

# TECHNOLOGY MANAGEMENT (TM)

---

## **TM 404 (s) Special Topics** **3 credits**

### **TM 419 Industrial Sustainability Analysis** **3 credits**

Cross-listed with INDT 419, Joint-listed with TM 519

This course covers two practical topics, which are Sustainability Assessment (Topic 1) and Advanced Manufacturing (Topic 2). Topic 1 establishes the concept of sustainability, and sustainable design and manufacturing. Under this section, we introduce the intersection of sustainability and manufacturing through sustainable development, sustainability principles, and sustainable engineering. Topic 2 provides an overview of what Advanced Manufacturing (AM) is, what approaches are used, what the possible applications are, and what the limitations of the technology are. We focus on AM processes, principles, sustainability performance of AM, and sustainability assessment of AM at the macro and micro level. Students in the 500-level class will complete two different projects and students in the 400-level class will complete one project. The class projects include techno-economic and socio-environmental studies in the broad area of food-energy-water processes and systems.

### **TM 482 Project Engineering** **3 credits**

Modern project engineering techniques for planning, scheduling, and controlling typical engineering and construction projects; linear programming and other optimization techniques as applied to resource allocation; microcomputer applications are emphasized and appropriate software used throughout the course.

**Prereq:** 'C' or better in STAT 251, STAT 301, or equivalent; and Senior standing; or Permission.

### **TM 500 Master's Research and Thesis** **Credit arranged**

### **TM 501 (s) Seminar** **Credit arranged**

### **TM 502 (s) Directed Study** **Credit arranged**

### **TM 504 (s) Special Topics** **Credit arranged**

### **TM 505 (s) Professional Development** **Credit arranged**

### **TM 510 Technology Management Fundamentals** **3 credits**

Fundamental principles of technology management. The course focuses on management theory and techniques associated primarily with project management, management theory applied to high technology environments; management processes and techniques; project leadership role of the engineering manager in technology organizations; team-taught by business, engineering, and technology management faculty.

**Prereq:** Permission

### **TM 513 Nuclear Criticality Safety** **3 credits**

Cross-listed with NE 535.

Nuclear criticality safety including nuclear physics, fusion and neutron multiplication, moderation and reflection of neutrons, criticality issues in the fuel cycle, critical experiments and sub-critical limits, calculations of criticality, nuclear criticality safety practices, emergency procedures, and nuclear regulations and standards.

**Prereq:** NE 450 or Permission

### **TM 514 Nuclear Safety** **3 credits**

Cross-listed with NE 514

An in-depth technical study of safety issues within the nuclear fuel cycle and within various reactor types. Evaluation methods, system disturbances, safety criteria, containment, NRC licensing, and codes for safety analysis will be presented. Case studies of reactor accidents and corrective measures included.

**Prereq:** Permission

### **TM 516 Nuclear Rules and Regulations** **3 credits**

Cross-listed with NE 516.

An in-depth examination of nuclear regulatory agencies; major nuclear legislation; current radiation protection standards and organizational responsibility for their implementation.

**Prereq:** Permission

### **TM 517 Critical Infrastructure Security and Resilience Fundamentals** **3 credits**

This course provides an introduction to the policy, strategy, and practical application of critical infrastructure security and resilience from an all-hazards perspective. It describes the strategic context presented by the 21st century, and discusses the challenges and opportunities associated with public-private partnerships in infrastructure protection, risk analysis and mitigation, and incident response.

### **TM 519 Industrial Sustainability Analysis** **3 credits**

Joint-listed with INDT 419 and TM 419

This course covers two practical topics, which are Sustainability Assessment (Topic 1) and Advanced Manufacturing (Topic 2). Topic 1 establishes the concept of sustainability, and sustainable design and manufacturing. Under this section, we introduce the intersection of sustainability and manufacturing through sustainable development, sustainability principles, and sustainable engineering. Topic 2 provides an overview of what Advanced Manufacturing (AM) is, what approaches are used, what the possible applications are, and what the limitations of the technology are. We focus on AM processes, principles, sustainability performance of AM, and sustainability assessment of AM at the macro and micro level. Students in the 500-level class will complete two different projects and students in the 400-level class will complete one project. The class projects include techno-economic and socio-environmental studies in the broad area of food-energy-water processes and systems.

