

Announcement

**Bachelor of Science degree in Industrial Technology
(BSIT)**

**The Aviation and Technology faculty at San José State
University have redesigned
the Manufacturing Systems concentration under the
B.S. I.T. degree based on industry and community input
and trends in the industry**

Manufacturing Systems

**has been completely redesigned to address industry
needs for**

Sustainable Manufacturing and Green Product Design

**Current students will have the option to complete their
degrees under the current curriculum or to switch to
the newly redesigned curriculum.**

Website: www.engr.sjsu.edu/avtech

**Program Information Attached
For more information you may also contact:
Seth Bates ~ seth.bates@sjsu.edu**

Course Overview for the B.S. Industrial Technology with concentration in
Manufacturing Systems

(Sustainable Manufacturing and Green Product Design)

Required Courses in Technology

Lower Division Courses

21 units

Tech 020: Design and Graphics
Tech 031: Quality Assurance and Control
Tech 025: Introduction to Materials
Tech 040: Intro to Product Design & Manufacturing
Tech 041: Machine Shop Safety and Fundamentals
Tech 045: Sustainable Facilities Design & Planning
Tech 046: Machine Operation and Management
Tech 060: Introduction to Electronics

Upper Division Courses

30 Units

Tech 115: Automation and Control
Tech 140: Green and Sustainable Product Design
Tech 145: Lean Manufacturing
Tech 147: Green Manufacturing Analysis and Mgt
Tech 149: Computer Integrated Manufacturing Systems
Tech 190: Senior Seminar in Technology
Tech 198: Technology and Civilization
Engr 100W: Engineering Reports
Electives: 6 units including 3 upper division from:
Tech 41, Tech 65, Tech 141, Tech 148, Tech 164, ME 106, ISE 102

Required Minor in Business Management

15 Units

Bus 090: Business Statistics
Bus 142: Total Quality Management
Bus 141: Materials Management
or >
Bus 144: Supply Chain Management
Bus 140: Fundamentals of Operations Management
or >
Bus 145: Global Operations Management
Bus 186 : Professional and Business Ethics

Support Courses

24 Units

Chem 30A and Chem 30B (6) *
Phys 2A and Phys 2B (8) **
Math 71 (3) ***
Econ 1B (4)
CompE 30 (3) ****

Substitutions:

- * You may substitute Chem 1A (5 units) for Chem 30A and Chem 30B
- ** You may substitute Phys 50 and Phys 51 (8 units) for Phys 2A and Phys 2B
- *** You may substitute Math 30P (5 units) or Math 30 (3 units) for Math 71
- **** You may substitute CompE 46 (3 units) or CS 049C or J for CompE 30

Course Descriptions for the BS Industrial Technology with concentration in Manufacturing Systems

(Sustainable Manufacturing and Green Product Design)

Lower Division

Tech/ME 020 Design and Graphics 2

Description: Introduction to design and graphical solutions to three-dimensional design problems involving points, lines, surfaces and solids. Development of visualization and technical sketching skills in conjunction with orthographic and pictorial projections. Focus on computer-aided design and graphical analytical methods. Corequisite: ENGR 10. Misc/Lab: Lecture 1 hour/lab 3 hours.

Tech 025 Introduction to Materials 3

Description: Study of industrial materials and their applications including metals, polymers, and composite materials. Selection principles. Laboratory experimentation, testing and evaluation procedures. Prerequisite: CHEM 1A and PHYS 2A (or equivalent). Lecture 3 hours.

Tech 031 Quality Assurance and Control 3

Description: Introduction to concepts and statistical methods that companies use to manage and improve quality. Sampling inspection, statistical process control, quality function deployment, cost of quality, design of experiment and Taguchi's method for designing in quality. Prerequisite: BUS 90 or equivalent. Misc/Lab: Lecture 2 hours/lab 3 hours.

Tech 040 Introduction to Product Design and Manufacturing 3

Description: Introduction to product design and manufacturing process with attention to green and sustainable product design. Introduction to three-dimensional solid modeling. Computer-aided design, manufacturing, and analysis using commercially available software. Familiarize students with design for manufacturing. Principles for green and sustainable product development.

