

Handout (1): Microelectronics

Microelectronics: sometimes referred to as solid state electronics which are semi-conductor based devices, and this is the science that made integrated circuits (ICs) possible.

Engineers and their roles:

- **Process Engineers:** They are responsible for ensuring a high yield and repeatability of a certain process, and they are also responsible for equipment maintenance.
- **Product Engineers:** They are responsible for implementing a process sequence while ensuring that each component meets the specifications, and they also carry out the failure analysis.
- **Design Engineers:** They are responsible for the layout of the components on a chip to meet certain specifications.

Historical Background:

- **Origins:** The transistor was invented in 1947 in a failed attempt at bell laboratories to create another device. Furthermore, bipolar transistors were made in 1951, while MOS transistors were made in 1960, and both are still dominating the market. Also, early transistors and diode were made as discrete devices (.i.e. one piece of semi-conductor contains one device).