



**SARVAJANIK UNIVERSITY**  
**Sarvajnik College of Engineering and Technology**  
**Master of Computer Applications**



**MCA Semester III**

**Subject Name: Advanced JavaScript with Node.js**

**Subject Code: MTCA14311**

**Type of course:** Professional Elective Course

**Prerequisite (if any):**

- Core Java
- Basic Java Script
- RDBMS

**List of Courses where this course will be prerequisite:** MERN Stack

**Rationale:** JavaScript frameworks are an essential part of modern front-end web development, providing developers with tried and tested tools for building scalable, interactive web applications. Many modern companies use frameworks as a standard part of their tooling, so many front-end development jobs now require framework experience

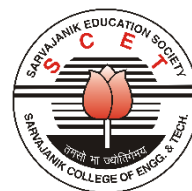
**Teaching and Examination Scheme:**

TEACHING SCHEME				Theory Marks			Practical Marks		Total
L	T	P	C	TEE	CA1	CA2	TEP	CA3	
3	0	4	5	60	25	15	60	40	200

**CA1:** Continuous Assessment (assignments/projects/open book tests/closed book tests) **CA2:** Sincerity in attending classes/class tests/ timely submissions of assignments/self-learning attitude/solving advanced problems **TEE:** Term End Examination **TEP:** Term End Practical Exam (Performance and viva on practical skills learned in course) **CA3:** Regular submission of Lab work/Quality of work submitted/Active participation in lab sessions/viva on practical skills learned in course



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**Content:**

Sr. No.	Content	Teaching Hrs.	Module Weightage
1	<b>Basic JavaScript:</b> Data types, Operators, Loops and conditions, Null and Undefined, Type conversion, Template literals / String interpolation, Array methods (find, filter, map, reduce, etc.), Object methods (keys, values, entries, etc.), Accessing DOM elements using Selector and operation on them, All about JSON	4	10
2	<b>Advance Javascript / ES6 Concepts:</b> Arrow functions, Closures, Callbacks, Promises, Async/Await, Destructuring Modules(Import/Export), JS Prototypes and Classes  <b>Operators:</b> Ternary Operator, Rest/Spread operator, Optional Chaining, Null Coalescing Operator	5	12
3	<b>Basics and fundamental of Node.js</b> Node: A new kind of web server, the node echo system, npm, a simple web server with node, event driven programming, routing,  <b>Basics and fundamental of Express.js:</b> views, static files and views, dynamic content in views, version control, The request and response object: request headers, response headers, request body, parameters, rendering content, processing forms Routing, Middleware	9	24
4	<b>Authentication:</b> Authentication using passport NPM  <b>Using session cookie:</b> cookies in express, examining cookies, memory stores setting up MongoDB, Mongoose, database connection with Mongoose, creating schemssas and models, seeding initial data, retrieving data, adding data	9	20
5	<b>React Fundamentals:</b> What is react, react concepts and terminologies, Lifecycle Diagram, Hooks, Context API, React Router, <b>Common React/JavaScript Libraries:</b> Formik, Yup, Redux, React Navigation	18	35



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	<b>Data Fetching &amp; Caching (API Calls):</b> Fetch API, Axios		
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**Suggested Specification table with Marks (Theory):**

<b>Distribution of Theory Marks</b>					
<b>R Level</b>	<b>U Level</b>	<b>A Level</b>	<b>N Level</b>	<b>E Level</b>	<b>C Level</b>
15	20	20	10	15	20

**Legends: R: Remembrance; U: Understanding; A: Application, N: Analyze and E: Evaluate  
 C: Create and above Levels (Revised Bloom’s Taxonomy)**

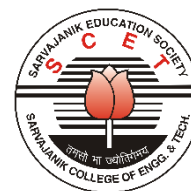
Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

**Reference Books:**

<b>Sr. no.</b>	<b>Title of book /article</b>	<b>Author(s)</b>	<b>Publisher and details like ISBN</b>	<b>Year of publication</b>	<b>Publication Edition</b>
1	JavaScript from Beginner to Professional	Laurence Lars Svekis, Maaike van Putten, Rob Percival	Packt Publishing	December 2021	
2	Beginning Node.js, Express & MongoDB Development	Greg Lim	Independently Published	2019	
4	Web Development with Node and Express: Leveraging the JavaScript Stack	Ethan Brown	O’Reilly		2 <sup>nd</sup>



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**Course Outcomes:**

Sr. No.	CO Statement After learning this subject, students will be able to	Marks % weightage
CO-1	Use JavaScript programming with variables and operators, Array methods and loops, conditional logic	16%
CO-2	Develop server backends leveraging Node.js	15%
CO-3	Develop server backends using Express and MongoDB .	17%
CO-4	Research and use common React and java script libraries	32%
CO-5	Research and use third-party libraries in building front-end and back-end web applications.	20%

**Mapping with POs:**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO-1	2	0	1	0	1	0	0	0	0	0	1	1			
CO-2	1	0	2	0	2	0	0	0	0	0	1	1			
CO-3	1	2	2	0	3	0	0	0	0	0	1	1			
CO-4	0	1	2	0	3	2	0	2	1	2	3	2			
CO-5	0	1	2	0	3	2	0	2	1	2	3	2			
Ratio nale*															

**Rationale\*:** Explaining why it is matching this particular program outcome

**List of Open learning website:**

1. <https://javascript.info/>
2. <https://developer.mozilla.org/en-US/docs/Web/JavaScript>
3. <https://nodejs.org/en/docs/>
4. <https://reactjs.org/>
5. <https://expressjs.com/>



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**List of Open Source Software:**

**FOR LAB SESSIONS:**

**List of Experiments:**

1. JavaScript Program to Make a Simple Calculator
2. JavaScript Program to Find HCF or GCD
3. JavaScript Program to Guess a Random Number
4. JavaScript Program to Sort Words in Alphabetical Order
5. JavaScript Program to Clone a JS Object
6. JavaScript Program to Loop Through an Object
7. JavaScript Program to Add Key/Value Pair to an Object
8. JavaScript Program to Format the Date
9. JavaScript Program to Append an Object to An Array
10. JavaScript Program to Include a JS file in Another JS file
11. JavaScript Program to Write to Console
12. Build Node.js Application with an HTTP Server; and understand some of the basic components for a Node.js Application.
13. Build Node.js application to connect to MySQL Database.

After performing above practical, Students have to develop Real-time Project involving most of the concepts covered in the syllabus.

Some examples of Projects

- Real Time chat application
- Social Media App
- Personal Blog
- E-commerce App
- Weather App

**Major Equipment Needed: NA**