



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**  
**KAKINADA – 533 003, Andhra Pradesh, India**

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

<b>III Year – II Semester</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
<b>MEAN STACK DEVELOPMENT</b> <b>(Job Oriented Course)</b>				

**Course Outcomes:**

At the end of the Course, Student will be able to:

- Build static web pages using HTML 5 elements.
- Apply JavaScript to embed programming interface for web pages and also to perform Client side validations.
- Build a basic web server using Node.js, work with Node Package Manager (NPM) and recognize the need for Express.js.
- Develop JavaScript applications using typescript and work with document database using MongoDB.
- Utilize Angular JS to design dynamic and responsive web pages.

**UNIT-I:**

**HTML 5:** Introduction to Web, Overview of Web Technologies, HTML - Introduction, HTML - Need, Case-insensitivity, Platform-independency, DOCTYPE Declaration, Types of Elements, HTML Elements - Attributes, Metadata Element, Sectioning Elements, Paragraph Element, Division and Span Elements, List Element, Link Element, Character Entities, HTML5 Global Attributes, Creating Table Elements, Table Elements : Colspan/ Rowspan Attributes, border, cellspacing and cellpadding attributes, Creating Form Elements, Input Elements - Attributes, Color and Date Pickers, Select and Datalist Elements, Editing Elements, Media, Iframe, Why HTML Security, HTML Injection, Clickjacking, HTML5 Attributes & Events Vulnerabilities, Local Storage Vulnerabilities, HTML5 - Cross-browser support, Best Practices For HTML Web Pages.

**UNIT-II:**

**JavaScript:** Why we need JavaScript, What is JavaScript, Environment Setup, Working with Identifiers, Type of Identifiers, Primitive and Non Primitive Data Types, Operators and Types of Operators, Types of Statements, Non - Conditional Statements, Types of Conditional Statements, If and Switch Statements, Types of Loops, Types of Functions, Declaring and Invoking Function, Arrow Function, Function Parameters, Nested Function, Built-in Functions, Variable Scope in Functions, Working With Classes, Creating and Inheriting Classes, In-built Events and Handlers, Working with Objects, Types of Objects, Creating Objects, Combining and cloning Objects using Spread operator, Destructuring Objects, Browser and Document Object Model, Creating Arrays, Destructuring Arrays, Accessing Arrays, Array Methods, Introduction to Asynchronous Programming, Callbacks, Promises, Async and Await, Executing Network Requests using Fetch API, Creating and consuming Modules.

**UNIT-III:**

**Node.js:** Why and What Node.js, How to use Node.js, Create a web server in Node.js, Node Package Manager, Modular programming in Node.js, Restarting Node Application, File Operations.

**Express.js:** Express Development Environment, Defining a route, Handling Routes, Route and Query Parameters, How Middleware works, Chaining of Middlewares, Types of Middlewares, Connecting to MongoDB with Mongoose, Validation Types and Defaults, Models, CRUD Operations, API Development, Why Session management, Cookies, Sessions, Why and What Security, Helmet Middleware, Using a Template Engine Middleware, Stylus CSS Preprocessor.



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**UNIT-IV:**

**Typescript:** Installing TypeScript, Basics of TypeScript, Function, Parameter Types and Return Types, Arrow Function, Function Types, Optional and Default Parameters, Rest Parameter, Creating an Interface, Duck Typing, Function Types, Extending Interfaces, Classes, Constructor, Access Modifiers, Properties and Methods, Creating and using Namespaces, Creating and using Modules, Module Formats and Loaders, Module Vs Namespace, What is Generics, What are Type Parameters, Generic Functions, Generic Constraints.

**MongoDB:** Introduction Module Overview, Document Database Overview, Understanding JSON, MongoDB Structure and Architecture, MongoDB Remote Management, Installing MongoDB on the local computer (Mac or Windows), Introduction to MongoDB Cloud, Create MongoDB Atlas Cluster, GUI tools Overview, Install and Configure MongoDB Compass, Introduction to the MongoDB Shell, MongoDB Shell JavaScript Engine, MongoDB Shell JavaScript Syntax, Introduction to the MongoDB Data Types, Introduction to the CRUD Operations on documents, Create and Delete Databases and Collections, Introduction to MongoDB Queries.

