TECHNOLOGY (TECH)

This course provides an introduction to the fundamentals of technical drawing and the related graphical tools used to communicate engineering design concepts. The topics include two dimensional graphics, orthographic projections, geometric dimensioning and tolerancing, computer-aided graphics, parametric solid modeling, and introduction to three dimensional graphics.

about Engineering Design Graphics
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Grade Mode: Standard Letter

TECH 1330. Assembly Processes.
Basic assembly process to include gas, arc, resistance, thermite, induction, and forge welding; weld-ability, weld metallurgy, weld symbology, and weld testing; brazing; soldering; mechanical fastening to include threaded fasteners, rivets, shrink and press fits, seams, staples, crimping, and structural adhesives. Principles of joint design and cost estimation. An overview of electronics assembly processes and automated assembly.

about Assembly Processes
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

TECH 1363. Manufacturing Processes I.
The course will provide an overview of the manufacturing processes. Major emphasis is placed on machining theory, setup and tooling. Metal forming and fabrication procedures are introduced. Joining and assembly includes welding, mechanical fastening, adhesive bonding and surface finishing concepts. Laboratory demonstrations and tutorials involve machining, joining and forming techniques.

about Manufacturing Processes I
3 Credit Hours. 2 Lecture Contact Hours. 3 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

TECH 1393. Manufacturing Processes II.
The course involves the fundamentals of casting and molding processes. Emphasis is placed on casting terminology, molding sand, molding processes, pattern making, coremaking and quality control. Ferrous and non-ferrous alloy composition and casting geometry are explored. Plastic and composite forming concepts are included. Microelectronic manufacturing principles and processes are introduced. Prerequisite: TECH 1363.

about Manufacturing Processes II
3 Credit Hours. 2 Lecture Contact Hours. 3 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

TECH 2190. Industrial Internship.
This course is a supervised experiential learning course in various technical disciplines as appropriate to a student's degree program. This work integrated learning course helps the student link theory with practice. Repeatable for credit. Prerequisites: 45 hours completed with at least 12 having been completed at Texas State and a minimum major GPA of 2.25.

about Industrial Internship
1 Credit Hour. 0 Lecture Contact Hours. 4 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Credit/No Credit

TECH 2310. Introduction to Computer-Aided Design (CAD).
Principles of 3D modeling are introduced in the preparation of drawings for manufacturing processes. Emphasis includes the parametric solid modeling of machine elements and geometric dimensioning and tolerancing. The laboratory component involves production of engineering drawings and simulations connecting this course to computer-aided engineering. Prerequisite: ENGR 1313 or instructor's approval.

about Introduction to Computer-Aided Design (CAD)
3 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

Fundamentals of Material Removal. (3-0) An overview of the micro and macro structure of materials is studied. Assessment of materials with regard to their chemical and mechanical properties and how these properties relate to machining is explored. Machining conditions with regard to feed, speed, surface finish, tooling requirements, horsepower capabilities, time, and cost analysis complete the class. Prerequisite: MATH 1315.

about Fundamentals of Material Removal
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

TECH 2344. Power Technology.
This class deals with understanding the basic laws of thermo-dynamics. It probes efficiency and examines energy-converting devices from the inputs, processes, outputs model. Internal combustion engines, electric motors, hydraulic, pneumatic, and gearing systems, and fuel analysis are reviewed from a practical and theoretical perspective.

about Power Technology
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter
Course covers principles of statics and strength of materials to include forces, equilibrium, friction, centroids, and stress/strain relationships, axial stress and deformation, thermal stress and deformation, stress concentrations, factor of safety, torsional stress, beam stresses and combined stress. Prerequisites: CSM 2342 or ENGR 2300, PHYS 1315 and PHYS 1115 or PHYS 1410 or PHYS 1430, all courses with a grade of C or higher.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Statics and Strength of Materials

TECH 2370. Electricity/Electronics Fundamentals.
Fundamentals of safety, Ohm's Law, series, parallel, and seriesparallel circuits, meters, relays, and basic transistor circuits. 3310 Industrial Design. (3-0) The fundamentals, elements, and principles of design applied in creative ways to industrial design problems emphasizing function, form, and aesthetics. Ergonomics, product life cycles, environmental concerns, and use of elementary statics for stress analysis. (WI).

