

# Lovely Professional University, Punjab

Course Code	Course Title	Lectures	Tutorials	Practicals	Credits	
INT222	ADVANCED WEB DEVELOPMENT	2	0	2	3	
<b>Course Weightage</b>	ATT: 5 CA: 45 ETP: 50	<b>Exam Category: X6: Mid Term Exam: Not Applicable – End Term Exam: Practical</b>				
<b>Course Focus</b>	EMPLOYABILITY,SKILL DEVELOPMENT,ENTREPRENEURSHIP					

**Course Outcomes** :Through this course students should be able to

CO1 :: Describe server-side JavaScript in web application development

CO2 :: Analyze the web application development using HTTP, FS and Buffer modules

CO3 :: Assess the node express, JSON, Socket.IO to allow high scalability with asynchronous code

CO4 :: demonstrate the use of CRUD application using Backend database in web application development

CO5 :: connect MongoDB database with Node.js

CO6 :: design rich interactive environments for the Web-based applications

	<b>TextBooks ( T )</b>		
Sr No	Title	Author	Publisher Name
T-1	PROFESSIONAL NODE.JS: BUILDING JAVASCRIPT BASED SCALABLE SOFTWARE	PEDRO TEIXEIRA	WILEY

  

	<b>Reference Books ( R )</b>		
Sr No	Title	Author	Publisher Name
R-1	SAMS TEACH YOURSELF NODE.JS IN 24 HOURS	GEORGE ORNBO	SAMS PUBLISHING
R-2	LEARN POSTGRESQL	LUCA FERRARI, ENRICO PIROZZI	PACKT PUBLISHING

<b>Other Reading ( OR )</b>	
Sr No	Journals articles as Compulsary reading (specific articles, complete reference)
OR-1	PostgreSQL 14 Administration Cookbook ,
OR-2	<a href="https://matfuvit.github.io/UVIT/predavanja/literatura/TutorialsPoint%20node.js.pdf">https://matfuvit.github.io/UVIT/predavanja/literatura/TutorialsPoint%20node.js.pdf</a> ,
OR-3	<a href="https://www.anuragkapur.com/assets/blog/programming/node/PDF-Guide-Node-Andrew-Mead-v3.pdf">https://www.anuragkapur.com/assets/blog/programming/node/PDF-Guide-Node-Andrew-Mead-v3.pdf</a> ,

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OR-4	<a href="https://riptutorial.com/Download/node-js.pdf">https://riptutorial.com/Download/node-js.pdf</a> ,
OR-5	<a href="https://assets.digitalocean.com/books/how-to-code-in-nodejs.pdf">https://assets.digitalocean.com/books/how-to-code-in-nodejs.pdf</a> ,

#### Relevant Websites ( RW )

Sr No	(Web address) (only if relevant to the course)	Salient Features
RW-1	<a href="https://www.infoworld.com/article/2078525/the-rise-of-node-js--javascript-graduates-to-the-server.html">https://www.infoworld.com/article/2078525/the-rise-of-node-js--javascript-graduates-to-the-server.html</a>	The rise of Node.js
RW-2	<a href="https://nodesource.com/resources/">https://nodesource.com/resources/</a>	Resources
RW-3	<a href="https://nodejs.org/en/">https://nodejs.org/en/</a>	About Node.js
RW-4	<a href="http://www.tutorialspoint.com/mongodb/">http://www.tutorialspoint.com/mongodb/</a>	Mongo DB
RW-5	<a href="https://www.mongodb.com/">https://www.mongodb.com/</a>	<a href="https://www.mongodb.com/">https://www.mongodb.com/</a>
RW-6	<a href="https://code.visualstudio.com/docs/nodejs/nodejs-debugging">https://code.visualstudio.com/docs/nodejs/nodejs-debugging</a>	Node.js Debugging
RW-7	<a href="https://bytearcher.com/articles/io-vs-cpu-bound/">https://bytearcher.com/articles/io-vs-cpu-bound/</a>	Handling Data I/O in Node.js
RW-8	<a href="https://www.pluralsight.com/blog">https://www.pluralsight.com/blog</a>	understanding Node.js
RW-9	<a href="http://www.tutorialspoint.com/nodejs/nodejs_restful_api.htm">http://www.tutorialspoint.com/nodejs/nodejs_restful_api.htm</a>	RESTFUL Web Services
RW-10	<a href="https://gist.github.com/teadmiston/5935757">https://gist.github.com/teadmiston/5935757</a>	nodejs-tcp-example.js
RW-11	<a href="https://www.javatpoint.com/mongodb-tutorial">https://www.javatpoint.com/mongodb-tutorial</a>	MongoDB Tutorial
RW-12	<a href="http://www.tutorialspoint.com/javascript/">http://www.tutorialspoint.com/javascript/</a>	Java script Basics
RW-13	<a href="https://developer.mozilla.org/en-US/docs/Learn/Getting_started_with_the_web/JavaScript_basics">https://developer.mozilla.org/en-US/docs/Learn/Getting_started_with_the_web/JavaScript_basics</a>	JavaScript
RW-14	<a href="https://blog.teamtreehouse.com/install-node-js-npm-windows">https://blog.teamtreehouse.com/install-node-js-npm-windows</a>	Installing Node.js
RW-15	<a href="https://www.javatpoint.com/json-tutorial">https://www.javatpoint.com/json-tutorial</a>	Node.JS Tutorial
RW-16	<a href="https://nodejs.org/api/tls.html">https://nodejs.org/api/tls.html</a>	TLS Server
RW-17	<a href="http://www.tutorialspoint.com/nodejs/nodejs_express_framework.htm">http://www.tutorialspoint.com/nodejs/nodejs_express_framework.htm</a>	Node.js Express

