Mathematics for biologists

Biotechnology

Instructor Name: Prof.Ranjith Padinhateeri
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Department: Biotechnology

About Instructor: I am a faculty in the department of biosciences and bioengineering at Iit Bombay. My research area is computational biophysics. I do theoretical study of biological systems using methods from physics.

Pre Requisites: :
Core/Elective: : Core
UG/PG: : Both
Industry Support :

Course Intro: : It is an introductory mathematics course for biology students with the aim of training them to do quantitative analysis of biological systems.

COURSE PLAN

SL.NO	Week	Module Name
1	1	Need of mathematics. FunctionsEquations as graphs and images (2D image & 3D objects)
2	2	Derivatives, meaning of derivatives, numerical computation of derivatives
3	3	Second derivative, maxima, minima, sketching functions
4	4	Integration with examples, numerical computation of integrals
5	5	Differential equations describing biological phenomena
6	6	Vectors with examples, differential equation with vector signs
7	7	Diffusion, Nernst equation, Einsteinâ€™s relation
8	8	Fourier seriesFourier transform: understanding scattering experiments
9	9	Basics of statistics, mean, standard deviation, distribution function
10	10	Binomial, Poisson and Normal distributions in biology
11	11	Survey, sampling, hypothesis testing z-test, t-test
12	12	Regression, curve fitting, Conclusion