**TM 520 Leadership and Conflict Resolution in a Technological Environment****3 credits**

The course explores leadership and related conflict management issues; personal and collective ways in which interpersonal and organizational conflict from a leadership perspective can be managed; focuses on theoretical and practical analysis of principles and processes for the management of conflict in relationships. Through a leadership framework, the skills and techniques for the identification, prevention, and resolution of conflict in interpersonal and workplace relationships will be discussed.

**TM 525 Emergency Management and Planning****3 credits**

A study of the basic principles in emergency management and planning in the United States. This course is not directed at any particular type of hazard, but the processes and considerations of planning for all-hazards along with the basics of generic protective actions and the planning concepts supporting effective protective action recommendations.

**TM 526 Community Emergency Planning****3 credits**

A study of the theory and practice of community emergency planning. The Citizen Corps, Principles of Emergency Planning, and CERT programs will be studied. Cases are studied in order to assist students in understanding the management and leadership complexity associated with modern emergencies and disasters. Recommended Preparation: TM 525.

**TM 528 Accident Investigation****3 credits**

In-depth examination and implementation of system safety concepts, principles, and methods; development of skills in accident investigation, audit and appraisal, operational readiness, and system safety analysis and review. Recommended Preparation: INDT 442.

**TM 529 Risk Assessment****3 credits**

Cross-listed with NE 529

In-depth evaluation and analysis techniques used to determine the risk of industrial, process, nuclear, and aviation industries; fault tree analysis; human reliability analysis; failure mode and effect analysis.

**TM 533 Chemical Hazards****3 credits**

Emergency responders can encounter a wide range of chemical hazards. Topics include information on interpreting hazardous chemical labels and Material Safety Data Sheets and the relationship between those two methods of hazard communication. Acute and chronic effects of hazardous chemicals to which responders may be exposed will be discussed. Recommended Preparation: TM 525.

**TM 534 Biological Hazards****3 credits**

Emergency responders can encounter a wide range of biological hazards. The objectives of this course are to understand the nature of biological hazards and how to control them. The biological hazards to be discussed are Bacteria, Viruses, Fungi/Molds, Protozoa, Prions – infectious proteins, Biological Toxins. Recommended Preparation: TM 525.

**TM 535 Radiation Detection and Measurement****3 credits**

Cross-listed with NE 554

Radiation transport and shielding concepts. Methods for quantifying attenuation of nuclear particles and electromagnetic radiation. Radiation detection methods, data acquisition and processing.

**Prereq:** MATH 310 or Permission

**TM 537 Nuclear Material Storage, Transportation and Disposal****3 credit**

Cross-listed with NE 527.

There is a wide range of nuclear materials that are stored, transported and disposed of each day. The materials include medical radioisotopes, new fuel pellets, used fuel, and industrial radioisotopes. This course will cover the regulations that govern nuclear material storage, transportation and disposal, as well as the engineering requirements and practical aspects of handling these materials.

**TM 538 Management of Nuclear Facilities****3 credits**

Cross-listed with NE 528

Nuclear facilities need a sustainable management system to make sure that matters of importance are not dealt with in isolation of other issues in the decision making process. Integrating all relevant issues, ranging from safety, security and safeguards to health and economic and environmental questions, leads to well-informed and balanced decisions. This course addresses from a practical point of view the safety and regulatory issues of operating and planned reactors in the U.S. and other countries.

**TM 552 Industrial Ergonomics****3 credits**

A course designed to focus on work design and ergonomics in occupational settings. Specific attention will be focused on introducing the terminology and the techniques used in work design, and on the fundamental concepts embodied in industrial ergonomics. (Summer only)

**TM 596 Capstone Integration****1 credit**

Capstone integration of degree material in Technology Management and comprehensive final exam.

**Prereq:** Advisor or Major Professor Permission

**TM 598 (s) Internship****Credit arranged****TM 599 (s) Non-thesis Master's Research****Credit arranged**

Research not directly related to a thesis or dissertation.

**Prereq:** Permission