#### Audio Visual Aids ( AV )

Sr No	(AV aids) (only if relevant to the course)	Salient Features
AV-1	<a href="https://youtu.be/spPtAEmwys4">https://youtu.be/spPtAEmwys4</a>	Node.js Tutorial for beginners - Learn Node.js framework in simple and easy steps
AV-2	<a href="https://youtu.be/Ya0H-7A5cE4">https://youtu.be/Ya0H-7A5cE4</a>	Mongodb tutorial for beginners
AV-3	<a href="https://youtu.be/eMIxuk0nOkU">https://youtu.be/eMIxuk0nOkU</a>	Learn PostgreSQL commands using pgAdmin and PSQL shell

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Software/Equipments/Databases		
Sr No	(S/E/D) (only if relevant to the course)	Salient Features
SW-1	<a href="https://nodejs.org/en/download/">https://nodejs.org/en/download/</a>	Download the Node.js source code or a pre-built installer for your platform
SW-2	<a href="https://www.postgresql.org/download/">https://www.postgresql.org/download/</a>	PostgreSQL is available for download as ready-to-use packages or installers for various platforms,
SW-3	<a href="https://www.mongodb.com/try/download/community">https://www.mongodb.com/try/download/community</a>	MongoDB Community Server Download

LTP week distribution: (LTP Weeks)	
Weeks before MTE	7
Weeks After MTE	7
Spill Over (Lecture)	4

### Detailed Plan For Lectures

Week Number	Lecture Number	Broad Topic(Sub Topic)	Chapters/Sections of Text/reference books	Other Readings, Relevant Websites, Audio Visual Aids, software and Virtual Labs	Lecture Description	Learning Outcomes	Pedagogical Tool Demonstration/ Case Study / Images / animation / ppt etc. Planned	Live Examples
Week 1	Lecture 1	Getting Started with Node.JS(Introducing Node.JS)	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA
		Getting Started with Node.JS(Node Pacakage Manager (npm))	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA
		Getting Started with Node.JS(Custom NPM modules,)	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA

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Week 1	Lecture 1	Getting Started with Node.JS(Installing Node)	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA
		Getting Started with Node.JS(use Node.js REPL)	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA
		Getting Started with Node.JS(Explore and use built-in modules of Node.js)	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA
		Getting Started with Node.JS(Use of Node.JS and GitHub)	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA
		Getting Started with Node.JS(collaborate on code with others using the git tool)	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA
	Lecture 2	Getting Started with Node.JS(Introducing Node.JS)	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA
		Getting Started with Node.JS(Node Pacakage Manager (npm))	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA

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Week 1	Lecture 2	Getting Started with Node.JS(Custom NPM modules,)	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA
		Getting Started with Node.JS(Installing Node)	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA
		Getting Started with Node.JS(use Node.js REPL)	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA
		Getting Started with Node.JS(Explore and use built-in modules of Node.js)	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA
		Getting Started with Node.JS(Use of Node.JS and GitHub)	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA
		Getting Started with Node.JS(collaborate on code with others using the git tool)	T-1 R-1	OR-2 OR-4 RW-3 RW-14 SW-1 AV-1	In this lecture the students will learn the basics of NodeJS and its installation.	Students will be able to understand the importance, and applications of NodeJS.	Live demonstration & Learning by Doing	NA





