

# DEPARTMENT OF ENGINEERING TECHNOLOGY

## Overview

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The Department of Engineering Technology offers four-year degree programs in Engineering Technology with majors in Construction Engineering Technology and Manufacturing Engineering Technology as well as its two concentrations: Bio-Manufacturing and Design & Technical Graphics. In addition, the Department offers a two-year (AAS) degree in Manufacturing Engineering Technology. The Department works in collaboration with regional universities to provide engineering transfer programs, 2 dual degree programs in Engineering Technology and Engineering.

## Engineering Technology

Engineering technology has been defined as that part of the technological field which requires the application of scientific and engineering knowledge and methods combined with technical skills in support of engineering activities; it lies in the occupational spectrum between the craftsman and the engineer at the end of the spectrum closest to the engineer.

Engineering technology is oriented less toward theory and more toward practical applications. The term "engineering technician" is applied to the graduates of associate degree programs. Graduates of baccalaureate programs are called "engineering technologists."

Transfer Programs

### Pre-Engineering

The students in the pre-engineering transfer program are strongly encouraged to work with their advisor in the Department of Engineering Technology to develop a transfer plan.

The exact plan followed will depend on the specialized area (civil, chemical, mechanical, electrical, etc.) and the engineering school to which the student plans to transfer. Also, many students are not prepared for calculus their first semester and special programs must be arranged. Students will not receive a pre-engineering degree or certificate from Missouri Western State University.

### Pre-Architecture

The pre-architecture transfer program is designed for students preparing themselves to transfer to a school of architecture. The students in the pre-architecture transfer program are strongly encouraged to work with their advisor in the Department of Engineering Technology to develop a transfer plan and to contact an advisor at their chosen transfer university. Students will not receive a pre-architecture degree or certificate from Missouri Western State University.

## Majors

- Construction Engineering Technology (Bachelor of Science, B.S.) (<http://catalog.missouriwestern.edu/undergraduate/business-professional-studies/engineering-technology/construction-engineering-technology-bs/>)
- Manufacturing Engineering Technology (Bachelor of Science, B.S.) (<http://catalog.missouriwestern.edu/undergraduate/business-professional-studies/engineering-technology/manufacturing-engineering-technology-bs/>)
- Manufacturing Engineering Technology, Bio-Manufacturing Option (Bachelor of Science, B.S.) (<http://catalog.missouriwestern.edu/undergraduate/business-professional-studies/engineering-technology/manufacturing-engineering-technology-bs-bio-manufacturing-option/>)
- Manufacturing Engineering Technology, Design & Technical Graphics Option (Bachelor of Science, B.S.) (<http://catalog.missouriwestern.edu/undergraduate/business-professional-studies/engineering-technology/manufacturing-engineering-technology-bs-design-technical-graphics-option/>)
- Manufacturing Engineering Technology (Associate of Applied Science, A.A.S.) (<http://catalog.missouriwestern.edu/undergraduate/business-professional-studies/engineering-technology/manufacturing-engineering-technology-aas/>)

## Minors

- Cognitive Science Minor (<http://catalog.missouriwestern.edu/undergraduate/interdisciplinary-studies/cognitive-science-minor/>)
- Construction Management Minor (<http://catalog.missouriwestern.edu/undergraduate/business-professional-studies/engineering-technology/construction-management-minor/>)
- Entrepreneurship Minor (<http://catalog.missouriwestern.edu/undergraduate/interdisciplinary-studies/entrepreneurship-minor/>)
- Manufacturing Technology Minor (<http://catalog.missouriwestern.edu/undergraduate/business-professional-studies/engineering-technology/manufacturing-technology-minor/>)

## Courses

### Construction Engineering Technology (CET)

**CET 101 Construction Industry Introduction Credits: 3**

**Typically Offered:** Fall, Spring.

**Course Description:** This foundational course introduces students to the diverse construction industry. Topics include various business sectors and companies, project and contract delivery methods, and the roles of key stakeholders such as owners, contractors, and engineers. Students will learn essential construction terminology and processes involved in managing construction projects. The course highlights the importance of reading and interpreting working drawings and construction documents, utilizing computer technologies, and understanding legal and safety requirements. By the end of the course, students will have a comprehensive overview of career opportunities in construction and the skills necessary for success in the field.

**CET 105 Construction Materials Credits: 3**

**Typically Offered:** Fall.

**Course Description:** Introductory study of materials used in the construction industry. Materials are studied with regard to properties of their substances and utilization in construction.

