Information Technology Department
College of Computing and Information Sciences

Course Delivery Plan

جامعة التقنية والعلوم التطبيقية
University of Technology and Applied Sciences

Course Name: Full Stack Web Development	**Credit hours:** 3		**Academic Year:** 2024-2025	**Course Level:** BTech
Course Code: CSSE4103	**Contact Hours:**	**Theory (hr/week):** 1 **Practical (hr/week):** 4	**Semester:** ☒ **Fall** ☐ **Spring** ☐ **Summer**	**Passing Grade:** C/67
Course Pre-requisite(s)/ Co-requisite(s): CSSE3101-Advanced Web Technologies	**Course Type:** ***(Tick all that applies)*** ☐ University Requirement ☐ College Requirement ☐ University Elective ☒ Specialization Requirement ☐ Department Requirement ☐ Specialization Elective ☐ Department Elective			

	Section	Day(s)	Time	Location	Tutorial Hours
Schedule of Course Lectures	1	Mon	10- 12	A130	
		Wed	10- 12	A130	
		Thu	11- 12	ETC306	

Faculty Details	
Name	Mohamed Ali N.M.A
Room No.	A101
Office Hours	Sun(10 – 11) & Tue(11- 12)
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Course Description
This course covers full-stack web application development. It implements a server side application that communicates to the client through a RESTful API. It enables the students to work with Node.js environment, Express framework, and deploy the web application on the cloud.

Course Objectives	Course Learning Outcomes
This course will enable the students to: 1. Build responsive React applications with advanced components. 2. Develop React-Redux applications. 3. Build RESTful API, server-side applications. 4. Test web applications. 5. Deploy web applications on the cloud.	By the end of the course, students will be able to: 1. Use Reactstrap for designing responsive React applications. 2. Develop react application with location-based services. 3. Discuss the Redux architecture. 4. Create React-Redux applications. 5. Explain server-side concepts like CRUD and REST. 6. Develop backend server applications using Node.js framework. 7. Create a RESTful API for the front-end to access backend services. 8. Use containerization and orchestration tools to build and manage a distributed application. 9. Use React testing framework. 10. Deploy web applications on the cloud.

Graduate Attributes	1. Communication skills	2. Teamwork and leadership	3. Discipline knowledge and skills	4. Creativity and innovation
	5. Entrepreneurial skills	6. Lifelong learning	7. Technical and Digital competency	8. Critical thinking, analysis, and problem solving

Weekly Distribution of the lessons							
Topics to be covered	**Contact Hours**		**Time plan (Week no.)**	**Coverage of Learning Outcomes**	**Coverage of Graduate Attributes**	**Methods for coverage of Outcomes**	**Assessment Method(s) /Activities**
	Theory	**Practical**					
Lesson 0 - Course Overview Course Goal, Objectives, Outcomes, Assessments Recall of MERN Simple Application **Lesson 1 – JavaScript Essential Concepts** a. Array Methods a. Push b. Filter c. Shift and Unshift d. Map b. Objects c. Functional Programming d. Pure Functions	**1**	**2**	**1**	**6**	**1,3,4,7,8**	● Interactive Discussion ● Live Coding Demonstration ● In class activities using targeted tasks (*e.g. code tracing and debugging, predicting output/result, fill in code gaps*) Student Centered Learning	Practical Activities

Lesson 2 –Front-End Development a. React UI Libraries b. ReactStrap Overview c. Installation d. Components in Reactstrap e. Form Validation a. Yup b. React Form	**1**	**5**	**2,3**	**1**	**1,3,4,7,8**	● Interactive Discussion ● Live Coding Demonstration ● In class activities using targeted tasks (*e.g. code tracing and debugging, predicting output/result, fill in code gaps*) ● Student Centered Learning	Practical Activities
Lesson 3 – Redux Fundamentals a. What is a State in ReactJS? b. What is State Management? c. What is Redux? d. Why and When Should to Use Redux? e. Redux Libraries and Tools f. Redux Terms and Concepts a. Immutability b. Terminologies g. Redux Application Data Flow	**1**	**3**	**3**	**1,3,4**	**1,3,4,7,8**	● Interactive Discussion ● Live Coding Demonstration ● In class activities using targeted tasks (*e.g. code tracing and debugging, predicting output/result, fill in code gaps*) ● Student Centered Learning	Practical Activities

