

The department of industrial engineering Laboratories

The laboratories used by the IE Department are located in the Laboratories Buildings (Buildings-11 and 12). The laboratories have adequate equipment for carrying out experimental work for courses, senior projects and community service. The laboratories are well maintained and regularly upgraded. The laboratories thus adequately support the curriculum delivery. These include the following laboratories:

- A. Engineering Workshop
- B. Mechanics of materials and engineering materials laboratory
- C. Fluid Mechanics and Hydraulic Lab.
- D. Work Study Lab
- E. Human Factors Lab.
- F. Manufacturing Processes and CIM Lab.
- G. Electrical Circuits Lab.
- H. Control Systems and Automation Lab.
- I. Computer Lab.

A. Engineering Workshop

The IE workshop is equipped with machines and apparatus for training the students in the fields of casting, metal forming, and machining processes. This Engineering Workshop covers the experimental work associated with the ENG 202, ENG 205, ENG 213, INEN 212 and INEN 331



courses.

B. Mechanics of materials and engineering materials laboratory

This lab actively contributes to teaching activities in the IE Department. Its enables faculty and students are to provide tests such as tension, compression, shear, buckling, hardness, bending, deep drawing, impact and metallurgical observations, and used in determining the mechanical

properties and characterization of materials and testing for students. It provides educational facilities at different levels to undergraduate students. The lab used in the graduation projects related to mechanical testing of materials and the graduation projects related to material science. The mechanics of materials and engineering materials laboratory, which covers the experimental work associated with ME 201 and ME 213 courses.



C. Fluid Mechanics and Hydraulic Lab.

The Fluid Mechanics and Hydraulic laboratory provides a “hands on” environment that is crucial for developing students understanding of theoretical concepts. The laboratory contains equipment for the measurement of various fluid properties and flow characteristics. Facilities are available for investigating the fundamentals of fluid statics as well as kinematics and kinetics of fluid flow to enhance the hands-on experience of our students. The lab is equipped with test rigs for experiments pertinent to fluid mechanics, pumping machinery, and hydraulic turbines. The pumping machinery and hydraulic turbines devices aim to give students hands-on experience at conducting experiments and analyzing the data to obtain the performance characteristics of various types of pumps, fans and compressors. Many experiments are conducting in the lab such as Performance characteristics of a centrifugal radial flow pump, Effect of impeller size on the performance of a centrifugal pump, Performance characteristics of an axial flow pump, Performance of centrifugal fans, Performance characteristics of a jet pump, Performance characteristics of a multi-stage centrifugal compressor. The Fluid Mechanics and Hydraulic lab covers the experimental work associated with the INEN 216 course. The lab has an essential and effective role enabling industrial engineering students to gain educational understanding and experimental information in the field of fluid mechanics and hydraulics, turbomachines and projects.



D. Work Study Laboratory

The Work Study laboratory is equipped with a wide variety of instructional facilities in work study. The laboratory contains modern instruments which are used to train students in the practical aspect of the work study. This laboratory class aims to provide students with a general knowledge of work study and methods engineering. Also, the laboratory session is an introductory laboratory in which students obtain general knowledge of human factor engineering as well as the nature of experiments and laboratory exercises that are covered throughout the semester. Safety instructions that must be followed during each laboratory session will be explained and discussed with students in the first day of lab. The work study laboratory covers the experimental work associated with the INEN 305, course.

E. Human Factors Laboratory

Human Factors Engineering (Ergonomics) is the study, design and integration of human capabilities and limitations into the workplace. The Human Factors Engineering Lab provides undergraduate students with the tools and measurement to collect data, analyze and provide recommendations for improved human effectiveness and productivity in the workplace. The lab covers the experimental work associated with the INEN 321 course.

F. Manufacturing Processes and CIM Laboratory

This laboratory is aiming to providing an introduction of Know-how of common processes used in industries for manufacturing parts by removal of material in a controlled manner. Auxiliary methods for machining to desired accuracy and quality will also be covered. The emphasis throughout the laboratory course will be on understanding the basic features of the processes rather than details of constructions of machine, or common practices in manufacturing or acquiring skill in the operation of machines. The Manufacturing Processes and CIM Lab covers the experimental work associated with the INEN 212, INEN 331and INEN 536 courses.

G. Electrical Circuits Lab

This lab is designed to give the student an overview of the electrical and electronic engineering lab instruments, such as Digital Multi-Meters (DMM), Power supply Oscilloscopes and the Training Electronic Boards (prototype boards) and to practice the use of these lab instruments. In the

Electrical Circuit Lab. students can create their own electrical circuits and do measurements on it. The laboratory emphasizes the practical, hands-on component of Electrical circuit's course. It complements the theoretical material presented in lectures. The lab demonstrates DC circuits, KVL, Network theorems, Transient analysis in RL, RC, and RLC circuits, and Power measurements. Students can analyze the collected data by creating graphs of the data and use the graphs in the conclusion. The lab covers the experimental work associated with the INEN 214 course.



H. Control Systems and Automation Laboratory

This lab consists of appropriate training kits and equipment to investigate the implementation of control systems principles on various applications and to explore the effect of tuning the control gains on the system responses. This lab provides students an overall background in the applications of engineering control for industrial uses. This laboratory covers the experimental work associated with the INEN 311 and INEN 535 courses.



I. Computer Laboratory

The students of the IE department have access to computer lab provided by the FAO. The complete description of the FAO computer center is shown in Table 7-2. The systems are supplied with all necessary software for the students to carry out their tasks like: MS-Office (complete), AUTOCAD, MATLAB and other software. Total Number of PCs is 30 with total capacity of the laboratory maximum of 30 students (see Fig 7.9). It is used for teaching different courses like Engineering Drawing, Supply chain Management, Computer Application in IE, Engineering Simulation, etc.,

