Course Title:	Mathematics for Biologists
Course Code:	
Course Coordinator	**Dr. Abhishek Singh**
Credits	**4**

Evaluation Scheme Total 100 Marks

Quiz (Total 20 Marks)				Assignment/Project (Total 20 marks) (Minimum Two Assignments or one Project)		Mid-Term	Major Examination	Total
Quiz I (5 marks	Quiz II (5 marks)	Quiz III (5 marks)	Quiz IV (5 marks)	Assignment I (10 marks)	Assignment II (10 marks)	20 marks) (1 ½ Hour Duration)	(40 marks) (3 Hour Duration	100 Marks

WEEKS	TOPICS TO BE COVERED
Week 1	Rank of Matrix, elementary transformations, elementary matrices
Week 2	Inverse of a matrix by use of elementary transformation
Week 3	Matrix reduced to normal forms, Cayley-Hamilton theorem
Week 4	Inverse of matrix by Cayley-Hamilton theorem
Week 5	Eigen values and Eigen vectors of a matrix
Week 6	Partial differentiation, Euler's theorem on homogeneous function
Week 7	Jacobians, Tangent and normal with examples, asymptotes
Week 8	Double points, maxima and minima of function
Week 9	Concavity, convexity and point of inflexion
Week 10	Review of differential equation, linear differential equation
Week 11 (17^{th} -21^{st} March, 2025)	**Mid-Term**
2^{nd} May, 2025	**Showing of Mid-Term Answer Sheets**
Week 13	Exact differential equation
Week 14	Linear differential equation with constant coefficient of second order
Week 15	Rules for finding complementary function and particular integral of linear differential equation
Week 16	Variation of parameter technique, Cauchy homogeneous linear equation

Week 17 (5th -9th May, 2025)	**Revision Week**
Week 18 (13th – 22nd May, 2025)	**Major Examinations**
29th May, 2025	**Showing of Major Exams Answer Sheets**

Course Outcomes: This course will enable the students to

CO1: Understand different types of Matrices and their types.

CO2: Find matrix form of basic geometric transformations and interpretation of eigenvalues and eigenvectors of such transformations.

CO3: Learn various methods of solution of ordinary differential equations.

CO4: Formulate the differential equations concerning physical phenomena like electric circuits, wave motion, heat equation etc.

Recommended Books:

1. Shanti Narayan, P.K. Mittal, A text book of Matrices, S. Chand. 2017.
2. E. Kreyszig, Advanced Engineering Mathematics, 10th ed., Wiley Eastern, 2011.
3. D.A. Murray, Differential and integral calculus, Maxwell Publishers, 2023.

Calendar of Quizzes/Assignment etc. to be provided as per below details and exact dates to be fixed in consultation with other course coordinators to avoid overlap of Quizzes of different courses.

Component	Date
Quiz-I	**27th -31st, January 2025**
Quiz-II	**24th -28th February, 2025**
Assignment-I	**10th -12th February, 2025**
Mid-Term	**17-21st March, 2025**
Assignment-II/ Project Submission	**21st – 24th April, 2025**
Quiz-III	**7th – 11th April, 2025**
Quiz-IV	**28th April-2nd, May, 2025**
Major Exam	**13th – 22nd May, 2025**

Note:

1. **One surprise Quiz may be fixed out of Quiz-II, Quiz-III or Quiz-IV.**

2. **In case of any deviation in evaluation methodology for courses such as AEC/VAC/SEC shall be mentioned accordingly. Thus, same shall be approved by the next BOS of school if not done earlier.**

Signature of Course Coordinator : Abhishek Singh