



Cairo University Faculty of Engineering



Mechanical Engineering Programs Bachelor Programs Credit Hours System

Alaa Elmokadem

*Associate Professor of Manufacturing Engineering
Department of Mechanical Design and Production*

MAY 2020



COORDINATOR



Dr. Alaa Elmokadem

Office: Building 14 – 2nd floor

Email: akadem1956@cu.edu.eg



What is Mechanical Engineering (ME)?

The profession in which power-producing and power-consuming machines are *researched, designed, and manufactured**.

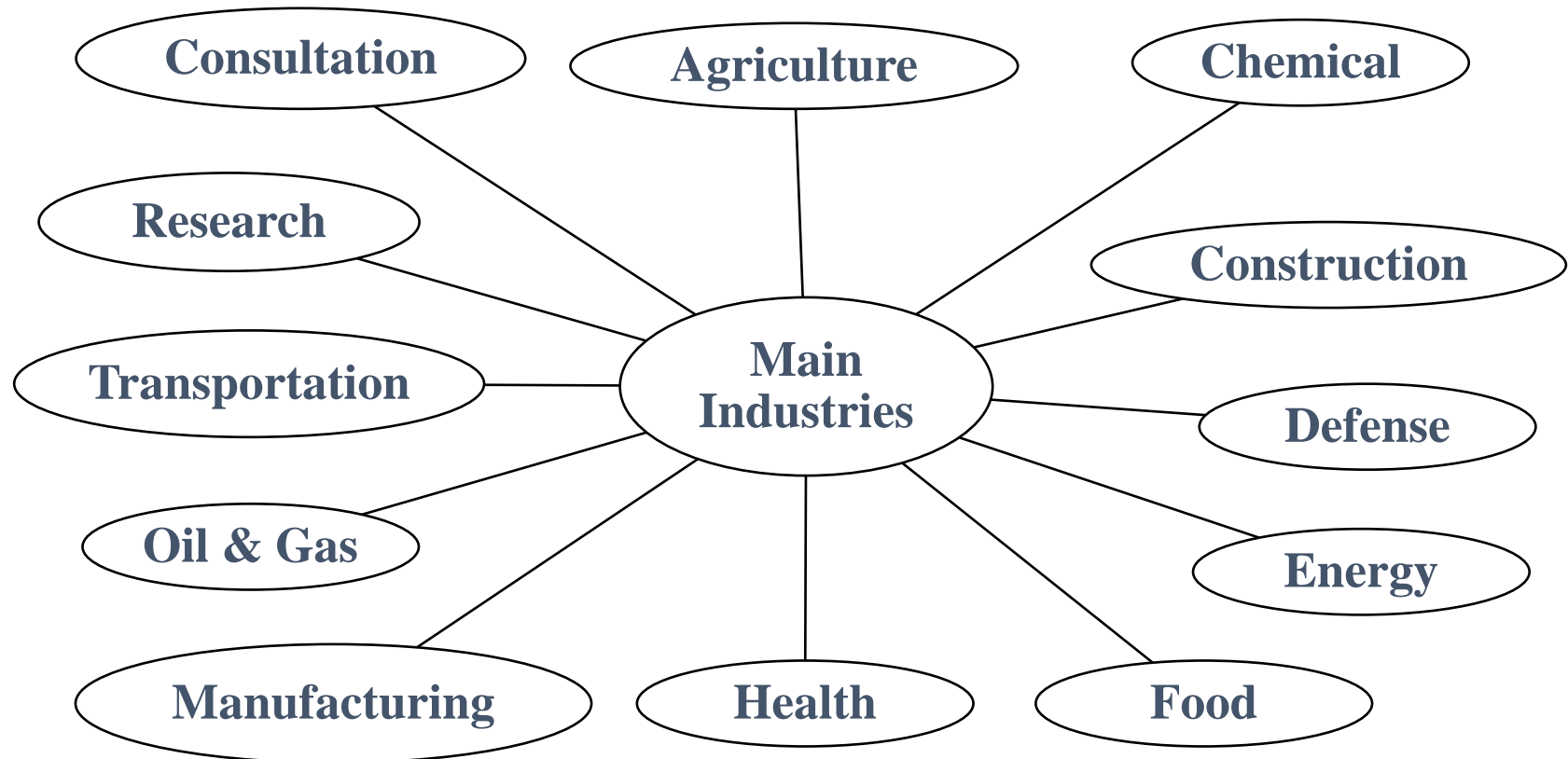


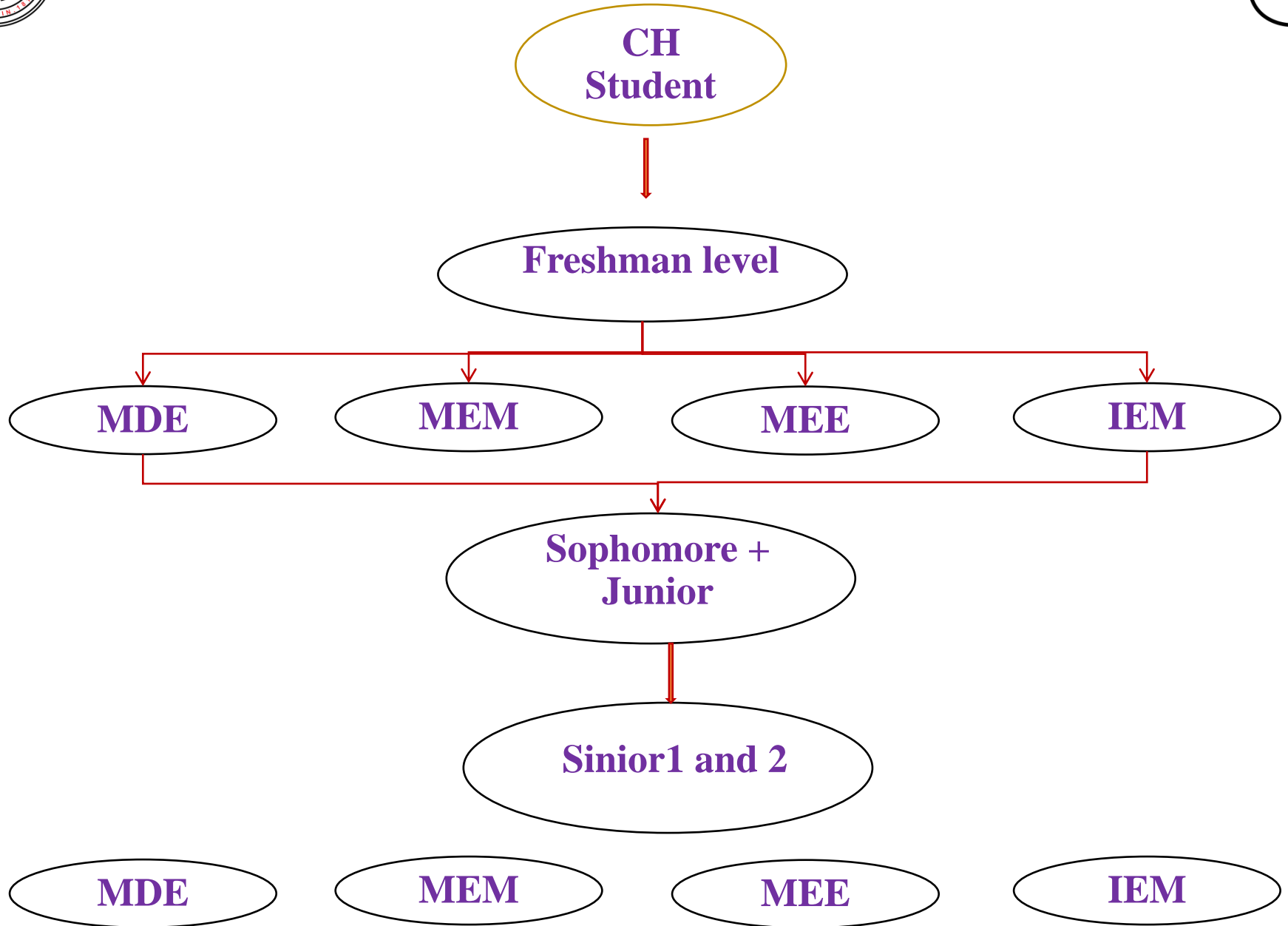
* J. Wickert and K. Lewis, “An Introduction to Mechanical Engineering”, 3rd ed. , Cengage Learning, 2013.



Why Mechanical Engineering (ME)?

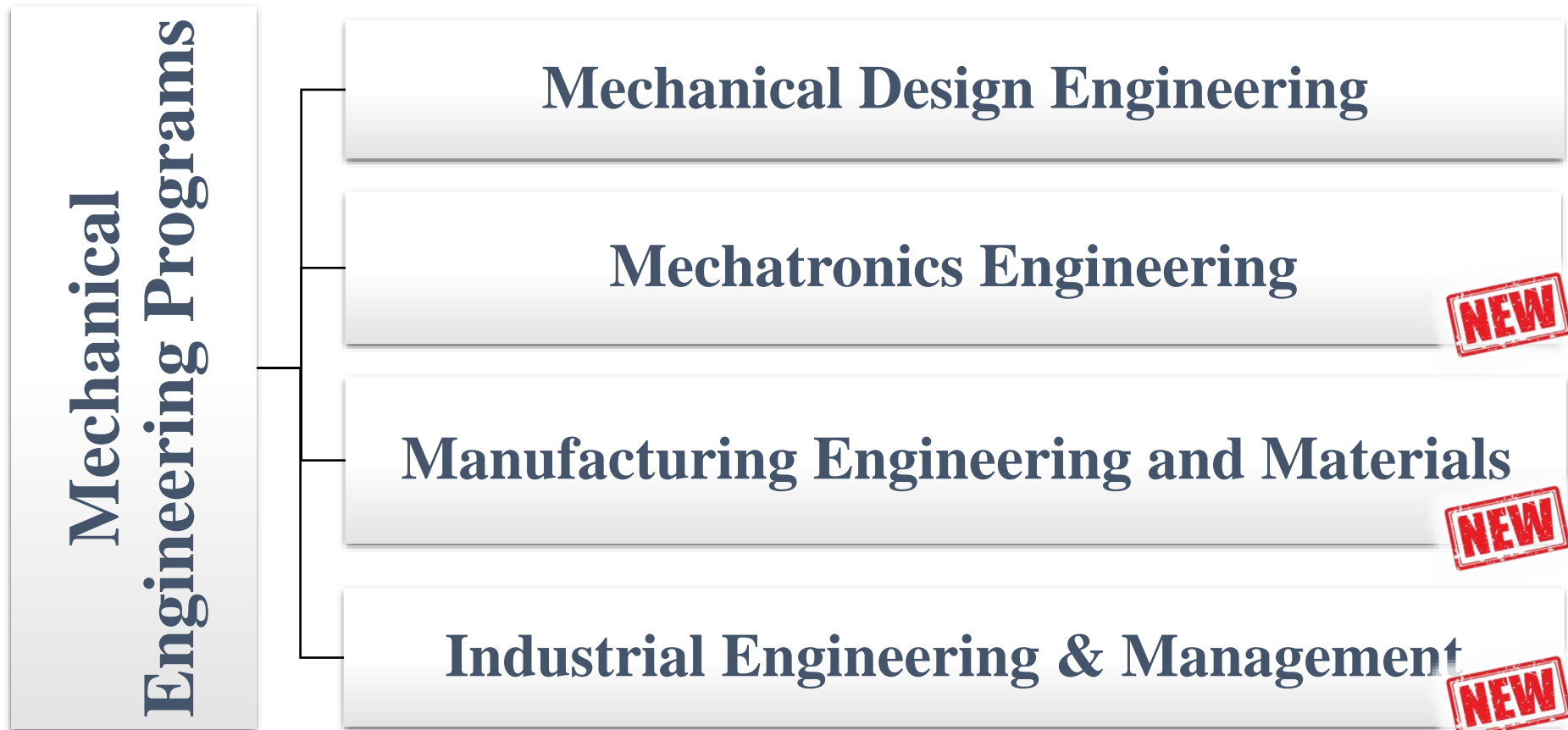
- The broadest of all the engineering disciplines.
- Almost every industry needs mechanical engineers.