**CET 202 Surveying I Credits: 3****Typically Offered:** Fall.

**Course Description:** Introduction to the basic principles of plane surveying with applications to engineering and construction problems; uses laboratory periods for in-the-field applications of introductory surveying techniques. Relevant computer software will be used. Two hours lecture, three hours lab. **Prerequisite(s):** Credit or concurrent enrollment in both MAT 116 and MAT 119.

**CET 250 Introduction to Statics, Strength of Materials and Structures Credits: 4****Typically Offered:** Spring.

**Course Description:** Studies fundamentals of statics and mechanics of materials as they apply to construction processes such as statics equilibrium, axial, torsional, bending, and stress and strain analysis. Introduction to various methods used in analysis of structures such as beams, trusses and frames will be included. Three hours lecture, three hours lab. **Prerequisite(s):** MAT 116 and MAT 119.

**CET 252 Advanced Surveying Credits: 3****Typically Offered:** Spring.

**Course Description:** Intermediate and advanced surveying techniques and procedures with applications to engineering and construction problems; includes mapping, hydrography, and photogrammetry; promotes in-the-field application of techniques. **Prerequisite(s):** CET 202 and credit or concurrent enrollment in EGT 205.

**CET 254 Construction Methods and Equipment Credits: 4****Typically Offered:** Spring.

**Course Description:** Introduction to the basic knowledge and skills of methods of building construction including foundation, structural framing, floor, roof, and wall systems; to the acquisition, selection, and use of construction equipment; and to the reading of construction blueprint drawings and specifications. Three hours lecture, three hours lab. **Prerequisite(s):** CET 105.

**CET 255 Legal Aspects of Boundary Surveying Credits: 3****Typically Offered:** Fall.

**Course Description:** Includes preparation of plats and writing of property descriptions referenced to Public Land Surveys of Subdivision of Townships and Sections. Discusses surveying and land right terminology as well as resurveying, retracing, restoration, monumentation and dedication. Also studies selected case law. Computer programs and field trips will be utilized. **Prerequisite(s):** Credit or concurrent enrollment in CET 202.

**CET 256 Bituminous, Concrete and Soils Credits: 3****Typically Offered:** Spring.

**Course Description:** Studies the properties and engineering applications of prime materials used in structural and roadway construction, including classification, basic quality control, and construction practices used with respect to asphalt, concrete, and soils. Two hours lecture, three hours lab. **Prerequisite(s):** CET 105.

**CET 260 Mechanics of Materials Credits: 4****Typically Offered:** Spring.

**Course Description:** Axial, torsional, bending, and combined stress and strain analysis; mechanical properties and applications for static, fatigue, creep, and impact conditions; emphasizes beam stresses and deflections, columns, and riveted and welded connections. There will be specific emphasis on quality and accuracy for reports and assignments. Three hours lecture, three hours lab. **Prerequisite(s):** EGT 260.

**CET 265 Subdivision Planning and Layout Credits: 3****Typically Offered:** Spring.

**Course Description:** Platting of boundaries, topographic layout, planning and layout for streets, sewers and water lines. Building site surveys.

**Prerequisite(s):** CET 202.**CET 270 Electrical Installations Credits: 3****Typically Offered:** Spring.

**Course Description:** Studies of DC circuits and electrical components, including conductors, insulators, resistors, inductors, capacitors, switches, voltage and current sources. Fundamentals of AC circuits, motors and generators, three-phase industrial power, power generation, distribution, transmission, and transformers. Includes laboratory sessions to demonstrate and reinforce understanding of these topics. Two hours lecture, three hours lab. **Prerequisite(s):** CET 105 or EGT 220.

**CET 290 Construction Technology Internship Credits: 1-3****Typically Offered:** Fall, Spring, Summer.

**Course Description:** Intended for students working full-time or part-time for a company in a job related to their major, which reinforces and extends knowledge and skills. Requires periodic progress reports, supervisor evaluation and a formal final report addressing the experience and the educational benefits derived. **Prerequisite(s):** Departmental approval.

**CET 302 Electronic Surveying Credits: 4****Typically Offered:** Spring.

**Course Description:** Land surveying work utilizing electronic surveying equipment including but not limited to: total station with data collector, topographic surveying utilizing data collection down-loaded into software program utilizing AutoCAD for topographic contouring, utilization of collected data for microstation mapping, utilization of GPS equipment for traversing and also techniques of GIS mapping. **Prerequisite(s):** CET 202 and credit or concurrent enrollment in EGT 205.

