Linked Representation of Graphs, Traversal of Graphs, Spanning Trees ,Shortest Path, Application of Graph.**Hashing:** Hash functions, Inserting into and Deleting items from hash tables.

Text Books:

1.Tremblie and Sorrenson, Data Structures, TMH Publications.

2. Lafore, Teach Yourself data Structure and Algorithms in 24 Hrs, BPB Publication.

Reference Books:

1. A. Aho, J.Hopcroft, J.Ulman, Data Structures and Algorithms, Pearson Education, 1998.

Course Code	Course Name	Load Distribution (LT P C)
DTCS-405	Management Information System	3 0 0 3

Learning Outcome:

1. Understand the basics of information system and organizational structures and business planning.
2. Understand the role played by Information systems in Manufacturing and Service sector.
3. Understanding the implementation of decision systems and mining techniques to enable the decision techniques.
4. Comprehend the design and functionality of ERP and CRM systems.
5. Understand the potential threats to information systems and various ethical issues to be avoided

Unit 1: 8 hours

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 Behavior, 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: 8 hours

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: 8 hours

Decision Systems and Mining:

Decision Support System, Characteristics of decision making process, Decision Support System (Concept, Components, Development, Risk). Management Information System and Decision Support System, Concept of Artificial Intelligence & Expert System. Data warehouse (Concept, Design, Organization and Management, Architecture, Implementation), Data in data warehouse, Data Mining.

Unit 4:

Integration of Information: 9 hours

Enterprise Resource Planning (ERP)-ERP (Basic features, Benefits,selection, implementation) Enterprise Management System (EMS) & Management Information System (MIS), Customer Relationship Management (CRM) (Concept , Three Phases of CRM, Benefits , Challenges & Trends), Business Process Outsourcing (BPO) -BPO, Voice BPO i.e. Call Center, Non-Voice BPO, Challenges in BPO Management.Electronic Commerce Systems (E-Commerce) – Concept, Scope, B2C, B2B, C2C, E-Commerce Applications.

Unit 5:

Security & Ethical challenges: 9 hours

Viewing Versus Security, Risks, Threats & Vulnerability, Assessing Risks. Common Controls (Physical, Electronic, Software, Management Controls). Common Threats (Natural Disasters Employee Errors, Computer Crime,Fraud, Abuse, Program Bugs). Ethical & Contractual Behaviors, Privacy, Access & Accuracy Issues, Property Issues.

Text Books:

1. Robert Schulthis& Mary Sumner, Management Information System, Tata Mcgraw Hill.
2. O'Brien, Management Information System, Tata Mcgraw Hill.

Reference Books:

1. Jawadekar, Management Information System, Tata Mcgraw Hill.

Course Code	Course Name	Load Distribution (LT P C)
DTCS-601	Entrepreneurship Development	3 0 0 3

Unit 1: **9 hours**

Introduction:

Entrepreneurship, Creativity & Opportunities, Concept, Classification & Characteristics of Entrepreneur, Creativity and Risk taking, Concept of Creativity & Qualities of Creative person, Risk Situation, Types of risk & risk takers, Business Reforms, Process of Liberalization, Reform Policies, Impact of Liberalization, Emerging high growth areas, Business Idea Methods and techniques to generate business idea. Transforming Ideas in to opportunities transformation involves Assessment of idea &Feasibility of opportunity SWOT Analysis.

Unit 2: **8 hours**

Information and Support Systems:

Information And Support Systems, Information Needed and Their Sources, Information related to project, Information related to support system, Information related to procedures and formalities, support systems: Small Scale Business Planning, Requirements, Govt. & Institutional Agencies, Formalities, Statutory Requirements and Agencies.**Market Assessment:** Marketing-Concept and Importance, Market Identification, Survey Key components, Market Assessment.

Unit 3: **9 hours**

Business Finance & Accounts: Business Finance- Cost of Project, Sources of Finance, Assessment of working capital, Product costing, Profitability, Break Even Analysis, Financial Ratios and Significance, Business Account, Accounting Principles, Methodology, Book Keeping, Financial Statements, Concept of Audit.

