

## Mechanical Engineering Tract Course Descriptions

### ***MEEN 5350 – Transport Phenomena***

The subject of transport phenomena includes three closely related topics: fluid dynamics, mass transfer, and heat transfer. Fluid dynamics involves the transport of momentum, mass transfer is concerned with the transport of mass of various chemical species, and heat transfer deals with the transport of energy. In practice, rarely are these phenomena acting alone. Thus in this introductory course, these three topics are studied together so that a more cohesive understanding of these interrelated processes is developed.

### ***MEEN 5275 - Mechatronics***

Mechatronics, as an engineering discipline, is the synergistic combination of mechanical engineering, electronics, control engineering, and computer science, all integrated through the design process. This course covers mechatronic system design, modeling and analysis of dynamic systems, control sensors and actuators, analog and digital control electronics, interfacing sensors and actuators to a microcomputer/microcontroller, discrete and continuous controller design, and real-time programming for control.

### ***MEEN 5410 – Experimental Design***

Application of statistical concepts to design engineering experiments to improve quality, production techniques, and reliability. Use and advantages of various models; factorial, fractional factorial, orthogonal arrays and fractional designs.

### ***MEEN 6473 – Computer Integrated Manufacturing***

Primary objectives include the validation of the underlying philosophy behind Computer Integrated Manufacturing and the definition of characteristics of various components which constitute a C.I.M. environment. Enables students to understand the benefits of C.I.M. and also know how to upgrade conventional plants to a C.I.M. operation. Prereq: MEEN 3443 or equiv.

### ***ENMA 6040 – Lean Manufacturing Systems***

Focuses on designing, implementing, and optimizing high-performance cost-effective manufacturing systems. Lean, mass, and craft production paradigms will be compared, with emphasis placed on the benefits and implementation of the lean principles of value stream, flow, pull, and waste. Student teams prepare, analyze, and propose optimized value streams for real-world manufacturing systems.

### ***ENMA 6070 – Engineering Project Management***

Applies collaboration tools such as MS Project to organize and direct global virtual teams developing technology-based products and services. Focus is on optimizing projects under the triple constraints of time, resources, and quality. Student projects provide hands-on experience in applying tools and methods to balance multiple and varying constraints in a real-world environment.