YESHWANTRAO CHAVAN COLLEGE OF ENGINEERING
(An Autonomous Institution affiliated to R T M Nagpur University Nagpur)
Accredited by NAAC (1st Cycle) with 'A' Grade (Score 3.25 on 4 Point Scale)
Wanadongri, Hingna Road, Nagpur-441110

Department of Computer Technology
(Honors in FSWD)

B.E. Honors in Full Stack Web Development
SoE & Syllabus 2021-22

B.E Honors in Full Stack Web Development

Information Brochure of Honor Program

1. Title of Program: **Honors Course in Full Stack Web Development**
2. Type of Program : **Honor**
3. Department offering the program: Computer Technology
4. Industry Collaboration: **Oxybills Services India Pvt Ltd, 2nd Floor, 983A, Near Majjhid, Ram Nagar, Amaravati Road, Nagpur, https://oxy-office.com, https://oxybills.com**
5. Department/s eligible to opt for the program:

   Students of Department of Computer technology are only eligible to opt for this program. Department of Computer Technology

6. **General information about courses in program:**

   Full-stack development is one of the milestones in the field of advanced technology. It is also the most demanding professions around the world. The goal of the Full Stack Web Development program is to equip learners with the unique skills they need to build database-backed APIs and web applications.

   Student of this program will be able to Design and build a database for a software application with the help of the course, SQL and Data Modeling for the Web. The courses like API Development and Documentation, NoSql Database Design from this program will make students able to Create and deploy a database-backed web API. The course Domain and Web Hosting helps the students to understand the process of user authentication and managing the secure access for an application backend. The students of this program will be able to Deploy a Flask-based web application to the cloud using Docker and Kubernetes using the Server Deployment and Containerization.

   The courses from this program will be delivered by the experts from the leading industries working using these technologies.

7. Advance knowledge or research orientation of Program:

Along with some basic concepts from the web application development domain, this program also provide the knowledge and practical exposure on the advance concepts like,

- NoSql
- Docker
- Kubernetes
- DevOps

8. Employability potential of program:

Because they can don several hats, full-stack developers are in demand also as software developers and software engineers. The U.S. Bureau of Labor Statistics has already reported that Full Stack Development jobs will increase from 135,000 to over 853,000 by 2024. It's a key role in any tech-savvy organization. Due to the growing number of online platforms and digitally driven businesses, the demand for full-stack developers has been on the rise in recent years. Thus, as long as we have the need for developing website applications, the demand for full-stack web developers will remain high.

On average, a full-stack developer in India earns INR 9.24 LPA. The pay varies depending on experience, job location, company size, etc. An experienced full-stack developer can earn INR 16 LPA, and a fresher can expect minimum INR 5–6 LPA to start with

A full-stack developer is an invaluable asset to any company that specializes in technology and development. With rapid advancements in software products and the demand for fast-paced technology, this profession is here to stay!

9. Departmental Steering committee:

SN	Name of the Faculty Member	Post	Designation	e-mail ID	Contact Number
1	Dr. G. M. Dhopavkar	HoD & Chairman	Asst. Prof.	hod_ct@ycce.edu	9822087970
2	Dr. P. A. Deshkar	Member	Asst. Prof.	padeshkar@ycce.edu	9923401052
3	Dr. K. R. Singh	Member	Asso. Prof.	singhkavita19@gmail.com	8275783031
4	Dr. S. D. Kamble	Member	Asso. Prof.	shailesh_2kin@rediffmail.com	9158886477
5	Dr. R. D. Wajgi	Member	Asst. Prof	rdwajgi@ycce.edu	9970238062
6	Dr. L. B. Damahe	Member	Asst. Prof.	lalitdamahe3379@ycce.edu	9823289971