**CET 308 Analysis of Structures Credits: 3****Typically Offered:** Fall.

**Course Description:** Introduction to various methods used in the analysis of statically determinate and indeterminate structures. Load path, load tracing, and code provisions are discussed. Three hours lecture.

**Prerequisite(s):** CET 260 and MAT 147.**CET 315 Mechanical Systems Credits: 3****Typically Offered:** Fall.

**Course Description:** Principles of water supply and treatment, plumbing, sanitation systems, heating, ventilation and air conditioning. Two hours lecture, three hours lab. **Prerequisite(s):** CET 105.

**CET 351 Construction Estimating I Credits: 3****Typically Offered:** Spring.

**Course Description:** An introduction to estimating techniques in construction projects. The course will focus on quantity take-offs such as earthwork, concrete, masonry, metals, woods, finishes, thermal and moisture protection, HVAC, and electrical. Includes overview of the estimating and bidding process, estimate development, labor rates, material pricing, and errors in estimates. Includes computer applications and ethical issues in bidding. Two hours lecture, three hours lab.

**Prerequisite(s):** CET 105 and EGT 205.**CET 358 Structural Steel and Wood Design Credits: 3****Typically Offered:** Spring.

**Course Description:** Introduction to elementary structural steel and wood design; design of individual members and their connections as dictated by various specifications (AISC, AITC, AASHTO, etc.). Includes computer techniques in the areas of structural analysis/design. **Prerequisite(s):** CET 308.

**CET 360 Construction Management Credits: 3****Typically Offered:** Fall.**Course Description:** Introduction to the business of construction including professional responsibilities and roles of the contractor, superintendent, designer, owner and inspector; study of bid package, issues during construction phase, and project delivery methods. Includes construction contracts, procurement, planning, scheduling, safety, cash flow, value of diversity in the construction industry, and risk management.**Prerequisite(s):** CET 105**CET 362 Construction Safety Credits: 3****Typically Offered:** Fall.**Course Description:** Review of existing safety requirements pertaining to Construction and Industrial Works, and discusses practices utilized to comply with these regulations. All OSHA regulations pertaining to construction as well as CFR documents are discussed. **Prerequisite(s):** CET 105.**CET 390 Technological Projects Credits: 1-3****Typically Offered:** Fall, Spring, Summer.**Course Description:** Intended for the advanced student whose project would enrich the educational experience. Approval by the Department Chairperson is required at least two weeks before the end of the previous term. May be taken for up to 4 credit hours.**CET 408 Design of Concrete and Masonry Structures Credits: 3****Typically Offered:** Spring.**Course Description:** Introduction to the design of reinforced concrete and masonry structures. Designs are based on the current ACI codes. Class assignments or projects will require integration, knowledge from preceding courses and application of problem-solving skills acquired throughout the entire curriculum. **Prerequisite(s):** CET 308.**CET 451 Advanced Construction Estimating and Bidding Credits: 2****Typically Offered:** Fall.**Course Description:** Advanced study of estimating and bidding procedures for construction projects. Includes unit price estimating, conceptual estimating, lump sum estimating, detailed estimating, production rates, subcontract pricing, overhead allocation, markups, bidding strategies, and presentation of the bid. Use of computer software and research skills for continuous improvement. One hour lecture, three hours lab. **Prerequisite(s):** CET 254 and CET 351.**CET 456 Construction Contracts Administration Credits: 3****Typically Offered:** Spring.**Course Description:** Emphasis is given to the interpretation and preparation of construction project documents. Subjects such as contract agreement, breach of contract, termination of agreements, materials specifications, workmanship specifications, general conditions, insurance, bonds, arbitration, labor law, disadvantaged business requirements, and cases related to finance are discussed. **Prerequisite(s):** CET 360.**CET 458 Soil Mechanics and Foundations Credits: 3****Typically Offered:** Fall.**Course Description:** Studies advanced topics in the properties of soils with applications in civil engineering design and construction. Class assignments or projects will require integration, knowledge from preceding courses and application of problem-solving skills acquired throughout the entire curriculum. Two hours lecture, three hours lab.**Prerequisite(s):** CET 256 and CET 260.**CET 480 Construction Planning and Scheduling Credits: 3****Typically Offered:** Spring.**Course Description:** Principles and techniques used to plan construction and schedule project activities. Networks, bar charts, computer techniques, productivity, construction time and cost parameters. Cash flow analysis, resource planning and control, and preparation of cost-to-complete reports will be discussed. Class assignments or projects will require integration, knowledge from preceding courses and application of problem-solving skills acquired throughout the entire curriculum.**Prerequisite(s):** CET 451.**CET 485 Selected Topics in Construction Credits: 3****Typically Offered:** Spring.**Course Description:** Study of selected topics, such as underground construction, underpinning, formwork and other project support requirements; evaluation and review of current practices in construction. The course includes study and research in a specific area that combines major elements from previous construction engineering technology courses culminating in an integrating experience through individual and/or group projects, technical reports and presentations. **Prerequisite(s):** CET 105 and CET 254.**CET 490 Building Codes, Standards, and Practices Credits: 3****Typically Offered:** Departmental Discretion.**Course Description:** Emphasis on content of the four main U.S. Building Codes and the interpretation of these codes from the contractors perspective. Also covers code enforcement procedures used by administration offices of municipal governments. Class exercises involve the review of plans and specifications to determine code compliance.**Prerequisite(s):** CET 451 and CET 480.**CET 492 Computer Tools for Construction Credits: 3****Typically Offered:** Fall.**Course Description:** This course equips students with the skills to leverage computer tools for solving practical challenges in the construction industry. Key topics include computer-integrated quantity takeoff, scheduling, supply chain management, process monitoring and control, and payment tracking. The weekly lecture introduces essential theoretical concepts, providing a foundation in the principles of construction management technologies. In the lab sessions, students will apply these concepts using industry-standard software, gaining hands-on experience with real-world scenarios. By the end of the course, students will be proficient in utilizing computer tools to optimize construction processes and improve project efficiency. Must be taken concurrently with CET 480.