Lesson 4 – Redux Toolkit a. What is Redux Toolkit? b. Installation c. Purpose d. Creating the Redux Store e. Providing the Redux Store to React f. Rules of Reducers g. Creating Slice Reducers h. Use Redux State and Actions in React Components a. useSelector hook b. useDispatch hook	**3**	**12**	**4-6**	**1,3,4**	**1,3,4,7,8**	● Interactive Discussion ● Live Coding Demonstration ● In class activities using targeted tasks (*e.g. code tracing and debugging, predicting output/result, fill in code gaps*) ● Student Centered Learning	Practical Activities
Midterm			**7**				
Lesson 5-Building RESTful APIs with MERN Stack and Redux Toolkit a. Redux Thunk Middleware in Redux Toolkit for Asynchronous API calls with Axios a. extrareducers b. Consume REST APIs using Axios c. MongoDb Database d. Creating REST API Routes e. Testing API Routes using Thunder Client f. User Login Authentication a. Bcrypt b. UseNavigate Hook c. useParams Hook	**3**	**11**	**7-9**	**1,3,4,5,6**	**1,3,4,7,8**	● Interactive Discussion ● Live Coding Demonstration ● In class activities using targeted tasks (*e.g. code tracing and debugging, predicting output/result, fill in code gaps*) ● Student Centered Learning	Practical Activities

Lesson 6- Accessing backend services using RESTful API a. Backend services b. Location-based services	**1**	**4**	**10-11**	**1,2,3,4,5,6,7**	**1,3,4,7,8**	● Interactive Discussion ● Live Coding Demonstration ● In class activities using targeted tasks (*e.g. code tracing and debugging, predicting output/result, fill in code gaps*) Student Centered Learning	Practical Activities
Lesson 7 – React Application Testing a. Why testing React Components is important? b. Types of React Tests c. Writing Unit Tests for React Components d. React Testing Components with Jest React Testing Library	**1**	**4**	**11-12**	**1,2,3,4,5,6,7,8,9**	**1,3,4,7,8**	● Interactive Discussion ● Live Coding Demonstration ● In class activities using targeted tasks (*e.g. code tracing and debugging, predicting output/result, fill in code gaps*) ● Student Centered Learning	Practical Activities

Lesson 8- Containerization Orchestration tools a. What Is Containerization? b. Benefits of Containerization c. What Is Container Orchestration? d. Container Orchestration Tools a. Kubernetes b. Docker	**1**	**4**	**12-13**	**1,2,3,4,5,6,7,8**	**1,3,4,7,8**	• Interactive Discussion • Live Coding Demonstration • In class activities using targeted tasks (*e.g. code tracing and debugging, predicting output/result, fill in code gaps*) • Student Centered Learning	Practical Activities
Lesson 9- Deploying React Redux Application in the Cloud • Environment Variables • Render	**1**	**4**	**13-14**	**1,2,3,4,5,6,7,8,9,10**	**1,3,4,7,8**	• Interactive Discussion • Live Coding Demonstration • In class activities using targeted tasks (*e.g. code tracing and debugging, predicting output/result, fill in code gaps*) • Student Centered Learning	Practical Activities
Lesson 10 – MERN Project Implementation MERN Mini Project and Presentation	**0**	**4**	**14-15**	**1,2,3,4,5,6,7,8,9,10**	**1,2, 3,4,5, 6, 7,8**	• Interactive Discussion • Live Coding Demonstration • In class activities using targeted tasks • Student Centered Learning • Project Based Learning	Practical Activities
FINAL EXAM							

