SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Department of Applied Mathematics		LP: MA18152
		Rev. No: 00
B.E/B.Tech : MARINE ENGINEERING Regulation: 2018		Date:7.12.2020
Sub.Code / Sub. Name : MA18152 -MATHEMATICS FOR MARINE ENGINEERING -I		
Unit I : THREE DIMENSIONAL ANALYTICAL GEOMETRY		

Unit Syllabus: Equation of a sphere – Plane section of a sphere – Tangent Plane – Equation of a cone – Right circular cone – Equation of a cylinder – Right circular cylinder.

OBJECTIVE: To develop the use of Three Dimensional Geometry techniques that is needed by Engineers for practical applications.

Session No.	Topics to be covered	Ref	Teaching Method
1	Basics of geometry	B.S.Grewal Pg 104-123	LCD/BB
2	Introduction to Sphere and Equation of sphere	Pg124	LCD/BB
3	Problems on equation of sphere	Pg125-127	LCD/BB
4	Introduction to Plane section of a sphere	Bali-pg322	LCD/BB
5	Problems on Plane section of a sphere	Pg323-329	LCD/BB
6	Introduction to Tangent Plane and problems	B.S.Grewal Pg128-130	LCD/BB
7	Tutorial Class	Worksheet	LCD/BB
8	Introduction to cone and problems	Pg130-132	LCD/BB
9	Problems on Right circular cone	Pg132-134	LCD/BB
10	Problems on Right circular cone	Pg132-134	LCD/BB
11	Introduction to cylinder and problems	Pg132-134	LCD/BB
12	Problems on Right circular cylinder	Pg135,136	LCD/BB

Content beyond syllabus covered (if any): Basics of Geometry

* Session duration: 50 mins

Sub. Code / Sub. Name:MA18152 / MATHEMATICS FOR MARINE ENGINEERING -I
Unit III : FUNCTIONS OF SEVERAL VARIABLES

Unit Syllabus:

Limits and continuity, Partial derivatives – definition, geometrical interpretation and rules of partial differentiation, Higher order partial derivatives, Homogeneous functions, Euler's theorem for homogenous functions – Total derivatives and chain rules, Differentiation of implicit functions and composite functions ,Errors and approximations, Maxima and Minima, Method of Lagrangian multipliers.

OBJECTIVE:

To familiarize with functions of several variables which is needed in many branches of Engineering.

Session No.	Topics to be covered	Ref	Teaching Method
13	Limits and Continuity	B.S.Grewal pg211,212	LCD/BB
14	Partial derivatives and higher order partial derivatives	Pg213-217	LCD/BB
15	Euler's theorem for homogenous functions	Pg219-222	LCD/BB
16	Tutorial class	Work sheet	LCD/BB
17	Total derivatives and chain rules	Pg223-229	LCD/BB
18	Differentiation of implicit functions and composite functions	Pg223-229	LCD/BB
19	Errors and approximations	Pg238-241	LCD/BB
20	CAT-I		
21	Maxima and minima function of two variables	Pg242-244	LCD/BB
22	More Problems on Maxima and Minima	Pg242-244	LCD/BB
23	Lagrange's method of undetermined multipliers	Pg244-249	LCD/BB
24	More Problems on Lagrange's method of undetermined multipliers	Pg244-249	LCD/BB

Content beyond syllabus covered (if any): nil

* Session duration: 50 mins

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Sub. Code / Sub. Name:MA18152 / MATHEMATICS FOR MARINE ENGINEERING -I
Unit V   : MULTIPLE INTEGRALS

Unit syllabus: Double and triple integrals – Cartesian coordinates- Region of integration and change of order of integration, Spherical polar and cylindrical coordinates .Theorems of parallel and perpendicular axes. Second moments of area and moments of inertia of rectangular and circular laminas

Applications- Area, Volume, Mass of wire, lamina and solid. Centre of Gravity of wire, lamina and solid. Moment of Inertia using multiple integrals.

OBJECTIVE:
• Be acquainted with mathematical tools needed in evaluating multiple integrals and their usage.

