AMERICAN INTERNATIONAL UNIVERSITY-BANGLADESH (AIUB)
Faculty of Science and Technology (FST)
Department of Computer Science (CS)
Undergraduate Program

COURSE PLAN	SEMESTER: Spring 2022-20223

I. Course Core and Title
CSC 4261: Advanced Programming in Web Technologies
II. Credit
3 credit hours (2 hours of theory + 3 hours of lab per week)
III. Nature
Elective Course for CS, CSE, CSSE, SE, CIS
IV. Prerequisite
CSC 3222: Web Technologies

V. Vision:
Our vision is to be the preeminent Department of Computer Science through creating recognized professionals who will provide innovative solutions by leveraging contemporary research methods and development techniques of computing that is in line with the national and global context.

VI. Mission:
The mission of the Department of Computer Science of AIUB is to educate students in a student-centric dynamic learning environment; to provide advanced facilities for conducting innovative research and development to meet the challenges of the modern era of computing, and to motivate them towards a life-long learning process.

VII - Course Description:

By the end of this course, students should be able to:
- At the end of the course, the following objectives shall have been attained
- Understood and appreciated the object-oriented programming concept
- Understood and appreciated programming Web-based applications using Web framework
- Understood and appreciated programming the security for framework-based applications
- Prepared and presented a group project using Web framework
- Understood and appreciated the object-oriented programming concept using JavaScript
- Understood and appreciated programming Web-based applications using JS framework
- Prepared and presented a group project using JS framework

VIII - Course outcomes (CO) Matrix:

COs*	CO Description	Level of Domain***			PO Assessed ****
		C	P	A	
CO1	*Determine* the requirements for an economic and optimized software solution to a real-life problem.		3		PO-k-1
CO2	*Demonstrate* the management skill and contribution to the developed solution as a team member/team leader.		3		PO-k-1
CO3	*Demonstrate* skills on engineering management principles applied on the developed software solution		3		PO-k-1
CO4	*Apply* skills of defending the solutions based on engineering management activities by delivering an effective presentation to the audience.		3		PO-k-1

C: Cognitive; P: Psychomotor; A: Affective Domain

*   *CO assessment method and rubric of COs assessment is provided in later section*

**	COs will be mapped with the Program Outcomes (POs) for PO attainment
***	The numbers under the 'Level of Domain' columns represent the level of Bloom's Taxonomy each CO corresponds to.
****	The numbers under 'PO Assessed' column represent the POs each CO corresponds to.

IX - Topics to be covered in the class and/or lab: *

Time Frame	CO Mapped	Topics	Teaching Activities	Assessment Strategy(s)
Week 1	CO1	Introduction to JavaScript Environment (NodeJS), Tools for Project Management, Course Policy	Lecture, Lab Work and Question-answer	Project, Lab Task, Assignment
Week 2	CO1, CO2	Group Formation, Project Proposal (PRD, Prototype, Data Model),	Lecture, Lab Work and Question-answer	Project, Lab Task, Assignment
Week 3	CO1, CO2, CO3	Introduction to NestJS, Architecture (Controllers, Modules, Service)	Lecture, Lab Work and Question-answer	Project, Lab Task, Assignment
Week 4	CO1, CO2, CO3	Middleware, Pipes, Validation	Lecture, Lab Work and Question-answer	Project, Lab Task, Assignment
Week 5	CO1, CO2, CO3	File, Session, Cookies	Lecture, Lab Work and Question-answer	Project, Lab Task, Assignment
Week 6	CO2, CO4	Postgres Database, TypeORM	Lecture, Lab Work and Question-answer	Project, Lab Task, Assignment
Week 7	CO2, CO4	Mail Server, Push Notification, SocketIO	Lab Task	Project, Lab Task, Assignment
Midterm (Week 8)				
Week 9	CO2, CO3, CO4	Project Demonstration	Lecture, Lab Work and Question-answer	Project, Lab Task, Assignment
Week 10	CO1, CO2	JSX	Lecture, Lab Work and Question-answer	Project, Lab Task, Assignment
Week 11	CO1, CO2, CO3	Introduction to React JS	Lecture, Lab Work and Question-answer	Project, Lab Task, Assignment
Week 12	CO1, CO2, CO3	React JS extended (Component, Packages, Modules)	Lecture, Lab Work and Question-answer	Project, Lab Task, Assignment
Week 13	CO1, CO2, CO3	Next JS, Third Party API Integration	Lecture, Lab Work and Question-answer	Project, Lab Task, Assignment
Week 14	CO1, CO2, CO3	TailwindCSS	Lecture, Lab Work and Question-answer	Project, Lab Task, Assignment
Week 15	CO1, CO2, CO3	Deployment, Docker	Lecture, Lab Work and Question-answer	Project, Lab Task, Assignment

Week 16	CO2, CO4	Lab Exam, Project Submission	Lab Task	Project, Lab Task, Assignment
		Final term (Week 17)		

* The faculty reserves the right to change, amend, add, or delete any of the contents.