Week 2	Lecture 3	JavaScript Primer(Defining Variables and their Scope)	T-1 R-1	OR-2 OR-4 OR-5 RW-3 RW-9 RW-14 SW-1 AV-1	Defining variables and scope and understanding java script datatypes, Creating Functions and Java script objects. Error Handling in java script.	Students will program the code with the basics of functions and JavaScript objects. Understanding JavaScript Data Types, Working with Operators and Loops etc	Live demonstration & Learning by Doing	NA
		JavaScript Primer (Understanding JavaScript Data Types)	T-1 R-1	OR-2 OR-4 OR-5 RW-3 RW-9 RW-14 SW-1 AV-1	Defining variables and scope and understanding java script datatypes, Creating Functions and Java script objects. Error Handling in java script.	Students will program the code with the basics of functions and JavaScript objects. Understanding JavaScript Data Types, Working with Operators and Loops etc	Live demonstration & Learning by Doing	NA
		JavaScript Primer(Working with Operators and Loops)	T-1 R-1	OR-2 OR-4 OR-5 RW-3 RW-9 RW-14 SW-1 AV-1	Defining variables and scope and understanding java script datatypes, Creating Functions and Java script objects. Error Handling in java script.	Students will program the code with the basics of functions and JavaScript objects. Understanding JavaScript Data Types, Working with Operators and Loops etc	Live demonstration & Learning by Doing	NA
		JavaScript Primer(Creating Functions, JavaScript Objects)	T-1 R-1	OR-2 OR-4 OR-5 RW-3 RW-9 RW-14 SW-1 AV-1	Defining variables and scope and understanding java script datatypes, Creating Functions and Java script objects. Error Handling in java script.	Students will program the code with the basics of functions and JavaScript objects. Understanding JavaScript Data Types, Working with Operators and Loops etc	Live demonstration & Learning by Doing	NA



Week 2	Lecture 3	JavaScript Primer(Working with Arrays)	T-1 R-1	OR-2 OR-4 OR-5 RW-3 RW-9 RW-14 SW-1 AV-1	Defining variables and scope and understanding java script datatypes, Creating Functions and Java script objects. Error Handling in java script.	Students will program the code with the basics of functions and JavaScript objects. Understanding JavaScript Data Types, Working with Operators and Loops etc	Live demonstration & Learning by Doing	NA
		JavaScript Primer(Adding Error Handling)	T-1 R-1	OR-2 OR-4 OR-5 RW-3 RW-9 RW-14 SW-1 AV-1	Defining variables and scope and understanding java script datatypes, Creating Functions and Java script objects. Error Handling in java script.	Students will program the code with the basics of functions and JavaScript objects. Understanding JavaScript Data Types, Working with Operators and Loops etc	Live demonstration & Learning by Doing	NA
		JavaScript Primer(Using Events, Listeners, Timers and Callbacks.)	T-1 R-1	OR-2 OR-4 OR-5 RW-3 RW-9 RW-14 SW-1 AV-1	Defining variables and scope and understanding java script datatypes, Creating Functions and Java script objects. Error Handling in java script.	Students will program the code with the basics of functions and JavaScript objects. Understanding JavaScript Data Types, Working with Operators and Loops etc	Live demonstration & Learning by Doing	NA
	Lecture 4	JavaScript Primer(Defining Variables and their Scope)	T-1 R-1	OR-2 OR-4 OR-5 RW-3 RW-9 RW-14 SW-1 AV-1	Defining variables and scope and understanding java script datatypes, Creating Functions and Java script objects. Error Handling in java script.	Students will program the code with the basics of functions and JavaScript objects. Understanding JavaScript Data Types, Working with Operators and Loops etc	Live demonstration & Learning by Doing	NA