7	Prof. N. M. Mangrulkar	Member	Asst. Prof.	nmangrulkar@ycce.edu	7767888776

10. Program Coordinator :

SN	Name of the Faculty Member	Post	Designation	e-mail ID	Contact Number
1	Dr. Prarthana A. Deshkar	Coordinator	Asst. Prof.	padeshkar@ycce.edu	9923401052

SoE_Honors in Full Stack Web Development

SN	Sem	Sub Code	Subject	T/P	Credit Hours				Credits	% Weightage				ESE Duration Hours
					L	T	P	Hrs		MSEs	TA	CA	ESE	
1	5	CTH131	SQL and Data Modeling for the Web	T	3	0	0	3	3	30	30		40	3
2	5	CTH132	Lab: SQL and Data Modeling for the Web	P	0	0	2	2	1			60	40	1
3	5	CTH133	API Development and Documentation	P	3	0	0	3	3	30	30		40	3
4	5	CTH134	Lab:API Development using Flask	P	0	0	2	2	1			60	40	1
5	6	CTH141	NoSql Database design	T	3	0	0	3	3	30	30		40	3
6	6	CTH142	Lab: NoSql Database design	P	0	0	2	2	1			60	40	1
7	6	CTH143	Domain and Web Hosting	T	3	0	0	3	3	30	30		40	3
8	7	CTH151	Lab:Frontend programming	P	0	0	2	2	1			60	40	1
9	7	CTH152	Lab: Server Deployment and Containerization	P	0	0	2	2	1			60	40	1
10	7	CTH153	Lab:DevOps and Version Controlling	P	0	0	2	2	1			60	40	1
TOTAL					**12**	**0**	**12**	**24**	**18**					

MSEs* = Three MSEs of 15 Marks each will conducted and marks of better 2 of these 3 MSEs will be considered for Continuous Assessment

TA ** = for Theory : 20 marks on lecture quizzes, 8 marks on assignments, 2 marks on class performance
TA = for Practical : MSPA will be 15 marks each**

V Semester

CTH131 :	**SQL and Data Modelling for the Web**			L= 3	T = 0	P = 0	Credits = 3
Evaluation Scheme *Best Two out of three MSE's would be considered	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
	15	15	15	30	40	100	3 Hrs
Prerequisites							

Course Objective

Students should be able to:

1. To learn different database system concepts
2. To learn the designing of Entity Relationship Diagram.
3. To know relational data model, relational algebra& SQL Queries.
4. To understand relational database design.
5. To know about data integrity issues

Course Outcome

Students will be able to

1. Analyze & compare different levels of abstraction & data independence.
2. Design Entity Relationship Diagram for any scenario.
3. Solve queries based on relational algebra & SQL.
4. Identify functional dependencies & normalise the database and apply ACID properties.
5. Analyse transaction management, various concurrency control protocols and crash recovery methods

UNIT I :
Advanced SQL: Accessing SQL from a Programming Language, Functions and Procedures, Triggers, Recursive Queries, Advanced Aggregation Features

UNIT II :
Database Design Using the E-R Model: Overview of the Design Process, The Entity-Relationship Model, Complex Attributes, Mapping Cardinalities, Primary Key, Removing Redundant Attributes in Entity, Extended E-R Features, Entity-Relationship Design Issues, Alternative Notations for Modeling Data.

UNIT III :
Complex Data Types: Semi-structured Data, Object Orientation, Textual Data, Spatial Data

UNIT IV :
Application Development: Application Programs and User, Interfaces, Web Fundamentals, Servlets

UNIT V:
Alternative Server-Side Frameworks, Client-Side Code and Web Services, Application Architectures, Application Performance, Application Security, Encryption and Its Applications

UNIT VI:
Advanced Application Development: Performance Tuning, Performance Benchmarks, Other Issues in Application, Development, Standardization, Distributed Directory Systems

Text Books:

	Title	Edition	Author	Publisher
1	Database System Concepts	7th Edition	Abraham Silberschatz, Henry F. Korth S. Sudarshan	Mc. Graw Hill Education

V Semester

CTH132	Lab: SQL and Data Modeling for the Web			L= 0	T = 0	P = 1	Credits = 1
Evaluation Scheme *Best Two out of three MSE's would be considered	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
	--	--	--	60	40	100	3 Hrs
Prerequisites							

Course Objective	**Course Outcome**
Students should be able to 1. To learn the designing of Entity Relationship Diagram. 2. To know relational data model, relational algebra& SQL Queries.	Students will be able to 1. Design Entity Relationship Diagram for any scenario. 2. Solve queries based on relational algebra & SQL.

