

LIST OF APPROVED TECHNICAL ELECTIVES FOR THE MECHANICAL ENGINEERING DEPARTMENT

Students must take 6 credits from the following list:

MEEN4301: Special Topics (3cr)

Course Description:

An investigation into specialized areas of engineering under the guidance of a faculty member. This course may be repeated for credit when topics of investigation differ. Offered: Spring and Fall.

Prerequisites: Pre-approval of academic advisor.

MEEN4324: Engineering Fracture Mechanics (3cr)

Course Description:

This course introduces the fundamental principles of linear elastic fracture mechanics in mechanical design and extends students' knowledge in mechanical component design with consideration of cracks. It also introduces stress intensity factors and energy release rates and calculation of stress intensity factors in various configurations. **Prerequisites:**

MEEN4325: Undergraduate Research (3cr)

Course Description:

The purpose of the class is to provide undergraduate students a unique opportunity to experience hands-on interdisciplinary research in the field of mechanical engineering. Selected students are generally in the senior year of their study with GPA > 3.2 and have sufficient basic knowledge to conduct research. **Prerequisites:** MEEN 3310, MATH 3301, MEEN 3320

MEEN4326: Control of Mech Systems (3cr)

Course Description:

Mathematical modeling of various systems, transient and steady-state response, frequency response analysis, root-locus, stability, control system design, steady-state representations, controllability and observability, and design of system in state space. **Prerequisites:** Offered: Fall

MEEN4350: Turbomachinery (3cr)

Course Description:

Flow problems encountered in the design of water, gas and steam turbines, centrifugal and axial-flow pumps and compressors, aerothermodynamic design of gas turbines. **Prerequisite:** MEEN 3311 and MEEN 3380 Offered: Other

MEEN4362: Energy Engineering (3cr)

Course Description:

Different types of energy resources and their uses, different types of energy conversion technology such as fuel cells, thermoelectric, and solar energy conversion, and energy conservation technologies such as pinch technology and cogeneration, current and future challenges of energy generation and conservation, environmental issues such as air pollution, smog and greenhouse effects, and NO_x emissions. **Prerequisite:** MEEN 3310, MEEN 3311, MEEN 3380 Offered: Other

MEEN4366: Manufacturing Analysis (3cr)**Course Description:**

Theoretical considerations in casting, bulk deformation, sheet metal forming, polymers parts machining and welding process will be taught in this manufacturing course. **Prerequisite:** INEN 3322
Offered: Other

MEEN4368: Gas Turbo heat Trans/Cool Tech (3cr)**Course Description:**

The important and fundamental consideration of gas turbines heat transfer and cooling are introduced. Different aspects of internal cooling and film cooling technologies are discussed. State-of-the-art experimental design and numerical modeling related to gas turbines heat transfer and cooling are presented. **Prerequisite:** MEEN 3310, MEEN 3311 Offered: Other

MEEN4369: Energy Conservation/Management (3cr)**Course Description:**

Students will learn fundamental of energy conservation and management, energy audit procedures, energy conservation analysis and technologies to improve energy efficiency. **Prerequisite:** MEEN 3310 and MEEN 3380 Offered: Other

Students must take 3 credits from the following list:

INEN 4320: Statistical Decision Making in Engineering (3cr)**Course Description:**

Analysis of data to help the engineer/executive make decisions. Evaluations of performance claims. **Prerequisite:** INEN 3320 Offered: Spring

MATH 3370: Intro. Theory Statistical Infer (3cr)**Course Description:**

A calculus-based introduction to statistics, probability, special probability distributions, nature of statistical methods, sampling theory, estimation, testing hypotheses. **Prerequisites:** Grade of C or better in MATH 2414 or its equivalent Prepares for: MATH 4380 Offered: Fall, Spring

Note: Other elective courses may be approved by the department chair if they meet the program educational objectives.