

Subject Code: 1SC2040403	Subject Title: Mathematical Methods -II
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Course Objective:

The overall objective of this course is to provide an introduction to the process of mathematical methods-II while giving students an opportunity to develop and construct appropriate various problem situations described in detail in the syllabus.

Teaching scheme (hours) per week		credit		Theory Marks		Practical Marks		Total
Theory	Tutorial	Theory	Tutorial	University Assessment	Cont. Assessment	University Assessment	Cont. Assessment	
4	1	4	1	60	40	-	-	100

Subject Contents			
Unit. No	Topic	Total Hours	Weight (%)
1	Functionals, Euler's equation, other forms of Euler's equation, some special forms of Euler's equation, geodesics.	18	25
2	Isoperimetric problems, several dependent variables, functionals involving higher order derivatives.	18	25
3	Integral equations, types of integral equations, conversion of differential equation into an integral equation and vice versa, solution of integral equation, Integral equations of convolution type, Abel's integral equations, integro - differential equation.	18	25
4	Bessel's equation, Laguerre's equation, Hermite equation, Sturm-Liouville equations, Conversion of various types of differential equations into Sturm-Liouville equation, their solutions.	18	25

Course Outcome:

On successful completion of the course, students should be able to

- Students will be able to understand the concept of Functionals, some special forms of Euler's equation.
- Students will be able to understand the concept of functionals involving higher order derivatives.
- Students will be able to understand the concept of types of integral equations and their solutions.

List of References:

- B. S. Grewal, Higher Engineering Mathematics, Khanna Publs, 3rd Edition, Delhi.
- N. Kumar, An elementary course on variational problems in calculus, Narosa Publishing House, New Delhi, 2005.
- B. V. Limaye, Functional analysis, 2nd Edition, New Delhi, 1996.
- S. Gupta, calculus of variations with applications, Prentice-Hall of India, New Delhi, 1999.
- S. G. Mikhlin, Integral Equations and Applications.