Course Name : All Branches of Diploma in Engineering & Technology

Course Code : AE/CE/CH/CM/CO/CR/CS/CW/DE/EE/EP/IF/EJ/EN/ET/EV/EX/IC/IE/IS/ ME/MU/PG/PT/PS/CD/CV/ED/EI/FE/IU/MH/MI

Semester : Second

Subject Title : Applied Mathematics

Subject Code : 17301

Teaching and Examination Scheme:

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

NOTE:

- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).**

Rationale:

Applied mathematics is designed for its applications in engineering and technology. It includes the topics integration, differential equation, probability distribution. The connection between applied mathematics and its applications in real life can be understood and appreciated.

Derivatives are useful to find slope of the curve, maxima and minima of function, radius of curvature. Integral calculus helps in finding the area. In analog to digital converter and modulation system integration is important. Differential equation is used in finding curve. Probability is used in Metrology and quality control.

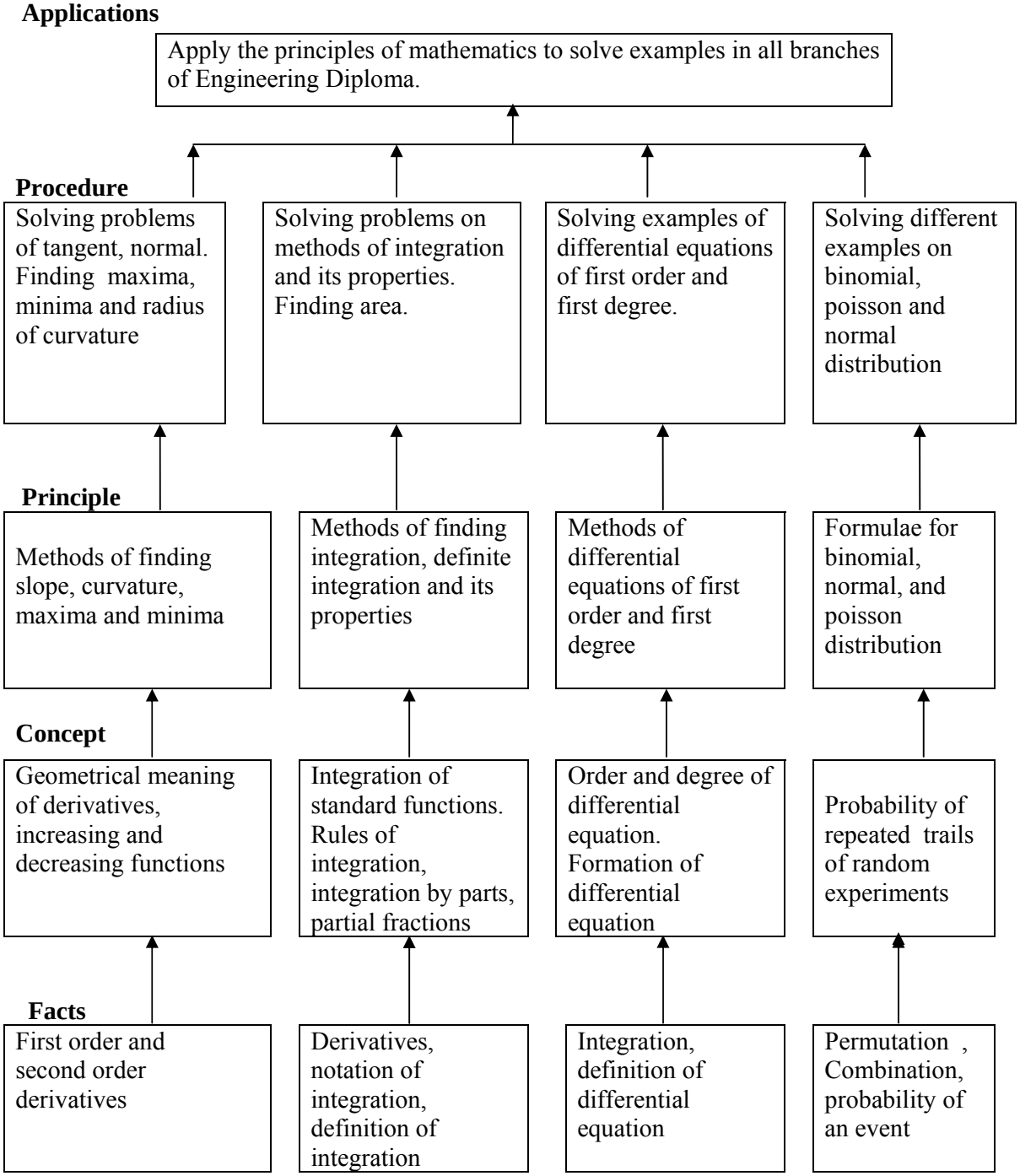
The fundamentals of this topic are directly useful in understanding engineering applications in various fields.