1. Conceptualize the problem to build the database
2. Design the ER model for the conceptualized database
3. Create a database using the SQL command
4. Manipulate the database
5. Populate the database
6. Design and implement the user interface
7. Implement the interactive user interface
8. Populate the database using the user interface
9. Manipulate the database using the user interface

V Semester

CTH133 :	**API Development and Documentation**			L= 3	T = 0	P = 0	Credits = 3
Evaluation Scheme *Best Two out of three MSE's would be considered	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
	15	15	15	30	40	100	3 Hrs
Prerequisites							

Course Objective

Students should be able to

1. Understanding the basics of REST API
2. A better understanding of database concepts
3. Use open-source API like maps, data, images, news, etc.
4. Create your REST API endpoints for your project.
5. Use your own endpoints from multiple projects.
6. Learn to share data publicly through API

Course Outcome

Students will be able to

1. Speeds your project development process.
2. Able to work efficiently in a team.
3. Able to write server-side code for web, mobile, desktop applications in a single language of your choice.
4. Able to use the same database for all your projects without data redundancy or database duplication.
5. Able to work on any type of application, due to language independency

UNIT I :

Soap api:- What is an API? Meaning, Definition, Types, Application, Web service architecture. What is SOAP?, Messages, Envelope, Header, Body, Fault, Encoding, Transport, Standards, Examples

UNIT II :

Introduction to REST and API, REST API Configuration and Installation, REST API Architectural Constraints, Introduction to Restful Webservices, supporting formats, methods, difference between SOAP and REST API..

UNIT III :

Encoding and decoding, Methods, Parsing, JSON to Array conversion, HTTP response codes, URLs, Domain Names, and IP Addresses

UNIT IV :

Interaction with database (MySQL), data fetching, DML , Converting database results into JSON format

UNIT V:

Introduction to Django Web Framework, Django Rest Framework(DRF), DRF Advantages and Constraints, Difference between Django and REST API , Serialization and Deserialization, JSON and XML, Mixins, Generic Views, ViewSets, Security using third party tool (postman).

UNIT VI:
DJango Documentation: Classy Django REST Framework, DRF-schema-adapter

Text Books:				
	Title	**Edition**	**Author**	**Publisher**
1	Test-Driven Development with Python (Obey the Testing Goat: Using Django, Selenium, and JavaScript)	Latest Edition	Harry Percival	O.Reilly
2	RESTful API Design	Latest Edition	Matthias Biehl	CreateSpace Independent Publishing Platform; 1st edition (August 29, 2016)
Reference Book:				
	Title	**Edition**	**Author**	**Publisher**
1	REST APIs with Django (Build powerful web APIs with Python and Django)	Latest Edition	William S. Vincent	Independently published (June 15, 2018)
2	Mastering Flask Web Development (Build enterprise-grade, scalable Python web applications)	Latest Edition	Daniel Gaspar, Jack Stouffer	Packt Publishing; 2nd edition (October 31, 2018)

V Semester

CTH134 :	**Lab: API Development and Documentation**			L= 0	T = 0	P = 1	Credits = 1
Evaluation Scheme *Best Two out of three MSE's would be considered	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
	--	--	--	60	40	100	3 Hrs
Prerequisites							

Course Objective

Students should be able to

1. Understanding the basics of REST API
2. A better understanding of database concepts
3. Use open-source API like maps, data, images, news, etc.
4. Create your REST API endpoints for your project.
5. Use your own endpoints from multiple projects.
6. Learn to share data publicly through API

Course Outcome

Students will be able to

1. Speeds your project development process.
2. Able to work efficiently in a team.
3. Able to write server-side code for web, mobile, desktop applications in a single language of your choice.
4. Able to use the same database for all your projects without data redundancy or database duplication.
5. Able to work on any type of application, due to language independency.

