

Choice Based Credit System (CBCS)

Shri Swami Vivekanand Shikshan Sanstha's
**VIVEKANAND COLLEGE (AUTONOMOUS),
KOLHAPUR**

DEPARTMENT OF COMPUTER SCIENCE

Syllabus for the Third Year B.Sc. (Computer Science)

Program: (Undergraduate) B.Sc.

Course: Computer Science

SYLLABUS OF COURSE TO BE OFFERED

Core Courses, Elective Courses & Ability Enhancement Courses

Credit Based Semester and Grading System with effect from the
academic year **2023–2024**

STRUCTURE OF COURSE

Sr. No	Paper	Name of Paper	Marks	Internal Assessment	Credits
SEMESTER-V					
(DSE) Discipline Specific Electives					
1	DSE-1006E1	Section-I Computer Network	70	30	4
		Section-II Software Engineering			
2	DSE-1006E2	Section-I Internet Technologies-I	70	30	4
		Section-II Introduction to Java			
3	SEC-1006C	PHP Programming			2
4	AECC	English	50		4
SEMESTER-VI					
(DSE) Discipline Specific Electives					
5	DSE-1006F1	Section-I Advanced Computer Network	70	30	4
		Section-II Object Oriented Software Engineering			
6	DSE-1006F2	Section-I Internet Technologies-II	70	30	4
		Section-II Data Science using Python			
8	SEC-1006D	Advanced PHP Programming			2
9	AECC	English	50		4
10	Practical Paper -I	Practical's based on DSE-1006E1, DSE-1006E2, SEC-1006C	50		4
11	Practical Paper -II	Practical's based on DSC-1006F1, DSC-1006F2, SEC-1006D	50		
12	Project	Major Project	80		4
13	Study Tour/Field Visit	Study Tour/Field Visit		20	

Semester V (Theory)

Course: DSE-1006E1	TOPICS (Credits : 4 Lectures/Week: 5) Computer Network and Software Engineering	
<p>Objectives – This course elaborates an introduction to the technical concepts that serve as the bases for the design of classical and modern computer networks and concepts of System analysis with respect to Software Development.</p> <p>Expected Course Outcomes of this course Students should be able to...</p> <ol style="list-style-type: none"> 1) Learn and Understand the basic Computer Network and Software engineering concepts 2) Learn and Understand Linux administration and Software Project Management. 3) Illustrate and Demonstrate Linux administration commands and Software Required Specification with use cases 4) Apply Linux administration commands to configure Network Topologies and Design SRS. 5) Analyze and Design SRS , test cases and local area Network for small laboratory. 6) Design SRS and test designs with use cases and construct local area Network for small laboratory. 		
SECTION – I		
Unit I	<p>Basic concepts: Components of data communication, standards and organizations, Network Classification, Network Topologies; network protocol; layered network architecture; overview of OSI reference model; overview of TCP/IP protocol suite. Network Security: Common Terms, Firewalls, Virtual Private Networks</p>	10L
Unit II	<p>ISO/OSI Model: Physical Layer: Cabling, Network Interface Card, Transmission Media Devices- Repeater, Hub, Bridge, Switch, Router, Gateway. Data Link Layer: Framing techniques; Error Control; Flow Control Protocols; Shared media protocols - CSMA/CD and CSMA/CA. Network Layer: Virtual Circuits and Datagram approach, IP addressing methods – Subnetting; Routing Algorithms (adaptive and non-adaptive) Transport Layer: Transport services, Transport Layer protocol of TCP and UDP Application Layer: Application layer protocols and services – Domain name system, HTTP, WWW, telnet, FTP, SMTP.</p>	10 L
Unit III	<p>Introduction to Linux Server Administration: Technical Summary of Linux Distributions, Managing Software Single-Host Administration: Managing Users and Groups, Booting and shutting down processes, File Systems, Core System Services, Process of configuring, compiling, Linux Kernel.</p>	10 L
SECTION – II		