X - Mapping of PO to Courses and K, P, A

PO Indicator ID	PO Indicators Definition (As per the requirement of WKs)	Domain	K	P	A
PO-k-1	Apply engineering management principles and economic decision to manage project as a team member / team leader.	Psychomotor Level 3 (Apply)			A2, A3, A5

XI – K, P, A Definitions

Indicator	Title	Description
PO-k	Project Management and Finance	Demonstrate knowledge and understanding of engineering management principles and economic decision making and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

XII – Mapping of CO Assessment Method and Rubric

The mapping between Course Outcome(s) (COs) and The Selected Assessment method(s) and the mapping between Assessment method(s) and Evaluation Rubric(s) is shown below:

COs	Description	Mapped POs	Assessment Method	Assessment Rubric
CO1	*Determine* the requirements for an economic and optimized software solution to a real-life problem**.**	PO-k-1	Report	Rubric for Project
CO2	*Demonstrate* the management skill and contribution to the developed solution as a team member/team leader.	PO-k-1	Project/Report	Rubric for Project
CO3	*Demonstrate* skills on engineering management principles applied on the developed software solution	PO-k-1	Project	Rubric for Project
CO4	*Apply* skills of defending the solutions based on engineering management activities by delivering an effective presentation to the audience.	PO-k-1	Report/Viva	Rubric for Project

XIII – Evaluation and Assessment Criteria

CO1: *Determine* the requirements for an economic and optimized software solution to a real-life problem**.**

Assessment Criteria	Not Attended/ Incorrect (0)	Inadequate (1-2)	Average (3)	Good (4)	Excellent (5)
Evaluation Criteria	**Evaluation Definition**				
Feature Description	Document notable features and project activities.				
Module Identification	In the development phase of a system the modules can be identified from a knowledge based on process description.				
Acceptance Criteria	Pre-establish the standards or requirements for a task that must meet.				

CO2: *Demonstrate* the management skill and contribution to the developed solution as a team member/team leader.

Assessment Criteria	Not Attended/ Incorrect (0)	Inadequate (1-2)	Average (3)	Good (4)	Excellent (5)
Evaluation Criteria	**Evaluation Definition**				
Teamwork	Showing the ability to work with others and to help others attain their full potential and achieve the goal.				
Architecture Design	Create fundamental structure of the software system that makes the system stable.				
Code Design	Make the code reusable and well structured.				

CO3: *Demonstrate* skills on engineering management principles applied on the developed software solution.

Assessment Criteria	Not Attended/ Incorrect (0)	Inadequate (1-2)	Average (3)	Good (4)	Excellent (5)
Evaluation Criteria	**Evaluation Definition**				
Grasp on Technology	Comprehensive and practical grasp of the tools and technology.				
Concept Understanding	Comprehensive and practical grasp of the system or solution.				
User Experience	Making the system that leads the user to a good experience.				

CO4: *Apply* skills of defending the solutions based on engineering management activities by delivering an effective presentation to the audience.

Assessment Criteria	Not Attended/ Incorrect (0)	Inadequate (1-2)	Average (3)	Good (4)	Excellent (5)
Evaluation Criteria	**Evaluation Definition**				
Justification	Good reasoning or explanation on the technology or the system.				
Promptness	Answering without delay.				

XIV- Course Requirements

- Students are expected to attend at least 80% class.
- Students are expected to participate actively in the class.
- In mid-term, there will be at least 1 quiz based on the theoretical knowledge and conceptual understanding of the topic covered discussed in the classes.
- Submit report based on the given course related problems.
- In both term submission of assignment and projects should be in due time.

XV – Evaluation & Grading System*

The following grading system will be strictly followed in this class

MID TERM		FINAL TERM	
Attendance	5%	Attendance	5%
Quiz	10%	Lab performance/Assignment	15%
Lab performance/Assignment	15%	Project	80%
Project	70%		
Total	100%	Total	100%
Grand Total 100% = 40% of Midterm + 60% of Final Term			

Letter	Grade Point	Numerical %
A+	4.00	90-100
A	3.75	85 - < 90
B+	3.50	80 - < 85
B	3.25	75 - < 80
C+	3.00	70 - < 75
C	2.75	65 - < 70
D+	2.50	60 - < 65
D	2.25	50 - < 60
F	0.00	< 50
I		Incomplete
W		Withdrawal
UW		Unofficially Withdrawal

The evaluation system will be strictly followed as par the AIUB grading policy.

XVI – Textbook/ References

1. **Eloquent JavaScript: A Modern Introduction to Programming; Marijn Haverbeke; 2011 Learning Node.js: A Hands On Guide to Building Web Applications in JavaScript; Marc Wandschneider; Addison-Wesley, 2013**
2. **Beginning Node.js; Basarat Ali Syed; Apress, 2014**
3. **W3Schools Online Web Tutorials, URL: http://www.w3schools.com**
4. **Node.js, URL: https://nodejs.org/en/**
5. **Next.js, URL: https://nextjs.org/**
6. **Nest.js, URL: https://nestjs.com/**
7. **React.js, URL: https://reactjs.org/**
8. **Docker, URL: https://www.docker.com/**

XVII - List of Faculties Teaching the Course

FACULTY NAME	SIGNATURE
SAZZAD HOSSAIN	

XVI – Verification

Prepared by:	Moderated by:	
Sazzad Hossain *Assistant Professor* *Course Convener* Date: 26/01/2023	--------------------------------- **Dr. Akinul Islam Jony** *Point of Contact* *OBE Implementation Committee for CS* Date:..	
Checked by: .... **Dr. Md. Abdullah-Al-Jubair** *Head (Undergraduate Program),* *Department of Computer Science* Date:..............................	**Certified by:** .... **Dr. Dip Nandi** *Director,* *Faculty of Science & Technology* Date:..............................	**Approved by:** .... **Mr. Mashiour Rahman** *Associate Dean,* *Faculty of Science & Technology* Date:..