

# SYSTEMS DESIGN ENGINEERING

## Biomaterials Science

**SYDE 780 - *Topic 2***

**Winter**

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The course will cover fundamental topics of biocompatibility of materials in medicine (polymers, ceramics, metals, composites, bioengineered materials, nanomaterials). Fundamental principles of materials science (bonding, atomic/molecular structure) as well as surface analysis will be reviewed. Materials response to biological systems such as corrosion, degradation, leaching, and fracture will be studied in the context of specific biomedical applications. The host response to materials (immune, inflammatory response and coagulation) will also be treated. Specific examples of material interactions with biological systems such as bone, blood, skin and the eye will be studied. Surface modification and novel material design as a mean to improve biocompatibility will be discussed.

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