Unit I	<p>Introduction to System Analysis: Definition of system, elements and characteristics of system, Types of system</p> <p>Software Engineering Concepts: Requirement analysis, System Design, Object Design, Participants and roles: System analyst, Characteristics of software, System Development Life Cycle (SDLC), Classical model, Water fall model, Feasibility study, Fact finding technique.</p>	10L
Unit II	<p>Software Engineering: Definition, Modelling, Problem Solving, Knowledge acquisition, Rationale Driven.</p> <p>Software Project Management: Estimation in Project Planning Process, Project Scheduling.</p> <p>Quality Management: Quality Concepts, Software Qualities, Software Quality Assurance, Software Reviews, Metrics for Process and Projects.</p> <p>Risk Management: Software Risks, Risk Identification, Risk Projection and Risk Refinement.</p>	10 L
Unit III	<p>Software Testing: White Box Testing, Black Box Testing, Alpha Testing, Beta Testing, Change Over.</p> <p>Case studies: College Admission system, Library system, Bank management System.</p>	10 L

Text books:

Additional References:

1. A.S.Tanenbaum, "Computer Networks", Pearson Education, Fourth Edition.
 2. Software Engineering by Pressman.
- Object Oriented Software Engineering by Ivar Jacobson.

Course: DSE-1006E2	TOPICS (Credits : 4 Lectures/Week: 5) Internet Technologies – I and Introduction to JAVA	
Objectives – This course will provide an opportunity for student to use python threading, GUI building, use of databases with the help of Django framework and also introduced JAVA framework.		
Expected Course Outcomes of this course		
Students should be able to...		
<ol style="list-style-type: none"> 1. Learn and Understand basics Java Programming Language, Flask Micro Framework Flask and Python 2. Apply Object Oriented Concepts with Java and understanding the basic of Web Development using Flask and Python 3. Recognize and identify the different concepts available in Java and Flask with Python 4. Solve and Analyze complex problems with different problem-solving concepts. 5. Design small applications using Java and Web Applications using Flask 6. Construct standalone and web applications using Java and Flask 		
SECTION – I		
Unit I	Introduction to Flask: Flask as Micro Framework, Characteristics, Who uses Flask, Setup tools and pip (Installing Python, Installing Flask), working with virualenv (Creating new VE, Activating and Deactivating VE, Adding and Removing packages to-from VE), Introduction to IDE (PyCharm, PyDev), Application Structure (Initialization, Routes and View Functions, Server Startup, The Request-Response Cycle, Application and Request Contexts, Request Dispatching, Request Hooks, Responses, Command-Line Options with Flask-Script),First Simple Application	10L
Unit II	Jinja Templating: The Jinja2 Template Engine, Rendering Templates, Comments, Variables, Control Structures, Filters, Templates with include and Inheritance, Twitter Bootstrap Integration with Flask- Bootstrap, Custom Error Pages, Links, Static Files	10 L
Unit III	Creating and Rendering Forms: Cross-Site Request Forgery (CSRF) Protection, Form Classes, HTML Rendering of Forms, Form Handling in View Functions, Redirects and User Sessions, Message Flashing, Validating Fields	10 L

