Semester –II

Choice Based Credit Grading Scheme with Holistic and Multidisciplinary Education (CBCGS-HME 2025) TCET Autonomy Scheme (w.e.f. A.Y. 2025-26)

M.C.A								**SEM: II**		
Full-stack Development								**Course Code** VSE-MCA-201		
Teaching Scheme (Program Specific)					**Examination Scheme (Academic)**					
Modes of Teaching / Learning / Weightage					**Modes of Continuous Assessment / Evaluation**					
Hours Per Week					**Theory (100)**			**Practical/ Oral/ Presentation (25)**	**Term Work (25)**	**Total**
					40		**60**			
Theory	**Tutorial**	**Practical**	**Contact Hours**	**Credits**	**IA**		**ESE**	**PR/OR**	**TW**	**25**
					CA	**ISE**				
-	-	2	2	1	-	-	-	25	-	

The weightage of marks for continuous evaluation of Term work/Report: Formative (40%), Timely completion of practical (40%) and Attendance / Learning Attitude (20%)

Prerequisite: Full-stack Development

Course Objective: Understand the architecture and components of full-stack web development. Develop front-end applications using HTML, CSS, JavaScript, and modern frameworks.Design and implement backend services using server-side technologies and databases.Integrate front-end and back-end components to build full-stack applications.

Course Outcomes: Upon completion of the course students will be able to:

CO Code	Course Outcome Statement	Bloom's Taxonomy Level	Mapped POs
CO1	Design and develop responsive front-end interfaces using HTML, CSS, JavaScript, and frameworks.	L1,L2	PO1, PO2
CO2	Build dynamic and scalable server-side applications with technologies like Node.js, Express.	L1,;L2,L3	PO1, PO2, PO5
CO3	Create and manage relational and NoSQL databases for full-stack applications.	L1,L2,L3,L4	PO2, PO3, PO4
CO4	Develop and consume RESTful APIs for client-server communication.	L1,L2,L2	PO5, PO6

CO5	Secure full-stack applications using authentication and authorization techniques.	L1,L2,L3,L4,L5,L6	PO9, PO10
CO6	Deploy and monitor full-stack applications using cloud and container technologies.	L1,L2,L3,L4	PO2, PO3

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	2	**1**	-	-	-	-	-	-	-
CO2	3	2	**2**	-	**3**	-	-	-	1	-
CO3	2	3	**3**	**2**	**2**	-	-	-	-	-
CO4	-	-	**2**	**1**	**3**	**1**	-	-	-	-
CO5	-	-	-	-	**1**	-	-	**3**	2	-
CO6	2	3	3	**3**	**3**	-	**1**	-	1	-

Detailed Syllabus:

Module No.	Topics	Hrs.	CO's	Cognitive levels of attainment as per Bloom's Taxonomy
1	**Introduction to Full-Stack Development** Overview of web development stacks (MEAN, MERN, LAMP, etc.) Client-server architecture and HTTP protocol Basics of front-end vs back-end development Development tools and environment	3	**CO1**	L1, L2, L3
2	**Front-End Development** HTML5, CSS3, and JavaScript essentials Responsive design using Bootstrap JavaScript frameworks – React (or Angular/Vue) State management and routing in front-end apps	3	**CO1**	L2, L3
3	**Back-End Development** Server-side scripting with Node.js and Express.js Middleware and routing Session handling and authentication basics Error handling and logging	3	**CO2**	L1, L2, L3
4	**Databases and Integration** Introduction to SQL (MySQL/PostgreSQL) and NoSQL (MongoDB) Data modeling and schema design	3	**CO3** **CO4**	L1, L3

	CRUD operations using ORM/ODM (Sequelize/Mongoose) Connecting front-end with back-end and database			
5	**APIs and Security** Designing and consuming RESTful APIs JWT authentication and OAuth basics Input validation and data sanitization Securing APIs and preventing common web attacks (XSS, CSRF, SQL Injection)	3	**CO4** **CO5**	L1, L3
6	**Deployment and DevOps Basics** Version control using Git and GitHub Deployment using cloud services (Heroku, Vercel, AWS) Using Docker containers and CI/CD basics Monitoring and performance optimization	3	**CO6**	L1, L3
	Total Hours	**15**		

Practicals:

Sr. No.	**Topic**	**Hrs**
1	Create a responsive website using HTML, CSS, and Bootstrap.	2
2	Develop a single-page application using React or Angular.	2
3	Build a backend service using Node.js and Express.	2
4	Design and connect a database using MongoDB or MySQL.	2
5	Implement RESTful APIs and integrate with front-end.	2
6	Add user authentication using JWT or OAuth.	2
7	Deploy a full-stack app to cloud (e.g., Heroku/Vercel/AWS).	2
8	Use Git and GitHub for version control and collaboration.	2
9	Create and run a Dockerized full-stack application.	2
10	Mini project: Develop a complete full-stack web application.	2
	Total Hours	**20**

Books and References:

1	"Full-Stack React Projects" – Shama Hoque, Packt Publishing
2	"Learning Web Design" – Jennifer Niederst Robbins, O'Reilly Media
3	"Node.js, MongoDB, and Angular Web Development" – Brad Dayley, Pearson Education
4	"The Road to React" – Robin Wieruch, Independently published

Online Reference:

Sr. No.	Website Name	URL	Modules Covered
1	freeCodeCamp – Full-Stack Curriculum	https://www.freecodecamp.org	M1-M3
2	MDN Web Docs	https://developer.mozilla.org	M4
3	React Official Docs	https://reactjs.org	M5
4	MongoDB University	https://nodejs.org/en/docs/	M6