

Course Code	Course Title	Credits	Lectures /Week
USCS406	Advanced Application Development	2	3
About the Course: The course aims at developing scalable, robust, and maintainable web applications using MEAN stack and developing advanced mobile applications using Flutter			
Course Objectives: <ul style="list-style-type: none"> To understand all the necessary and important technologies such as MongoDB, Express.js, AngularJS, and Node.js. To understand modern app development using Flutter 			
Learning Outcomes: After successful completion of this course, students would be able to <ul style="list-style-type: none"> Store the data in NoSQL, document-oriented MongoDB database that brings performance and scalability. Use Node.js and Express Framework for building fast, scalable network applications Use AngularJS framework that offers declarative, two-way data binding for web applications. Integrate the front-end and back-end components of the MEAN stack. Develop robust mobile applications using Flutter. 			
Unit	Topics	No of Lectures	
I	Node.js (N): Introduction to Node.js. Installing Node.js. The package.json File. The Node.js Event Loop. The I/O Cycle. The Anatomy of a Node.js Module. Creating Node Modules. Exploring the Node.js HTTP Module. Creating an HTTP Webserver with Node.js. Responding to HTTP Requests. Routing in Node.js. Creating a Sample Node.js Application. MongoDB(M): Introduction to MongoDB. Installing MongoDB. Using MongoDB Compass. Using Mongo Shell Interface. Connecting to MongoDB. Creating Schemas and Models. Querying Documents Using find(). Inserting Documents Using create(). Updating Documents Using findOneAndUpdate(). Deleting Documents Using findOneAndDelete() & deleteMany()	15	
II	Server-Side Development with Express (E): Introduction to the Express Framework. Installing and Testing Express. Creating a Node.js Express App. Restructuring an Express App. Creating Templates. Using Express Middleware Functions. Creating the List Page. Creating the Details Page. Creating the Edit Page. Creating the Add Page. Deleting Data. REST API Basics. Testing REST APIs. Refactoring APIs. Understanding Angular.JS(A): Getting Started with Angular. Creating an Angular Application. Angular Project File Structure. Anatomy of an Angular	15	

	<p>Component. One-way Data Binding. Two-way Data Binding. Using NgIf Directive. Using NgForOf Directive. Angular Modules. Creating NgModules Using Angular Router. Configuring Templates. Creating Navigations. Working with Template-driven Forms. Working with Reactive Forms. Validating Form Data. Services Dependency Injection (DI). Reading Data from Database. Inserting Data into Database. Updating Data in the Database. Delete Data from Database.</p>	
III	<p>Understanding Flutter: Importance of Flutter, Flutter Framework, Android Studio, Flutter SDK, Installing and Configuring Flutter SDK.</p> <p>Dart Programming: main() function, Dart Variables, Dart Data Types, Dart Conditional Operators, Control Flow & Loops. Dart Functions - Functions, Function Structure, creating a Function, Function Returning Expression. Object-Oriented Programming (OOP) - Creating a Class, Adding Methods to Classes, Class — Getters and Setters, Class Inheritance, Abstract Class.</p> <p>Flutter Widgets Fundamentals: Scaffold Widget, Image Widget, Container Widget, Column and Row Widgets, Icon Widget, Layouts in Flutter, Card Widget, Hot Reload and Hot Restart, Stateful and Stateless Widgets</p> <p>Navigation and Routing: Button Widget, App Structure and Navigation, Navigate to a New Screen and Back, Navigate with Named Routes, Send and Return Data among Screens, Animate a Widget across Screens, WebView Widget in Flutter</p>	15
<p>Textbooks:</p> <ol style="list-style-type: none"> 1. Node.js, MongoDB and Angular Web Development: The definitive guide to using the MEAN stack to build web applications by Brad Dayley, Brendan Dayley, Caleb Dayley, Pearson, 2018. 2. Beginning Flutter: A Hands On Guide to App Development by Marco L. Napoli, Wrox, 2019 <p>Additional References:</p> <ol style="list-style-type: none"> 1. Full Stack Javascript Development with Mean - MongoDB, Express, AngularJS, and Node.JS by Adam Bretz, Colin J Ihrig, Shroff/SitePoint, 2015 2. Practical Flutter by Zammetti Frank, Apress, 2019 		