FY2020

Interdisciplinary Research Fundamentals I 2 [Life Engineering Course]

Course description and goals

The course will give a broad introduction to the concepts, phenomena, and discoveries that form the pillars of modern science, medicine, and technology (SMT). The course will highlight modern applications of ideas and concepts that may in some cases be centuries old. Specifically, the course will start with an introduction to the birth and evolution of quantum mechanics. Next, discoveries by Isaac Newton that led to the formulation of modern spectroscopy will be discussed in the context of materials science and environmental monitoring. The course will evolve into ideas underpinning electromagnetism, discovery of electromagnetic radiation, and electronic devices and technology with emphasis on life sciences. The course will conclude with an outline of recent SMT trends including exo-planets and gravitational waves, 2D materials, and DNA editing.

Day/Period 2Q Thursday 8:50-10:30 (Broadcasted by Zoom)

1. 6/25 Thursday	Birth of quantum mechanics and related concepts
2. 7/2 Thursday.	Atomic structure and Heisenberg uncertainty principle
3. 7/9 Thursday	Fundamentals of optical spectroscopy and instrumentation
4. 7/16 Thursday	Electromagnetism and modern telecommunications engineering
5. 7/23 Thursday	Materials science for modern electronics
6. 7/30 Thursday	Basics of electronic circuits, MRI, ELISA, DNA editing
7. 8/6 Thursday	Recent research in science, medicine, and technology