

Industrial engineering is a branch of engineering

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Industrial engineering is a branch of engineering which deals with the optimization of complex processes or systems. It is concerned with the development, improvement, implementation and evaluation of integrated systems of people, money, knowledge, information, equipment, energy, materials, analysis and synthesis, as well as the mathematical, physical and social sciences together with the principles and methods of engineering design to specify, predict, and evaluate the results to be obtained from such systems or processes.

While industrial engineering is a traditional and negotiating engineering discipline subject to (and eligible for) professional engineering licenser in most jurisdictions, its underlying concepts overlap considerably with certain business-oriented disciplines such as operations management.

Depending on the specialties involved, industrial engineering may also be known as, or overlap with, operations management, management science, operations research, systems engineering, management engineering, manufacturing engineering, ergonomics or human factors engineering, safety engineering, or others, depending on the viewpoint or motives of the user.

For example, in health care, the engineers known as health management engineers[not verified in body] or health systems engineers are, in essence, industrial engineers by another name. While the term originally applied to manufacturing, the use of " industrial" in " industrial engineering" can be somewhat misleading, since it has grown to encompass any methodical or

quantitative approach to optimizing how a process, system, or organization operates.

Some engineering universities and educational agencies around the world have changed the term " industrial" to broader terms such as " production" or " systems", leading to the typical extensions noted above. In fact, the primary US. Professional organization for Industrial Engineers, the Institute of Industrial Engineers (IIE) has been considering changing its name to something broader (such as the Institute of Industrial & Systems Engineers), although the latest vote among membership deemed this unnecessary for the time being.

The various topics concerning industrial engineers include: accounting: the measurement, processing and communication of financial information about economic entities operations research, also known as management science: discipline that deals with the application of advanced analytical methods to help make better decisions operations management: an area Of management concerned with overseeing, designing, and controlling the process of production and redesigning business operations in the production of goods or services. Job design: the specification of contents, methods and relationship of jobs in order to satisfy technological and organizational requirements as well as the social and personal requirements of the job holder. Financial engineering: the application of technical methods, especially from mathematical finance and computational finance, in the reactive of finance engineering management: a specialized form of management that is concerned with the application of engineering principles

to business practice supply chain management: the management of the flow of goods.

It includes the movement and storage of raw materials, work-in- process inventory, and finished goods from point of origin to point of consumption. Process engineering: design, operation, control, and optimization of chemical, physical, and biological processes. Systems engineering: an interdisciplinary field of engineering that focuses on how to sign and manage complex engineering systems over their life cycles. Ergonomics: the practice of designing products, systems or processes to take proper account of the interaction between them and the people that use them. Safety engineering: an engineering discipline which assures that engineered systems provide acceptable levels Of safety. Cost engineering: practice devoted to the management of project cost, involving such activities as cost- and control- estimating which is cost control and cost forecasting, investment appraisal, and risk analysis. Alee engineering: a systematic teeth to improve the " value" of goods or products and services by using an examination of function. Quality engineering: a way of preventing mistakes or defects in manufactured products and avoiding problems when delivering solutions or services to customers. Industrial plant configuration: sizing of necessary infrastructure used in support and maintenance of a given facility. Agility management: an interdisciplinary field devoted to the coordination of space, infrastructure, people and organization engineering design process: formulation of a plan to help an engineer build a product with a specified reference goal. Traditionally, a major aspect of industrial engineering was planning the layouts of factories and designing assembly lines and other

manufacturing paradigms. And now, in so-called lean manufacturing systems, industrial engineers work to eliminate wastes of time, money, materials, energy, and other resources.

Examples of where industrial engineering might be used include flow process charting, process mapping, designing an assembly workstation, straightening for various operational logistics, consulting as an efficiency expert, developing new financial algorithm or loan system for a bank, streamlining operation and emergency room location or usage in a hospital, planning complex distribution schemes for materials or products (referred to as supply-chain management), and shortening lines (or queues) at a bank, hospital, or a theme park.

Modern industrial engineers typically use predetermined motion time system, computer simulation (especially discrete event simulation), along with extensive mathematical tools for modeling, such as mathematical optimization and queue theory, and computational methods for system analysis, evaluation, and optimization.