## Engineering Technology (EGT)

**EGT 101 Manufacturing Industry Introduction Credits: 3****Typically Offered:** Fall, Spring.**Course Description:** This course provides a comprehensive introduction to the manufacturing industry, exploring a variety of career paths and opportunities within the field. Students will gain insights into different manufacturing sectors, company types, and project structures. The course covers various manufacturing systems and the application of engineering principles to improve processes by reducing cycle times, maintaining quality, enhancing safety, and controlling costs. Through an understanding of the roles and responsibilities of key participants in manufacturing projects, students will develop foundational knowledge essential for a successful career in manufacturing. This course is ideal for anyone aspiring to enter the manufacturing industry.

**EGT 102 Programming for Engineering Technology Credits: 3****Typically Offered:** Fall, Spring.**Course Description:** Fundamental concepts about computers and approaches to computer programming including top-down design, selection control structures (if else, switch statements), repetition control structures (while, for, and do while loops), simple data types, arrays, strings, etc. Study of selected computer programming language.**EGT 103 Electronics Engineering Technology Fundamentals Credits: 1****Typically Offered:** Fall, Spring.**Course Description:** Introduction to electronics engineering technology concepts, OSHA safety, ethics, and career potentials. Study of teamwork, diversity and globalization, quality, timeliness, continuous improvement and lifelong learning.**EGT 105 Introduction to Architecture Credits: 3****Typically Offered:** Fall, Spring.**Course Description:** This course introduces to the student and understanding and appreciation of architecture and human built environment through a broad examination of cultural and aesthetic paradigms. The student will be informed of the historic legacy and value of architecture; how it impacts society today and daily lives. Three hours lecture.**EGT 110 ET Fundamentals and Critical Thinking Credits: 3****Typically Offered:** Fall.**Course Description:** Introduction to engineering technology concepts, ethics, career potentials, and critical thinking. Study of teamwork, diversity and globalization, quality, timeliness, continuous improvement and lifelong learning, methodology of critical thinking and required mathematics and physics knowledge. Three hours lecture.**EGT 205 Computer-Aided Drafting I Credits: 3****Typically Offered:** Fall, Spring.**Course Description:** Techniques in drafting with computer applications. Students will use a CAD software to produce mechanical, electrical and/or architectural drawings and will explore other software with their applications. The emphasis is on orthographic projections, sections, auxiliary views, dimensioning, component libraries and the applications of drafting using descriptive geometry. Two hours lecture, three hours lab.**EGT 215 Computer-Aided Drafting II Credits: 3****Typically Offered:** Fall, Spring.**Course Description:** Advanced techniques in drafting with computer applications. Students expand their drafting skills by creating computer generated multi-detailed drawings using 3-D techniques. Architectural, structural, mechanical, and/or electrical applications will be discussed with emphasis in detailing, tolerances, and symbol libraries. Importing/exporting of files, customizing the CAD software, and productivity techniques will be used. Principles of drawing for residential structures using various construction materials and methods will be included. Two hours lecture, three hours lab. **Prerequisite(s):** EGT 205.**EGT 220 Engineering Materials Credits: 3****Typically Offered:** Fall.