**UNIT-V:**

What is Angular, Features of Angular, Angular Application Setup, Components and Modules, Executing Angular Application, Elements of Template, Change Detection, Structural Directives - ngIf, ngFor, ngSwitch, Custom Structural Directive, Attribute Directives - ngStyle, ngClass, Custom Attribute Directive, Property Binding, Attribute Binding, Style and Event Binding, Built in Pipes, Passing Parameters to Pipes, Nested Components Basics, Passing data from Container Component to Child Component, Passing data from Child Component to ContainerComponent, Shadow DOM, Component Life Cycle, Template Driven Forms, Model Driven Forms or Reactive Forms, Custom Validators in Reactive Forms, Custom Validators in Template Driven forms, Dependency Injection, Services Basics, RxJS Observables, Server Communication using HttpClient, Communicating with different backend services using Angular HttpClient, Routing Basics, Router Links, Route Guards, Asynchronous Routing, Nested Routes.

**Text Books:**

1. Programming the World Wide Web, 7th Edition, Robert W Sebesta, Pearson.
2. Pro Mean Stack Development, 1st Edition, Eyal Leshem, Apress O'Reilly.
3. Full Stack JavaScript Development with MEAN, Colin J Ihrig, Adam Bretz, 1<sup>st</sup> edition, SitePoint, SitePoint Pty. Ltd., O'Reilly Media.
4. MongoDB – The Definitive Guide, 2nd Edition, Kristina Chodorow, O'Reilly.

**Reference Books:**

1. Web Technologies, HTML, JavaScript, PHP, Java, JSP, XML and AJAX, Black book, 1st Edition, Dream Tech.
2. An Introduction to Web Design, Programming, 1st Edition, Paul S Wang, Sanda SKatila, Cengage Learning.

**Web Links:**

1. [https://infyspringboard.onwingspan.com/en/app/toc/lex\\_17739732834840810000\\_shared/overview](https://infyspringboard.onwingspan.com/en/app/toc/lex_17739732834840810000_shared/overview) (HTML5)
2. [https://infyspringboard.onwingspan.com/en/app/toc/lex\\_18109698366332810000\\_shared/overview](https://infyspringboard.onwingspan.com/en/app/toc/lex_18109698366332810000_shared/overview) (Javascript)
3. [https://infyspringboard.onwingspan.com/en/app/toc/lex\\_32407835671946760000\\_shared/overview](https://infyspringboard.onwingspan.com/en/app/toc/lex_32407835671946760000_shared/overview) (Node.js & Express.js)
4. [https://infyspringboard.onwingspan.com/en/app/toc/lex\\_9436233116512678000\\_shared/overview](https://infyspringboard.onwingspan.com/en/app/toc/lex_9436233116512678000_shared/overview) (Typescript)
5. [https://infyspringboard.onwingspan.com/en/app/toc/lex\\_20858515543254600000\\_shared/overview](https://infyspringboard.onwingspan.com/en/app/toc/lex_20858515543254600000_shared/overview) (Angular JS)
6. [https://infyspringboard.onwingspan.com/en/app/toc/lex\\_auth\\_013177169294712832113\\_shared/overview](https://infyspringboard.onwingspan.com/en/app/toc/lex_auth_013177169294712832113_shared/overview) (MongoDB)



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	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>EMPLOYABILITY SKILLS-II</b>				

**Course Objectives:**

The main objective of this course is to assist students in developing employability skills and personal qualities related to gaining and sustaining employment.

**Course Outcomes:** After completion of this course

- Solve various Basic Mathematics problems by following different methods
- Follow strategies in minimizing time consumption in problem solving Apply shortcut methods to solve problems
- Confidently solve any mathematical problems and utilize these mathematical skills both in their professional as well as personal life.
- Analyze, summarize and present information in quantitative forms including table, graphs and formulas

**UNIT I:**

**Numerical ability I:** Number system, HCF & LCM, Average, Simplification, Problems on numbers

**Numerical ability II:** Ratio & Proportion, Partnership, Percentages, Profit & Loss

**UNIT II:**

**Arithmetical ability I:** Problems on ages, Time & Work, Pipes & Cistern, Chain Rule.

**Arithmetical ability II:** Time & Distance, Problems on boats & Steams, Problems on Trains

**UNIT III:**

**Arithmetical ability III:** Allegation, Simple interest and compound interest, Races & Games of skills, Calendar and Clock,

**Logical ability:** Permutations and Combination and Probability.

**UNIT IV:**

**Mensuration:** Geometry, Areas, Volumes

**UNIT V:**

**Data interpretation:** Tabulation, Bar graphs, Pie charts, line graphs

**Text Books And Reference Books:**

1. R. S. Aggarwal “Quantitative Aptitude”, Revised ed., S Chand publication, 2017  
ISBN:8121924987

**E- resources:**

1. [https://blog.feedspot.com/aptitude\\_youtube\\_channels/](https://blog.feedspot.com/aptitude_youtube_channels/)
2. [https://www.tutorialspoint.com/quantitative\\_apititude/](https://www.tutorialspoint.com/quantitative_apititude/)
3. <https://www.careerbless.com/aptitude/qa/home.php>