ANNEXURE

STATE BOARD OF TECHNICAL EDUCATION & TRAINING, TAMILNADU
DIPLOMA IN ENGINEERING / TECNOLOGY - SYLLABUS
M-SCHEME
(Implements from the Academic Year 2015-2016 on wards)

Course Name :All branches of Diploma in Engineering and Technology and Special Programmes except DMOP, HMCT and film & TV.

Subject Code : 30022

Semester : II Semester

Subject Title : **ENGINEERING MATHEMATICS – II**

TEACHING AND SCHEME OF EXAMINATION:

No of weeks per semester: 15 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
Engineering Mathematics - II	5 Hrs.	75 Hrs.	Internal Assessment	Semester Examination	Total	
			25	75	100	3 Hrs

TOPICS AND ALLOCATION OF HOURS:

Sl.No.	Topics	Time (Hrs.)
1	Analytical Geometry	14
2	Vector Algebra – I	14
3	Vector Algebra – II	14
4	Integral Calculus – I	14
5	Integral Calculus – II	14
Test and Tutorial		5
TOTAL		**75**

Rationale: In many fields of Engineering, there are situations where in the effects due to various factors can be calculated only in a smaller region. To calculate the total effect or effect over a larger region the Integration concept is used. Integration plays vital role in many fields of Engineering.

Objectives: The student will be able to acquire knowledge of algebra of vectors and its application in finding work done, moment, volumes , to acquire knowledge of Integration principles and different methods of Integration.

30022 ENGINEERING MATHEMATICS - II

DETAILED SYLLABUS

Contents: Theory

UNIT	NAME OF TOPICS	Hours
I	**ANALYTICAL GEOMETRY**	5
	Chapter - 1.1 EQUATION OF CIRCLE Equation of circle – given centre and radius. General equation of circle – finding centre and radius. Equation of circle on the line joining the points (x_1, y_1) and (x_2, y_2) as diameter. Simple Problems.	
	Chapter - 1.2 FAMILY OF CIRCLES Concentric circles, contact of two circles(Internal and External) -Simple problems. Orthogonal circles (results only). Problems verifying the condition .	4
	Chapter - 1.3 INTRODUCTION TO CONIC SECTION Definition of a Conic, Focus, Directrix and Eccentricity. General equation of a conic $a x^2 + 2h x y + b y^2 + 2g x + 2 f y + c = 0$ (statement only). Condition for conic (i) for circle: $a = b$ and $h = 0$ (ii) for pair of straight line: $\begin{vmatrix} a & h & g \\ h & b & f \\ g & f & c \end{vmatrix} = 0$ (iii) for parabola: $h^2 - ab = 0$ (iv) for ellipse: $h^2 - ab < 0$ and (v) for hyperbola: $h^2 - ab > 0$. Simple Problems.	5
II	**VECTOR ALGEBRA – I**	5
	Chapter - 2.1 VECTOR - INTRODUCTION Definition of vector - types, addition, and subtraction of Vectors, Properties of addition and subtraction. Position vector. Resolution of vector in two and three dimensions. Directions cosines, Direction ratios. Simple problems.	
	Chapter - 2.2 SCALAR PRODUCT OF VECTORS Definition of Scalar product of two vectors – Properties – Angle between two vectors. Simple Problems.	5
	Chapter - 2.3 APPLICATION OF SCALAR PRODUCT Geometrical meaning of scalar product. Work done by Force. Simple Problems.	4
III	**VECTOR ALGEBRA – II**	5
	Chapter - 3.1 VECTOR PRODUCT OF TWO VECTORS Definition of vector product of two vectors. Geometrical meaning. Properties – Angle between two vectors – unit vector perpendicular to two vectors. Simple Problems.	

UNIT	NAME OF TOPICS	Hours
III	**Chapter - 3.2 APPLICATION OF VECTOR PRODUCT OF TWO VECTORS & SCALAR TRIPLE PRODUCT** Definition of moment of a force. Definition of scalar product of three vectors – Geometrical meaning – Coplanar vectors. Simple Problems.	5
	Chapter - 3.3 VECTOR TRIPLE PRODUCT & PRODUCT OF MORE VECTORS Definition of Vector Triple product, Scalar and Vector product of four vectors Simple Problems.	4
IV	**INTEGRAL CALCULUS – I**	5
	Chapter - 4.1 INTEGRATION – DECOMPOSITION METHOD Introduction - Definition of integration – Integral values using reverse process of differentiation – Integration using decomposition method. Simple Problems.	
	Chapter - 4. 2 INTEGRATION BY SUBSTITUTION Integrals of the form $\int [f(x)]^n f'(x)dx,\ n \neq -1$, $\int \frac{f'(x)}{f(x)}dx$ and $\int F[f(x)]f'(x)dx$. Simple Problems.	5
	Chapter - 4.3 STANDARD INTEGRALS Integrals of the form $\int \frac{dx}{a^2 \pm x^2}$, $\int \frac{dx}{x^2 - a^2}$ and $\int \frac{dx}{\sqrt{a^2 - x^2}}$. Simple Problems	4
V	**INTEGRAL CALCULUS – II**	5
	Chapter - 5.1 INTEGRATION BY PARTS Integrals of the form $\int x \sin nx\,dx$, $\int x \cos nx\,dx$, $\int x e^{nx}\,dx$, $\int x^n \log x\,dx$ and $\int \log x\,dx$. Simple Problems.	
	Chapter - 5.2 BERNOULLI'S FORMULA Evaluation of the integrals $\int x^m \sin nx\,dx$, $\int x^m \cos nx\,dx$ and $\int x^m e^{nx}\,dx$ where $m \leq 2$ using Bernoulli's formula. Simple Problems.	4
	Chapter - 5.3 DEFINITE INTEGRALS Definition of definite Integral. Properties of definite Integrals - Simple Problems.	5

Text Book:

1. Mathematics for Higher Secondary – I year and II year (Tamil Nadu Text Book Corporation)
2.

Reference Book:

1. Engineering Mathematics - Dr.M.K.Venkatraman, National Publishing Co, Chennai
2. Engineering Mathematics – Dr.P.Kandasamy & Others, S.Chand & Co Ltd, New Delhi.

Board Examination - Question paper pattern

Time: 3 Hrs. **Max.Marks: 75**

PART A - 5 Questions to be answered out of **8** for 2 marks each.
PART B - 5 Questions to be answered out of **8** for 3 marks each.
PART C - All the **5** Questions to be answered
Each question in PART C will contain **3** Sub questions, out of these **3** Sub questions **2** Sub questions is to be answered for 5 marks each.

PART A	**5** x 2 marks	**10** Marks
PART B Short answer type questions	**5** x 3 marks	**15** Marks
PART C Descriptive answer type questions Each question in PART C will contain **3** Sub questions, out of these **3** Sub questions **2** Sub questions is to be answered for 5 marks each.	**5 x 2** x 5 marks	**50** Marks
Total		**75** Marks

Out of the **3 Sub questions** in **PART C, one sub question** must be on problem based to test the analytical ability/logical ability /diagnostic ability/conceptual ability relevant to that subject content. Equal weightage is to be given to whole syllabus.

Clarks table will not be permitted for the Board Examinations.