Week 2	Lecture 4	JavaScript Primer (Understanding JavaScript Data Types)	T-1 R-1	OR-2 OR-4 OR-5 RW-3 RW-9 RW-14 SW-1 AV-1	Defining variables and scope and understanding java script datatypes, Creating Functions and Java script objects. Error Handling in java script.	Students will program the code with the basics of functions and JavaScript objects. Understandin g JavaScript Data Types, Working with Operators and Loops etc	Live demonstration & Learning by Doing	NA
		JavaScript Primer(Working with Operators and Loops)	T-1 R-1	OR-2 OR-4 OR-5 RW-3 RW-9 RW-14 SW-1 AV-1	Defining variables and scope and understanding java script datatypes, Creating Functions and Java script objects. Error Handling in java script.	Students will program the code with the basics of functions and JavaScript objects. Understandin g JavaScript Data Types, Working with Operators and Loops etc	Live demonstration & Learning by Doing	NA
		JavaScript Primer(Creating Functions, JavaScript Objects)	T-1 R-1	OR-2 OR-4 OR-5 RW-3 RW-9 RW-14 SW-1 AV-1	Defining variables and scope and understanding java script datatypes, Creating Functions and Java script objects. Error Handling in java script.	Students will program the code with the basics of functions and JavaScript objects. Understandin g JavaScript Data Types, Working with Operators and Loops etc	Live demonstration & Learning by Doing	NA
		JavaScript Primer(Working with Arrays)	T-1 R-1	OR-2 OR-4 OR-5 RW-3 RW-9 RW-14 SW-1 AV-1	Defining variables and scope and understanding java script datatypes, Creating Functions and Java script objects. Error Handling in java script.	Students will program the code with the basics of functions and JavaScript objects. Understandin g JavaScript Data Types, Working with Operators and Loops etc	Live demonstration & Learning by Doing	NA



Week 2	Lecture 4	JavaScript Primer(Adding Error Handling)	T-1 R-1	OR-2 OR-4 OR-5 RW-3 RW-9 RW-14 SW-1 AV-1	Defining variables and scope and understanding java script datatypes, Creating Functions and Java script objects. Error Handling in java script.	Students will program the code with the basics of functions and JavaScript objects. Understanding JavaScript Data Types, Working with Operators and Loops etc	Live demonstration & Learning by Doing	NA
		JavaScript Primer(Using Events, Listeners, Timers and Callbacks.)	T-1 R-1	OR-2 OR-4 OR-5 RW-3 RW-9 RW-14 SW-1 AV-1	Defining variables and scope and understanding java script datatypes, Creating Functions and Java script objects. Error Handling in java script.	Students will program the code with the basics of functions and JavaScript objects. Understanding JavaScript Data Types, Working with Operators and Loops etc	Live demonstration & Learning by Doing	NA
Week 3	Lecture 5	Handling Data I/O in Node.js(Working with fs module)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-3 RW-9 RW-15 RW-16 SW-1 AV-1	Working with JSON and working with various modules Buffer, FS, Stream Module. Compression and Decompression.	Students will learn about JSON and Various Module in Node.js	Live demonstration & Learning by Doing	NA
		Handling Data I/O in Node.js(Working with JSON)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-3 RW-9 RW-15 RW-16 SW-1 AV-1	Working with JSON and working with various modules Buffer, FS, Stream Module. Compression and Decompression.	Students will learn about JSON and Various Module in Node.js	Live demonstration & Learning by Doing	NA





Week 3	Lecture 5	Handling Data I/O in Node.js(Using Buffer Module to Buffer Data)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-3 RW-9 RW-15 RW-16 SW-1 AV-1	Working with JSON and working with various modules Buffer, FS, Stream Module. Compression and Decompression.	Students will learn about JSON and Various Module in Node.js	Live demonstration & Learning by Doing	NA
		Handling Data I/O in Node.js(Using Stream Module to Stream Data)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-3 RW-9 RW-15 RW-16 SW-1 AV-1	Working with JSON and working with various modules Buffer, FS, Stream Module. Compression and Decompression.	Students will learn about JSON and Various Module in Node.js	Live demonstration & Learning by Doing	NA
		Handling Data I/O in Node.js(Compressing and Decompressing Data with Zlib)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-3 RW-9 RW-15 RW-16 SW-1 AV-1	Working with JSON and working with various modules Buffer, FS, Stream Module. Compression and Decompression.	Students will learn about JSON and Various Module in Node.js	Live demonstration & Learning by Doing	NA
	Lecture 6	Handling Data I/O in Node.js(Working with fs module)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-3 RW-9 RW-15 RW-16 SW-1 AV-1	Working with JSON and working with various modules Buffer, FS, Stream Module. Compression and Decompression.	Students will learn about JSON and Various Module in Node.js	Live demonstration & Learning by Doing	NA