	on the server side, Creating custom fields and validation.	
SECTION – II		
Unit I	Introduction to Java and Java Fundamentals: History of Java , Features of Java , Comparison of Java and C++ , Java Environment, Java Tools – jdb, javap, javadoc ,Java IDE – Eclipse/NetBeans, Structure of java program, ,First java program, Types of Comments, Data types, Variables, Operators, Keywords, Naming Convention, Declaring 1D, 2D array, Decision Making (if, switch),Looping(for, while) ,Type Casting , Accepting input using Command line argument, Accepting input from console	10L
Unit II	Object, Classes and Inheritance in Java: Defining Your Own Classes, Access Specifiers (public, protected, private, default), Array of Objects , Constructor, Overloading Constructors and use of ‘this’ Keyword, static block, static Fields and methods, Object class methods, String Class, Inner class, Packages, Wrapper Classes , Garbage Collection, Memory allocation for objects, Constructor, Implementation of Inheritance, use of super keyword, Implementation of Polymorphism, Method Overloading, Method Overriding, Nested and Inner classes, Use of final keyword related to method and class, abstract class and abstract methods, Defining and Implementing Interfaces, Object Cloning	10 L
Unit III	Exception Handling, GUI components using AWT and Swing and Applets: Exception types, Using try catch and multiple catch, Nested try, throw, throws and finally, Creating User defined Exceptions, Assertions, Basics of AWT and Swing, their Difference, Layout Manager, Layouts, Components: JButton, JLabel, JText, JTextArea, JCheckBox and JRadioButton, JList, JComboBox, JMenu and JPopupMenu Class, JMenuItem and JCheckBoxMenuItem, JRadioButtonMenuItem, JScrollBar, Dialogs (Message, confirmation, input), JFileChooser, JColorChooser, Event Handling: Event sources, Listeners Mouse and Keyboard Event Handling, Adapters, Applet Life Cycle , appletviewer tool, Applet HTML Tags, Passing parameters to Applet , repaint() and update() method	10 L
<p>Text books:</p> <p>Additional References:</p> <ol style="list-style-type: none"> 1. Learn Web Development with Python by Fabrizio Romano, Gaston C. Hillar, Arun Ravindran, Packt Publishing, ISBN: 9781789953299, 2018 2. Django for Beginners: Build websites with Python and Django Paperback – March 7, 2018 by William S. Vincent. 3. Core Java2 Volume I-Fundamentals by Cay S. Horstmann, Gary Cornell 4. Effective Java Programming Language Guide by Joshua Bloch 5. Herbert Schildt , Java 7, The Complete Reference, , 8th Edition, 2009 6. Java 2 programming black books, Steven Horlzner 7. Programming with Java , A primer ,Forth edition , By E. Balagurusamy 		

Course: SEC-1006C	TOPICS (Credits : 2 Lectures/Week) PHP Programming	
<p>Objectives – This course is designed with objectives like student will be known to server side scripting, web application development environment and will be able to designing dynamic web applications.</p> <p>Expected Learning Outcomes of this course</p> <ol style="list-style-type: none"> 1. Students will be knowing basics PHP programming Language. 2. Students will be getting the primer knowledge of web application development frameworks. 3. Students will be known about internet techniques. 4. Students should be able to design and develop web applications. 		
Details		
Unit I	<p>Introduction: PHP introduction, inventions and versions, important tools and software requirements (like Web Server, Database, Editors etc.), PHP with other technologies, scope of PHP, Basic Syntax, PHP variables and constants ,Types of data in PHP , Expressions, scopes of a variable (local, global), Operators: Arithmetic, Assignment, Relational , Logical operators, Bitwise, ternary and MOD operator, PHP operator Precedence and associativity Control Structure: PHP IF Else conditional statements (Nested IF and Else), Switch case, while, For and Do While Loop, Goto, Break, Continue and exit</p>	12L
Unit II	<p>String and Regular Expression: Creating and accessing String , Searching & Replacing String , Formatting, joining and splitting String , String Related Library functions , Use and advantage of regular expression over inbuilt function ,Use of preg_match(), preg_replace(), preg_split() functions in regular expression</p> <p>Arrays: Anatomy of an Array, Creating index based and Associative array, Accessing array, Looping with Index based array, with associative array using each() and foreach(). Functions: Need of Function, declaration and calling of a function , PHP Function with arguments, Default Arguments in Function, Function argument with call by value, call by reference, Scope of Function Global and Local. Files: Working with files and directories Directories: Getting File Information, Changing File Permissions, Splitting a Filename into Its Component Parts, Deleting, Copying or Moving a File, Processing All Files in a Directory, Getting a List of Filenames Matching a Pattern, Processing All Files in a Directory Recursively, Making, Removing a Directory and Its Contents</p>	12 L
<p>Text books: PHP Cookbook by David Sklar & Adam Trachtenberg</p> <p>Additional References:</p> <ol style="list-style-type: none"> 1. PHP & MySQL for Dummies by Janet Valade 2. PHP and MySQL Web Development by Luke Welling, Laura Thompson 3. Programming PHP by Rasmus Lerdorf, Kevin Tatroe 		

