BE 228: Introduction to Mathematical Oncology

(3:0) – January semester

Course Instructor: Prof. Mohit Kumar Jolly (BE)

Course code: BE 228
No. of credits: 3
PhD, Int-PhD, Masters (M.Sc., M.Tech.), senior undergraduate students
Class timing: 10.00 – 11.30 Tuesday, Thursday; BSSE M Tech classroom (Annexe)
Instructor: Mohit Kumar Jolly

Couse description:

This course shall introduce how different mathematical models and computational techniques can be used to understand the dynamics of in cancer progression at various temporal and spatial scales, in close collaboration with existing experimental data. We shall emphasize how computational methods can influence both our fundamental understanding of tumor growth, as well as suggest new therapeutic strategies to control tumor aggressiveness, including various case studies. We shall introduce various hallmarks of cancer (cell cycle deregulation, angiogenesis, plasticity, metastasis) from a mathematical perspective, and discuss research papers related to simulating them using ordinary/partial differential equations.

Basic grasp of engineering mathematics and programming skills in MATLAB, C, Mathematica, or Python is recommended. Basic introduction to biology at an under-graduate level (or the drive to self-educate) is recommended.