**Course Description:** An introduction to the relationship between structure, processing and properties of materials; including atomic structure, strain hardening and annealing, solidification, ferrous and non-ferrous alloys, ceramic materials, polymers, composite materials, behavior of materials, and protection against deterioration of materials.**EGT 225 Computer-Aided Manufacturing Credits: 3****Typically Offered:** Spring.**Course Description:** Application of computer assistance in manufacturing process; machine process control, inventory and material handling, robotics and automated assembly, product design and part grouping in relation to total manufacturing operation. **Prerequisite(s):** EGT 215.**EGT 260 Statics Credits: 3****Typically Offered:** Fall.**Course Description:** Fundamentals of statics; static equilibrium; topics of study include elements of statics in two and three dimensions; laws of equilibrium applied to structures and machines. **Prerequisite(s):** MAT 119.**EGT 265 Engineering Statics Credits: 3****Typically Offered:** Fall.**Course Description:** Composition and resolution of forces; equilibrium of force systems; application of the principles of statics to problems, including force analyses of simple structures. Centroids; moments of inertia. **Prerequisite(s):** MAT 167 and PHY 210.**EGT 290 ET Practicum/Co-op Credits: 3****Typically Offered:** Spring.**Course Description:** Intended for advanced students working full-time or part-time for a company in a job related to their major, which reinforces and extends knowledge and skills. Requires periodic progress reports, supervisor evaluation and a formal final report addressing the experience and the educational benefits derived.**EGT 345 3D Modeling and Design Processes Credits: 3****Typically Offered:** Spring.**Course Description:** This course will investigate the creation and manipulation of three-dimensional forms and environments using experimental methods - primarily digitally based methods coupled with new forms of output such as 3D printing. Two hours lecture, three hours lab. **Prerequisite(s):** EGT 215.**EGT 350 Engineering Documentation Credits: 3****Typically Offered:** Spring.**Course Description:** Studies various forms of reports; includes practical projects in preparing reports of various lengths and degrees of complexity and oral presentation of report material; emphasizes clear communication of technical ideas. **Prerequisite(s):** ENG 104.**EGT 356 Fluids and Hydraulics Credits: 3****Typically Offered:** Spring.**Course Description:** Introduction to fluid mechanics including fluid statics and elementary fluid dynamics; includes energy equations of steady flow, steady flow of incompressible fluids in pipes, and open channel flow. Three hours lecture. **Prerequisite(s):** PHY 110 and credit or concurrent enrollment in MAT 147.**EGT 370 Financial Aspects of Engineering Projects Credits: 2****Typically Offered:** Spring.**Course Description:** Principles of engineering decision making process, including simple and compound interest calculations, equivalence, present worth, uniform annual cost, rate of return, depreciation, equipment replacement, and competing projects. **Prerequisite(s):** MAT 116.**EGT 390 ET Seminar Credits: 2****Typically Offered:** Fall.**Course Description:** Provide the students with the basic knowledge and skills needed as an employee and prepare them to be workforce ready. The course covers personal finance, time management, job hunting skills, basic business structure, employee characters, etc.



**EGT 400 Dynamics Credits: 3**

**Typically Offered:** Departmental Discretion.

**Course Description:** Motion of a particle; kinetics of rigid bodies; work and energy; impulse and momentum; impact. **Prerequisite(s):** EGT 265.

**EGT 440 Thermodynamics Credits: 3**

**Typically Offered:** Departmental Discretion.

**Course Description:** Fluid properties, work and heat, first law, second law, entropy, applications to vapor, and ideal gas processes. **Prerequisite(s):** EGT 260 or PHY 210.