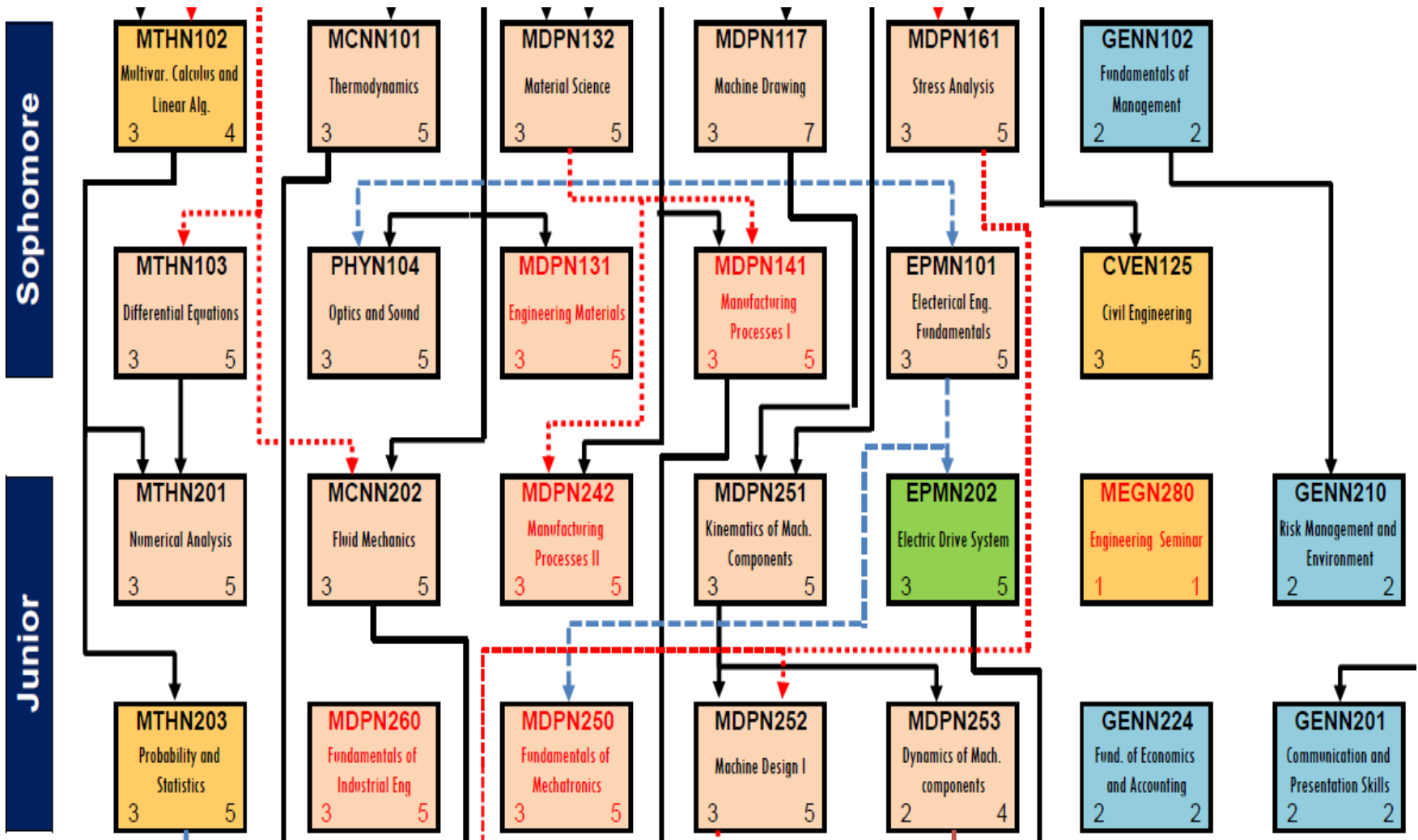
The Mechanical Engineering group includes four main programs:





Mechanical Engineering Tracks

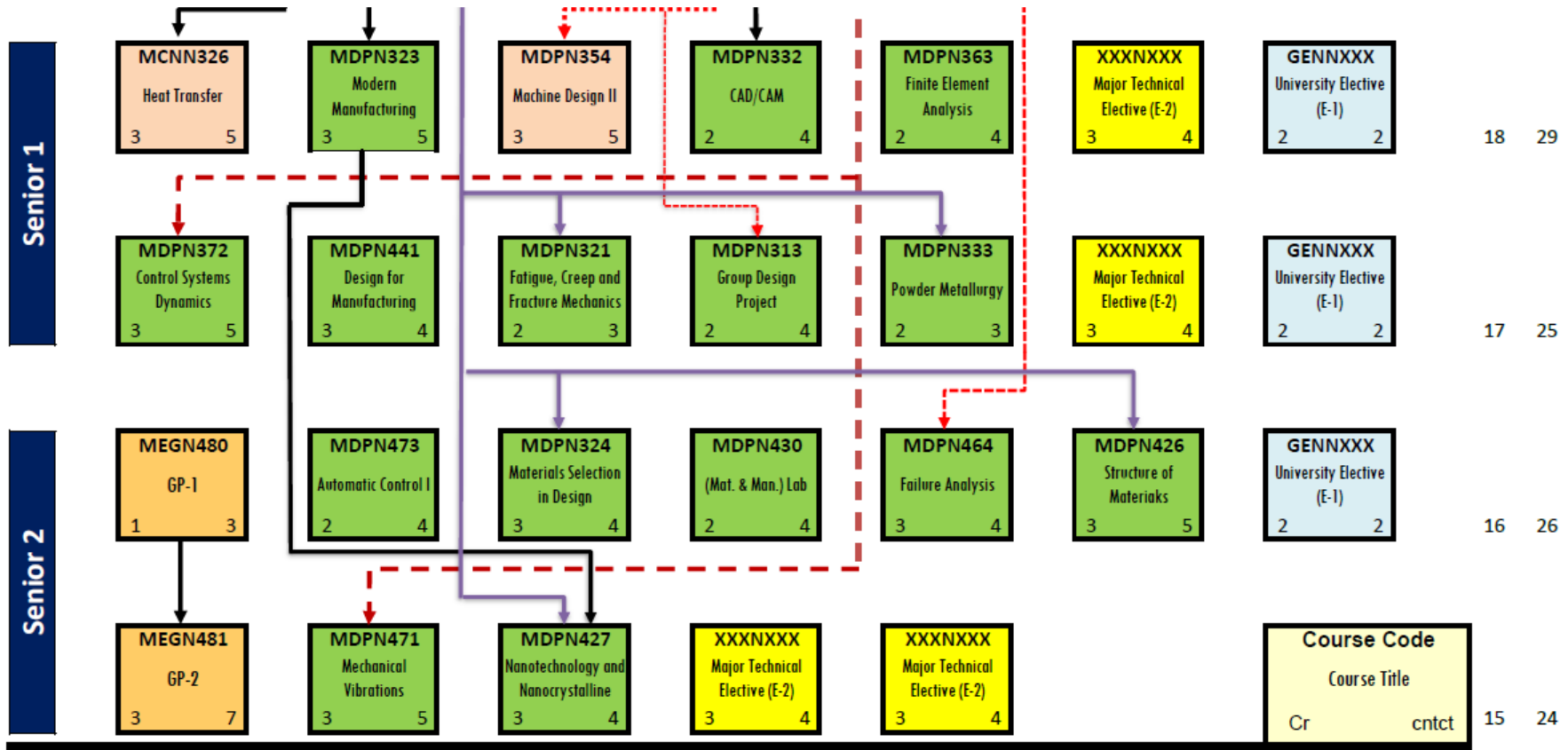
Credit Hours System, Faculty of Engineering, Cairo University