1. Installing Python and Flask
2. Introducing FLASK
3. Creating and running a Basic Flask Application
4. Creating an API
5. Build a REST API using Flask
6. To execute FLASK HTTP methods
7. Creation of FLASK request object
8. To Build Web Applications with Flask and Docker
9. Form Handling using FLASK
10. FLASK Project

VI Semester

CTH141 :	**No SQL database design**			L= 3	T = 0	P = 0	Credits = 3
Evaluation Scheme *Best Two out of three MSE's would be considered	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
	15	15	15	30	40	100	3 Hrs
Prerequisites							

Course Objective

Students should be able to

1. Explore the emergence, requirements and benefits of a NoSQL database
2. Site principles behind the NoSQL databases, such as chapters from modern distributed database theory, P2P indexing or the Map Reduce programming model;
3. Understand the basic architecture and data models of a NoSQL database (key-value stores, document databases, column-family stores, graph databases);.

Course Outcome

Students will be able to:

1. Define, compareand use the four types of NoSQL Databases (Document-oriented, KeyValue Pairs, Column-oriented and Graph).
2. Demonstrate an understanding of the detailed architecture, define objects, load data, query data and performance tune Column-oriented NoSQL databases.
3. Explain the detailed architecture, define objects, load data, query data and performance tune Document-oriented NoSQL databases.

UNIT I :

Introduction and Basic Concepts: Define what a NoSQL database is, Why we need NoSQL and how is it different from traditional databases. Learn about the various tools available such as MongoDB, Cassandra, HBase etc. Explore the principles of NoSQL using elementary examples in MongoDB

UNIT II :

Distribution Models –Single Server, Sharding, Master-Slave Replication, Peer-to-Peer Replication, Combining Sharding and Replication –New NoSQL stores , MongoDB, Cassandra, OrientDB use and deployment, Application , Challenges NoSQL approach –Key-Value and Document Data Models, Aggregate-Oriented Databases

UNIT III :

MongoDB: Why Mongo DB –Terms used in RDBMS and Mongo DB –Data Types – MongoDB Query Language –Storing Data In and Accessing Data from MongoDB, Querying MongoDB

UNIT IV :

Cassandra: Features – CQL Data Types –CQLSH –Keys paces –CRUD Operations –Collections –Using a Counter –Time to Live –Alter Commands –Import and Export –Querying System Tables

UNIT V: OrientDB: Basic Concepts –Data Types –Database Commands –Record Commands –Cluster and Class Commands –Property, Vertex, and Edge Commands –Hooks –Caching –Logging.
UNIT VI: Graph NoSQL databases using Neo4, NoSQL database development tools and programming languages, Graph Databases, What Is a Graph Database? Features, Consistency, Transactions, Availability, Query Features, Scaling, Suitable Use Cases, Connected Data, Routing, Dispatch, and Location- Based Services, Recommendation Engines,

Text Books:

	Title	Edition	Author	Publisher
1	"Professional NOSQL",	Latest Edition	Shashank Tiwari	WROX Press, 2011.
2	NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence.	Latest Edition	Pramod J. Sadalage; Martin Fowler	Addison-Wesley. 2012 ISBN: 0321826620 (PS)

Reference Book:

	Title	Edition	Author	Publisher
1	"Seven Databases in Seven Weeks: A Guide to Modern Databases and the NoSQL Movement	Latest Edition	Redmond, E. & Wilson, J.	Raleigh, NC: The Pragmatic -Programmers , LLC.ISBN-13: 978-1934356920, ISBN-10: 1934356921.

