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MIDDLE TENNESSEE

STATE UNIVERSITY

Engineering Systems Technology



manufacturing execution system

a concentration within the
Engineering Technology Department

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MIDDLE
TENNESSEE
STATE UNIVERSITY

Engineering Technology Department
MTSU Box 19
1301 E. Main Street
Murfreesboro, TN 37132

The role of the engineering systems professional

- participates in the strategic planning and manufacturing planning for the organization
- participates in project design and management as part of a concurrent engineering team
- designs industrial and business processes, handling systems, assembly systems, storage systems, and work measurement/ergonomic systems
- researches, justifies, and procures capital equipment to meet competitive challenges and to improve quality and productivity
- functions as facilitator, educator, and workforce trainer to foster creativity, self-direction, teamwork
- advises on product and process capabilities and limitations to ensure proper alignment between product design and process capability
- develops and leads continuous improvement activities such as quality improvement, cycle time reduction, downtime reduction, and non-value-adding reductions using the latest tools in lean manufacturing such as Value Stream Mapping and Six Sigma
- studies and analyzes global and business issues to maintain proper strategic and operational focus
- assists in workplace safety and health issues including ergonomic programs and hazardous waste

Engineering Systems Technology graduates are in high demand, have more career opportunities, and earn higher starting salaries.

Engineering systems as a formal field of study is relatively new.

Most engineering systems programs emerged in the past quarter century. During the 1940s and '50s, the term "industrial engineering" was associated with **technically trained personnel who designed and analyzed production systems**. Early programs were relegated to options within traditional industrial engineering curricula and consisted of time and motion studies and statistical quality control. The traditional "stopwatch" industrial engineering programs have evolved into programs of broader scope called engineering and business systems. **Pressure on U.S. companies to become more productive and to improve quality and competitive global position** has created the need for a new technology to design, analyze, and manage the total engineering and business system.

Synchronous Process Flow



The supplier's parts are then delivered to the OEM in exactly the right order and at exactly the right time.

Engineering technology at MTSU

MTSU offers a **four-year degree program** that is accredited by ABET, Inc., a professional agency which assures that this instructional program conforms to high standards of excellence.

The curriculum

In addition to the General Education **core courses** required by the University, certain supporting and technical courses are required or suggested.

Supporting Courses (required)

CSCI 1170	Computer Science I
MATH 1910	Calculus I
MATH 1530	Applied Statistics
ACTG 3000	Survey of Accounting for General Business
ENGL 3620	Professional Writing

Technical Courses (required)

ET 1840	Engineering Fundamentals
ET 2310	Computer-Assisted Drafting/Design I
ET 2920	Industrial Orientation Internship
ET 3210	Machine Tool Technology
ET 3260	Manufacturing Processes and Materials
ET 3601/02	Electrical Circuit Analysis I and II
ET 3810	Engineering Thermodynamics and Heat Transfer
ET 3830	Statics
ET 3910	Introduction to Operations Management
ET 3960	Industrial Quality Technology
ET 4420	Industrial Safety
ET 4590	Manufacturing Automation Systems
ET 4600	Programmable Logic Controllers
ET 4710	Industrial Seminar
ET 4803	Senior Problem in Engineering Technology
ET 4900	Productivity Strategies

ET 4915	Technical Project Management and Soft Skills
ET 4920	Plant Layout and Materials Handling
ET 4970	Engineering Economy
ET 4990	Industrial Engineering Systems

Technical Courses (electives)

ET 1210	Introduction to Metals and Metallurgy
PSY 3320	Introduction to Industrial and Organizational Psychology
ET 3360	Computer-Assisted Drafting/Design II
ET 3860	Strength of Materials
ET 3950	Metrology
ET 4280	Computer-Aided Manufacturing: Numerical Control (NC)
ET 4370	Tool Design
ET 4850	Fluid Power
ET 4860	Robotics

A total of 124 semester hours is required for the bachelor's degree.

“MTSU prepared me to enter the workforce with the mentality to succeed in my profession. The knowledge gained from instructors with experience in the field has proven to be of great benefit. The department and its instructors should be proud of the individuals who graduate and succeed.”

*Ernest Dunkley
Corp. Tooling/
Mfg. Engineering Supervisor
Calsonic North America-Tennessee*

Unique program features

- Hands-on learning opportunities on campus and with industry projects
- Certification in Lean Manufacturing, Safety, and Six Sigma
- Experiential learning—up to 30 hours credit awarded for applicable work experience

Industry alliances

An active **industry advisory group** offers input to ensure that our program produces graduates who meet national and global industry needs. This group also helps through internships and **real-world projects** for students.

Master of Science Degree

Major: Engineering Technology and Industrial Studies

Concentrations: Engineering Technology
Occupational Health and Safety

Facilities

Facilities to support the program include a range of **CAD/CAM, rapid prototyping, design of experiments, and robotic flexible manufacturing systems** as well as basic laboratories for metallurgy, electronics, metrology, and machining.

Financial aid

Scholarships and grant programs are available to qualified students. Applications should be made through the ET Department and the Financial Aid Office.

Job opportunities

Many **manufacturing opportunities** are available locally, nationally, and globally. Typical positions filled by graduates are in tool design, quality control, manufacturing engineering, facilities engineering, and supervision. Average **starting salaries for our graduates** have been among the highest offered.

The University and community

MTSU has been listed in *U.S. News and World Report's America's Best Colleges* as a **national university**. The spacious campus features modern buildings that exist harmoniously with historic structures. New residence accommodations, a fully computerized library, a recreation center, and computer access make it possible to provide solid programs to more than **23,000 students**. Individual help and attention from faculty members is an important aspect of MTSU's educational philosophy.

MTSU is located in the historic town of Murfreesboro, only **30 miles southeast of Nashville** and in the center of manufacturing for the region. Living here allows students to enjoy a metropolitan atmosphere with small-town friendliness.

“MTSU prepares students well. I've supervised numerous student projects over the past few years. Students and industry both benefit from these hands-on experiences.”

*Mark S. Stewman
Director of Engineering
Cumberland Swan Holdings Inc.*

For more information

ET Department 615/898-2776
MTSU Box 19 fax: 615/898-5697
1301 E. Main Street **www.mtsu.edu**
Murfreesboro, TN 37132

Admissions Office
615/898-2111
1-800-331-MTSU (in Tennessee)
1-800-433-MTSU (out of state)
www.mtsu.edu/admissn