Week 3	Lecture 6	Handling Data I/O in Node.js(Working with JSON)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-3 RW-9 RW-15 RW-16 SW-1 AV-1	Working with JSON and working with various modules Buffer, FS, Stream Module. Compression and Decompression.	Students will learn about JSON and Various Module in Node.js	Live demonstration & Learning by Doing	NA
		Handling Data I/O in Node.js(Using Buffer Module to Buffer Data)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-3 RW-9 RW-15 RW-16 SW-1 AV-1	Working with JSON and working with various modules Buffer, FS, Stream Module. Compression and Decompression.	Students will learn about JSON and Various Module in Node.js	Live demonstration & Learning by Doing	NA
		Handling Data I/O in Node.js(Using Stream Module to Stream Data)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-3 RW-9 RW-15 RW-16 SW-1 AV-1	Working with JSON and working with various modules Buffer, FS, Stream Module. Compression and Decompression.	Students will learn about JSON and Various Module in Node.js	Live demonstration & Learning by Doing	NA
		Handling Data I/O in Node.js(Compressing and Decompressing Data with Zlib)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-3 RW-9 RW-15 RW-16 SW-1 AV-1	Working with JSON and working with various modules Buffer, FS, Stream Module. Compression and Decompression.	Students will learn about JSON and Various Module in Node.js	Live demonstration & Learning by Doing	NA



Week 4	Lecture 7	Implementing HTTP Services in Node.JS (Introduction to HTTP module,)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-1 RW-3 RW-6 RW-7 RW-9 RW-15 SW-1 AV-1	HTTP and Introducing Express More on Express and Persisting Data.	Students will understand the basics of HTTP and Express. Processing Query Strings and Form Parameters , URLs	Live demonstration & Learning by Doing	NA
		Implementing HTTP Services in Node.JS (Processing URLs)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-1 RW-3 RW-6 RW-7 RW-9 RW-15 SW-1 AV-1	HTTP and Introducing Express More on Express and Persisting Data.	Students will understand the basics of HTTP and Express. Processing Query Strings and Form Parameters , URLs	Live demonstration & Learning by Doing	NA
		Implementing HTTP Services in Node.JS (Processing Query Strings and Form Parameters)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-1 RW-3 RW-6 RW-7 RW-9 RW-15 SW-1 AV-1	HTTP and Introducing Express More on Express and Persisting Data.	Students will understand the basics of HTTP and Express. Processing Query Strings and Form Parameters , URLs	Live demonstration & Learning by Doing	NA



Week 4	Lecture 7	Implementing HTTP Services in Node.JS (Understanding Request , Response and Server Objects)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-1 RW-3 RW-6 RW-7 RW-9 RW-15 SW-1 AV-1	HTTP and Introducing Express More on Express and Persisting Data.	Students will understand the basics of HTTP and Express. Processing Query Strings and Form Parameters , URLs	Live demonstration & Learning by Doing	NA
	Lecture 8	Implementing HTTP Services in Node.JS (Introduction to HTTP module,)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-1 RW-3 RW-6 RW-7 RW-9 RW-15 SW-1 AV-1	HTTP and Introducing Express More on Express and Persisting Data.	Students will understand the basics of HTTP and Express. Processing Query Strings and Form Parameters , URLs	Live demonstration & Learning by Doing	NA
		Implementing HTTP Services in Node.JS (Processing URLs)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-1 RW-3 RW-6 RW-7 RW-9 RW-15 SW-1 AV-1	HTTP and Introducing Express More on Express and Persisting Data.	Students will understand the basics of HTTP and Express. Processing Query Strings and Form Parameters , URLs	Live demonstration & Learning by Doing	NA