Semester VI (Theory)

Course: DSE-1006F1	TOPICS (Credits : 4 Lectures/Week: 5) Advanced Computer Network and Object Oriented Software Engineering	
<p>Objectives – This course elaborates an introduction to the technical concepts that serve as the bases for the design of classical and modern computer networks and concepts of System analysis with respect to Software Development.</p> <p>Expected Course Outcomes of this course Students should be able to...</p> <ol style="list-style-type: none"> 1. Learn and Understand various OOSE concepts and advanced network concepts. 2. Illustrate and demonstrate advanced network concepts and UML diagrams. 3. Design and Apply Network Concepts and UML Diagrams. 4. Analyze applied Network Concepts and designed UML Diagrams. 5. Design case studies for small network and software system applications. 6. Construct and develop small case studies 		
SECTION – I		
Unit I	Networking and Security: TCP/IP for System Administrators, basic network Configuration, Linux Firewall (Netfilter), System and network security	10L
Unit II	Internet Services: Domain Name System (DNS), File Transfer Protocol (FTP), Apache web server, Simple Mail Transfer Protocol (SMTP), Post Office Protocol and Internet Mail Access Protocol (POP and IMAP), Secure Shell (SSH), Network Authentication, OpenLDAP Server, Samba and LDAP, Network authentication system (Kerberos), Domain Name Service (DNS), Security.	10 L
Unit III	Intranet Services: Network File System (NFS), Samba, Distributed File Systems (DFS), Network Information Service (NIS), Lightweight Directory Access Protocol (LDAP), Dynamic Host Configuration Protocol (DHCP), MySQL, LAMP Applications File Servers, Email Services, Chat Applications, Virtual Private Networking.	10 L
SECTION – II		
Unit I	Introduction to OOAD: Object Oriented Concepts and Modelling: Introduction to class, Object, inheritance, polymorphism, Aggregation and Composition. Introduction to UML: Overview, Conceptual Model of UML, UML architecture.	10L
Unit II	Unified Process Model Views, UML Diagrams: Class diagrams, Object diagrams, Statechart diagram. Static Modelling Notation: Package Diagrams, Composite Structures, Component Diagrams, Deployment Diagrams Dynamic Modelling Notation: Use Case Diagrams, Activity Diagrams, Interaction Diagrams	10 L

Unit III	Mapping Object Model to Database Schema: Object Oriented Design: System Design process, Partitioning the analysis model, Concurrency and subsystem allocation, Task, Data and Resource management. Object Oriented Analysis: Iterative Development, Unified process & UP Phases: Inception, Elaboration, Construction and Transition. Object Oriented Testing: Types of Testing, Object oriented Testing strategies, Test case design for OO software	10 L
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Text books:

Additional References:

1. Software Engineering by Pressman.
2. Object Oriented Software Engineering by Ivar Jacobson.
3. The Unified Modeling Language User Guide by Grady Booch, James Rumbaugh, Ivar Jacobson.
4. Applying UML and Patterns by Craig Larman

Course: DSE-1006F2	TOPICS (Credits : 4 Lectures/Week: 5) Internet Technologies – II and Data Science using Python	
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Objectives – This course will provide students to get acquainted with Web Framework and Services. FLASK framework, exposure to compatible framework will be provided to the student so that they may utilize python for their target web applications. Also, the course will be introduced Data Science with the help of python.

Expected Course Outcomes of this course

Students should be able to...