Sources	
Book References	Pro MERN Stack: Full Stack Web App Development with Mongo, Express, React, and Node by Vasan Subramanian Released May 2019Publisher(s): ApressISBN: 9781484243916 Full-Stack React Projects: Learn MERN stack development by building modern web apps using MongoDB, Express, React, and Node.js, 2nd Edition, By Shama Hoque. Publisher: Packt
Web References\ e-library(s)	1. https://reactjs.org/ 1. https://www.w3schools.com/js/default.asp 2. https://www.w3schools.com/REACT/DEFAULT.ASP 3. https://nodejs.org/en/ 4. https://code.visualstudio.com/ 5. https://getbootstrap.com/ 6. https://www.mongodb.com/ 7. https://reactstrap.github.io/?path=/story/home-installation--page 8. https://redux.js.org/tutorials/essentials/part-2-app-structure
Software Requirement	IDE - Visual Studio Code NodeJS MongoDb Compass MongoDb Atlas Cloud Databae (https://www.mongodb.com/atlas/database)
Hardware Requirement	

Assessment Plan			
No.	Assessment Activity	Weight %	Learning Outcomes Mapping
1	Class/Lab Activities	5	
2	Mini Project	25	
3	Mid Exam	20	
4	Final Exam	50	
5			
Total		100	

Prepared & Agreed by:			
S. No.	Faculty Name	Branch	Signature
1.	Dr. Abdul Rahiman Shaik	UTAS-Muscat	
2.	Ms. Jasmin Tumulak Estudillo	UTAS-Salalah	
3.			
4.			
Date of Submission:	**04/09/2024**		

Approved by:			
Designation	Name	Date	Signature
Program Leader	Dr. Fatma Al Abri	9th Sep 2024	

GRADING SCHEME

- *Refer to Academic bylaw*

STUDENT ATTENDANCE POLICY

- *Refer to Academic bylaw*

ACADEMIC INTEGRITY AND HONESTY POLICY

- *Refer to Academic bylaw*

Year: 2024/2025, Fall Semester

Week No.	SUN	MON	TUE	WED	THU	1st Class	2nd Class	3rd Class	Remarks
1	15-Sep	16-Sep	17-Sep	18-Sep	19-Sep	----	Orientation, L0	L1	**15-Sep**: Start of Teaching **15-Sep**: Prophet Mohammed Birthday [Tentative]
2	22-Sep	23-Sep	24-Sep	25-Sep	26-Sep	L2	L2	L2	
3	29-Sep	30-Sep	1-Oct	2-Oct	3-Oct	L2/L3	L3	L3	Mini Project Prototype Submission with UI Design
4	**6-Oct**	7-Oct	8-Oct	9-Oct	10-Oct	L4	L4	L4	
5	13-Oct	14-Oct	15-Oct	16-Oct	17-Oct	L4	L4	L4	
6	20-Oct	21-Oct	22-Oct	23-Oct	24-Oct	L4	L4	L4	
7	**27-Oct**	28-Oct	29-Oct	30-Oct	31-Oct	L5	L5	MID	**27-Oct**: Start of Mid Exams
8	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	L5	L5	L5	**7-Nov**: Last Day of Course Withdrawal
9	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	L5	L5	L5	
10	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	----	----	L6	Expected 2 days National Day Holidays
11	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	L6	L6	L7	
12	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	L7	L7	L8	Mini project Presentation

13	8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	L8	L8	L9	
14	15-Dec	16-Dec	17-Dec	18-Dec	19-Dec	L9	L9	L10	
15	22-Dec	23-Dec	24-Dec	25-Dec	**26-Dec**	L10	L10/ Presentation	Presentation	**26-Dec**: Last Day of Teaching & Announcement of Total Internal Marks
16	29-Dec	30-Dec	31-Dec	1-Jan	2-Jan				**29-Dec**: Start of Final Exams
17	5-Jan	6-Jan	7-Jan	8-Jan	9-Jan				
18	12-Jan	13-Jan	14-Jan	15-Jan	**16-Jan**				**16-Jan**: End of Final Exams