**LESSON-PLAN (Session 2021-22) Even Semester**

**Name of Professor**: **Dr Iqbal Kaur**

**Subject: Mathematics**

**Class: B. Sc. I / B.A. I**

**Subject/Paper: Ordinary Differential Equations**

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| **Sr. No.** | **Days**  | **Topics to be covered** | **Remarks if any** |
|  | **01-04-2022to 15-04-2022** | Geometrical meaning of a differential equation.  |  |
|  | **16-04-2022 to 30-04-2022** | Exact differential equations integrating factors. First order higher degree equations solvable for x,y,p Lagrange’s equations, Clairaut’s equations. Equation reducible to Clairaut’s form. Singular solutions. |  |
|  | **01-05-2022to 15-05-2022** | Orthogonal trajectories: in Cartesian coordinates and polar coordinates. Self-orthogonal family of curves. |  |
|  | **16-05-2022 to 31-05-2022** | Linear differential equations with constant coefficients. Homogeneous linear ordinary differential equations. Equations reducible to homogeneous Linear differential equations of second order: Reduction to normal form. Transformation of the equation by changing the dependent variable/ the independent variable. |  |
|  | **01-06-2022to 15-06-2022** | Solution by operators of non-homogeneous linear differential equations. Reduction of order of a differential equation. Method of variations of parameters. Method of undetermined coefficients. |  |
|  | **16-06-2022 to 30-06-2022** | Ordinary simultaneous differential equations. Solution of simultaneous differential equations involving operatorsx(d/dx) or t(d/dt) etc. Simultaneous equation of the form dx/P = dy/Q = dz/R. Total differential equations.  |  |
|  | **01-07-2022 to 19-07-2022** | Condition for Pdx + Qdy +Rdz = 0 to be exact. General method of solving Pdx + Qdy + Rdz = 0 by taking one variable constant. Method of auxiliary equations. |  |

\*Vacation as per university calendar

\*Assignment 1 and assignment 2 have to besubmitted at the end of April and May, and unit test will be taken every week.

**LESSON-PLAN (Session 2021-22) Even Semester**

**Name of Professor**: **Dr Iqbal Kaur**

**Subject: Mathematics**

**Class: B. Sc. I / B.A. I**

**Subject/Paper: Vector Calculus**

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| **Sr. No.** | **Days**  | **Topics to be covered** | **Remarks if any** |
|  | **01-04-2022to 15-04-2022** | Scalar and vector product of three vectors, |  |
|  | **16-04-2022 to 30-04-2022** | Product of four vectors. Reciprocal vectors. Vector differentiation Scalar Valued point functions, vector valued point functions, derivative along a curve,  |  |
|  | **01-05-2022to 15-05-2022** | directional derivatives, Gradient of a scalar point function, geometrical interpretation of grad F , character of gradient as a point function. |  |
|  | **16-05-2022 to 31-05-2022** | Divergence and curl of vector point function, characters of Div f and Curl f as point function, examples. Gradient, divergence and curl of sums and product and their related vector identities. Laplacian operator. |  |
|  | **01-06-2022to 15-06-2022** | Orthogonal curvilinear coordinates Conditions for orthogonality, fundamental triad of mutually orthogonal unit vectors. |  |
|  | **16-06-2022 to 30-06-2022** | Gradient, Divergence, Curl and Laplacian operators in terms of orthogonal curvilinear coordinates, Cylindrical co-ordinates and Spherical coordinates. |  |
|  | **01-07-2022 to 19-07-2022** | Vector integration; Line integral, Surface integral, Volume integral Theorems of Gauss, Green & Stokes and problems based on these theorms. |  |

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\*Assignment 1 and assignment 2 have to be submitted at the end of April and May, and unit test will be taken every week.