THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE
Department of Architecture

ARC 212 – Theory of Structures II

COURSE PARTICULARS

Course Code: ARC 212
Course Title: Theory of Structures II
No. of Units: 2
Course Duration: Two hours of theory per week for 15 weeks.
Status: Compulsory
Course Email Address:
Course Webpage:
Prerequisite: ARC 211

COURSE INSTRUCTORS

i.   **Dr. A. A. Taiwo**
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COURSE DESCRIPTION

This course is a build up to Theory of Structures I (ARC211). Also it is introductory course to design of structures, definitions, convections, rational analysis of structural members of system and common language for discussion. Calculation is kept to a necessary minimum instead concentrating on imbuing understanding that will allow rational decision making in architectural design process. And overlap with a studio work project to illustrate the process of basic static and the application of statics to the determination of reactions, stresses, shears and moments in trussed structures. Introduction to the analysis of statically indeterminate structures, moment area theorem, conjugate beam and moment distribution.

COURSE OBJECTIVES

The objectives of this course are to:
- build on the students knowledge on the theory and application of structures in buildings
- provide students with opportunities to develop simple and basic calculation skills with respect to building structures and design.

COURSE LEARNING OUTCOMES / COMPETENCIES

Upon successful completion of this course, the student will be able to:
(Knowledge based)
- understand components of forces and their implications in systems of forces
- resolve system of two or more forces both graphically and mathematically
- understand the relationships between actions and reactions in a given system of forces
- understand the rotational effect (moment) of forces on a body
- understand the principle of stability in a given force system.

(Skills)
The students will also be able to:
- calculate horizontal and vertical components of forces simultaneously
- calculate resultant force to a given system of forces
- investigate whether a system of force is stable or not
- determine the magnitude and sense of the moment of force

GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

Class Attendance	5%
Assignments	15%
Test(s)	20%
Final Examination	60%
TOTAL	**100%**

GENERAL INSTRUCTIONS

Attendance to lectures: minimum of 65% attendance will be allowed for each of the students. It is expected that every student will be in class for lectures and also participate in all course-related exercises. In case of illness or other unavoidable cause of absence, the student must relate as soon as possible with any of the instructors, indicating the reason for the absence.

Originality of Work: Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances are prohibited. You are not allowed to make copies of another person's work and submit it as your own.

Submission Assignments: Students are expected to submit assignments as scheduled. Failure to submit an assignment at the scheduled time will earn you zero for that assignment. Only under proven circumstances, for which a student has notified any of the instructors in advance, will late submission of assignments be permitted.

Code of Conduct in Lecture Rooms: Students are expected to concentrate and be attentive in class. There is no room for discussion, side-talks or any form of distraction. Students should turn off their cell phones during lectures. Students are prohibited from engaging in other activities (such as texting, watching videos, *etc*.) during lectures. Food and drinks are not permitted in the lecture rooms.

READING LIST

[1]Durka, M.F. (1989). *Structural Mechanics*. (4th Ed.). Morgan, W., Williams, D.T. Longman Group, UK. 266p.

[1]Introduction to Structural Mechanics *by Trefor J. Reynolds, Lewis E. Kent and David W. Lazenby.*

Solving problems in structures. *Volumes 1 & 2. By P.C.L. Croxton and L.H. Martin.*

Legend
1- Available in the University Library
2- Available in Departmental/School Libraries
3- Available on the Internet.
4- Available as Personal Collection
5- Available in local bookshops.

COURSE OUTLINE

Week	Topic	Remarks
1	Introduction and Course Overview	During this first class, the expectations of the students from the course will also be documented.
2 & 3	Components and Resolution of Forces (PART 1) • Triangle of Forces • Parallelogram of Forces • Horizontal and Vertical Components of Forces • Resultant of two or more forces	Theoretical background for the topics will be laid before the calculations
4 & 5	Components and Resolution of Forces (PART 2) • Horizontal and Vertical Components of Forces • Resultant of two or more forces	Theoretical background for the topics will be laid before the calculations
6 & 7	Moment of Forces (PART 1) • Moments in Beam Support Reactions • Resultant and net moments	Theoretical background for the topics will be laid before the calculations
8	**MID SEMESTER TEST**	
9 & 10	Moment of Forces (PART 2) • Couples and General Conditions of Equilibrium • Resultant and net moments	Theoretical background for the topics will be laid before the calculations
11 & 12	Moment of Forces (PART 3) • Moment in Roof Truss	Theoretical background for the topics will be laid before the calculations
13 & 14	**REVISION**	
15	**SEMESTER TEST**	