Program:	Industrial and Systems Engineering
Degree:	BS
Department:	Industrial and Systems Engineering
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Outcome	**Master the depth of knowledge required for a degree**
Marketable Skills***	• Knowledge of the principles and practices requisite for detailed problem definition in the form of technical artifacts (HOQ, functional, process, information, physical models etc) • Knowledge of the principles, methods, techniques, procedures, and tools to define, design, implement, operate, and sustain production systems and the generation of goods and services. • Knowledge of incoming materials, their applicability to the use, production processes, quality control, costs, and other techniques for maximizing the effective manufacture and distribution of goods. • Knowledge of industrial equipment and tools, including their designs, uses, repair, and maintenance. • Knowledge of data sciences to include information system design techniques, tools, and principles involved in establishment of information systems supporting the core production system. • Knowledge of the common techniques for technical artifact (plans, blueprints, drawings, and models) development and interdisciplinary team communication. • Knowledge of essential planning, management and production system artifact development computer hardware and software, including applications and programming. • Knowledge of underlying models, methods, and principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods, and coordination of scarce and shared resources. • Knowledge and understanding the human situated in the workplace – design the work for the human worker in a knowledge based enterprise in manual, semi-manual, and automated contexts. • Demonstrated knowledge and techniques to: define and plan detailed work tasks (task engineering), estimate operational costs, develop aggregate and operational plans, create graphical representations of industrial production systems, setup and instrument quality control systems, direct quality control activities, recommend technical design or process changes to improve efficiency, quality, or performance, communicate technical information to suppliers, contractors, or regulatory agencies, discuss designs or plans with clients, schedule operational activities, analyze design or requirements information for mechanical equipment or systems, document technical design details, evaluate designs or specifications to ensure quality, supervise engineering or other technical personnel, implement design or process improvements.

Outcome	**Demonstrate critical thinking**
Marketable Skills***	• Facilitate problem definition and brainstorming sessions • Make careful and critical distinctions to clarify the needs from the requirements and engineering characteristics • Listen and internalize to what other people are saying, taking time to understand the points being made, asking questions as appropriate, and not interrupting at inappropriate times. • Identify complex problems and review related information to develop and evaluate options and implement solutions.

	• Apply logic and reasoning to identify the strengths and weaknesses of alternative solutions, conclusions or approaches to problems.

Outcome	**Communicate effectively**
Marketable Skills***	• Understand technical requirements; their representational formats • Communicate effectively in writing technical requirements within the context of the production system • Listens to and understands technical information and reads and understands information and ideas presented in writing. • Articulate and make distinctions between symptoms and concerns, when something is wrong or is likely to go wrong. • Communicate analysis artifacts and data so others can rapidly assimilate the essence.

Outcome	**Practice personal and social responsibility**
Marketable Skills***	• Knowledge of principles and methods for curriculum and training design, teaching and instruction for individuals and groups, and the measurement of training effects. • Knowledge of principles and processes for providing customer and personal services. This includes customer needs assessment, meeting quality standards for services, and evaluation of customer satisfaction. • Honest and ethical and willing to take on responsibilities and challenges. • Takes a logical approach to address work-related issues and problems. • Displays a good-natured, cooperative attitude. • Persistence in the face of obstacles, and maintains composure, keeping emotions in check, controlling anger, and avoiding aggressive behavior, even in very difficult situations. • Establishing and maintaining personally challenging achievement goals and exerting effort toward mastering tasks. • Open to change (positive or negative) and to considerable variety in the workplace. • Creativity and alternative thinking to develop new ideas for and answers to work-related problems. • Takes initiative, guiding oneself with little or no supervision, and depending on oneself to get things done.

Outcome	**Demonstrate social, cultural, and global competence**
Marketable Skills***	• Sensitive to cultural differences and being understanding and helpful on the job. • Prefers teaming arrangement; being personally connected with others on the job. • Participate in international conferences and alliances on a continuous basis. • Work offers advancement, potential for leadership, and are often considered prestigious. • Work is results oriented and allow employees to use their strongest abilities, giving them a feeling of accomplishment.

Outcome	**Prepare to engage in lifelong learning**

Marketable Skills***	• Take and pass the ISE Fundamentals of Engineering exam
	• Attain PE license and attain requisite professional development hours
	• Attain certifications in specialized skill areas: AM, PMP, 6σ, Lean, …
	• Active in technical societies, including:
	  ○ American Society for Quality
	  ○ American Society of Safety Engineers
	  ○ Board of Certified Safety Professionals
	  ○ Institute of Industrial and Systems Engineers

	○ National Society of Professional Engineers ○ Occupational Outlook Handbook: Industrial engineers ○ SAE International ○ Society of Manufacturing Engineers ○ Surface Mount Technology Association ○ International Council on Systems Engineering

Outcome	**Work collaboratively**
Marketable Skills***	• Identifies the educational needs of others, developing formal educational or training programs or classes, and teaching or instructing others. • Identifying the developmental needs of others and coaching, mentoring, or otherwise helping others to improve their knowledge or skills. • Handles complaints, settles disputes, and resolves grievances and conflicts, or otherwise negotiates with others. • Assembles members of a group to work together to accomplish tasks. • Encourages and builds mutual trust, respect, and cooperation among team members. • Communicates with people outside the organization, representing the organization to customers, the public, government, and other external sources.

***Source: Marketable skills listed for this program were drawn from the Knowledge, Skills, Abilities, Activities, etc. as identified by the US Department of Labor and Statistics for "Industrial Engineers" as published on onetonline.org