Week 4	Lecture 8	Implementing HTTP Services in Node.JS (Processing Query Strings and Form Parameters)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-1 RW-3 RW-6 RW-7 RW-9 RW-15 SW-1 AV-1	HTTP and Introducing Express More on Express and Persisting Data.	Students will understand the basics of HTTP and Express. Processing Query Strings and Form Parameters , URLs	Live demonstration & Learning by Doing	NA
		Implementing HTTP Services in Node.JS (Understanding Request , Response and Server Objects)	T-1 R-1	OR-2 OR-3 OR-4 OR-5 RW-1 RW-3 RW-6 RW-7 RW-9 RW-15 SW-1 AV-1	HTTP and Introducing Express More on Express and Persisting Data.	Students will understand the basics of HTTP and Express. Processing Query Strings and Form Parameters , URLs	Live demonstration & Learning by Doing	NA
Week 5	Lecture 9	Basic Websites With Node.JS(Introducing Express)	T-1 R-1	OR-3 OR-4 OR-5 RW-1 RW-16 SW-1 AV-1	More on Express and Persisting Data	Students will Learn More on Express and Persisting Data	Live demonstration & Learning by Doing	NA
		Basic Websites With Node.JS(More on Express)	T-1 R-1	OR-3 OR-4 OR-5 RW-1 RW-16 SW-1 AV-1	More on Express and Persisting Data	Students will Learn More on Express and Persisting Data	Live demonstration & Learning by Doing	NA



Week 5	Lecture 9	Basic Websites With Node.JS(GET, POST, bodyParser)	T-1 R-1	OR-3 OR-4 OR-5 RW-1 RW-16 SW-1 AV-1	More on Express and Persisting Data	Students will Learn More on Express and Persisting Data	Live demonstration & Learning by Doing	NA
	Lecture 10	Basic Websites With Node.JS(Introducing Express)	T-1 R-1	OR-3 OR-4 OR-5 RW-1 RW-16 SW-1 AV-1	More on Express and Persisting Data	Students will Learn More on Express and Persisting Data	Live demonstration & Learning by Doing	NA
		Basic Websites With Node.JS(More on Express)	T-1 R-1	OR-3 OR-4 OR-5 RW-1 RW-16 SW-1 AV-1	More on Express and Persisting Data	Students will Learn More on Express and Persisting Data	Live demonstration & Learning by Doing	NA
		Basic Websites With Node.JS(GET, POST, bodyParser)	T-1 R-1	OR-3 OR-4 OR-5 RW-1 RW-16 SW-1 AV-1	More on Express and Persisting Data	Students will Learn More on Express and Persisting Data	Live demonstration & Learning by Doing	NA
Week 6	Lecture 11	Creating Middleware with Connect(What is Middleware?)		OR-2 OR-3 OR-5 RW-9 RW-14 SW-1 AV-1	Understanding middleware's and its uses.	Students will understand the role of middle ware in web applications	Live demonstration & Learning by Doing	NA
		Creating Middleware with Connect(Middleware in Connect)		OR-2 OR-3 OR-5 RW-9 RW-14 SW-1 AV-1	Understanding middleware's and its uses.	Students will understand the role of middle ware in web applications	Live demonstration & Learning by Doing	NA



Week 6	Lecture 11	Creating Middleware with Connect(Access Control with Middleware)		OR-2 OR-3 OR-5 RW-9 RW-14 SW-1 AV-1	Understanding middleware's and its uses.	Students will understand the role of middle ware in web applications	Live demonstration & Learning by Doing	NA
	Lecture 12	Socket Services in Node.js: (Understanding Network Sockets)	T-1 R-1 R-2	OR-1 RW-15 AV-1 AV-2	Implementing Socket Services in Node.js (Implementing TCP Socket Servers and Clients)	Students will learn the basics of Network Sockets in Node.js	Live demonstration & Learning by Doing	NA
Week 7	Lecture 13	Socket Services in Node.js: (A Socket.IO Chat Server)	T-1 R-1		Implementing Socket Services in Node.js (Implementing TCP Socket Servers and Clients)	Students will learn Socket IO server and Twitter Client in Node.js	Live demonstration & Learning by Doing	NA
		Socket Services in Node.js:(, A Streaming Twitter Client)	T-1 R-1		Implementing Socket Services in Node.js (Implementing TCP Socket Servers and Clients)	Students will learn Socket IO server and Twitter Client in Node.js	Live demonstration & Learning by Doing	NA
		SPILL OVER						
Week 7	Lecture 14				Spill Over			
		MID-TERM						
Week 8	Lecture 15	Introduction to Backend: (Introduction to PostgreSQL database)	T-1	RW-2 RW-4 RW-5 RW-12 RW-13 SW-1 SW-2	PostgreSQL is a back-end database for dynamic websites and web applications.	This lecture student will understand the PostgreSQL	Live demonstration & Learning by Doing	
		Introduction to Backend: (Basics of the CRUD pattern.)	T-1		CRUD is the acronym for CREATE, READ, UPDATE and DELETE.	For manipulating data, CRUD is the method to use. CRUD Operations using NodeJS	Live demonstration & Learning by Doing	NA



