

**Course Name** : Electrical and Electronics Engineering Group

**Course code** : EE/EP/ET/EJ/EN/EX/IE/IS/IC/DE/EV/MU/ IU/ED/EI

**Semester** : Third

**Subject Title** : Applied Mathematics **Subject Code:** 9030

**Teaching and examination scheme:**

Teaching Scheme			Examination Scheme						
TH	PR	TU	PAPER HRS	TH	TEST	PR	OR	TW	TOTAL
03	--	--	03	80	20	--	--	--	100

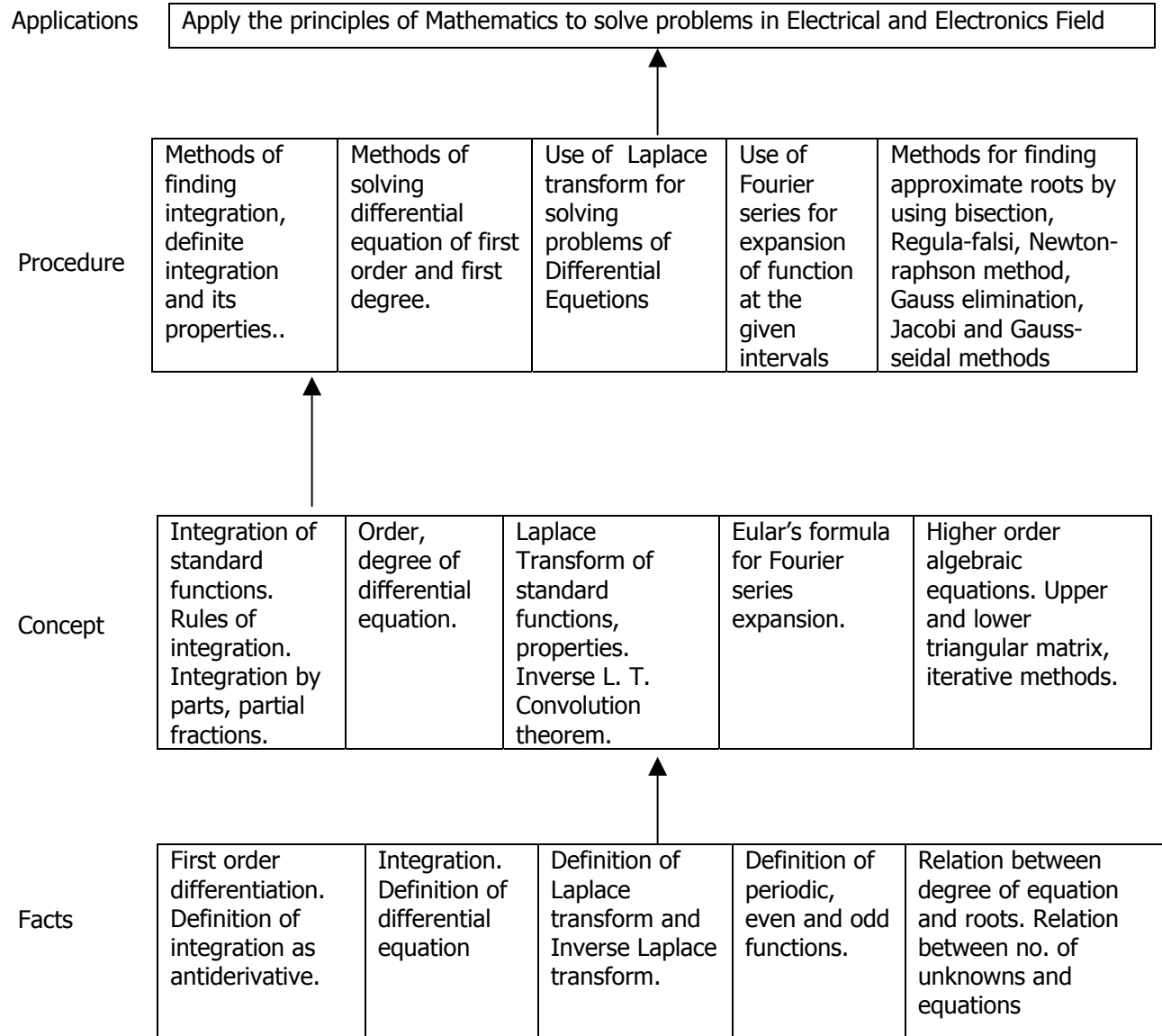
**RATIONALE:**

The study of mathematics is necessary to develop in the student the skills essential for studying new technological development. This subject introduces some applications of engineering, through which the student can understand the link of Mathematics with engineering principles.

