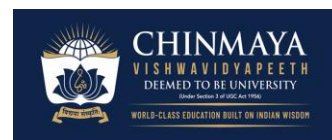


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## Module Sessions

### Module 1: (15 Hours)

Definition, Formation of a differential equation, Solution of a differential equation, Equations of the first order and first degree, Variables separable, Integrating factors, Homogeneous form– Reducible to homogeneous form, Linear equations, Bernoulli's equation, Exact equations, Equations reducible to exact equations.

#### Reading:

1. Grewal
2. Raisinghania
3. Rainville and Bedient

#### Activities:

- a) Quiz
- b) Assignment

### Module 2: (20 Hours)

Equations of the first order and higher degree, Clairaut's equation solvable for  $x$  and  $y$  and  $p$ , Orthogonal trajectories in polar and Cartesian form, Operator  $D$ , Rules for finding the particular integral, Cauchy-Euler differential equation, Legendre's differential equations, Simultaneous differential equations.

#### Reading:

1. Kreyszig
2. Raisinghania
3. Murray

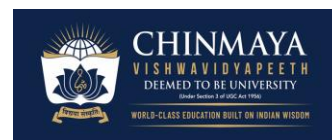
#### Activities:

- a) Quiz
- b) Assignment
- c) Presentation

### Module 3: (20 Hours)

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Equations which do not contain x, Equation whose one solution is known, Equations which can be solved by changing the independent variable and dependent variable, Variation of parameters, Total differential equation:  $Pdx + Qdy + Rdz = 0$ , Simultaneous equations of the form  $dx/P = dy/Q = dz/R$ .

**Reading:**

1. Ayres
2. Mittal
3. Raisinghania

**Activities:**

- a) Quiz
- b) Assignment

**Module 4:**

**(20 Hours)**

Formation by elimination of arbitrary constants, Formation by elimination of arbitrary functions, Solution by direct integration, Lagrange's linear equations  $Pp + Qq = R$ , Standard types of first order non-linear partial differential equations, Charpit's method, Homogeneous linear equations with constant coefficients, Rules for finding the complementary functions, Rules for finding the particular integral, Separation of variables.

**Reading:**

1. Ayres
2. Vasishta and Sharma
3. Mittal
4. Raisinghania

**Activities:**

- a) Quiz
- b) Assignment
- c) Presentation