VI Semester

CTH142 :	Lab: No SQL database design			L= 0	T = 0	P = 1	Credits = 1
Evaluation Scheme	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
*Best Two out of three MSE's would be considered	--	--	--	60	40	100	3 Hrs
Prerequisites							

Course Objective

Students should be able to

1. Explore the emergence, requirements and benefits of a NoSQL database
2. Site principles behind the NoSQL databases, such as chapters from modern distributed database theory, P2P indexing or the Map Reduce programming model;
3. Understand the basic architecture and data models of a NoSQL database (key-value stores, document databases, column-family stores, graph databases);.

Course Outcome

Students will be able to

1. Define, compareand use the four types of NoSQL Databases (Document-oriented, KeyValue Pairs, Column-oriented and Graph).
2. Demonstrate an understanding of the detailed architecture, define objects, load data, query data and performance tune Column-oriented NoSQL databases.
3. Explain the detailed architecture, define objects, load data, query data and performance tune Document-oriented NoSQL databases.

1. Installation and set up of MongoDB client and server
2. Create a database and collection using MongoDB environment. For example a document collection meant for analyzing Restaurant records can have fields like restaurant_id, restaurant_name, customer_name, locality, date, cuisine, grade, comments. etc.
3. Experiment with MongoDB comparison and logical query operators - $gt, $gte, $lt, $lte, $in, #nin, $ne, $and, $or, $not
4. Practice exercise on element, array based and evaluation query operators -$exists, $type, $mod, $regex
5. Exercise on MongoDB shell commands and user management
6. Installation and configuration of Cassandra. Find out two use cases where Cassandra is preferred over MongoDB
7. Create database in Casandra using – Create, Alter and Drop. Add records using Inset, Update, Delete and Truncate.
8. Exercise based on Cassandra Query Language i.e. selecting records, select records with specific conditions
9. Mini Project

VI Semester

CTH143 :	**Domain and Web Hosting**			L= 3	T = 0	P = 0	Credits = 3
Evaluation Scheme *Best Two out of three MSE's would be considered	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
	15	15	15	30	40	100	3 Hrs
Prerequisites							

Course Objective

Students should be able to

1. To learn domain name system and its services.
2. 2. To learn the different types of web hosting servers.
3. 3 To understand the working of various protocols that are used in networking.
4. 4. To understand the comparision between OSI and TCP/IP models and server configuration.
5. control.

Course Outcome

Students will be able to

1. To understand DNS configuration process and create simple web hosting server.
2. Apply the knowlege of various softwares related to the control panel and data center automation.
3. Analyze the working strategies of various layers of nettworking models and protocols.
4. Apply the knowlege of Server installation and backup utilities.

UNIT I :

Introduction: Domain Name System, configiration of domain name system, Introduction to wWeb Hosting and Web Hosting servers, Different types of web hosting servers

UNIT II :

Domain Name Cycles, Different types of web hosting packages, Web Hosting backend

UNIT III :

Introduction to Web Host Manager (WHM), Web Hosting Control Panel Software(cPanel), commercia web hosting and server data center automation software (Plesk)

UNIT IV :

TCP.IP Model, OSI Reference model, different layers in OSI, Different types of Protocols in Networking

UNIT V: Configuring File Transfer Protocol, Emails, Database, Introduction to SSL, TLS, and HTTP, Webdisk.
UNIT VI: Server Configuration, Backup and restoration of server, Auto SSL and installation

Text Books:				
	Title	**Edition**	**Author**	**Publisher**
1	Web Hosting	Latest Edition	Kenneth Hoffmaster	Springer Science
2	Strategies for Web Hosting and Managed Services 1st Edition, Kindle Edition	Latest Edition	Doug kaye	Willey
Reference Book:				
	Title	**Edition**	**Author**	**Publisher**
1	Web Hosting Service A Complete Guide -	Latest Edition	Gerardus Blokdyk	5STARCooks