3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter
TCCN: ENGR 2305
about Electricity/Electronics Fundamentals

TECH 3322. Development of Technology.
The role of technology in the development of Western World culture is studied from a technical perspective. Social repercussions resulting from the introduction of foundational technical developments are reviewed. Examples of technical areas examined are agriculture, transportation, manufacturing, engineering, defense, and communications. Readings focus discussions and papers on specific topics and encourage synthesis level understanding. (WI).

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Multicultural Content
Writing Intensive
Grade Mode: Standard Letter
about Development of Technology

TECH 3344. Applied Thermofluids.
Basic concepts, first and second laws of thermodynamics, thermodynamic properties, heat transfer by conduction, convection and radiation, fluid statics and fluid dynamics are studied. Prerequisites: TECH 2344 and PHYS 1430.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Applied Thermofluids

The course provides an in-depth understanding of the lean principles as they apply to manufacturing and service organizations with emphasis on lean tools and concepts such as Value Stream Mapping, SS, kaizen, waste, takt/cycle time, visual control, six-sigma, mistake proofing, single piece flow, cell design and pull systems. Prerequisite: TECH 3364.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Principles of Lean Systems

TECH 3357. Facilities Planning and Design.
This project-based course provides students with a practical knowledge of designing efficient facility layout and material handling system. Systematic layout planning (SLP) based on a product and process information is studied in depth. Simulation tools are used for flow analysis. Prerequisites: TECH 2310.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Facilities Planning and Design

TECH 3364. Quality Assurance.
This course covers the principles of quality management to include basic probability and statistics concepts, control charts for attributes and variables, sampling plans, quality audits and costs. The laboratory component of this class includes exercises that provide exposure to basic metrology and data collection.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Quality Assurance

TECH 3370. Electronics.
This course is a study of the characteristics of basic electronic circuits and their component parts. Course content includes the use of electronic test equipment, inductance, capacitance, reactance, impedance, rectification, switching, amplification, and electronic circuit fabrication. Prerequisite: TECH 2370 or EE 2400.

3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter
about Electronics

This course deals with basic principles of communication systems. Specific topics include analysis of signals and systems, modulation techniques (digital and analog), analysis of transmitters and receivers, networking, and wireless communication systems. Prerequisites: TECH 2370 or EE 2400.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Communication Systems

TECH 4197. Special Problems.
The investigation of a special topic by developing the problem, researching the topic, and presenting the findings as they apply to industry/technology. This course will be applicable to all areas of technology, and must be done only with the approval of the cooperating faculty member and Department Chair. Repeatabale for credit with different emphasis.

1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter
about Special Problems
TECH 4330. Foundry & Heat Treatment.
The technical aspects of foundry and heat treatment of ferrous and non-ferrous metals are reviewed. Students gain proficiency with interpretation of binary phase diagrams, mathematical modeling of gate and runner systems, micro-structural analysis, process cost evaluation, sand testing, investment casting and other technical processes. Technical report writing is an important part of this class. Data collection and data analysis with experiments allow students to develop appropriate techniques for presenting technical data in report format. Prerequisites: TECH 2310, ENGR 2300 and TECH 2351 or MFGE 2332 or Instructor’s Approval. (WI).

Grade Mode: Standard Letter
Course Attribute(s): Lab Required|Writing Intensive
about Foundry & Heat Treatment
3 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.