1. Learn and Understand advanced concepts of Web Development using Flask and Python and basics of data science.
2. Learn and Understand basics of application deployment and Machine Learning concepts.
3. Apply web development and Data science concepts and methods to solve small problems in real-world contexts
4. Analyze web development and data science concepts with small problems.
5. Design and Analyze case studies.
6. Implement Machine Learning Algorithms and web applications

SECTION – I

Unit I	Working with Databases: SQL Databases, My S Q L Databases, Python Database Frameworks, Database Management with Flask-MySQL, Model Definition, Relationships, Database Operations ,Creating the Tables, Inserting Rows, Modifying Rows, Deleting Rows, Querying Rows, Database Use in View Functions, Integration with the Python Shell.	10L
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Unit II	User Authentication: Authentication Extensions for Flask ,Password Security ,Hashing Passwords with Werkzeug ,Creating an Authentication Blueprint, User Authentication with Flask-Login, Preparing the User Model for Logins, Protecting Routes, Adding a Login Form, Signing Users In, Signing Users Out, Understanding How Flask-Login Works, Testing Logins, New User Registration, Adding a User Registration Form, Registering New Users ,Account Confirmation , Generating Confirmation Tokens with itsdangerous, Sending Confirmation Emails, Account Management.	10 L
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Unit III	Application Deployment: Deployment Workflow, Logging of Errors During Production, Cloud Deployment, Deploying with any hosting service, Deploying an Upgrade.	10 L
SECTION – II		
Unit I	Introduction to Data Science: Definition, Big Data and Data Science hype, Getting past the hype, Datafication, History and Current landscape of perspectives, Drew Conway’s Venn diagram of data science, Roles and Skill sets of the Data Scientist in Data Science.	10L
Unit II	Statistical Inference: Populations and samples of Big Data, Statistical Modeling, Probability Distributions, Fitting a Model. Introduction to Data Structures, Exploratory Data Analysis (EDA): The Data Science Process, Basic tools (plots, graphs and summary statistics) of EDA, Case Study: RealDirect (online real estate firm).	10 L
Unit III	Introduction to Machine Learning: Interpreting parameters, Confidence intervals, The role of explicit assumptions, Three basic Algorithms - Linear Regression: Fitting the model, Extending beyond least squares, Adding in modeling assumptions about the errors, Evaluation metrics(R-squared, p-values, Cross-validation), Transformations. k-Nearest Neighbors (k-NN): distance metrics(Cosine Similarity, Jaccard Distance, Mahalanobis Distance, Hamming Distance, Manhattan), Training and test sets, Choosing k, Binary Classes, Test Set in k-NN, modeling assumptions. k-means: Hierarchical modeling, 2D version, unsupervised learning.	10 L
Books:		
<ol style="list-style-type: none"> 1. Python 3 Web Development Guide, Michel Anders, Beginners guide, PACKT Publishing, open source 2. Doing Data Science by Rachel Schutt, Cathy O’Neil, Publisher: O’Reilly Media, Inc. 2014. 3. An Introduction to Statistical Learning by Gareth James (2017) Publisher: Springer 4. The Data Science Handbook by FIELD CADY, ISBN: 978-1-119-09294-0(2017), Publisher: Wiley 		

