Syllabus for Biotechnology Engineering

Courses Offered by Career Avenues - GATE Coaching by IITians.

Linear Algebra:

Matrices and determinants, Systems of linear equations, Eigen values and Eigen vectors.

Calculus:

Limit, continuity and differentiability, Partial derivatives, Maxima and minima, Sequences and series, Tes

Differential Equations:

Linear and nonlinear first order ODEs, higher order ODEs with constant coefficients, Cauchy's and Eule

Probability and Statistics:

Mean, median, mode and standard deviation, Random variables, Poisson, normal and binomial distribut

Numerical Methods:

Solution of linear and nonlinear algebraic equations, Integration of trapezoidal and Simpson's rule, Singl

Microbiology:

Prokaryotic and eukaryotic cell structure; Microbial nutrition, growth and control; Microbial metabolism (a

Biochemistry:

Biomolecules and their conformation; Ramachandran map; Weak inter-molecular interactions in biomac

Molecular Biology and Genetics:

Molecular structure of genes and chromosomes; DNA replication and control; Transcription and its contr

Process Biotechnology:

Bioprocess technology for the production of cell biomass and primary/secondary metabolites, such as ba

Bioprocess Engineering:

Kinetics of microbial growth, substrate utilization and product formation; Simple structured models; Steril

Plant and Animal Biotechnology:

Special features and organization of plant cells; Totipotency; Regeneration of plants; Plant products of in

Characteristics of animal cells:

Metabolism, regulation and nutritional requirements for mass cultivation of animal cell cultures; Kinetics

Immunology:

The origin of immunology; Inherent immunity; Humoral and cell mediated immunity; Primary and second

Recombinant DNA Technology:

Restriction and modification enzymes; Vectors: plasmid, bacteriophage and other viral vectors, cosmids,

Bioinformatics:

Major bioinformatics resources (NCBI, EBI, ExPASy); Sequence and structure databases; Sequence an