TECH 4345. Method Engineering and Ergonomics.
The course provides an in-depth understanding of the lean principles as they apply to manufacturing and service organizations with emphasis on lean tools and concepts such as Value Stream Mapping, 5S, kaizen, waste, takt/cycle time, visual control, six-sigma, mistake proofing, single piece flow, cell design and pull systems. Prerequisite: TECH 3364.

Grade Mode: Standard Letter
Course Attribute(s): Lab Required
about Method Engineering and Ergonomics
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

This course will provide students with fundamentals of manufacturing processes planning and engineering. Major emphasis will be placed on make-buy analysis, tolerance analysis and dimensional control, tool and fixture design, process and material selection, design for manufacturing, design for assembly, and process planning. Prerequisites: TECH 1393 and TECH 2310.

Grade Mode: Standard Letter
Course Attribute(s): Lab Required
about Manufacturing Process Engineering
3 Credit Hours. 1 Lecture Contact Hour. 3 Lab Contact Hours.

Principles of the design of mechanical components; theories of failure; material selection; design of shafts, gears, cams, fasteners, springs and brakes; dynamics; balancing of machinery and vibration control are studied. Prerequisites: TECH 2310 and TECH 2351.

Grade Mode: Standard Letter
Course Attribute(s): Lab Required
about Machine Elements: Dynamics and Design
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.

TECH 4367. Polymer Properties and Processing.
Structure, physical & mechanical properties, design considerations and processing methods for polymer-based materials are presented. Processing methods include: injection molding, blow molding, thermoforming, compression molding, extrusion, filament winding, lay-up methods, vacuum bag molding and poltrusion. Prerequisite: ENGR 2300.

Grade Mode: Standard Letter
Course Attribute(s): Lab Required
about Polymer Properties and Processing
3 Credit Hours. 3 Lecture Contact Hours. 1 Lab Contact Hour.
TECH 4385. Driver and Traffic Safety Education II.
Content, methods and materials for instruction in the laboratory phase of driver education in Texas. Topics include in-car instruction, multi-car range, and simulation. During laboratory sessions participants will observe in-car instructors, peer teach in the car, and teach a high school student how to drive. TECH 4383 and 4385 will be taken simultaneously. Prerequisites: TECH 4383 and a good driving record.
Repeatable for credit. Prerequisites: Consult internship coordinator. (WI).
three credit hours. three lecture contact hours. three lab contact hours.
Course Attribute(s): Exclude from 3-peat Processing|Lab Required
Grade Mode: Standard Letter
about Driver and Traffic Safety Education II

TECH 4387. Motorcycle Safety and Rider Education.
Techniques and methods of teaching beginner rider education. Includes classroom techniques as well as laboratory experience in on-street and off-street riding. Not applicable to the BS in Technology program. about Motorcycle Safety and Rider Education
three credit hours. three lecture contact hours. three lab contact hours.
Course Attribute(s): Exclude from 3-peat Processing|Lab Required
Grade Mode: Standard Letter
about Motorcycle Safety and Rider Education

TECH 4389A. Advanced Residential Construction.
Advanced concepts in residential construction are covered including land acquisition, land development, infrastructure, deed restrictions, cash flow, financial forecasting, marketing, scheduling and sustainable building practices. Prerequisite: CSM 2360 with a grade of "C" or higher.
about Advanced Residential Construction
three credit hours. three lecture contact hours. three lab contact hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter
about Advanced Residential Construction

TECH 4389B. Construction Industry Best Practices.
This course will cover current issues facing the construction industry today including the best practices used to resolve these issues. Several industry leaders will lecture on these contemporary problems facing the industry. Restricted to Junior level Construction Science and Management Majors.
about Construction Industry Best Practices
three credit hours. three lecture contact hours. three lab contact hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter
about Construction Industry Best Practices

