

# THE FEDERAL UNIVERSITY OF TECHNOLOGY, AKURE

## *Department of Civil and Environmental Engineering*

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### **CVE 514 – Civil Engineering Systems Analysis and Design**

#### **COURSE PARTICULARS**

**Course Code:** CVE 514

**Course Title:** Civil Engineering Systems Analysis and Design

**No. of Units:** 3

**Course Duration:** Two hour of theory and three hours of practicals per week for 15 weeks.

**Status:** Compulsory

**Course Email Address:** [cve514@gmail.com](mailto:cve514@gmail.com)

**Course Webpage:** <http://www.fwt.futa.edu.ng/courseschedule.php?coursecode=FWT%20514>

**Prerequisite:** NIL

#### **COURSE INSTRUCTORS**

**Engr. (Prof.) A. M. Oguntuase**

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#### **COURSE DESCRIPTION**

Analysis and design of civil engineering projects from the viewpoint of the whole. Interactions between the individual components (subsystems) and the effects of such on the overall system. Optimal operation of the projects; as measured by stability, ease of operation, and economic returns. Systems management (operations research) techniques and applications in civil engineering – modelling linear programming, dynamic programming PERT – CPM in systems management. Transportation problems, Queuing theory and applications.

#### **COURSE OBJECTIVES**

The objectives of this course are to:

- introduce the use of operations research and systems analysis techniques in the technical management of civil engineering projects.

- teach the students how to develop the techniques commonly associated with operations research and systems engineering which are applicable to the design and operation of civil engineering systems.
- provide an opportunity of learning how to be an overall manager or system engineer for various civil engineering projects, where all the knowledge acquired from other engineering science and professional civil engineering courses are used in a synthesizing fashion.
- stimulate the students towards open systems thinking towards optimum solutions of real life engineering problems.

## COURSE LEARNING OUTCOMES / COMPETENCIES

Upon successful completion of this course, the student will:

- have gained a general overview of the subject of operation research, system analysis and associated topics applicable to the design and operation of civil engineering systems.
- have developed the ability to make decisions based on scientific analysis.
- be able to work within a team of specialists for large projects, with appreciation of the various contributions towards the realization of the projects' objectives.

## GRADING SYSTEM FOR THE COURSE

This course will be graded as follows:

Continuous Assessment:	
Comprising Technical paper, Home-work and Tests	- 40%
<u>Final Examination</u>	<u>- 60%</u>
<b><u>TOTAL</u></b>	<b><u>100%</u></b>

## GENERAL INSTRUCTIONS

Since the course is optional (or an elective), the few students who take it, are expected to attend all lectures and participate actively in the class discussion. Topics for Technical Papers will be given to individual students or groups of students who will work independently to be submitted at the end of the semester. The students will have the option of selecting their topics in any area of civil engineering. Home work will be assigned on each major topic. At least two tests will be conducted during the semester. A 3 – hour final examination is given during the unit exam period.

## READING LIST

- <sup>1</sup>Andrew B. Templeman (1982). Civil Engineering Systems. The Macmillan Press Ltd.
- <sup>1</sup>Cupta, Kumar Prem and Hira D.S. (2011). Operations Research, 6th Edition, S. Chand and Company Ltd, New Delhi.
- <sup>1</sup>Dandy G.C. and Warner R.F. (1989). Planning and Design of Engineering Systems. London: Unwin Hyman.
- <sup>1</sup>Kapoor, V.K. (1993). Problems and Solutions in Operations Research Sultan Chand and Sons, New Delhi.
- <sup>4</sup>Notes prepared by the instructor given in advance
- <sup>1</sup> Ossenbruggen, Paul (1984). System Analysis for Civil Engineers. John Wiley and Sons, New York.
- <sup>1</sup>Stark, Robert M. and Nicholls, R. L. (1972). Mathematical Foundations for Design: Civil Engineering Systems, McGraw Hill Book Company, New York.
- <sup>1</sup>Smith, Alan A., Ernest Hinton, and Roland W. Lewis (1993). Civil Engineering Systems Analysis and Design. John Wiley and Sons, Ltd, Chester UK.

### *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.