INSTITUTE	FACULTY OF TECHNOLOGY
PROGRAM	BACHELOR OF TECHNOLOGY (COMPUTER ENGINEERING)
SEMESTER	5
COURSE TITLE	ADVANCED WEB TECHNOLOGY
COURSE CODE	01CE0510
COURSE CREDITS	4

Objective:

1 The objective of this course is to expose students to learn advance concepts, technologies and tools in web application development. The emphasis is on developing cross platform web application which uses web services.

Course Outcomes: After completion of this course, student will be able to:

1 Learn about advanced JavaScript concepts like Arrow Functions, Template Literals, Destructuring Assignment, Modules, Classes, Promises, Proxies, Reflect API.

2 Build complex user interfaces having a unidirectional data flow with understanding of React, React Router, Redux and other popular libraries.

3 Develop server-side applications using Node JS framework.

4 Study the concept of database using MongoDB and connect database with application.

5 Design rich and interactive user interface using Angular.

Pre-requisite of course: NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
3	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**ECMA Script 6** Introduction, Constants and Scoping, Enhanced Object Properties, Arrow Functions, Extended Parameter Handling, Template Literals, Destructuring Assignment, Modules, Classes, Iterators, Generators, Map, Set, Symbols, Promises, Proxies, Reflect API, Tail Recursion Calls	7
2	**React** Introduction, Templating using JSX, components, Working with state and props, Rendering lists, Event handling in React, nderstanding Component Lifecycle, forms, Routing with React Router, Redux	8

Contents : Unit	Topics	Contact Hours
3	**Node.js** Setup Node JS Environment, Package Manager, Features, Console Object, Concept of Callbacks, Work with File System, Debugging, Events and Event Loop, timers, Buffers, Streams, Express.js framework, Mongoose module, Database Connectivity, Node JS REST API, Sessions and Cookies	14
4	**MongoDB** Introduction and Overview of MongoDB, MongoDB Installation, CRUD Operation in MongoDB, Data Modeling, Storage Classes, Indexing and Performance Considerations, Aggregation, MongoDB Replication	7
5	**Angular** Introduction, architecture, components, modules, directives, data and event binding, templates, pipes, forms, routing, dependency injection, services, Creating single page website using Angular	6
Total Hours		**42**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Practical - 1** ECMA Script 6 – I	2
2	**Practical - 2** ECMA Script 6 – II	2
3	**Practical - 3** React – I	2
4	**Practical - 4** React – II	2
5	**Practical - 5** React – III	2
6	**Practical - 6** Node.js – I	2
7	**Practical - 7** Node.js – II	2
8	**Practical - 8** Node.js – III	2
9	**Practical - 9** Node.js – IV	2
10	**Practical - 10** Node.js – V	2
11	**Practical - 11** MongoDB – I	2
12	**Practical - 12** MongoDB – II	2

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
13	**Practical - 13** Angular Application – I	2
14	**Practical - 14** Angular Application – II	2
Total Hours		**28**

Textbook :

1 ECMA Script 6 Succinctly, Matthew Duffield, CreateSpace Independent Publishing Platform, 2017

References:

1 React Quickly: Painless web apps with React, JSX, Redux, and GraphQL, React Quickly: Painless web apps with React, JSX, Redux, and GraphQL, Azat Mardan, Manning Publication, 2017

2 Node.js in Action , Node.js in Action , Alex Young, Bradley Meck et al, Manning Publication, 2017

3 Professional Node.js, Professional Node.js, Pedro Teixeira, Wiley Publication, 2012

4 MongoDB in Action , MongoDB in Action , Kyle Banker, Peter Bakkum, Manning Publication, 2016

5 Pro Angular: Build Powerful and Dynamic Web Apps, Pro Angular: Build Powerful and Dynamic Web Apps, Adam Freeman, Apress Publication, 2022

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking
7.00	15.00	35.00	22.00	14.00	7.00

Instructional Method:

1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.

2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.

3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.

Supplementary Resources:

1 https://www.javatpoint.com/es6
2 https://react.dev/
3 https://nodejs.org/
4 https://www.mongodb.com/
5 https://angular.io/