IE 463 – FACILITIES PLANNING AND MATERIAL HANDLING

Designation as a 'Required' or 'Elective' course

TYPE OF COURSE: Required for BSIE Major

Course (catalog) description

COURSE DESCRIPTION: Facilities design functions, computer-aided plant layout, facility location, warehouse layout, Minimax location, deterministic and probabilistic conveyor models.

Prerequisite(s)

PREREQUISITE(S): IE 471 (Operations Research I), 3 hours

Textbook(s) and/or other required material

SAMPLE SOURCES AND RESOURCE MATERIALS:

1) Facilities Planning (4th edition), J. A. Tompkins, J. A. White, Y. A. Bozer, J. M. A. Tanchoco, John Wiley & Sons, 2010.

Course objectives

COURSE OBJECTIVES: This course introduces students to various aspects of facilities planning process. The objective is to provide the students with basic tools and methodologies used in this process, and to expose the students to the application of such tools. Both quantitative and qualitative tools (methods) are discussed.

Topics covered

MAJOR TOPICS:		Hrs
1.	Introduction	3
2.	Computer-aided plant layout	8
3.	Facilities location problems	8
4.	Warehouse layout problems	8
5.	Minimax layout and location problem	8
6.	Deterministic and probabilistic conveyor models	10
	Total	45

IE 463 Instruction Notes on Relevant ABET Outcomes:

A	Ability to apply knowledge of mathematics, science and engineering.	Students are able to use mathematical calculations in solving engineering problems and are able to formulate engineering problems based on scientific and engineering principles. They also use operation research techniques to formulate and solve facilities planning problems. For example, they apply Integer Programming to design an optimal layout of a facility.
C	Ability to design a system, component, or process to meet desired needs.	Students develop the ability to define and follow an iterative design procedure and think

		creatively. Also, students are supposed to decide and design the right layout and material handling equipment for their projects.
E	Ability to identify, formulate, and solve engineering problems.	Students develop the ability to understand what is needed, formulate problems mathematically and build on fundamental knowledge and apply it to new situations. In addition, operations research techniques are taught in the lecture portion of this course. The students select the right technique and interpret the mathematical solution of their model to provide answers for their engineering problem. For example, graph theory is used to investigate the adjacency of production departments of a facility.
G	Ability to communicate effectively.	Students develop the ability to present effectively in senior design, write laboratory reports and course project reports, develop good interview skills, and create engineering drawings. In addition, students have to present their project results by two oral and two written presentations.
J	Knowledge of contemporary issues.	Students acquire the knowledge of major technological issues facing society and the world and develop an appreciation for the society's concerns with security in technology. In the feasibility study phase of the term projects, the students are encouraged to select a facility, which is economically, technologically and operationally feasible.
K	Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.	ents develop the ability to utilize computers for engineering analysis purposes and technical approaches in engineering experimentation. Simulation software, LP packages and other mathematical programming software tools are used to find the optimal design of material handling systems, plant layout and location.

Person(s) who prepared this description and date of preparation
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These outcomes are what students are expected to gain from this course.