Course: SEC-1006D	TOPICS (Credits : 2 Lectures/Week) Advanced PHP Programming	
Objectives – This course will be able to develop dynamic Web sites using PHP and to connect the developed website using MySQL.		
Expected Learning Outcomes of this course <ol style="list-style-type: none"> 1) Students should to learn the basic tags used in HTML. 2) Student should develop their own Cascading Sheets in order to design web pages. 3) Students should be able to develop Static web pages. 		
Details		
Unit I	Classes and Objects: Instantiating Objects, Defining Object Constructors, Defining Object Destructors, Implementing Access, Preventing Changes to Classes and Methods, Defining Object Stringification ,Requiring Multiple Classes to Behave Similarly , Creating Abstract Base Classes, Assigning Object References, Cloning Objects, Overriding Property Accesses, Calling Methods on an Object Returned by Another Method, Aggregating Objects, Accessing Overridden Methods, Creating Methods Dynamically, Using Method Polymorphism, Defining Class Constants, Defining Static Properties and Methods, Controlling Object Serialization, Introspecting Objects, Checking If an Object Is an Instance of a Specific Class, Auto loading Class Files upon Object Instantiation, Instantiating an Object Dynamically Working with Forms: Processing Form Input, Validating Form Input: Required Fields, Numbers, Email Addresses, Drop-Down Menus, Radio Buttons, Checkboxes ,Dates and Times, Credit Cards ,Preventing Cross-Site, Processing Uploaded Files, Working with Multipage Forms ,RedisplayingForms with Inline Error Messages, Guarding Against Multiple Submissions of the Same Form, Preventing Global Variable Injection Using Form Elements with Multiple Options	12L
Unit II	Database Access: Using DBM Databases, Using an MySQL Database, Connecting to an MySQL Database, Querying an MySQL Database, Retrieving Rows Without a Loop, Modifying Data in an MySQL Database, Repeating Queries Efficiently, Finding the Number of Rows Returned by a Query, Escaping Quotes, Logging Debugging Information and Errors, Creating Unique Identifiers, Building Queries Programmatically, Making Paginated Links for a Series of Records, Caching Queries and Results, Accessing a Database Connection Anywhere in Program. Web Techniques: Setting Cookies, Reading Cookie Values, Deleting Cookies, Building a Query String, Reading the POST Request Body, Using HTTP Basic or Digest Authentication, Using Cookie Authentication, Reading an HTTP Header, Writing an HTTP Header, Sending a Specific HTTP Status Code, Redirecting to a Different Location, Flushing Output to the Browser Buffering Output to the Browser, Compressing Web Output Introduction to Web Development Frameworks: Laravel, Codeingniter, Joomla	12 L

	Case Studies: Building User Authentication and Personalization, Building a Shopping Cart, e-learning, e-shop	
<p>Text books: PHP Cookbook by David Sklar & Adam Trachtenberg</p> <p>Additional References:</p> <ol style="list-style-type: none">4. PHP & MySQL for Dummies by Janet Valade5. PHP and MySQL Web Development by Luke Welling, Laura Thompson6. Programming PHP by Rasmus Lerdorf, Kevin Tatroe		

Semester V – Practical's

Practical Paper I	Practical's based on DSE-1006E1, DSE-1006E2, SEC-1006C (Credits: 2, Pract/Week: 4)
	<p>COMPUTER NETWORK</p> <ol style="list-style-type: none">1. Study of different types of Network cables and practically implement the cross-wired cable and straight through cable using clamping tool.2. Study of Network Devices in Detail (Switch, Hub, Router etc.)3. Study of Network IP.4. Connect the computers in Local Area Network.5. Study of basic network commands and Network configuration.6. Configure a Network topology using packet tracer software.7. Configure a Network topology using Distance Vector Routing protocol.8. Configure a Network topology using Link State Vector Routing protocol. <p>SOFTWARE ENGINEERING</p> <ol style="list-style-type: none">1. Development of SRS document, Design document for the case studies.2. Development of DFD, data dictionary, E-R diagram, structured chart for the case studies. <p>INTRODUCTION TO JAVA</p> <ol style="list-style-type: none">1. WAP to find the largest of n natural numbers.2. WAP to find whether a given number is prime or not.3. Write a menu driven program for following:<ol style="list-style-type: none">a. to display a Fibonacci seriesb. to compute Factorial of a numberc. to check whether a given number is odd or even.d. to check whether a given string is palindrome or not.4. WAP to print the sum and product of digits of an Integer and reverse the Integer.5. Write a program to create an array of 10 integers. Accept values from the user in that array. Input another number from the user and find out how many numbers are equal to the number passed, how many are greater and how many are less than the number passed.6. Write a program that will prompt the user for a list of 5 prices. Compute the average of the prices and find out all the prices that are higher than the calculated average.7. Write a program in java to input N numbers in an array and print out the Armstrong numbers from the set.8. Write java program for the following matrix operations:<ol style="list-style-type: none">a. Addition of two matrices