TECH 4390. Internship.
Supervised on-the-job professional learning experience in construction, manufacturing, electronics, and other technical areas. This course provides practical work experience in their particular field of interest. Repeatable for credit. Prerequisites: Consult internship coordinator. (WI).
about Internship
three credit hours. four lecture contact hours. forty lab contact hours.
Course Attribute(s): Exclude from 3-peat Processing|Dual Enrollment|Time Conflicts Permitted|Writing Intensive
Grade Mode: Standard Letter
about Internship

TECH 4392. Micro and Nano Manufacturing.
This course covers the basic principles of micro and nano manufacturing. Emphasis is placed on the process descriptions, terminology, equipment requirements, and processes for micro and nano systems. Basic physics and process chemistry is combined with control schemes to arrive at overall systems descriptions. Prerequisites: CHEM 1335 or CHEM 1341, and PHYS 1325 or PHYS 1420 or PHYS 2425.
about Micro and Nano Manufacturing
three credit hours. three lecture contact hours. three lab contact hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter
about Micro and Nano Manufacturing

TECH 4393. Driver and Traffic Safety Education III.
Content, procedures, and administration of multi-phase driver education programs. Topics include scheduling, maintenance and operation of laboratory equipment, record keeping, lesson plan development, and driver education for the handicapped. Practicum in classroom and/or simulation instruction. Not applicable to the Bachelor of Science in Technology degree program. Prerequisite: TECH 4383, TECH 4385, and TECH 4393 may be taken simultaneously.
about Driver and Traffic Safety Education III
three credit hours. three lecture contact hours. three lab contact hours.
Course Attribute(s): Exclude from 3-peat Processing|Lab Required
Grade Mode: Standard Letter
about Driver and Traffic Safety Education III

TECH 4394. Microelectronics Manufacturing II.
This is an intermediate level course in integrated circuit processing. Topics covered include: atomic models for diffusion, oxidation and ion implantation; topics related to thin film processes such as chemical vapor deposition, physical vapor deposition; planarization by chemical-mechanical polishing and rapid thermal processing; and process integration for bipolar and MOS device fabrication. Students will design processes and model them using a simulation tool such as SUPREM.
about Microelectronics Manufacturing II
three credit hours. three lecture contact hours. three lab contact hours.
Course Attribute(s): Exclude from 3-peat Processing|Lab Required
Grade Mode: Standard Letter
about Microelectronics Manufacturing II

TECH 4395. Automated Manufacturing Systems I.
This course primarily deals with automation in industrial systems. In particular, this course focuses on automation and control technologies in manufacturing systems at machine and device levels. Included in its structure are areas such as fundamentals of industrial automation, sensors and actuators, numerical control, robotics, and PLC.
Prerequisites: TECH 1393 and TECH 2310 or TECH 4373.
about Automated Manufacturing Systems I
three credit hours. three lecture contact hours. three lab contact hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter
about Automated Manufacturing Systems I
TECH 4396. Automated Manufacturing Systems II.
This course primarily deals with automation in industrial systems. In particular, this course focuses on automation and control technologies at a system level. This course includes topics such as simulation of manufacturing systems, flexible manufacturing systems, automated quality control, automated identification, and automated material handling. Prerequisites: TECH 4395.

Course Attribute(s): Lab Required
Grade Mode: Standard Letter

TECH 4397. Special Problems.
The investigation of a special topic by developing the problem, researching the topic, and presenting the findings as they apply to industry/technology. This course will be applicable to all areas of technology, and must be done only with the approval of the cooperating faculty member and Department Chair. Repeatable for credit with different emphasis.

Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter

TECH 4398. Senior Design.
This course deals with application of technical and non-technical skills and knowledge using a multidisciplinary team-based approach for solving real-world problems related to product and process development. The topics include systematic product development, development of business plans, project management, cost estimation, documentation and presentation, prototyping, fabrication and concurrent engineering. Prerequisites: TECH 4395 or TECH 4372 or EE 3400 or GEO 4313. (WI).

Course Attribute(s): Lab Required|Writing Intensive
Grade Mode: Standard Letter

TECH 4399. Seminar in Technology.
The topics for this course will vary. The course will involve the identification of the topic, its nomenclature, its processes, tools, equipment or materials, and its application to technology. The topic may apply to either the certification program or technology program or to both. A final report summary or presentation will conclude each seminar. Repeatable for credit with different emphasis.

Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter

TECH 5100. Academic Instruction for Technology.
The course is seminar based and covers topics related to teaching and employment responsibilities. Completion of this course is required as a condition of employment for graduate assistants. This course does not earn graduate credit. Repeatable with different emphasis. Graded on a credit (CR), no-credit (F) basis.

Course Attribute(s): Graduate Assistantship|Exclude from Graduate GPA
Grade Mode: Leveling/Assistantships

TECH 5195. Industrial Internship.
This course is a supervised experiential learning course in Technology Management. This work integrated learning course helps the student link theory with practice. Repeatable for credit. Prerequisites: 9 hours completed toward the Master of Science in Technology Management degree and the approval of the graduate advisor.

Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Credit/No Credit

TECH 5199B. Thesis.
This course represents a student’s continuing thesis enrollments. The student continues to enroll in this course until the thesis is submitted for binding. Graded on credit (CR), progress (PR), no-credit (F) basis.

Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Credit/No Credit

TECH 5299B. Thesis.
This course represents a student’s continuing thesis enrollments. The student continues to enroll in this course until the thesis is submitted for binding. Graded on credit (CR), progress (PR), no-credit (F) basis.

Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Credit/No Credit

Principles of quality management including probability theory and basic statistics, control charts for attributes and variables, sampling plans, quality audits, and costs. Experiences in basic metrology and data collection for quality control. This course does not count as credit toward a degree.

Course Attribute(s): Exclude from Fundamentals of Quality Assurance
Grade Mode: Credit/No Credit
TECH 5307. Fundamentals of Manufacturing Processes.
Application of metal cutting principles. Includes steel rule dye layout, machine layout, tool life, tool wear, tool geometry and reconditioning, principles of feed rate and speed, material removal rates and power consumption. Machining of steel and castings using various cutting tools. Does not count toward degree credit. Prerequisite TECH 2330.

3 Credit Hours. 1 Lecture Contact Hour. 3 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Credit/No Credit
about Fundamentals of Manufacturing Processes

TECH 5310. Product Design and Development.
This course provides an overview of the new product realization process. The focus is on the steps of systematic product design including problem identification, product planning, conceptual design, and embodiment design. Standard CAD tools are employed for product modeling. Prerequisite: TECH 2310 or instructor’s approval.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Product Design and Development

Application of computer hardware and software to the design of products and systems; geometric modeling; engineering computational methods; overview of engineering analysis software which may include finite element analysis, manufacturing simulation, solidification modeling, and rapid prototyping. Prerequisites: TECH 5310 and MATH 2471, or equivalents.

3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter
about Computer Aided Engineering

TECH 5315. Engineering Economic Analysis.
This course deals with economic analytical techniques used in engineering decision making. Topics include time value of money, comparing alternatives, depreciation, replacement, and income tax considerations. Prerequisite: MATH 1315 or MATH 1319 or consent of instructor.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Engineering Economic Analysis

Provides the student with in-depth knowledge of inferential statistics as applied to design of robust processes and products. Topics covered include probability distributions, ANOVA, fractional factorial design, response surface method, orthogonal arrays, and Taguchi method. Prior experience with introductory-level statistics is assumed. Prerequisite: TECH 5394 with a grade C or higher.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Robust Product and Process Design

TECH 5365. Industrial Project Management and Scheduling.
Introduce students to industrial management system concepts and applications as they relate to management operations; system design, implementation and management; case studies of practices; and application of theory to practical problems.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Industrial Project Management and Scheduling

TECH 5382. Sustainability in Industrial Management.
This class will cover the basic concepts, principles, and techniques related with sustainability in the fields of engineering and management. Emphasis will be placed on the construction and manufacturing technologies. Case studies will be introduced to understand a broad spectrum of industrial activities.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Sustainability in Industrial Management

TECH 5384. Problems in Technology.
Graduate students investigate a special topic by developing a technical problem, researching the topic, and presenting the findings. Plans will be developed on an individual basis with strict faculty supervision. May be repeated for additional credit with permission of the department chair.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Problems in Technology

TECH 5385. Readings in Technology.
A study of the ethical and moral viewpoints typically associated with American society as related to the development and introduction of new technology and engineering. Past, present, and future issues will be studied with selected readings focusing on industrial related problems and issues.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Readings in Technology

TECH 5387. Planning Advanced Technology Facilities.
An in-depth study of technical problems encountered in designing, equipping, arranging, and specifying facility requirements for industrial and technical training facilities.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
about Planning Advanced Technology Facilities
TECH 5390. Research in Technology. 
Examination of scientific methods including theory formulation, deductive reasoning, hypothesis generation, observation, inductive reasoning, and theory revision. Categories of research are compared and contrasted as regards methodology. In-depth study of experimental research as it relates to significant industrial problems including considerations of design, internal and external validity, and appropriate analytical technique. Introduction to data analysis and its proper interpretation.

about Research in Technology
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

TECH 5391. Advanced Manufacturing Systems. 
This course introduces students to various advanced tools, technologies, and strategies in modern manufacturing. An emphasis is placed on the state-of-the-art in factory automation and global manufacturing enterprises. Topics include process automation and control, advanced manufacturing processes, intelligent manufacturing control, and information technology in manufacturing. Prerequisites: TECH 1363 and TECH 5307 or instructor's approval.

about Advanced Manufacturing Systems
3 Credit Hours. 2 Lecture Contact Hours. 2 Lab Contact Hours.
Grade Mode: Standard Letter

An introduction to integrated circuit fabrication to include crystal growth, wafer preparation, epitaxial growth, oxidation, diffusion, ion implantation, thin film deposition, lithography, etching, device and circuit formation, packaging and testing. Significant project involves actual production/testing of a functional semiconductor device. Laboratory component involves actual production/testing of a functional semiconductor device.

about Fundamentals of Microelectronics Manufacturing
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

TECH 5394. Design of Industrial Experiments. 
This course deals with the study of the fundamentals and applications of industrial experiments. Prerequisite: TECH 5390.

about Design of Industrial Experiments
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

TECH 5398. Directed Project. 
This course is a formal investigation into a business or industry problem. The directed project is an applied research project that is more extensive than an independent study and less extensive than a thesis. The course culminates in a detailed project report and oral presentation. Prerequisites: TECH 5390 and TECH 5394 and the approval of the graduate advisor.

about Directed Project
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Credit/No Credit

TECH 5399A. Thesis. 
This course represents a student's initial thesis enrollment. No thesis credit is awarded until student has completed the thesis in Technology 5399B. Graded on a credit (CR), progress (PR), no-credit (F) basis.

about Thesis
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

TECH 5399B. Thesis. 
This course represents a student's continuing thesis enrollments. The student continues to enroll in this course until the thesis is submitted for binding. Graded on credit (CR), progress (PR), no-credit (F) basis.

about Thesis
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

TECH 5599B. Thesis. 
This course represents a student's continuing thesis enrollments. The student continues to enroll in this course until the thesis is submitted for binding. Graded on credit (CR), progress (PR), no-credit (F) basis.

about Thesis
5 Credit Hours. 5 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

TECH 5999B. Thesis. 
This course represents a student's continuing thesis enrollments. The student continues to enroll in this course until the thesis is submitted for binding. Graded on credit (CR), progress (PR), no-credit (F) basis.

about Thesis
9 Credit Hours. 9 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

about Thesis