



MANUFACTURING AND DESIGN

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Track Description

Manufacturing and design are foundational to the realization of all mechanical systems. Effective design processes help engineers translate customer needs and requirements into marketable products and systems. Developing in-depth understanding of manufacturing processes enables engineers to realize their products faster, cheaper, and with enhanced functionality. This thrust allows students to obtain a concentration in manufacturing and design as a basis for graduate study and practice in all areas of product development and mechanical systems design.

ELECTIVE COURSES

ME 336: Materials Processing
ME 350: Machine Tool Operations for Engineers
ME 350R: Robot Mechanism Design
ME 355K: Engineering Vibrations
ME 359: Materials Selection
ME 368C: Additive Manufacturing
ME 371D: Medical Device Design & Manufacturing
ME 372C: Theory/Design of Mechanical Measurement
ME 374C: Combustion Engine Processes
ME 374E: Racecar Engineering & Project Management
ME 376N: High Throughput Nanopatterning
ME 379M: Composites Design & Manufacturing
ME 377K: Projects in Mechanical Engineering
ORI 370: Statistical Methods in Manufacturing
ES 277: Humanitarian Product Design (2 semesters)
ES 277K+L: Projects with Underserved Communities

Faculty Mentors

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RELATED PROGRAMS

Humanitarian Engineering
(Certificate Program)

Design Strategies (Bridging
Disciplines Program)

For course descriptions visit the University Catalog.



The University of Texas at Austin
Walker Department
of Mechanical Engineering
Cockrell School of Engineering

Industry Applicability

This certificate program area is appropriate to prepare mechanical engineers for jobs in industry that deal with one or more of the following:

- Design of products and mechanical systems
- Fabrication of mechanical systems and interactions between manufacturing and design
- Additive manufacturing (3D printing) Engineering entrepreneurship
- Design for under-served communities

Selected Examples

1. Design of products and mechanical systems: The design of mechanical systems is central to many engineering roles in the energy, aerospace, automotive, and biomedical industries. Challenges include creative concept generation, collaborative teaming, computer aided design and simulation, and design for manufacturing/assembly/ sustainability. Engineers with excellent product development skills will continue to raise the level of innovation in these fields.

2. Energy Investment: Energy companies must spend significant amounts of capital in order to bring energy projects to the market. Energy prices are volatile and these investments are risky. These companies need help modeling their investment opportunities and making the right choice. 2. Advanced manufacturing, including additive manufacturing (3D printing): The manufacturing industry is rapidly transitioning towards greater levels of automation, direct digital design and manufacturing, and customized products. Engineers with in-depth knowledge of conventional and advanced manufacturing processes are well-positioned to shorten product development cycles, improve product quality, and realize unprecedented levels of customization.

3. Engineering entrepreneurship: Successful engineering entrepreneurs must be fluent in product development, including generating creative ideas that fulfill new or existing customer needs and converting those ideas into marketable products.

4. Engineering for under-served communities: Modern product development has focused primarily on typical customers in developed economies. New products and services are needed to address life-threatening challenges associated with hunger, hygiene, resource depletion, climate change, and displaced populations worldwide. Even in fully developed economies, products often under-serve customers with physical, mental and other challenges. Design and manufacturing skills are needed to identify and address these gaps in product development.

