KVR GOVT. COLLEGE FOR WOMEN (AUTONOMOUS), KURNOOL
Re-Accredited by NAAC with Grade "A"
CHOICE BASED CREDIT SYSTEM (w.e.f. 2016-17)
FIRST YEAR B.Sc. MATHEMATICS
FIRST SEMESTER, CORE COURSE-I
CORE COURSE-I: DIFFERENTIAL EQUATIONS(w. e. f. 2021-2022)

Course Syllabus(75 hours):

UNIT – I (12 Hours)

Differential Equations of first order and first degree:

Linear Differential Equations; Differential equations reducible to linear form; Exact differential equations; Equations reducible to exact form ; Integrating factors; Change of variables.

Equations reducible to first order and first degree by $p = \frac{dy}{dx}$ substitution.

UNIT – II (12 Hours)

Orthogonal Trajectories

Differential Equations of first order but not of the first degree:

Equations solvable for *p*; Equations solvable for *y*; Equations solvable for *x*; Equations that do not contain x (or y); Equations homogeneous in x and y; Equations of the first degree in *x* and *y* – Clairaut's Equation.

UNIT – III (12 Hours)

Higher order linear differential equations-I:

Solution of homogeneous linear differential equations of order n with constant coefficients; Solution of the non-homogeneous linear differential equations with constant coefficients by means of polynomial operators. General Solution of f(D)y=0.

General Solution of f(D)y = Q when Q is a function of x, $\frac{\mathbf{1}}{\boldsymbol{f(D)}}$ is expressed as partial fractions.

P.I. of f(D)y = Q when Q = be^{ax}

P.I. of f(D)y = Q when Q is bsinax or bcos ax.

UNIT – IV (12 Hours)

Higher order linear differential equations-II:

Solution of the non-homogeneous linear differential equations with constant coefficients.

P.I. of f(D)y = Q when Q = bx^k

P.I. of f(D)y = Q when Q = $e^{ax}V$, where V is a function of x.

P.I. of f(D)y = Q when Q = xV, where V is a function of x.

P.I. of f(D)y = Q when Q = x^mV , where V is a function of x.

UNIT –V (12 Hours)

Higher order linear differential equations-III :

Method of variation of parameters; Linear differential Equations with non-constant coefficients; The Cauchy-Euler Equation, Legendre's linear equations, System of two linear differential equations with constant coefficients

Co-Curricular Activities(15 Hours)

Seminar/ Quiz/ Assignments/ Applications of Differential Equations to Real life Problem /Problem Solving.

Text Book :

1. A text book of B.Sc.Mathematics, Volume-I (Theory and Practical), by V.Venkateswara Rao,N. Krishna Murthy & others, published by S.Chand & Company, New Delhi.

Reference Books :

1.Differential Equations and Their Applications by Zafar Ahsan, published by Prentice-Hall of India Pvt. Ltd, New Delhi-Second edition.

2. Ordinary and Partial Differential Equations by Dr. M.D,Raisinghania, published by S. Chand & Company, New Delhi

3. Differential Equations with applications and programs – S. Balachandra Rao & HR Anuradha-Universities Press.

4. Differential Equations -Srinivas Vangala & Madhu Rajesh, published by Spectrum University Press.