



Dharampeth M. P. Deo Memorial Science College, Nagpur

Syllabus wise You Tube Links

B. Sc. SEM III (Mathematics)

M-5: Partial Differential Equations & Calculus of Variations

Unit I

Simultaneous differential equations of first order and first degree in three variables, Methods of solution of $dx/P = dy/Q = dz/R$, Pfaffian differential forms and equations, Solution of Pfaffian differential equation in three variables, Partial differential equations of first order, Origins of first order partial differential equations

https://www.youtube.com/watch?v=uMCIEs6DtOw&list=PLzuxOP_ebC2HBmRg_pbnYkxSBr1sz8hjI&index=2 By Roshan Thakre

Unit II

Linear equations of first order, Integral surface passing through a given curve, Compatible system of first order equations, Charpit's method, Jacobi's method.

https://www.youtube.com/watch?v=rZfam46UKMw&list=PLzuxOP_ebC2HBmRg_pbnYkxSBr1sz8hjI&index=1 By Roshan Thakre

Unit-III

Partial differential equation (PDE) of second order, Linear PDE with constant coefficients and their solutions.

https://www.youtube.com/watch?v=rZfam46UKMw&list=PLzuxOP_ebC2HBmRg_pbnYkxSBr1sz8hjI&index=1 By Roshan Thakre

Unit IV

Calculus of Variations: Functionals, Classes of functions, Extremum of a functional, Variation of functional, The necessary condition for an extremum of a functional, Special cases of integrability of Euler's equation, Functional dependent on higher order derivative, Functional dependent on two functions of one independent variable, Euler-Ostrogradsky equation, Invariance of Euler's equation.

https://www.youtube.com/watch?v=rZfam46UKMw&list=PLzuxOP_ebC2HBmRg_pbnYkxSBr1sz8hjI&index=1 By Roshan Thakre