Mechanical Engineering tracks

Credit Hours System, Faculty of Engineering, Cairo University



~ 15 core courses for each program + ~ 4 electives



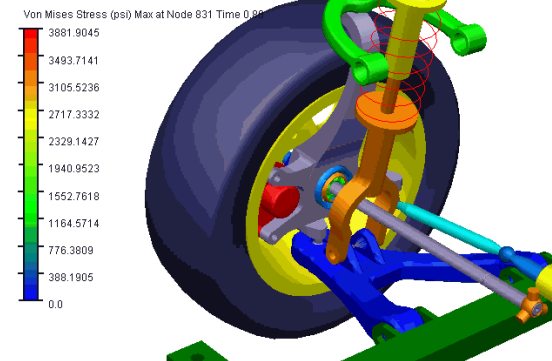
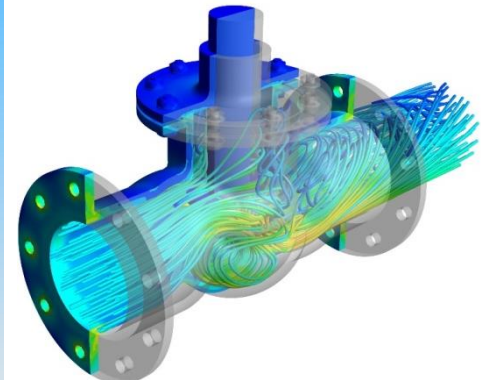
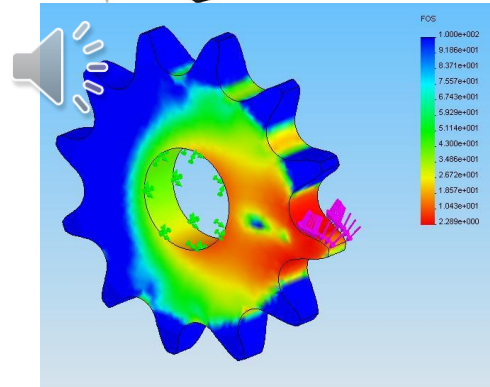
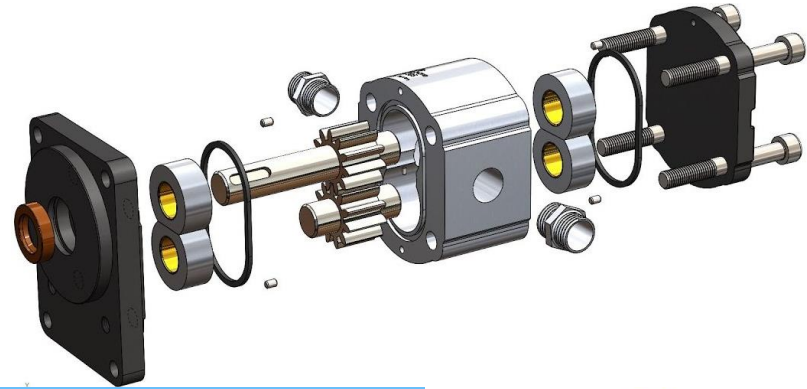
Mechanical Engineering Tracks

Credit Hours System, Faculty of Engineering, Cairo University



Mechanical Engineering students take courses in various fields:

- Basic Sciences
- Material Science
- Mechanics of Materials
- Machine Design (CAD)
- Manufacturing Technology
- Machine Dynamics
- Thermodynamics
- Fluid Mechanics
- Automatic Control
- Electrical Engineering
- Industrial Engineering





Mechanical Engineering
Mechanical Design Engineering Program
[MDE]



Mechanical Engineering tracks

Credit Hours System, Faculty of Engineering, Cairo University



Mechanical Design Engineers deal with:

- Design, development and modification of products and machine elements based on needs, functions, problems arising upon usage and competition.
- Provide optimum solutions; based on availability and requirements.
- Maintain mechanical systems and equipment.
- Choosing of certain product, items or machine element among alternatives, classes, grades, capacities.





Mechanical Engineering tracks

Credit Hours System, Faculty of Engineering, Cairo University



Mechanical Design Engineers may have one of the following Job titles:

- Product Design Engineer
- Maintenance Engineer
- Project Engineer
- Sales Engineer





Mechanical Engineering
MEchatronics Engineering Program
[MEE]



Mechanical Engineering Tracks

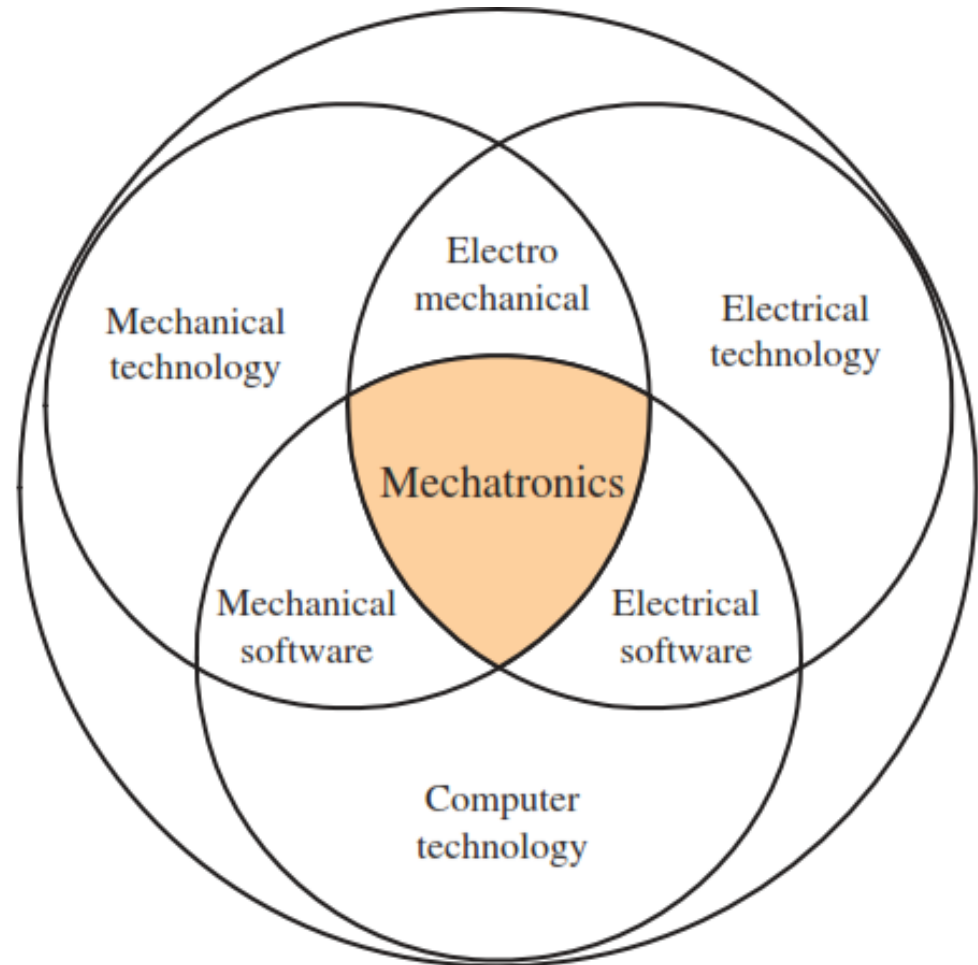
Credit Hours System, Faculty of Engineering, Cairo University