VII Semester

CTH151 :	**Lab Frontend Programming**			L= 0	T = 0	P = 1	Credits = 1
Evaluation Scheme	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
*Best Two out of three MSE's would be considered	--	--	--	60	40	100	3 Hrs
Prerequisites							

Course Objective

Students should be able to

1. Building Strong expertise to develop front end application using HTML5
2. Building Strong expertise to develop front end application using CSS3
3. Building Strong expertise to develop front end application using HTML5, CSS3 and JavaScript along with jQuery and AngularJS framework
4. Implement MVC and responsive design to scale well across PC, tablet and Mobile Phone

Course Outcome

Students will be able to

1. Building Strong expertise to develop front end application using HTML5
2. Building Strong expertise to develop front end application using CSS3
3. Building Strong expertise to develop front end application using HTML5, CSS3 and JavaScript along with jQuery and AngularJS framework
4. Implement MVC and responsive design to scale well across PC, tablet and Mobile Phone

Unit- I:

HTML5: Introduction HTML5, Basics, Elements, HTML5 Semantic, Attributes, Headings, Paragraph, Styles, Formatting, Quotations, Computer Code, Comments & Colors, CSS, Links and Images, Lists, Blocks, Classes, Layout, Responsive, iframes, JavaScript, Head, Entities and URI Code, Symbols and XHTML, Charset and Forms

Unit- II :

CSS3: Introduction CSS3, Syntax, Colours, Backgrounds, Boarder, Padding, Height/Width, Gradients, Shadows, Text, Fonts, 2D Transforms, 3D Transforms, Links, Lists, Tables, Box Model, Outline, Display, Max-width, Position, CSS Float CSS Inline-block, Align, Combinators, Pseudo-class, Pseudo-element, Navigation Bar, Dropdowns

Unit- III:

JavaScript: Introduction to JavaScript, Language Basics, Objects, Scope, Events, String, Numbers, Math, Arrays, Boolean, Comparisons, Conditions, Switch, Loops, Type Conversion, RegExp, Errors,

Debugging, Hoisting, Strict Mode, Functions, Objects, Forms, DOM, BOM

Unit- IV:

Query: Introduction to jQuery, Syntax, Selectors, Events, Effects, Traversing, AJAX, Misc

Unit- V:

Bootstrap: Introduction to Bootstrap, Basics, Grids, Themes, Bootstrap CSS, Bootstrap JS

Unit- VI:

AngularJS: Introduction to AngularJS, Expressions, Modules, Data Binding, Scopes, Directives & Events, Controllers, Filters, Services, HTTP, Tables, Fetching Data from MySQL, Validation, API, Animations.

01	Designing a web page using HTML
02	Designing an interactive webpage using CSS and XHTML
03	Designing an interactive webpage using CSS3 and XHTML
04	Designing the website using javascript
05	Designing the interactive website using advanced Java Script features
06	Create the website application using jQuery
07	Create the web application using Bootstrap
08	Create the web application using Angular JS

VII Semester

CTH152 :	**Lab: Server Deployment and Containerization**			L= 0	T = 0	P = 1	Credits = 1
Evaluation Scheme *Best Two out of three MSE's would be considered	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
	--	--	--	60	40	100	3 Hrs
Prerequisites							

Course Objective

Students should be able to

1. To introduce with the internet technology
2. To study the basic of web page designing
3. To introduce the validations in the web page
4. To introduce the concepts of data storage using XML
5. To learn the advance technique for designing the interactive web page

Course Outcome

Students will be able to

1. Understand various internet technologies
2. To design the web pages using some basic techniques
3. To design and implement the interactive web pages
4. To use the XML technology to store the data
5. To design and develop the interactive web pages using the advanced technique

Unit- I:
Introduction to containers, Docker basics, Docker files and semantics, Docker Images.