Unit 4: **9 hours**

Business Plan & Project Report- Business plan steps involved from concept to commissioning:Activity Recourses, Time, Cost, Project Report- Meaning and Importance, Components of project report/profile, Project Appraisal, Meaning and definition, Technical, Economic feasibility, Cost benefit Analysis.

Unit 5: **8 hours**

Enterprise Management And Modern Trends: Enterprise Management, Essential roles of Entrepreneur in managing enterprise, Product Cycle: Concept and importance, Probable Causes Of Sickness, Quality Assurance, Importance of Quality, Importance of testing, E-Commerce, Concept and process,Global Entrepreneur.

Text Books:

1. Entrepreneurship Theory and Practice, J.S. Saini, B.S.Rathore, Wheeler Publisher New Delhi.

2. Entrepreneurship Development, E. Gorden, K.Natrajan, Himalaya Publishing, Mumbai.

Reference Books:

1.Evaluation of Enterpreneurship Development Programmes, D.N.Awasthi , Jose Sebeastian.

Course Code	Course Name	Load Distribution (LT P C)
DTCS-602	Advanced Web Technologies	3 0 0 3

Unit 1: **8 hours**

Basics of Internet and Web:

The basics of Internet, World Wide Web, Web page, Home page, Web site, Static, Dynamic and Active web page, Overview of Protocols –Simple Mail Transfer Protocol, Gopher, Telnet, Emails, TFTP, Simple

Network Management Protocol, Hyper Text Transfer Protocol, Client server computing concepts.

Unit 2 :

Introduction to HTML : **9 hours**

Introduction to HTML 4 and 5, Essential Tags, Tags and Attributes, Text Styles and Text Arrangements, Text, Effects, Exposure to Various Tags (DIV, MARQUEE, NOBR, DFN, HR, LISTING, Comment, IMG), Color and Background of Web Pages, Lists and their Types, Attributes of Image Tag, Hypertext, Hyperlink and Hypermedia, Links, Anchors and URLs, Links to External Documents, Different Section of a Page and Graphics, Footnote and e-Mailing, Creating Table, Frame, Form and Style Sheet.

Unit 3 : **8 hours**

Java Script:

Objects, Methods, Events and Functions, Tags, Operators, Data Types, Literals and Type Casting in JavaScript, Programming Construct, Array and Dialog Boxes, Relating JavaScript to DHTML, Dynamically Changing Text, Style, Content.

Unit 4: **8 hours**

XML and JSON:

Introduction to XML, uses of XML, simple XML, XML key components, DTD and Schemas, Using XML with application. JSON, creation and modification .

Unit 5:

Introduction to PHP: **9 hours**

Server Side Programming , Introduction to PHP, Basic Programming Concepts of PHP: Variables, Data-types, Constants, Scope of Variables, Type of Variables, Type Casting, Operators, Operators Precedence, References, Arrays; Control Structures: Branching, If statement, Switch statement; Looping: for Loop, while Loop, do while Loop, for each Loop; Functions: User Defined Functions, Built -in Function, Functions for Variables; Script Controlling Functions, Array Functions, Date and Time Functions, Mathematical Functions, String Functions, PHP Server Variables; Working with form, Uploading files to Web Server using PHP.

Text Books:

1. Mastering HTML, CSS &Javascript Web Publishing, Laura Lemay, Rafe Colburn, Jennifer Kyrnin .
2. PHP and MySQL Web Development, 2016,by Luke Welling and Laura Thomson

Reference Books:

1. Learning PHP, MySQL & JavaScript with j Query, CSS & HTML5,2015, Robin Nixon, O'Reilly.

Course Code	Course Name	Load Distribution (LT P C)
DTCS-603	Information Security	3 0 0 3

Unit 1: **8 hours**

Introduction and Security trends:
Threats to security: Viruses and Worms, Intruders, Insiders. Avenues of attack, steps in attack, Types of attack: Denial of service, backdoors and trapdoors, sniffing, spoofing, man in the middle, replay, TCP/IP Hacking, encryption attacks. Malware: Viruses, Logic bombs.