Mechatronics is the synergy between **Mechanical**, **Electronic**, and **Computer Engineering** to *build, develop, and maintain* smart products.

Mechatronics students take courses in various fields:

- Mechanical Engineering
- Electronics Engineering
- Electrical Engineering
- Computer Engineering
- Control Engineering
- Biomechanical Engineering





Mechanical Engineering Tracks

Credit Hours System, Faculty of Engineering, Cairo University



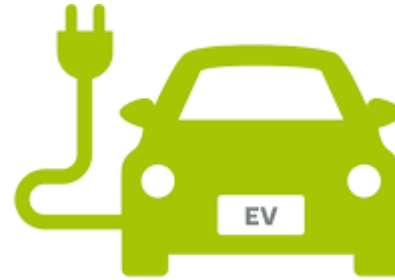
Mechatronics Applications (*build – develop – maintain*):



Industrial Robots



CNC Machines



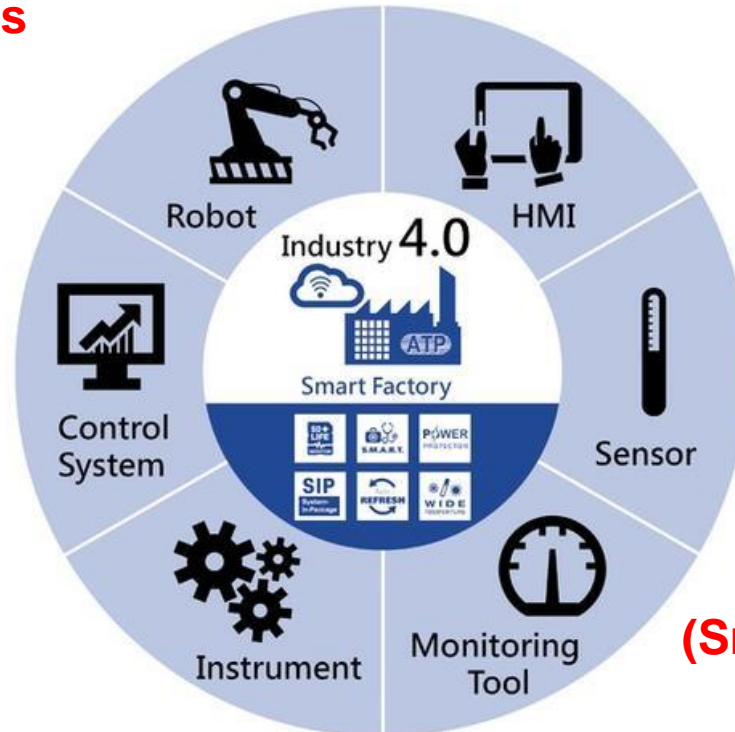
Hybrid and Electric Vehicles



Exoskeletons



Automated Production Lines



Industry 4.0 (Smart Factories)



Mechanical Engineering Tracks

Credit Hours System, Faculty of Engineering, Cairo University



Mechatronics Engineers may have one of the following Job titles:

- Control/Automation Engineer
- Instrumentation Engineer
- Monitoring/Diagnostics Engineer
- Hydraulic/Pneumatic Control Engineer
- Robotics Engineer





Mechanical Engineering

Manufacturing Engineering and Materials Program

[MEM]



Mechanical Engineering Tracks

Credit Hours System, Faculty of Engineering, Cairo University



Manufacturing covers a broad range of processes and modeling/simulation/experimentation activities all focused on

