
Mechanical Engineering Technology

The goals of the Mechanical Engineering Technology (MET) program are to provide quality undergraduate studies, prepare students to enter professional careers and graduate study, and find employment in their field after graduation. This program values and encourages academic and intellectual achievement of the highest quality and the technical competencies inherent to the field of MET. The faculty are committed to the integration of these elements in a coherent program of higher education.

MET graduates are problem solvers with hands-on skills and a well-rounded technical background. They work in a wide range of advanced mechanical systems and processes. Job functions include design and development, installation, maintenance, documentation, manufacturing, fabricating, testing and evaluation, and technical sales. Typical starting jobs for MET graduates include product development and design, computer-aided design and manufacturing, and technical management and supervision. Graduates of this program pursue careers not only in MET, but also in related fields such as computer science and industrial, manufacturing, and civil engineering.

Students take a series of required courses to obtain technical expertise in the fundamental areas of mechanical engineering technology. Technical expertise with added technical depth is required in each of the following three areas:

1. Mechanical Design
2. Thermal Sciences
3. Computer-Aided Engineering Graphics

The MET program is accredited by the Technology Accreditation Commission of the Accreditation Board for Engineering and Technology (TAC/ABET.) In January 2005, the American Society for Engineering Educators (ASEE) ranked SUNYIT tenth in the nation based on the number of engineering technology bachelor's degrees awarded.

B.S. Degree Requirements

To earn a Bachelor of Science (B.S.) degree in MET, a student must complete a minimum of 128 credits hours and fulfill the following requirements:

I. Arts and Sciences - 60 credits

A. Liberal Arts

- Oral Communication
- Written Communication
- Upper-Division Writing
- Humanities*
- Social Sciences*
- American History*
- Western Civilization*
- Other World Civilizations*
- Fine Arts*
- Foreign Language*

*Complete coursework in at least 5 of the above 7 categories

24 credits

- B. *Mathematics and Science*
Physics (with laboratory)**
Chemistry (with laboratory)**
Physics elective**
Mathematics, including Calculus I & II, Differential Equations
**Students are encouraged to take calculus-based sciences
- 24 credits**

- C. *Computer Programming Language*
Electives: Liberal Arts, Math, Science, Computer Science
- 12 credits**

II. Technical Courses - 66 credits

A Grade Point Average (GPA) of 2.0 is required in all MET courses taken at SUNYIT.

A. Required Courses - 30 credits

- MTC 101 - Intro to Engineering Technology
or MTC 301 - Professionalism in the Workplace
- MTC 162 - Computer-Aided Design
- MTC 198 - Industrial Instrumentation
or MTC 398 - Mechanical Measurements
- MTC 211 - Manufacturing Processes
- MTC 218 - Statics
- MTC 222 - Strength of Materials
- MTC 336 - Material Science Applications
- MTC 352 - Thermodynamics
- MTC 430 - Engineering Dynamics
- MTC 461 - Fluid Mechanics
- MTC 420 - Capstone Experience (taken during senior year at SUNYIT)

B. Courses with Technical Depth - 12 credits

Students must take at least 4 credits from each of the following groups at SUNYIT.

Group 1: Mechanical Design

- MTC 308 - Mechanical Components
- MTC 362 - Experimental Stress Analysis
- MTC 465 - Advanced Machine Design

Group 2: Thermal Sciences

- MTC 450 - Solar Energy Concepts
- MTC 454 - Engineering Heat Transfer
- MTC 462 - Turbomachinery

Group 3: Computer-Aided Engineering Graphics

- MTC 388 - Fundamentals of Solid Modeling
with Pro/E
- MTC 405 - Solid Modeling and Rapid Prototyping
- MTC 476 - Finite Element Applications

C. Mechanical Electives - 20 credits

Students must take at least 10 credits at SUNYIT.

D. Electrical Electives - 4 credits

III. Open Electives - Balance of 128 credits

Students are encouraged to take course in Industrial Engineering Technology (ITC), Electrical Engineering Technology (ETC), Computer Science (CSC), Mathematics (MAT), and Physics (PHY).

Total Credits 128

Areas of Concentration†

Students may specialize in one of the following areas. A total of 20 credits must be taken from the following courses:

Mechanical Design - 20 credits

- MTC 218 - Statics
- MTC 222 - Strength of Materials
- MTC 308 - Mechanical Components
- MTC 330 - Assistive Technology
- MTC 336 - Material Science Applications
- MTC 388 - Fundamentals of Solid Modeling with Pro/ENGINEER
- MTC 398 - Mechanical Measurements
- MTC 430 - Engineering Dynamics
- MTC 464 - Vibrations Analysis
- MTC 465 - Advanced Machine Design

Thermal Sciences - 20 credits

- MTC 350 - Solar Energy Technology
- MTC 352 - Thermodynamics
- MTC 450 - Solar Energy Concepts
- MTC 454 - Engineering Heat Transfer
- MTC 461 - Fluid Mechanics
- MTC 462 - Turbomachinery
- MTC 471 - Space Technology

Computer-Aided Engineering Graphics - 20 credits

- MTC 222 - Strength of Materials
- MTC 308 - Mechanical Components
- MTC 362 - Experimental Stress Analysis
- MTC 388 - Fundamentals of Solid Modeling with Pro/ENGINEER
- MTC 405 - Solid Modeling/Rapid Prototyping
- MTC 442 - Computer-Aided Manufacturing
- MTC 465 - Advanced Machine Design
- MTC 467 - Computer-Aided Design
- MTC 476 - Finite Element Applications

†Students are not required to complete a concentration.

Mechanical Laboratories

The MET program has numerous laboratories with equipment to provide hands-on application of classroom learning. These laboratories encompass many aspects of the MET curriculum, including:

- Instron multi-purpose testing machine
- Bending moment and deflection of beams apparatus
- Electronic strain measurement equipment
- Static equilibrium devices
- Dynamics test stands: centrifugal force, ballistic projectiles, linear momentum, conservation of potential energy, acceleration, forces of gravity
- Machine shop for prototyping
- Computer Numeric Control (CNC), CNC machining center, CNC turret lathe

- Rapid prototyping
- Heat exchangers - conduction, convection, and radiation heat transfer units
- Heat pipes and pumps, solar energy systems
- Subsonic wind tunnels, reaction and impulse turbines
- Mechanical measurements lab with a wide range of electro-mechanical sensors and data acquisition electronics
- Electrical course requirements also include dedicated laboratories with electronic equipment.

Computer Skills

This curriculum provides students experience with modern software and hardware that is used in industry. Some of the advanced courses are taught using software such as:

- AutoCAD for mechanical design and layout
- AutoDesk Inventor Professional
- ALGOR for finite element analysis
- LabVIEW for mechanical measurements
- MATLAB/SimuLink for simulation
- ProENGINEER for solid modeling and analysis
- SolidWorks for rapid prototyping

The MET program has several dedicated computer labs, and students have access to numerous other modern computer labs throughout the campus. For the computer language requirement, students may learn C/C++, JAVA, and Visual Basic.

Student Clubs

MET students may join chapters of the following professional societies:

- ASME - American Society of Mechanical Engineers
- SAE - Society of Automotive Engineers
- SME - Society of Manufacturing Engineers
- SWE - Society for Woman Engineers
- ASQ - American Society for Quality

Recent activities of these clubs include the SAE Baja project, where students design and build a single-passenger off-road vehicle for the international race and design competitions. Members of the ASME club have also participated in regional and international design competitions.