Unit 2: **8 Hours**

Security Basics – Confidentiality, Integrity, Availability, Operational model of Computer Security, Layers of security. Access control : Discretionary, Mandatory, Role based Organizational/ Operational security, Role of people in security

Unit 3: **8 Hours**

Password selection, Piggybacking, Shoulder surfing, Dumpster diving, Installing unauthorized software / hardware, Access by non employees, Security, awareness, Individual user responsibilities.

Unit 4: **8 Hours**

Security policies, standards, procedures and guidelines. Physical security: Access controls Biometrics : finger prints, hand prints, Retina, patterns, voice, patterns, signature and writing patterns, keystrokes, Physical barriers. Social Engineering

Unit 5 **8 Hours**

Cryptography and Public key Infrastructure Encryption algorithm/Cifer, Caesar's cipher, shift cipher, substitution software, Vigenere cipher, Transposition techniques, Steganography Hashing, SHA , Symmetric encryption DES (Data encryption standard). Asymmetric encryption, Digital signatures

Reference Books

1. Principles of Computer by Dwayne Williams, Mc Graw Hill Technology Education
2. Computer Networks by A.S.Tanenbaum, PHI,ISBN 81-203-2175-8.
3. Data communication and networking by B.A.Farouzan, Tata McGraw Hill

Course Code	Course Name	Load Distribution (LT P C)
DTCS-604	Advanced Java Programming	3 0 0 3

Unit 1: 12 hours

Introduction the Abstract Window Toolkit: (AWT)

Working with Windows and AWT, AWT classes, Windows Fundamentals, Working with frame windows,Creating a frame window in applet, Creating windowed program, Display information within with in a window, Working with graphics, Working with color, Setting the paint mode, Working with Fonts, Managing text output using Font Metrics, Exploring text & graphics, Using AWT Controls, Layout Managers and Menus, Control Fundamentals, Labels, Using Buttons, Applying Check Boxes, Checkbox, Group, Choice Controls,Using Lists, Managing scroll Bars, Using a Text Field, Using a Text Area, Understanding Layout Managers, Menu Bars and Menu, Dialog Boxes, File Dialog, Handling events by Extending AWT Components, Exploring the Controls, Menus, and Layout Managers.

Unit 2: 8 hours

Networking:

Basics, Socket overview, client/server, reserved sockets, proxy servers, internet addressing. Java & the Net, The networking classes & interfaces, Inet address, Factory methods, instance method, TCP/IP Client Sockets, What is URL, Format, URL connection, TCI/IP Server Sockets, Data grams, Data gram packets, Data gram server & client.

Unit 3: 8 hours

Java Data Base Client/ Server:

Java as a Database front end, Database client/server methodology, Two-Tier Database Design, Three-Tier Database Design, The JDBC API, The API Components, Security Considerations, A JDBC Database Example JDBC Drivers ,JDBC-ODBC Bridge, Current JDBC Drivers.

Unit 4: 8 hours

The Tour of Swing:

J applet, Icons and Labels ,Text Fields, Buttons, Combo Boxes Tabbed Panes, Scroll Panes. Trees, Tables, Exploring the Swings.

Unit 5: 8 hours

Servlets:

Background, The Life Cycle Of a Servlet,The Java Servlet Development Kit, The Simple Servlet, TheServlet API, The Javax Servlet Package, Reading Servlet Parameters Reading Initialization Parameters,The Javax. Servlet. http package, Handling HTTP

Requests and responses, Using Cookies, Session Tracking, Security Issues, Exploring Servlet.

Text Books:

1. Patrick Naughton-Herbert Schildt, The Complete Reference Java 2 (Third Edition) Tata McGraw hill.
2. Cay S. Horstmann, Gary Cornell, Core Java 2: Fundamentals, Sun Microsystems.