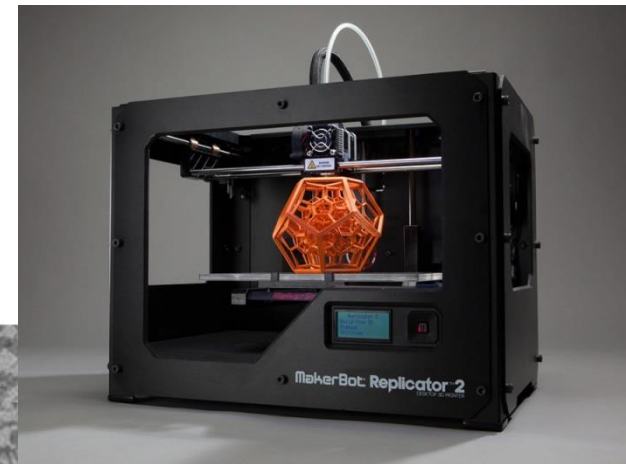
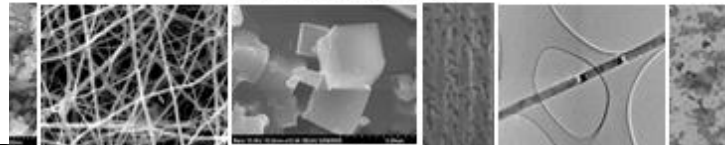
“the conversion of raw materials into products”

in the most *economic, efficient, and effective* way possible.



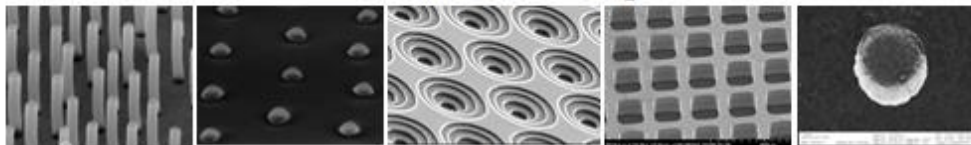
Nano-Manufacturing

Nanomaterials



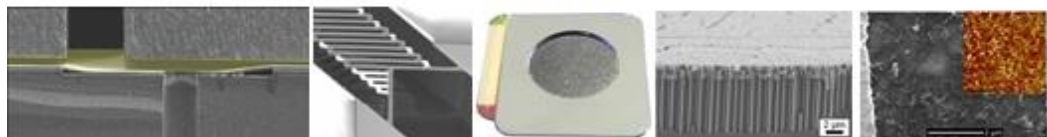
**CNC
Machining**

Nanomanufacturing



**3D
Printing**

Nanodevices





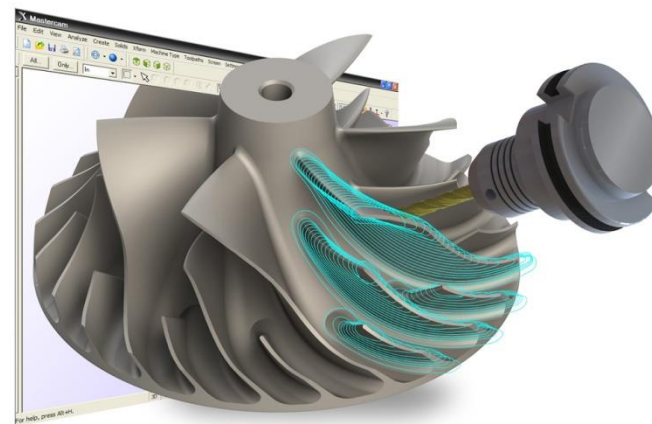
Mechanical Engineering Tracks

Credit Hours System, Faculty of Engineering, Cairo University



In addition to Mechanical Engineering courses, Manufacturing and Materials students take courses in:

- Advanced Manufacturing
- Composite Materials
- Nanomaterials
- Powder Metallurgy
- Materials Selection
- Nanocrystalline Materials





Mechanical Engineering Tracks

Credit Hours System, Faculty of Engineering, Cairo University



Manufacturing and Materials Engineers may have one of the following Job titles:

- Manufacturing Engineer
- Production Engineer
- Process Engineer
- Materials Engineer





Mechanical Engineering

Industrial Engineering & Management Program [IEM]

