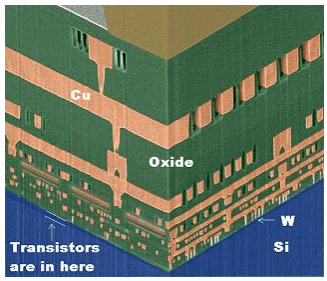
3.1.3 Summary to: 3.1 Thin Films - General

- Semiconductor technology is almost synonymous with thin film technology
  - A thin film is adhering to a substrate and (at least orginally) continous.
  - Thin films may still be found in the product or may have been "sacrificed" during the making of the product.
  - An **IC** is a study of thin films in and on the **Si** substrate.
  - The same is true for pretty much every semiconductor product.



- Thin always means "thin" relative to some intrinsic (internal) length scale. Examples are:
  - Structural length scales
  - Wavelength and interaction length scales
  - Transport parameter length scales
  - Electrical scales

• Dimensions $d_{x, y, z}$ • Grain size d_{grain} • Lattice constants a_0 • λ radiation (light, **IR**, **UV**) • Absorption depths • Mean free path lengths. • Diffusion length	• **SCR** width d_{SCR} • Debye length d_{Debye} • Critical thickness d_{crit} for electrical break down • Critical thickness d_{tu} for tunneling

- There are many thin film applications outside of semiconductor technolgy:
  - Optical, electrical, chemical, mechanical, magnetical technologies use thin films

Exercise 3.1-1

All Questions to 3.1