Semester:	3		
Course Title:	**Full Stack Web development**		
Course Code:	**22CS3AEFWD**	Total Contact Hours:	30
L-T-P:	**0-0-1**	Total Credits:	1

Guidelines:

- This course focuses on developing comprehensive skills in Full Stack Web Application Development. Students will learn to develop both front-end and back-end components of web applications, integrate with databases and external services, and apply best practices in web development.
- Under this project work, student should develop Advanced Web based Application using technologies such as PHP, Python, Node JS, React, Angular.
- Students can form a group with minimum of two and maximum of four.
- Teacher allotted for project work to students should teach full stack technologies like Node JS, React, etc., during Class/Lab hours as per the allotment. Teacher allotted for project work should guide the students in choosing the topic and towards carrying out project work and complete the evaluation of assigned students.

Reference Books:

Sl. No	Book Title	Authors	Edition	Publisher	Year
1	Modern Full-Stack Development: Using Type Script, React, Node.js	Frank Zammetti	1st	Apress	2020
2	Beginning MERN Stack , Build and Deploy a Full Stack MongoDB, Express, React, Node.js App	Greg Lim	1st	Amazon Digital Services	2021

Tutorial Links:

1. https://www.springboard.com/resources/learning-paths/web-development-python-django/
2. https://www.coursera.org/learn/introduction-to-web-development-with-html-css-javacript
3. https://www.boardinfinity.com/micro-learning/full-stack-development-course-with-certification
4. https://www.udemy.com/course/next-js-the-complete-developers-guide/

5. https://www.udemy.com/course/nextjs-build-full-stack-apps-with-nextjs-using-redux/

Course Outcomes (COs):

CO1	Apply full-stack web development technologies to solve real-world problems.
CO2	Design and develop user-centric web applications focused on social and environmental issues.
CO3	Integrate front-end and back-end components effectively with databases and external services.
CO4	Demonstrate teamwork and problem-solving skills in project development.

CO-PO-PSO mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3				3								3	3
CO2			3		3	3	3						3	3
CO3			3		3								3	3
CO4								3	2	3				

Assessment Plan for CIE:

Tool	Remarks	Marks
Internals	---	---
QUIZ	---	---
Lab Component	CIE through Reviews	50
Alternate Assessment Tool	---	---
Total		50

Weekly Activities and Delivery

Week	Activity	Content deliverables by the assigned teacher	Technologies/Skills to be Covered
1st	Formation of groups. Note: Student groups of size 3 to 4	Introduction to Full Stack Technologies & Issue Identification	• Overview of full stack development tools and frameworks. • Overview of web development (HTML, CSS, JavaScript),

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			• Introduction to full stack frameworks (MEAN, MERN), Identifying social/environmental issues for web solutions.
2nd	Project topic selection by each Group. Presentation: Student and Project topic introduction by each group	Conceptualizing a Web Application	• Identifying problem and understanding social and environmental issues. • Brainstorming and planning a web application focused on a chosen social/environmental issue. • Tools for wireframing and prototyping (Figma, Sketch),
3rd	Design Layout of the Web Pages	Basic Front-end and Back-end Development	• Define layouts based on project scope and objectives. • Learning the basics of front-end (HTML, CSS, JavaScript) and back-end (Node.js, Python) development. • Front-end: HTML5, CSS3, JavaScript basics. • Back-end: Introduction to Node.js, Express.js, RESTful API development
4th ,5th , and 6th	Front end and back-end implementation	Data Management and Integration	• Techniques for managing and integrating data in web applications. • Database technologies (MongoDB, SQL), Integrating databases with back-end (Mongoose for MongoDB), Basic CRUD operations.
7th 8th and 9th	Design and Development of connecting among different web pages	Advanced Front-end & Back-end Technologies Project Development and Mid-term Review	• Delving into advanced front-end technologies (React, Angular) and back-end technologies (databases, server management). • Front-end: React.js/Angular for dynamic UI development. • Back-end: Advanced Node.js,

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			Authentication (JWT, OAuth), Server-side rendering.
			Development of the project with guidance and a mid-term review to assess progress.
10th	Presentation by each group	Integrating Feedback & Refining Applications	• Applying feedback from the mid-term review and refining the application for better performance and impact. • Implementing feedback, Optimization for performance, Security best practices (HTTPS, data validation), User testing and UX improvements.
11th	Complete Project Work Demonstration by each group	Final Project Presentations and Submissions	Students present their completed projects and submit their final work for assessment.
12th	Project Report Preparation		

Rubrics for Project Evaluation:

Criteria	Excellent	Good	Satisfactory	Needs Improvement	Points
Problem Identification & Relevance (18)	(18-16) Clearly articulates a significant social/environmental issue with insightful, innovative solutions.	(15-10) Recognizes a pertinent issue and offers practical solutions.	(9-5) Identifies a basic issue with standard solutions.	(4-0) Fails to identify a relevant issue or solution.	_/18

Technical Implementation (28)	(28-21) Exemplary implementation of full-stack technologies, showcasing efficiency, integrity, scalability, sustainability and technical excellence.	(20-11) Reliable and proficient technical performance and integrity meeting key objectives.	(10-5) Basic implementation incorporating essential features and functionalities.	(4-0) Inadequate or incomplete technical implementation.	_/28
User Experience & Interface (20)	(20-15) Exceptional UI/UX design, prioritizing intuitiveness and user-friendliness, with a professional standard of execution.	(14-10) Competent UI design focused on usability and functionality.	(9-5) Basic UI design encompassing essential functions and user needs.	(4-0) Poor or non-functional user interface, lacking in user-centricity.	_/20
Group Participation (12)	(12-9) Exhibits active engagement, exceptional collaboration, and effective teamwork throughout the project lifecycle.	(8-6) Consistent participation and constructive collaboration within the group.	(5-3) Minimal but noticeable participation and occasional contributions.	(2-0) Lack of active participation and collaboration in the group.	_/12
Presentation (10)	(10-8) Professional, engaging presentation with outstanding visuals and comprehensive content, demonstrating exceptional delivery skills.	(7-6) Well-structured presentation with clear content and effective delivery.	(5-3) Basic presentation with some structure and varying delivery quality.	(2-0) Disorganized presentation lacking in coherence and adequate content.	_/10

Report & Documentation (12)	(12-9) Comprehensive report covering all project aspects with meticulous documentation, including methodology, design, and future scope.	(8-6) Well-structured report with detailed coverage of project implementation.	(5-3) Basic report with limited content, covering essential project details.	(2-0) Poorly structured and incomplete report, lacking essential details.	_/12
				Total	_/100

Note: The project will be evaluated for 100 marks and reduced to 50 marks.

SEE Exam (50 Marks)

Projects carried out by students will be evaluated by External examiner along with internal faculty.