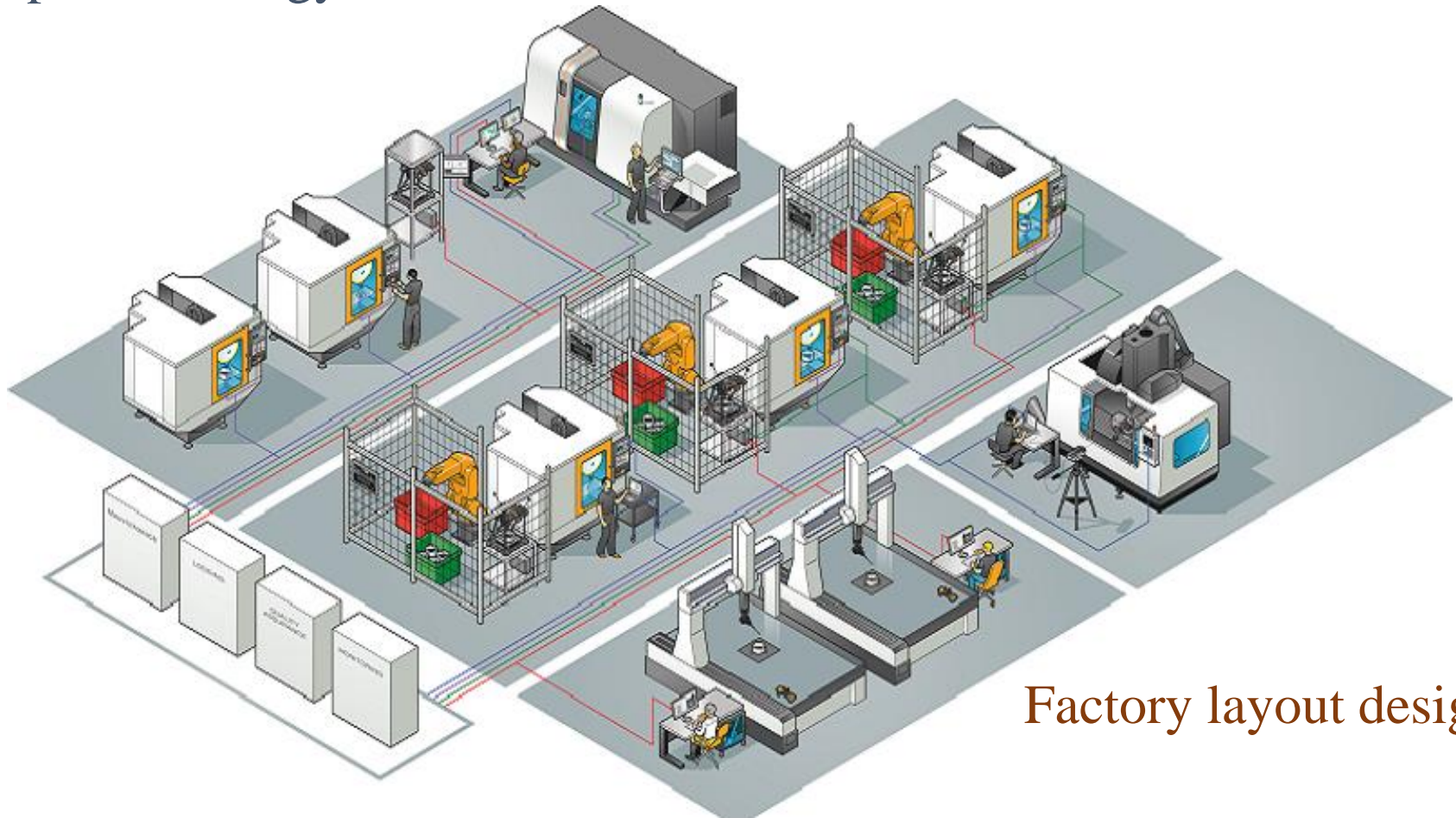


Mechanical Engineering Tracks

Credit Hours System, Faculty of Engineering, Cairo University



Industrial Engineering is concerned with the optimization of complex systems, by developing, improving and implementing integrated systems of people, money, knowledge, information, equipment, energy and materials.



Factory layout design



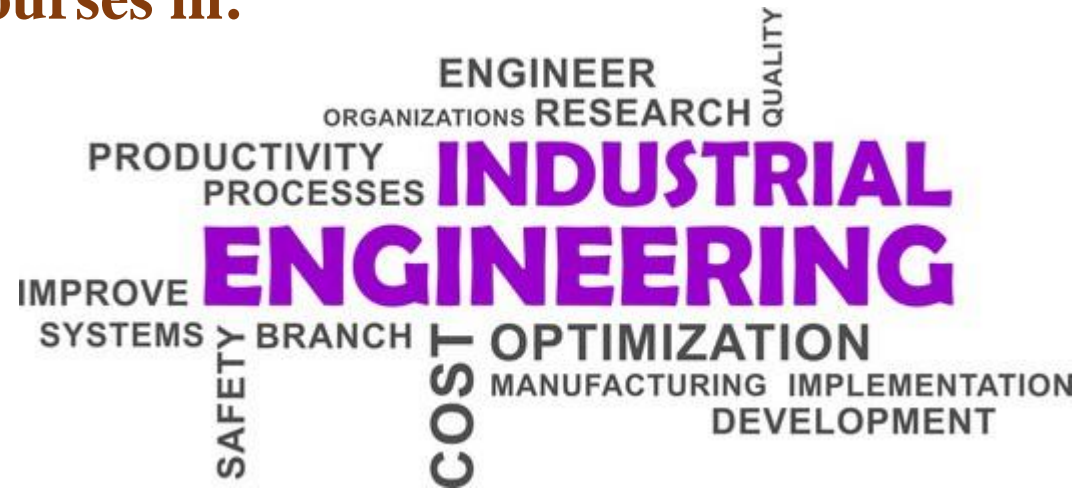
Mechanical Engineering Tracks

Credit Hours System, Faculty of Engineering, Cairo University



In addition to Mechanical Engineering courses, Industrial Engineering students take courses in:

- Quality Control
- Engineering Economy
- Operations Research
- Supply Chain Management
- Production Management
- Plant Engineering





Mechanical Engineering Tracks

Credit Hours System, Faculty of Engineering, Cairo University



Industrial Engineers may have one of the following Job titles:

- Quality Control Engineer



- Inventory Control Engineer

- Cost Engineer



- Reliability Engineer



- Sales/Marketing Engineer

- Maintenance Engineer



- Ergonomics Engineer



Mechanical Engineering Tracks

Credit Hours System, Faculty of Engineering, Cairo University



Thank You!