Mechanical Engineering Department
New Mexico Tech

November 2, 2015

Proposal to revise MENG431 and create a combined laboratory MENG431L

Current catalog description for MENG 431:
MENG 431, 431D, Fluid and Thermal Systems Design I, 3 cr, 3 cl hrs
Prerequisites: MENG 305; ES 350; MATH 335
Advanced dimensional analysis. Design and synthesis of systems based on application of incompressible fluid flow, heat transfer, design optimization theories, and economics. Design problems to include complex pressure conduit and pipe networks, heat exchangers, dynamic and positive displacement pumps, and hydraulic motors.

Current catalog description for MENG 351L:
MENG 351L, Fluid and Thermal Sciences Laboratory, 1 cr, 3 lab hrs
Prerequisites: ES 216/MENG 216, ES 347, MENG 341
Corequisites: ES 350
Experimental analysis of fluid flow, heat transfer and thermodynamic systems. CFD tools are used for visualization, validation and comparisons with experimental data. A final project in the field of fluid and thermal sciences is required for each laboratory group. Laboratory reports are presented in oral and written formats.

Proposed revised catalog description for MENG 431:
MENG 431, 431D, Fluid and Thermal Systems, 2 cr, 2 cl hrs
Prerequisites: ES 216/MENG 216, ES 347
Corequisites: ES 350, MENG 431L
A capstone course in the thermal-fluid sciences of Mechanical Engineering. The course combines the basic concepts and analysis techniques that were developed throughout the fundamental undergraduate thermodynamics, fluid dynamics, and heat transfer courses, to perform in depth analysis and design of complete thermal-fluid systems. Topics will include analysis and design of piping systems, heat exchangers, and pump systems, and their incorporation into complete systems such as refrigeration and power cycles. Advanced dimensional analysis, mathematical relationships, and computational analysis will be used to solve problems.

Changes:

- Revised course title: Fluid and Thermal Systems ~~Design I~~
- Reduced credits from 3 to 2
- Removed MENG341 as a prerequisite, add MENG 431L as corequisite
- Revised overall description to better reflect material taught

Proposed new course MENG 431L (revision of MENG351L):
MENG 431L, Fluid and Thermal Systems Laboratory, 1 cr, 3 lab hrs
Corequisite: MENG 431
Experimental analysis of fluid flow, heat transfer and thermodynamic systems. Experimental techniques common to the fluid-thermal sciences fields will be used in hands-on laboratory experiments. Techniques include wind tunnel measurements, pitot-static systems, temperature measurement, flow visualization, pump power, and use of data acquisition systems. A final project including the application of measurement techniques and use of experimental facilities in the field of fluid and thermal sciences is required for each laboratory group. Laboratory reports are presented.

Changes:

- Course name changed to mirror the lecture course name
- New course number MENG 431L to reflect combination with lecture
- All pre-requisites are eliminated, co-requisite changed to just MENG 431L
- Revised overall description to reflect current laboratory experiments performed

The proposed change will results in the following catalog cleanup.

In catalog, page 183, replace MENG 351L with MENG 431 (2) & 431L (1) and remove MENG 431 (3).

In catalog, page 184, remove MENG 351L from Semester 6 and replace MENG 431 with MENG 431 & 431L in Semester 8.

Catalog, page 190, change

MENG 465, Biorheology, 3cr, 2 cl hrs, 3 lab hrs
Prerequisite: MENG 351L or consent of instructor

To

MENG 465, Biorheology, 3cr, 2 cl hrs, 3 lab hrs
Prerequisite: MENG 431L or consent of instructor