Tech 041 Machine Shop Safety and Fundamentals 1

Description: Introduction to basic machine shop safety and skills. Fabricating of mechanical components and assemblies from engineering drawings, performing tolerance inspection, developing fabrication process plans. Prerequisites: ME 020, Tech 020, CE 020 or equivalent. Lab 3 hours.

Tech 045 Sustainable Facilities Design and Planning 3

Description: Construction, planning, and maintenance of physical facilities and equipment for sustainable manufacturing operations. Green and sustainable practices and standards, plant facilities layout/design, regulatory and environmental compliance, safety/security, energy conservation, and process improvement. Production line planning. OSHA and NIOSH standards.

Tech 046 Machine Operation and Management 3

Description: Current machining processes using computer numerically-controlled and manual machines, including turning, milling, drilling, grinding, and sawing machines. Manual and computer-aided part programming. Management of machining environment including processes, tooling, instruments, equipment, personnel safety. Prerequisite: Tech/ME 20. Misc/Lab: Lecture 2 hours/lab 3 hours.

Tech 060 Introduction to Electronics 3

Description: Electronic principles underlying commonly used high technology devices and systems such as iPhones, digital cameras, HDTV, cell phones, IPODS, and the Internet. Emphasizes practical applications of electronics principles, AC and DC principles in contemporary electronics products and services. Lecture 3 hours.

Lower Division total 21 units

Upper Division

Tech 115	Automation and Control	3
Description: Theory and application of automation elements including analog and digital sensors, controllers, indicators, actuators. Control modes for proportional, derivative, and integral control systems. Hands-on integration practices among PLC, robots, automatic identification devices, computers, and other industrial equipment. Prerequisite: Tech 60. Misc/Lab: Lecture 2 hours/lab 3 hours.		
Tech 140	Green and Sustainable Product Design	3
Description: Advanced product and process design with a focus on sustainable design and manufacturing for green products. Analysis of process and material selection. Polymers, composites and advanced materials processing. Laboratory exercises in designing and processing. Planning for green manufacturing. (Prereqs: Tech/ME 40)		
Tech 145	Lean Manufacturing	3
Description: Exploration and practice of techniques for reducing waste to optimize the value stream in both manufacturing and non-manufacturing environments. Toyota Production System, Value Stream Mapping, 7 Wastes, 5S, Just-in-Time, TPM, Kaizen. Prerequisite: Bus 140 or Bus 145 or ISE 140.		
Tech 147	Green Manufacturing Analysis & Management	3
Description: Design, operation, and control of production systems using computational and simulation techniques to promote sustainability and minimize environmental impact. Emphasis is on the physical design of high performance manufacturing and will include production flow, scheduling, work flow, layout of manufacturing plants, and material handling. Misc/Lab: Lecture 2 hours/lab 3 hours.		
Tech 149	Computer Integrated Manufacturing Systems	3
Description: Integration of all aspects of a manufacturing enterprise using computer-integrated manufacturing (CIM) technologies. Design development and implementation of manufacturing systems using project management techniques and team work. Prerequisite: Tech 146, Tech 147, ME 106. Misc/Lab: Lecture 2 hours/lab 3 hours.		
Tech 190	Senior Seminar in Technology	3
Description: Current industry analysis and career development. Technology trends in manufacturing and electronics. Leadership skills for a technology professional. Ethics for technology managers. Prerequisite: Graduating senior, major form completed. Lecture 3 hours.		
Tech 198	Technology and Civilization	3
Description: History, development, and use of technology in different cultures. Technology's impact on society, global environment, the workplace, cultural values, gender roles, and newly industrialized countries of the world. Prerequisite: Completion of core GE, satisfaction of Writing Skills Test and upper division standing. For students who begin continuous enrollment at a CCC or a CSU in Fall 2005 or later, completion of, or corequisite in a 100W course is required.		
Engr 100W	Engineering Reports	3
Electives:	Six units selected from the following list:	6
	ME/Tech 041, Tech 065, Tech 141, Tech 148, Tech 164, ME 106; ISE 102	

Upper Division total 30 units

Required Minor in Business Management	15
Support Courses in Math, Chemistry, Physics, Economics, and computer Science	24
Units for the degree	122