**OBJECTIVE:**

1. Apply Mathematical term, concept, principals, and different methods
2. Apply Mathematical methods to solve technical problems,
3. Execute management plans with precision.
4. Use Mathematical techniques necessary for daily and practical problems.

## LEARNING STRUCTURE:



## Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	<b>Integration:</b> 1.1 Definition of integration as anti-derivative. Integration of standard function. 1.2 Rules of integration (Integrals of sum, difference, scalar multiplication). 1.3 Methods of Integration. 1.3.1 Integration by substitution 1.3.2 Integration of rational functions. 1.3.3 Integration by partial fractions. 1.3.4 Integration by trigonometric transformation. 1.3.5 Integration by parts. 1.4 Definite Integration. 1.4.1 Definition of definite integral. 1.4.2 Properties of definite integral with simple problems. 1.5 <b>Applications of definite integrals.</b> 1.5.1 Area under the curve. 1.5.2 Area between two curves. 1.5.3 Mean and RMS values	12	24
02	<b>Differential Equation</b> 2.1 Definition of differential equation, order and degree of differential equation. Formation of differential equation for function containing single constant. 2.2 Solution of differential equations of first order and first degree such as variable separable type, reducible to Variable separable, Homogeneous, Nonhomogeneous, Exact, Linear and Bernoulli equations. 2.3 Applications of Differential equations. 2.3.1 Laws of voltage and current related to EC, RC, and LRC Circuits.	10	16

03	<p><b>Laplace Transform</b></p> <p>3.1 Definition of Laplace transform, Laplace transform of standard functions.</p> <p>3.2 Properties of Laplace transform such as Linearity, first shifting, second shifting, multiplication by <math>t^n</math>, division by <math>t</math>.</p> <p>3.3 Inverse Laplace transforms. Properties- linearly first shifting, second shifting. Method of partial fractions,</p> <p>3.4 Convolution theorem.</p> <p>3.5 Laplace transform of derivatives,</p> <p>3.6 Solution of differential equation using Laplace transform (up to second order equation).</p>	08	16
04	<p><b>Fourier Series</b></p> <p>4.1 Definition of Fourier series (Euler's formula).</p> <p>4.2 Series expansion of continuous functions in the intervals <math>(0, 2l), (-l, l), (0, 2\pi), (-\pi, \pi)</math></p> <p>4.3 Series expansions of even and odd functions.</p> <p>4.4 Half range series.</p>	08	08
05	<p><b>Numerical Methods</b></p> <p><b>4.1 Solution of algebraic equations</b> Bisection method. Regularfalsi method. Newton – Raphson method.</p> <p><b>4.2 Solution of simultaneous equations containing 2 and 3 unknowns</b> Gauss elimination method. Iterative methods- Gauss seidal and Jacobi's methods.</p>	05  05	08  08
	Total	48	80

## Learning Resources:

### Books:

Sr. No.	Title	Authors	Publications
1	Mathematics for polytechnic	S. P. Deshpande	Pune Vidyarthi Griha Prakashan, Pune
2	Calculus: single variable	Robert T. Smith	Tata McGraw Hill
3	Laplace Transform	Lipschutz	Schaum outline series.
4	Fourier series and boundary value problems	Brown	Tata McGraw Hill
5	Higher Engineering Mathematics	B. S. Grewal	Khanna Publication, New Dehli
6	Introductory Methods of Numerical analysis	S. S. Sastry	Prentice Hall Of India, New Dehli
7	Numerical methods for scientific & engineering computations	M. K. Jain & others	Wiley Eastern Publication.