**EGT 450 Independent Research/Project Credits: 1-4**

**Typically Offered:** Fall, Spring, Summer.

**Course Description:** Investigation of a research problem, project, or topic on an individual conference basis. May be taken for up to 4 credit hours. **Prerequisite(s):** Minimum of 2.5 GPA in major field and department chairperson's approval.

**EGT 490 Engineering Technology Internship Credits: 1-4**

**Typically Offered:** Fall, Spring, Summer.

**Course Description:** Intended for advanced students working full-time or part-time for a company in a job related to their major, which reinforces and extends knowledge and skills. Requires periodic progress reports, supervisor evaluation and a formal final report addressing the experience and the educational benefits derived. May be taken for up to 4 credit hours. **Prerequisite(s):** Junior or Senior standing, declared engineering technology major, a minimum of 2.5 GPA, and department chairperson's approval.

## Manufacturing Engineering Technology (MET)

**MET 100 Electrical Circuits for Manufacturing Credits: 3**

**Typically Offered:** Fall.

**Course Description:** Studies fundamentals of electricity, solution of DC and AC circuits, motors and generators, three-phase industrial power, power generation, distribution, transmission, and transformers. Includes laboratory sessions to demonstrate and reinforce understanding of these topics. Two hours lecture, three hours lab.

**MET 101 Electronic Instrumentation for Manufacturing Credits: 3**

**Typically Offered:** Spring.

**Course Description:** Studies electronic devices used in manufacturing and control equipment, such as diodes, transistors, SCR's, triacs, and integrated circuits. Also studies electronic circuits including power supplies, amplifiers, oscillators, digital electronics, basic principles of electronic communications, and electronic control circuits.

**Prerequisite(s):** MET 100.

**MET 111 Manufacturing Processes Credits: 2**

**Typically Offered:** Spring.

**Course Description:** Introduction to manufacturing engineering. OSHA safety regulations, GMP, quality control, SPC, Lean manufacturing and Six-sigma.

**MET 132 Manufacturing Methods Credits: 3**

**Typically Offered:** Spring.

**Course Description:** Machine shop practices using hand tools, precision measuring equipment, and machine tools. Topics include metal casting and forming, machining of materials, and inspection. Operating traditional machine tools such as engine lathe, milling machines, drill presses and grinders. Two hours lecture, three hours lab.

**MET 223 Machines and Tooling Credits: 3**

**Typically Offered:** Fall.

**Course Description:** Introduction to tooling for different machining processes, machining fixtures, jigs, and dies. Study and practice manufacturing and inspection procedures and the necessary equipment needed to manufacture specific products or components. **Prerequisite(s):** MET 132.

**MET 232 Computer Integrated Manufacturing Credits: 2**

**Typically Offered:** Fall.

**Course Description:** Study of the various components and operations in automated manufacturing systems including material handling, robotics, tooling, inspection, and quality control. Study of PLC programming and operation. One hour lecture, two hours lab. **Prerequisite(s):** MET 101.

**MET 241 CNC Machining Credits: 3**

**Typically Offered:** Spring.

**Course Description:** Basic theory and laboratory work in basic programming, operation and maintenance of CNC machines. Two hours lecture, three hours lab. **Prerequisite(s):** MET 132.

**MET 242 CNC Machining Processes Credits: 2**

**Typically Offered:** Fall.

**Course Description:** Study and practice of CNC machine operation including setup, programming, coordinate system, tool change, tool compensation, work-hold, and machine-computer interface. One hour lecture, two hours lab. **Prerequisite(s):** MET 132.

**MET 260 Mechanics of Materials Credits: 4**

**Typically Offered:** Spring.

**Course Description:** Axial, torsional, bending, and combined stress and strain analysis; mechanical properties and applications for static, fatigue, creep, and impact conditions; emphasizes beam stresses and deflections, columns, and riveted and welded connections. There will be specific emphasis on quality and accuracy for reports and assignments. Three hours lecture, three hours lab. **Prerequisite(s):** EGT 260.

**MET 285 Selected Topics in Manufacturing Credits: 3**

**Typically Offered:** Departmental Discretion.

**Course Description:** Study of selected topics in manufacturing, including the evaluation and review of specific manufacturing processes and study in a given area that combines previous manufacturing engineering courses culminating in an integrated experience through an individual technical report and presentation. **Prerequisite(s):** MET 101, MET 111, and MET 132.

**MET 315 Mechanical Systems Credits: 3**

**Typically Offered:** Fall.

**Course Description:** Principles of water supply and treatment, plumbing, sanitation systems, heating, ventilation and air conditioning. Two hours lecture, three hours lab. **Prerequisite(s):** EGT 220.