	<ul style="list-style-type: none">b. Summation of two matricesc. Transpose of a matrixd. Input the elements of matrices from user. <p>9. Write a java program that computes the area of a circle, rectangle and a Cylinder using function overloading.</p> <p>10. Write a Java for the implementation of Multiple inheritance using interfaces to calculate the area of a rectangle and triangle.</p> <p>11. Write a java program to create a frame window in an Applet. Display your name, address and qualification in the frame window.</p> <p>12. Write a program that reads two integer numbers for the variables a and b. If any other character except number (0-9) is entered then the error is caught by NumberFormatException object. After that ex.getMessage() prints the information about the error occurring causes.</p> <p>13. Write a program for the following string operations:</p> <ul style="list-style-type: none">a. Compare two stringsb. Concatenate two stringsc. Compute length of a string <p>14. Create a class called Fraction that can be used to represent the ratio of two integers. Include appropriate constructors and methods. If the denominator becomes zero, throw and handle an exception.</p>
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Semester VI - Practical's

Practical Paper II	Practical's based on DSC-1006F1, DSC-1006F2, SEC-1006D (Credits: 2, Pract/Week: 4)
	<p>OBJECT ORIENTED SOFTWARE ENGINEERING</p> <ol style="list-style-type: none">1. To study and draw various UML diagrams.2. To illustrate the use of class diagrams.3. To draw an activity diagram and use case diagram for ATM and Library Management System.4. Draw Object Diagram for ATM System.5. Development of State Transition Diagram.6. Draw ER Diagram for Hospital Management System. <p>INTERNET TECHNOLOGY</p> <ol style="list-style-type: none">1. Internet Technology2. Create a webpage to display text3. Create webpages using templates.4. Demonstrate database connection in django platform5. Demonstrate thread with example.6. Demonstrate menus, toolbars, Drawings with django platform.7. Demonstrate GET and POST method.8. Create a web application for your college.9. Create a web application for e-commerce <p>DATA SCIENCE</p> <ol style="list-style-type: none">1. Importing Data with read_csv() in python.2. Tutorial on Probability Distributions in Python.3. Tutorial on Exploratory data analysis in Python.4. Tutorial to learn the k-Nearest Neighbors algorithm in Python.5. Tutorial to learn Distance Metrics in Machine Learning.

Evaluation Scheme

I. Internal Exam - Marks – 20 Marks for each paper

(i) Test – 10 Marks

10 marks Test – Duration 20 mins

It will be conducted either using any open source learning management system such as Moodle (modular object-oriented dynamic learning environment) or a test based on an equivalent online course on the contents of the concerned course(subject) offered by or build using MOOC (Massive Open Online Course) platform.

(ii) 10 Marks – Active participation in routine class instructional deliveries, Overall conduct as a responsible student, Organizing co-curricular activities etc.

II. External Exam - Marks –80 Marks for each paper

1. Duration - 3 Hours.

2. Theory question paper pattern:-

All questions are compulsory.

Question Based on Marks

Section-I

Q.1 Unit I [10]

Q.2 Unit II [15]

Q.3 Unit III [15]

Section – II

Q.1 Unit I [10]

Q.2 Unit II [15]

Q.3 Unit III [15]

All questions shall be compulsory with internal choice within the questions. Each Question may be sub divided into sub questions as a, b, c, d & e, etc & the allocation of Marks depends on the weightage of the topic.

III. Practical Exam – 100 (50+50) marks

(Certified Journal is compulsory for appearing for practical exam)

Practical's based on DSE-1006E1, DSE-1006E2, SEC-1006C– 40 marks + 5 marks (journal) + 5 marks (viva)

Practical's based on DSE-1006F1, DSE-1006F2, SEC-1006D – 40 marks + 5 marks (journal) + 5 marks (viva)

IV. Major Project – 80 marks

V. Study Tour/Field Visit – 20 marks