Unit- II:
Microservices, Introduction to AWS Farget, Container networking, Persistent Stoarage

Unit -III:
Container Orchestration, Scheduling and task placement, Case Study.

Unit -IV:
Introduction to kubernets, Kubernets ecosystem,

Unit -V:
Deploy a Docker container to a Kubernetes cluster using AWS EKSand the AWS command line interface (CLI), Manage Kubernetes clusters using the AWS CL

Unit -VI:
Implement Continuous Delivery (CD) and Continuous Integration(CI) with AWS CodePipeline and AWS CodeBuild

Expt. No.	**List of Experiments**
01	Create a mini project using the Kubernets ecosystem

VII Semester

CTH153 :	**Lab: DevOps and Version Controlling**			L= 0	T = 0	P = 1	Credits = 1
Evaluation Scheme *Best Two out of three MSE's would be considered	MSE-I*	MSE-II*	MSE-III*	TA	ESE	Total	ESE Duration
	--	--	--	60	40	100	3 Hrs
Prerequisites							

Course Objective

Students should be able to

1. To introduce with the internet technology
2. To study the basic of web page designing
3. To introduce the validations in the web page
4. To introduce the concepts of data storage using XML
5. To learn the advance technique for designing the interactive web page

Course Outcome

Students will be able to

1. Understand various internet technologies
2. To design the web pages using some basic techniques
3. To design and implement the interactive web pages
4. To use the XML technology to store the data
5. To design and develop the interactive web pages using the advanced technique

Unit- I:

Introduction to Devops: What Is Devops, History of Devops, Devops definition, DevOps Main Objectives, DevOps and Software Development Life Cycle, Waterfall Model, Agile Model, Continuous Integration & Deployment, Jenkins, Containers and Virtual Development, Docker, Vagrant, Configuration Management Tools, Ansible, Puppet, Chef.

Unit- II:

Cloud Computing: What is Cloud?, Evolution of Cloud Computing, IAAS (Infrastructure as a Service), SAAS (Software as a Service), PAAS (Platform as a Service), Private, Public and Hybrid Cloud, Public Clouds, Amazon Web Services, Microsoft Azure, Google Cloud Services.

Unit -III:

LINUX Basic and Admin: Linux OS Introduction, Importance of Linux in DevOps, Linux Basic, Command Utilities, Linux Administration, Environment Variables, Networking, Linux Server Installation, RPM and YUM Installation.

Shell Scripting: Introduction, Variables, Flow Controls, Loops, Functions, Lists, Manipulating Strings, Reading and Writing Files, Positional Parameters.

Unit -IV:

Continuous Integration – Jenkins: Introduction to Jenkins, Continuous Integration with Jenkins, Configure Jenkins, Jenkins Management, Scheduling build Jobs, POLL SCM, Build Periodically, Maven Build Scripts, Support for the GIT version control System, Different types of Jenkins Jobs, Jenkins Build Pipe Line, Parent and Child Builds, Sequential Builds, Jenkins Master & Slave Node Configuration,

Jenkins Workspace Management, Securing Jenkins, Authentication, Authorization, Confidentiality, Creating Users, Jenkins Plugins, Installing Jenkins Plugins, SCM plugin, Build and test,

Unit -V:
Version Control-GIT: GIT Features, 3-Tree Architecture, GIT – Clone /Commit / Push, GIT Hub Projects, GIT Hub Management, GIT Rebase & Merge, GIT Stash, Reset, Checkout, GIT Clone, Fetch, Pull.

Unit -VI:
Build tool- Maven, ANSIBLE, Docker

1. Installation of DevOps software
2. Deployment of the application
3. Configuration of the docker
4. Installation and deployment of cloud
5. Installation of Linux
6. Program based on shell script
7. Application development and deployment using Jetkins
8. Application version controlling
9. Demonstrate the tool Mavem