**MET 322 Advanced Electrical Circuits for Manufacturing Credits: 4**

**Typically Offered:** Spring.

**Course Description:** Analysis of series and parallel DC networks by various methods including mesh and nodal analyses, network theorems (Thevenin's, Norton's and Superposition). Analyses of AC series and parallel networks (RL, RC & RLC circuits), phasors, reactances, power, AC network theorems, sinusoidal AC voltages, currents, impedances and admittances, transformers, and circuit analysis applications using computer simulation program. Troubleshooting and maintenance are also discussed. Laboratory exercises using AC sources, dual-trace oscilloscope, frequency generator, and circuit prototyping reinforce the lecture concepts. Three hours lecture, three hours lab. **Prerequisite(s):** MET 100.

**MET 324 Industrial Controls Credits: 3****Typically Offered:** Fall.

**Course Description:** Studies of the basic principles and applications of industrial controls. Introduction to industrial control systems, solid state devices in industrial application, using thyristor devices such as SCRs and Triacs, discrete automation sensors and devices, DC and AC motors and their controls, transformers and their applications, microcontrollers control applications, and programmable logic controllers applications. Troubleshooting and maintenance for the control equipment/system are also discussed. **Prerequisite(s):** MET 322.

**MET 325 Machine Parts and Mechanical Design Credits: 3****Typically Offered:** Spring.

**Course Description:** Introduction to the design and analysis of machine elements, such as shafting, springs, screws, belts, brakes, clutches, gears, and bearings. Emphasis on materials, loads, stress, strain, deflection, and quality. **Prerequisite(s):** EGT 260.

**MET 372 Programmable Logic Controllers Credits: 4****Typically Offered:** Spring.

**Course Description:** Studies programmable logic controllers (PLC's); hardware components, memory structure, I/O modules, PLC ladder logic diagrams and basic programming functions, sequencing, contact and coil programming, fail-safe circuits and applications. Laboratory experiments feature hardware/software applications using industrial-grade PLC's of the major manufacturers interfaced with I/O devices for data acquisition and control experiments. Three hours lecture, three hours lab. **Prerequisite(s):** MET 232.

**MET 390 Manufacturing Technology Internship Credits: 1-4****Typically Offered:** Fall, Spring, Summer.

**Course Description:** Analysis, development and implementation of a project or work and study in an approved position in industry to enrich educational experience. **Prerequisite(s):** Department chairperson's approval.

**MET 422 Electrical Power Technology Credits: 3****Typically Offered:** Spring.

**Course Description:** Studies the principles and applications of various types of DC and AC generators and motors, methods of power control, using thyristor devices, solid-state AC and DC motor drives and servo mechanisms, microcontrollers control applications for motor drives, interface to programmable logic control systems, inverters, converters, and cycloconverters; principles of three-phase power systems; transformers; generation, transmission, motors/generators, and three-phase power relationships. Three hours lecture. **Prerequisite(s):** MET 322.

**MET 452 Automation and Process Control Technology Credits: 4****Typically Offered:** Fall.

**Course Description:** Studies principles of feedback control systems, compensation techniques, major types of sensors, electromechanical components and the interface between mechanics and electronics. Three hours lecture, three hours lab. **Prerequisite(s):** MET 372.

**MET 462 Production Planning and Control Credits: 3****Typically Offered:** Fall.

**Course Description:** This course covers models and techniques for designing integrated production systems to manage material, service, and information flows in response to changing market demands. Topics include forecasting, aggregate planning, operations strategy, capacity planning, supply chain management, JIT systems, lean manufacturing, materials requirement planning, inventory management, short-term scheduling, sequencing, and line balancing. **Prerequisite(s):** MET 132 and MAT 147.

## Faculty

**Goksu Avdan** (2024) Assistant Professor, Engineering. Ph.D., Southern Illinois University - Edward.

**Angela Caw** (2006) Professor of Practice, Engineering. B.S., Missouri Western State University.

**Tiffany Davis** (2016) Professor of Practice, Engineering. M.A.S., Missouri Western State University.

**Dennis Merritt** (2012) Professor of Practice, Engineering. Ph.D., Saint Louis University.

**Jinwen Zhu** (2005) Professor, Engineering. Ph.D., University of North Carolina - Charlotte.