Proforma for course plan

- Course Name: Genomics : Mathematics-I
- Course Code: IT-401
- Credit: 3 Credits
- Course offered to: M.Sc (Semester - I)

- Course description: This course will fulfill the basic need of mathematics as well as advance so that the students can learn to apply mathematics for real world problems. The aim of this course is enhance the knowledge and understanding of the students for developing new mathematical real world problems and their solutions. The whole of the course will be embodied by different topic of mathematics which will develop student's conceptual knowledge along with the applications. The expected outcome of this course is to enhance the knowledge and understanding of mathematics and help out in their research work.

- Pre-requisite (Mandatory): Student should be able to understand mathematics at the +2 level.

- Pre-requisite (Desirable): Nil
- Course Outcome (CO):

Students should be able to understand:

1. Basic Calculus:
2. Optimization: This topic will introduce the maximization or minimization of linear function subject to linear constraints. Its application to biological problem.
3. Numerical Analysis: Numerical methods are more accurate in comparison to analytical methods. And In research work numerical techniques have become indispensable tools in all the fields.
4. Integral Transform: The Solution of differential equation with the help of fourier transform and its applications.
5. Curve fitting: A set of observations can be express by an equation of best fit.

- Tentative teaching plan:

Week number	**Lecture topic**	**CO met**
12	Basic Calculus: Limits, Continuity, differentiability, Differentiation, Integration, Maxima and Minima (Applications).	CO1
3-5	Optimization: Extrema of functions of single and **two** variables, Lagrange multipliers more than two variables (Applications).	CO2

6-8	Numerical Analysis: Bisection Method, Method of False Position, Iteration Method, Newton-Raphson Method, Interpolation: Forward difference, Backward differences, Central differences, Newton's Formulae for interpolation - Central difference interpolation formulae - Gauss Central Difference Formulae - Lagrange's Interpolation formulae- B. Spline interpolation, Cubic spline, Simpson's 3/8 Rule, Gaussian Integration.	CO3
9-11	Integral Transform: Fourier Transform, Fourier Sine and cosine Transform, Fourier Transform of Derivative of a function, Solution of differential equation, Lplace Tnasform, Inverse Laplace transform, Solution of differential equation.	C04
12-14	Curve Fitting: Method of least squares and curve fitting of straight line and parabola, Solution of cubic and bi-quadratic equations.	CO5

1. Advanced Engineering Mathematics — by Kreyazig. E
2. Higher Engineering Mathematics — by B. S. Grewal.
3. Engineering Mathematics — by Lazpath Roy.
4. I. M. J. Strauss, G. L. Bradley and K. J. Smith, Calculus (3rd Edition), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education), Delhi, 2007.
5. H. Anton, I. Bivens and S. Davis, Calculus (7th Edition), John Wiley and Sons (Asia) Pte. Ltd., Singapore, 2002.
6. Numerical Methods -by R.K. Jain,S.R.K. lyengar, 2002
7. Integral Transform and their applications- B. Davies
8. Numericcal Analysis- Doron Levy, 2010
9. Optimization Techniques- Godfrey C. Onwubolu, B. V. Babu and
10. Engineering Optimization: Theory and Practice- S. S. Rao