General Objectives:

Students will be able to:

1. Apply derivatives to find slope, maxima, minima and radius of curvature.
2. Apply integral calculus to solve different engineering problems.
3. Apply the concept of integration for finding area.
4. Apply differential equation for solving problems in different engineering fields.
5. Apply the knowledge of probability to solve the examples related to the production process.

Learning Structure:



Theory:

Topic and Contents	Hours	Marks
Topic-1 Applications of Derivative **Specific objectives :** ➢ Find slope, curvature, maximum and minimum value of functions related to different engineering applications. • Examples for finding slope , equations of tangent and normal to the curve • Maxima and minima. • Radius of curvature.	06	16
Topic-2 Integral Calculus		
2.1 Integration ---------- 20 **Specific objectives :** ➢ Integrate function using different method. • Definition of integration as anti derivative, rules of integration. • Integration of standard functions • Methods of integration Integration by substitution. Integration by partial fractions. Integration by parts and generalized rule by parts.	14	44
2.2 Definite Integrals ---------- 16 **Specific objectives :** ➢ Solve problems on definite integrals using the properties. • Definite integral- Definition, examples. • Properties of definite integrals without proof and simple examples.	08	
2.3 Application of Definite Integrals ----------08 **Specific objectives :** ➢ Find area. 1. Area under a curve. 2. Area between two curves.	04	
Topic 3 - Differential Equation.		
3.1 Differential equation **Specific objectives :** ➢ Solve the differential equation of first order and first degree ➢ Solve different engineering problems using differential equation • Differential equation- Definition, order and degree of a differential equation. Formation of differential equation containing single constant. • Solution of differential equation of first order and first degree for following types Variable separable form, Equation reducible to variable separable form. Linear differential equation. Homogeneous differential equation. Exact differential equation.	10	20

Topic 4 - Probability		
4.1 Probability **Specific objectives : ---------- 08** ➢ Solve different engineering problems related to probability process. • Definition of random experiment, sample space, event, occurrence of event and types of event (impossible, mutually exclusive, exhaustive, equally likely) • Definition of probability, addition and multiplication theorems of probability.	02	20
4.2 Probability Distribution ---------- 12 • Binomial distribution • Poisson's Distribution • Normal distribution	04	
Total	**48**	**100**

Learning Resources:

1) Books:

Sr. No	Title	Authors	Publication
1	Mathematic for Polytechnic	S. P. Deshpande	Pune Vidyarthi Girha Prakashan' Pune
2	Calculus : Single Variable	Robert. T. Smith	Tata McGraw Hill
3	Higher Engineering mathematics	B. V Ramana	Tata McGraw Hill
4	Higher Engineering mathematics	H. K. Dass	S .Chand Publication
5	Higher Engineering Mathematics	B. S. Grewal	Khanna Publication, New Delhi
6	Applied Mathematics	P. N. Wartikar	Pune Vidyarthi Griha Prakashan, pune

2) Websites :

i) www.khan academy