Week 8	Lecture 16	Introduction to Backend: (Build application using CRUD)	T-1 R-2		Create a application using CRUD framework or library to create a user interface for your to-do application	student will build an application using CRUD (Create, Read, Update, Delete) and add a user interface for a to-do application in Node.js:	importance, and applications of NodeJS. Live demonstration & Learning by Doing	NA
Week 9	Lecture 17	Introduction to Backend: (Add User Interface for To-do Application)	T-1 R-2		Create a application using CRUD framework or library to create a user interface for your to-do application	student will build an application using CRUD (Create, Read, Update, Delete) and add a user interface for a to-do application in Node.js:	importance, and applications of NodeJS. Live demonstration & Learning by Doing	
	Lecture 18	Introduction to Backend: (Convert visual design into working HTML and CSS)	T-1 R-1		Convert ui design to HTML using simple design to code tools	Convert your figma design to code and export or publish your work using Node.JS	Live demonstration & Learning by Doing	
Week 10	Lecture 19	Introduction to Backend: (Sequelize association, migration and validation.)	T-1 R-1		it will created migrations and models using sequelize-cli commands. Then ran sequelize db:migrate and created tables in database.	Student will create the migration file where we will be doing all the associations: sequelize migration	Live demonstration & Learning by Doing	
	Lecture 20	Getting Started with MongoDB(Understanding MongoDB and Its Data Types)	T-1 R-1		MongoDB is a non-relational database.Documents in MongoDB consist of key-value pairs, which are the basic unit of data	This Lecture will learn about the MongoDB & its Data types	Live demonstration & Learning by Doing	NA
Week 11	Lecture 21	Getting Started with MongoDB(Building the MongoDB Environment)	T-1 R-2		MongoDB environments provide users with a server to create databases with MongoDB.	This Lecture will specified with environment variables take precedence over the profile stored in the configuration file.	Live demonstration & Learning by Doing	NA





Week 11	Lecture 22	Getting Started with MongoDB(Connecting to MongoDB from Node.js)	T-1 R-1	OR-1 OR-2 OR-3 OR-4 OR-5 RW-1 RW-3 RW-4 RW-11 RW-15 SW-2 SW-3 AV-2	To connect to a MongoDB database, select Add Connection and enter the connection details for the database then Connect.	this lecture will connect to MongoDB from Node.js, So use the MongoDB Node.js Driver. This driver provides a simple and easy-to-use interface for connecting to MongoDB and interacting with data.	Live demonstration & Learning by Doing	
Week 12	Lecture 23	Getting Started with MongoDB(Accessing and Manipulating Databases)	T-1 R-1	OR-5 RW-1 RW-8 RW-10 RW-17 AV-1 AV-2 AV-3	MongoDB uses Role-Based Access Control (RBAC) to manage access to its system	This lecture will used to create, modify, and update the database and organizing managing data	Live demonstration & Learning by Doing	
		Getting Started with MongoDB(Accessing and Manipulating Collections)	T-1 R-1		MongoDB uses Role-Based Access Control (RBAC) to manage access to its system	This lecture will used to create, modify, and update the database and organizing managing data	Live demonstration & Learning by Doing	NA
	Lecture 24	Getting Started with MongoDB(Administering Databases)	T-1 R-1		Provides the ability to perform administrative tasks such as schema-related tasks, indexing, and gathering statistics	This lecture addresses the ongoing operation and maintenance of MongoDB instances and deployment	Live demonstration & Learning by Doing	NA
		Getting Started with MongoDB(Managing Collections)	T-1 R-1		Provides the ability to perform administrative tasks such as schema-related tasks, indexing, and gathering statistics	This lecture addresses the ongoing operation and maintenance of MongoDB instances and deployment	Live demonstration & Learning by Doing	NA
Week 13	Lecture 25	Debugging, Testing and Deploying(Debugging Node.js Applications)	T-1 R-1		Node.js application in debug mode and break at the breakpoint.	This Lecture Start the debugger together with your application using a Node. js run/debug configuration.	Live demonstration & Learning by Doing	NA