Session No.	Topics to be covered	Ref	Teaching Method
25	Evaluation of Double integration in Cartesian co-ordinates	B.S.Grewal pg294-297	LCD/BB
26	Change of order of Integration	Pg297-300	LCD/BB
27	Evaluation of Double integration in polar co-ordinates	Pg301,302	LCD/BB
28	Problems on Spherical polar and cylindrical coordinates	Mukul Bhatt pg5.142-5.156	LCD/BB
29	Theorems of parallel and perpendicular axes	Pg297-302	LCD/BB
30	Tutorial class	Work sheet	LCD/BB
31	Second moments of area and moments of inertia of a rectangular and circular laminas	Pg297-302	LCD/BB
32	Applications- Area, Volume, Mass of wire, lamina and solid	Internet	LCD/BB
33	Tutorial class	Work sheet	LCD/BB
34	Centre of Gravity of wire, lamina and solid.	B.S.Grewal pg294-296	LCD/BB
35	Moment of Inertia using multiple integrals	Pg297-302	LCD/BB
36	CAT-II		

Content beyond syllabus covered (if any): nil

* Session duration: 50 mins

Sub. Code / Sub. Name:MA18152 / MATHEMATICS FOR MARINE ENGINEERING -I
Unit IV   : INTEGRAL CALCULUS

Unit syllabus:

Integration of standard forms by substitution and by parts. The definite integral as the limit of a sum. Application of integration to area under curve; volume of revolution; First moment of area and the position of a centroid of an area; Work done by variable forces; mean values, Root mean square values of in sin x and Cos nx. The rules of Guldinus. Theorems of parallel and perpendicular axes. Second moments of area and moments of inertia of rectangular and circular laminas

OBJECTIVE:
Be acquainted with the mathematical tools needed in evaluating integrals and their applications.

Session No.	Topics to be covered	Ref	Teaching Method
37	Integration of standard forms by substitution and by parts	Higher secondary	LCD/BB
38	The definite integral as the limit of a sum	Pg250-256	LCD/BB
39	Tutorial class	Work sheet	LCD/BB
40	Application of integration to area under curve; volume of revolution	Grewal pg274-281	LCD/BB
41	First moment of area and the position of a centroid of an area	Internet	LCD/BB
42	Tutorial class	Work sheet	LCD/BB
43	Work done by variable forces	Internet	LCD/BB
44	Mean values, Root mean square values of in sinnx and Cos nx	Internet	LCD/BB
45	Tutorial class	Work sheet	LCD/BB
46	The rules of Guldinus	Internet	LCD/BB
47	Theorems of parallel and perpendicular axes.	Pg297-302	LCD/BB
48	Second moments of area and moments of inertia of a rectangular and circular laminas	Pg297-302	LCD/BB

Content beyond syllabus covered (if any): Nil

* Session duration: 50 mins

SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Sub. Code / Sub. Name: MA18152 / MATHEMATICS FOR MARINE ENGINEERING -I
Unit II : DIFFERENTIAL CALCULUS

Unit Syllabus: Differentiation of algebraic, circular, exponential and logarithmic functions, of products, quotient, functions of a function and simple implicit functions. Successive differentiation- intro. And notation, nth order derivatives of standard functions, nth order derivatives using (a) trig. identities and standard functions (b) partial fractions, Leibnitz theorem, Maclaurin's Theorem, and standard expansions, Expansions using standard expansions, Taylor's theorem, Indeterminate forms and L'Hospital's rule, Curve tracing of Cartesian and polar curves.

OBJECTIVE: • To understand effectively the basics of Differential Calculus.

Session No.	Topics to be covered	Ref	Teaching Method
49	Differentiation of algebraic, circular, exponential and logarithmic functions	Higher secondary	LCD/BB
50	Differentiation of products, quotient, functions of a function and simple implicit functions.	Higher secondary	LCD/BB
51	Introduction to successive differentiation and problems	Grewal-pg145,146	LCD/BB
52	nth order derivatives of standard functions	pg147-149	LCD/BB
53	nth order derivatives using (a) trig. identities and standard functions (b) partial fractions	pg147-149	LCD/BB
54	Introduction to Leibnitz theorem and problems	Pg150	LCD/BB
55	Problems on Leibnitz theorem	Pg150-152	LCD/BB
56	Introduction to Maclaurin's Theorem and problems	Pg159-161	LCD/BB
57	Introduction to Taylor's theorem and problems	Pg161-163	LCD/BB
58	Introduction to Indeterminate forms and L'Hospital's rule and problems	Pg163-168	LCD/BB
59	Curve tracing of Cartesian and polar curves.	Pg169-174	LCD/BB
60	Curve tracing of polar curves	Pg169-174	LCD/BB
61	CAT - III		

Content beyond syllabus covered (if any): Practical applications of differential equations
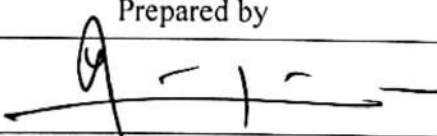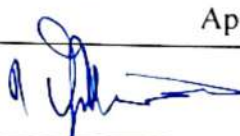
* Session duration: 50 mins

Sub. Code / Sub. Name:MA18152 / MATHEMATICS FOR MARINE ENGINEERING -I

TEXT BOOKS:

1. