

Industrial Technology Course Descriptions

Course Number, Title, and Description	Credit	Type	Prerequisite(s)	Professor(s)
100 Introduction to Industrial Technology Introduction to career opportunities, job functions, and professional organizations in industrial technology. Discussion of curriculum and departmental procedures. 1 lec.	1	Required		Klein
101 Engineering Graphics Fundamentals Basic theory and practice in engineering drawing. Topics include geometric construction, orthographic projection, dimensioning, and auxiliary, section, and pictorial views. Lab activities include free-hand sketching and computer-aided design (CAD) using AutoCAD and SolidEdge Software. 2 lec, 3 lab.	3	Required		McCuiiston Sexton
102 Engineering Graphics Applications Theory and practice of constructing three-dimensional geometric models using computer aided-design (CAD). Also includes geometric dimensioning and tolerancing, fasteners, and the integration of graphic documents into the industrial environment. Lab activities include development of note, detail, and assembly drawings. 2 lec, 4 lab.	4	Required	101	McCuiiston Sexton
104 Architectural Drawing <i>Basic techniques used in architectural drawing. Includes use of instruments, orthographic and isometric projection, floor plans, elevations, and sections. 5 lec.</i>	5	Service	<i>interior design major</i>	<i>Sexton</i>
110 Introduction to Manufacturing Processes Survey of industrial materials and processes with applications to current manufactured consumer products. Emphasis is placed on generic processes such as forming and separating as applied to a variety of industrial materials. 4 lec.	4	General Education Tier 2A		Reeves
111 Manufacturing Materials Survey of industrial materials used in manufacturing, including ferrous, nonferrous, polymeric, wood, elastomers, and composite materials. Analysis of relationships between product requirements and material characteristics. Includes strength of materials, alloying elements, heat treatment, and cold working are related to basic chemical and/or crystalline structure of materials. Lab activities emphasize the selection of materials from vendors, determination of material properties, and comparison of various materials as a choice for design applications. 3 lec, 2 lab	4	Required		Scott Kuruppallil
112 Introduction to Manufacturing Introduction to the workings of a manufacturing enterprise. Includes the study of planning, organizing, and controlling labor, material, equipment and tooling. Lab activities emphasize use of manufacturing documentation and tooling to produce quality products. 2 lec, 4 lab.	4	Required	101	Klein Myers
117 Basic Metal Machining <i>Study and application of the machining processes used in manufacturing, emphasizing economic impact of design parameters. Includes process planning, machine tool set up and operating procedures, metal cutting parameters, and machine tool capabilities. Also includes precision measurement and introduction to CAD/CAM (computer-aided design/computer-aided manufacturing) and nontraditional machining. Lab activities include analyzing part prints, selecting equipment, and using both traditional and CNC machine tools to produce parts. (no credit for both 117 and 216) 2 lec, 4 lab.</i>	4	Service	<i>101 & Not IT Major</i>	<i>Deno Kuruppallil</i>
201 Computer Graphics Study and application of advanced computer-aided design (CAD) and computer-aided engineering (CAE) systems using parametric modeling principles. Lab activities based upon commercial CAD/CAE systems. 2 lec, 4 lab.	4	Elective	101 & Adv. Standing	McCuiiston Sexton
205 Geometric Dimensioning and Tolerancing Theory and practice of geometric dimensioning as a precise engineering language to specify part geometry based on the function and relationship of assembled parts. Includes size tolerances, data, and all geometric characteristics. 4 lec.	4	Elective	102, (117 or 216) & Advanced Standing	McCuiiston
206 Computer Methods in Industrial Technology Study of common methods used to solve industrial and business problems. Emphasis is on developing solutions using common software. Topics include project management (Project), advanced spreadsheet modeling (Excel) and database implementation (Access). 3 lec, 2 lab.	4	Required	Advanced Standing	McCuiiston
208 Industrial Plastics Study of plastics materials and manufacturing processes. Includes material properties and applications. Emphasis on major industrial processes including injection molding, extrusion, and thermoforming. Lab activities include material testing, process set-up and operation, and quality control. 2 lec, 4 lab.	4	Required	102, 111, 112, & (CHEM 121 or 150 or 151) & Adv Standing	Klein Kuruppallil

216 Metal Machining Study and application of machining processes used in manufacturing, emphasizing shop floor management and problem solving. Includes process planning, machine tool set up and operating procedures, metal cutting parameters, and machine tool capabilities. Also includes precision measurement and introduction to computer numerical control (CNC) and nontraditional machining. Lab activities include analyzing part prints, selecting equipment, and using traditional machine tools to produce parts. (No credit for 117 and 216) 2 lec, 4 lab.	4	Required	102, 111, 112& Adv Standing	Deno Kuruppallil
217 Production Metal Machining Theory and practice of production techniques for metal machining using computer numerical control (CNC), machine tools, and electrical discharge machining (EDM). Includes part print analysis, process analysis and planning, quality assurance factors, and computer-aided design and machining (CAD/CAM). Lab activities include programming CNC turning and machining centers to mass-produce parts. 2 lec, 4 lab.	4	Elective	206 & 216 & Adv Standing	Deno Kuruppallil
218 Metal Fabricating and Casting Theory and practice of sheet metal forming and fabricating, and hot metal casting. Explores the relationship between material properties and processing capabilities. Lab activities emphasize shearing, bending, welding, mechanical fastening, and sand casting. 2 lec, 4 lab.	4	Required	102, 111, 112, & Advanced Standing	Myers
220 Aircraft Powerplants <i>Theory of operation of reciprocating engines and gas turbine engines for aircraft. Exposure to thermodynamics of power delivery. Includes fan, jet, shaft, and propeller propulsion machines. Also includes propulsion systems issues such as fuel, lubrication, air supply, and electrical systems. Lab experiences provide investigation of actual hardware and exposure to FAA regulations and engine maintenance considerations. 3 lec, 2 lab.</i>	4	Service	<i>Aviation management or flight major</i>	Scott
221 Power Transmission Theory and application of physical principles associated with the use of mechanical, hydraulic, pneumatic, and electrical power in manufacturing. Includes gear trains, couplings, clutches, pumps, cylinders, compressors, and electric single and multiphase motors. Lab activities include working with gear systems, internal combustion engines, conveyors, motors, hydraulic and pneumatic systems. 3 lec, 2 lab.	4	Required	PHYS 201 or 251 & Advanced Standing	Scott
222 Civil Engineering Graphics <i>Theoretical applications of problems relating to true length lines, angle between a line and a plane, dihedral angles, and true size and shape of planes. Development of practical application drawings in the areas of property layout, road plan and profile, reinforced concrete retaining walls, environmental problems, layout of water, storm sewer, and sanitary sewer utilities and road cross section. Includes use of computer-aided design (CAD) software. 2 lec, 3 lab.</i>	3	Service	<i>101 CE major</i>	Sexton
230 Manufacturing Computer Technology Overview of hardware platforms, operating systems, networks, and applications used in manufacturing. Includes use of computers to support automated production machinery and equipment. Emphasis on designing, planning, developing proposals for, and implementing integrated computer and production systems. Lab demonstrations illustrate the technology components presented in lecture. 3 lec, 2 lab.	4	Required MIT	206 & Advanced Standing	Deering
231 Manufacturing Database Applications Survey of database types and their applications in manufacturing. Includes principles of database design and implementation. Also includes introduction to e-commerce and the sharing of database information over the Internet. Activities include using IDEF1x to design databases, developing graphical front-ends, and implementing typical manufacturing databases using commercial software. 3 lec, 2 lab.	4	Required MIT	206 & Advanced Standing	Deering Myers
303 Applications of Object Oriented Programming Introduction to object oriented programming and rapid application development using Visual Basic as programming language. Lab activities emphasize the development of programs for various industrial technology applications, including the use of graphics and integration with other Windows-based programs. 3 lec, 2 lab.	4	Required	(206 & Advanced Standing) or ISE 200	Berisso Deering
309 Plastics Tooling Study of tooling required for extrusion, injection molding, compression molding, thermo-forming, and other production processes used to produce plastic parts. Lab activities include design and construction of molds for plastic forming. 2 lec, 4 lab.	4	Elective	208 & Advanced Standing	Klein
317 Superabrasive Machining Study and application of industrial diamonds and cubic boron nitride tools for metal machining and grinding. Includes manufacture, identification, and selection of superabrasive tools. Lab activities include tool wear studies and economic analyses. 2 lec, 4 lab.	4	Elective	216 & Advanced Standing	Deno
318 Computer Numerical Control Advanced computer-aided design and computer-aided machining (CAD/CAM) for computer numerical control (CNC) machine tools. Lab activities emphasize mold design and construction on CAD/CAM software. 2 lec, 4 lab.	4	Elective	217 & Advanced Standing	Deno Kuruppallil

320 Hydraulics and Pneumatics Application of hydraulic and pneumatic principles to common industrial uses for power transmission and mechanism control. Includes a study of hardware and circuitry. Lab activities include construction and testing of fluid power circuits. 2 lec, 4 lab.	4	Required MMP	221 & Advanced Standing	Reeves
332 Industrial Electronics Theory and application of fundamental concepts of DC and AC circuits. Includes measurement of DC and AC electrical parameters and operation of electrical output devices such as transistors, operational amplifiers, AC and DC motors, solenoids, and transformers. Also includes Boolean logic used in digital circuits. Lab experiences include building, testing, and troubleshooting basic AC and DC electrical circuits. 3 lec, 2 lab.	4	Required	221, (PHYS 202 or 252) & Advanced Standing	Scott
337 Manufacturing Networks and Data Communications Theory and applications of communication technology used in manufacturing plants. Includes study of dedicated device communications, network communication protocols for interconnecting manufacturing equipment and computers, and specialized standards for communicating with controllers and shop floor data acquisitions systems. 3 lec, 2 lab.	4	Required MIT	230, 332 & Advanced Standing	Deering
347 Plastics Molding Processes In-depth analysis of selected molding plastics processes including essentials of product/process design and their impact on product quality. Lab activities involve extensive analysis of molding and processes. 2 lec, 4 lab.	4	Elective	208, 216, (CHEM 121 or 151) & Advanced Standing	Klein
348 Plastics Forming and Fabricating Advanced study of plastics product manufacturing using extrusion, blow molding, thermo-forming, fabrication, composite, and finishing processes. Includes part and mold/die design, material selection, process optimization, and manufacturing costs. Lab activities include mold designing, building, and testing and process optimization. 2 lec, 4 lab.	4	Elective	208, 216, (CHEM 121 or 151) & Advanced Standing	Klein
351 Production Tooling Theory and practice of designing and constructing tooling to improve productivity and quality in various manufacturing applications. Includes an introduction to tool and die design. Lab activities include using computer-aided design (CAD) software to design work holding jigs and fixtures. Also includes construction and testing of jigs, fixtures, and gages. 2 lec, 4 lab.	4	Required MMP	208, 216, 218 & Advanced Standing	Berisso Kuruppallil
354 Automatic Identification and Data Capture Study of methods and systems used to automatically identify objects including bar coding, optical character recognition, magnetic stripe, radio frequency identification and biometrics. Various industrial applications will be studied, such as inventory production control, order picking, and shipping/receiving. Lab experiences emphasize application of automatic identification technologies. 3 lec, 2 lab.	4	Elective	231 & 337 & Advanced Standing	Berisso Myers
361 Product Design Study of product design from concept to release for production, with emphasis on design for manufacturability. Lab activities include the design, development, and creation of a prototype product using various software systems. 3 lec, 2 lab.	4	Elective	102, 206, (208 or 216) & Advanced Standing	
362 Product Documentation Theory and practice of documenting the objectives and outcomes of a manufacturing company using the international quality standard ISO 9000:2000. Also includes product configuration control and product data management (PDM). 4 lec.	4	Required MMP	206 & 208 or 216 or 218 & Advanced Standing	McCuiestion
363 Quality Assurance and Metrology Theory and practice of quality assurance principles in manufacturing. Includes statistical process control, process capability, gage capability, and quality management. 4 lec.	4	Required	206, 208, 216, 218, ENG 3XXJ, and MATH 251 or ISE 306 & Adv Standing	McCuiestion
370 Professional and Technical Writing Preparation, organization, writing, and editing of documents for manufacturing and business activities. Satisfies junior level English composition requirement.	3	Elective	Junior	McCuiestion
390 Industrial Materials Advanced theory and application of common industrial materials. Includes examination of the behavior of ceramics, polymers, metals, and composites. 4 lec.	4	Elective	208, (CHEM 122 or 152) & Advanced Standing	
395 Industrial Work Experience Credit for work experience related to B.S.I.T. degree. Minimum 10-week term of fulltime employment required. Written report required. May be repeated for maximum of 3 credits.	1	Elective	Advanced Standing	Klein
400 Senior Seminar Discussion of projected employment opportunities, career enhancement activities, and professional development options in industrial technology. 1 lec.	1	Required	Senior & Advanced Standing	Klein

405 Dimensional Analysis Study effects of general and geometric dimensioning on the form, fit, and function of an assembly of parts. Emphasis on solving assembly stack-up problems by manual calculation and computer simulation programs to determine clearance or interference between assembled components. 4 lec.	4	Elective	205 & Advanced Standing	McCouston
432 / 532 Lean Enterprise Methods In today's world organizations compete in a global market place. In order to compete successfully organizations must eliminate all forms of waste from their process through continuous improvement processes. Lean enterprise principles provide methods to achieve these goals. Lean operational approaches provide a organization with a set of methods and tools to assist in the identification and then continuous elimination of waste and enterprise improvements. 3 lec, 2 lab.	4	Elective	206 and MGT202 and Junior	Myers Klein
433 Radio Frequency Identification for the Supply Chain Radio frequency identification (RFID) is a key technology within the supply chain and automatic identification arenas. This course will introduce students to the various types of RFID that exist, why it is such an important topic and how to successfully implement RFID to solve a business problem. Lectures, assignments and various projects will help students to understand the advantages, obstacles and various issues surrounding the technology. 3 lec, 2 lab.	4	Elective	231 or 303 or CS210 or 230 or 462 or CTCH241 or 242 or 285 or ET181 or MIS220 or 400 or ITS335	Berisso Myers
435 Industrial Instrumentation and Controls Theory and application of digital controls in manufacturing. Includes relay logic and closed loop control theory using negative feedback. Introduction to sensors, signal conditioning, circuits, D-A and A-D conversion, and Proportional-Integral-Derivative (PID) control. Lab experiments include programmable logic controllers and control of mechanical, hydraulic, pneumatic and electrical systems. 3 lec, 2 lab.	4	Required	303, 332 & Advanced Standing	Scott
436 Electronic Applications in Manufacturing Study of practical applications of electronic control systems in manufacturing, including sensors, process control, packaging systems, assembly and material handling. Emphasis on analysis and improvement of existing applications. Lab activities focus on the integrated control of conveyors, robots, and machines. 3 lec, 2 lab.	4	Elective	332 & Advanced Standing	Scott
452 Contemporary Integrated Manufacturing Capstone course. Theory and application of computer and information technology in manufacturing. Introduces integration strategies and product phases from conception to retirement. Includes technology enablers and their interfaces. Lab activities include the development of an integrated environment using commercial software for the specific product produced in 451, including CAD, CAM, CAPP, database, and economic and production models. IT 452 and 462 must be taken as a two quarter sequence. 3 lec, 2 lab.	4	Required	(337 or 362) & Advanced Standing	Myers
462 Product Manufacturing Capstone course requiring student teams to use knowledge from previous technical and business courses to develop a manufacturing plan for a product. Development and implementation of a plan for manufacturing a product. Includes production planning and control, resource planning, product cost considerations, facilities planning, and tooling design and construction. Lab activities include the implementation of the above plan including tool build, plant layout, and actual production of parts and product. IT 452 and 462 must be taken as a two quarter sequence. 2 lec, 6 lab.	5	Required	(351 or 354), 452. Senior and Advanced Standing	Klein
464 Robotic Applications Theory and application of robots used in manufacturing. Includes classifications, sensors and feedback mechanisms, robot/computer communications, and programming. Also includes selection of robots based on task and economic criteria. Lab activities include on- and off-line programming of robots and developing robotic work cells. 3 lec, 2 lab.	4	Required MMP	332 & Advanced Standing	Berisso Scott
484 Maintenance Systems Study of organized industrial maintenance systems. Includes environmental control, structural, mechanical, and electrical requirements. 4 lec.	4	Elective	320 or 332 & Advanced Standing	
490 Special Investigations Independent concentrated study in a specific area under the direction of a faculty member.	1-4	Elective	Advanced Standing & permission	
491 Special Topics in Industrial Technology Selected topics that are current and relevant to industrial technology. May be repeated.	1-5	Elective	Advanced Standing	