Week 13	Lecture 26	Debugging, Testing and Deploying(Testing Node.js Applications)	T-1 R-2		Node.js unit testing helps you to guarantee the quality of your website	This lecture used testing framework for Node.js applications	Live demonstration & Learning by Doing	NA
Week 14	Lecture 27	Debugging, Testing and Deploying(Deploying Node.js Applications)	T-1 R-2	RW-3 RW-4 RW-5 RW-6 RW-7 RW-11 SW-1 SW-3	Node deployment is performed by the Bare Metal service to prepare a node for use by a workload	In this lecture we explain how to deploy, build and run a React Node.js application.	Live demonstration & Learning by Doing	
		<b>SPILL OVER</b>						
Week 14	Lecture 28				Spill Over			
Week 15	Lecture 29				Spill Over			
	Lecture 30				Spill Over			

### Scheme for CA:

CA Category of this Course Code is:C010102 (Total 3 tasks, 1 compulsory and out of remaining 1 best out of 2 to be considered)

Component	Iscompulsory	Weightage (%)	Mapped CO(s)
Project - Live project	Yes	50	CO1, CO2, CO3, CO4, CO5, CO6
Test - Code based 1	NO	50	CO1, CO2
Test - Code based 2	NO	50	CO3, CO4

### Details of Academic Task(s)

Academic Task	Objective	Detail of Academic Task	Nature of Academic Task (group/individuals)	Academic Task Mode	Marks	Allottment / submission Week
Project - Live project	To create a Live website for client using Node.js	Students will be able to create live web based applications using Node.js. The parameter of Website Evaluation Rubric include Content, Layout, Navigation, graphics and copyrights.	Individual	Offline	30	3 / 11
Test - Code based 1	To test the knowledge of students	This task will include topics like JavaScript Primer, Getting Started with Nodejs, Debugging, Testing and Deploying	Individual	Offline	30	5 / 6

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.



Test - Code based 2	To Test the practical skills of the students	This task will include topics like basic websites with NodeJs, Implementing HTTP Services in NodeJS, Implementing Socket Services in Node.js, Intermediate Sites with Node.js and Scaling Applications using Multiple Processors.	Individual	Offline	30	9 / 10
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**MOOCs/ Certification etc. mapped with the Academic Task(s)**

Academic Task	Name Of Certification/Online Course/Test/Competition mapped	Type	Offered By Organisation
Test - Code based 2	SERVER SIDE JAVASCRIPT WITH NODE.JS	MOOCs	COURSERA

- Where MOOCs/ Certification etc. are mapped with Academic Tasks:
1. Students have choice to appear for Academic Task or MOOCs etc.
  2. The student may appear for both, In this case best obtained marks will be considered.

**Detailed Plan For Practicals**

Practical No	Broad topic	Subtopic	Other Readings	Learning Outcomes
Practical 1	List of Practical	Create JavaScript Objects and functions		The students will learn the basics of Java script objects and functions
Practical 2	List of Practical	Create JavaScript Objects and functions		The students will learn the basics of Java script objects and functions
Practical 3	List of Practical	Working with the arrays		Students will work and analyze the different operations of Java Script arrays.
Practical 4	List of Practical	Assessing file system from Node.js		Students will learns how to Assessing file system from Node.js
Practical 5	List of Practical	Assessing file system from Node.js		Students will learns how to Assessing file system from Node.js
Practical 6	List of Practical	Implementing HTTP Services in Node.JS		Students will work on Implementing HTTP Services in Node.JS
Practical 7	List of Practical	Implementing HTTP Services in Node.JS		Students will work on Implementing HTTP Services in Node.JS
Practical 8	List of Practical	Use Jason API website development		Students will be working on JSON API web development
Practical 9	List of Practical	Implementing Socket Services in Node.js		Students will be Implementing Socket Services in Node.js with client server applications.
Practical 10	List of Practical	Implementing Socket Services in Node.js		Students will be Implementing Socket Services in Node.js with client server applications.
Practical 11	List of Practical	Create a basic website using node.js		Students are able to Create a basic website using node.js
Practical 12	List of Practical	Create a basic website using node.js		Students are able to Create a basic website using node.js

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Practical 13	List of Practical	Building the MongoDB Environment and Administering Databases		Students will be able to build the MongoDB Environment and Administering Databases
Practical 14	List of Practical	Building the MongoDB Environment and Administering Databases		Students will be able to build the MongoDB Environment and Administering Databases
	<b>SPILL OVER</b>			
Practical 15	Spill Over			