Module (Course Syllabus) Catalogue

2023-2024

College/ Institute	Technical Engineering College	
Department	Highway Engineering	
Module Name	Prestressed Concrete Bridge Design	
Module Code	PCB201	
Degree	Technical Diploma ☐ Bachelor ☐ High Diploma ☐ MSC ■ PhD ☐	
Semester	2	
Qualification		
Scientific Title	Assist. Prof.	
ECTS (Credits)	7	
Module type	Prerequisite ■ Core ■ Assist. ☐	
Weekly hours	4	
Weekly hours (Theory)	(4)hr Class	(81)Total hrs Workload
Weekly hours (Practical)	(0)hr Class	(0)Total hrs Workload
Number of Weeks	15	
Lecturer (Theory)	Dr. Ghafur H. Ahmed	
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Lecturer (Practical)		
E-Mail & Mobile NO.		
Websites		

Course Book

Course Description	This course presents the required knowledge in the field of Prestressed Concrete Bridge Design, starting from bridge engineering basics, to the design of Prestressed bridges.
Course objectives	• To further develop skills in bridge classifications and bridge elements. • To familiarize the student with the bridge loads and load combinations. • Learn to compare bridges, bridge aesthetics. • Develop a basic understanding of bridge failures. • Learn design of deck slab, girders and other bridge elements.
Student's obligation	• To attend the classes regularly with minimum absence. • To participate actively in the class discussion and Q&A session • Study on daily basis to digest the class material • To write note off-handouts • Prepared for sudden Quizzes • Vet through the references provided by the lecturer and to solve as much as possible of homework and exercises for the subjective materials. • Prepare the assignment and the seminar as instructed by the lecturer.
Required Learning Materials	Basically, a handout shall be given to the students at the beginning of the academic year. The page-by-page read shall be performed by the lecturer and to illustrate the points with aide of white board whenever necessary. The video clips that illustrate further the subject material shall be illustrated with the aid of overhead projector.

	Task		Weight (Marks)	Due Week	Relevant Learning Outcome
Evaluation	Paper Review		-		
	Assignments	Homework	10		
		Class Activity	2		
		Report/Project	8		
		Seminar	8		
		Essay	-		
		Project	-		
	Quiz		8		
	Lab.		0		
	Midterm Exam		24		
	Final Exam		40		
	Total		100		

Specific learning outcome:	By the end of the current course, • The student shall be able to learn the major activities related to the bridge engineering and design. • The student would be able to classify bridge, recognize bridge elements, and estimate the causes of failures in bridge structures. • Students shall have design skills and learning how to put the loads on the bridge structures, then analyzing the state of stresses and deformations. • The most effect matter the student learns in this course is to decide on safe and most economical prestressed concrete bridge for the subjective projects.
Course References:	AASHTO LRFD SPECIFICATIONS FOR BRIDGE DESIGN-2020

Course topics (Theory)		**Week**	**Learning Outcome**
SECTION-1	INTRODUCTION TO BRIDGE ENGINEERING	1	
SECTION-2	BRIDGE CLASSIFICATION AND BRIDGE ELEMENTS	2	
SECTION-3	BRIDGE PLANNING AND SAFETY	3	
SECTION-4	BRIDGE AESTHETICS	4	

SECTION-5	BRIDGE LOADS AND LOAD COMBINATIONS	5	
SECTION-6	BRIDGE FAILURES CAUSES AND ANALYSIS	6	
SECTION-7	INFLUENCE LINES AND MOVING LOADS	7	
SECTION-8	LIVE LOAD DISTRIBUTION IN TRANSVERSE DIRECTION (LF)	8	
SECTION-9	SLAB BRIDGE DESIGN	9	
SECTION-10	REINFORCED CONCRETE DECK AND BEAM DESIGN	10	
SECTION-11	PRESETRESSED CONCRETE	11	
SECTION-12	PRESTRESSED CONCRETE BRIDGE - SUPERSTRUCTURE DESIGN	12	
SECTION-13	BOX GIRDER BRIDGE DESIGN	13	
SECTION-14	DESIGN OF ELASTOMERIC BEARING	14	
SECTION-15	DESIGN OF BRIDGE SUB-STRUCTURE	15	

Practical Topics	**Week**	**Learning Outcome**
N/A		

Questions Example Design
N/A (First Time)

Extra notes:
External Evaluator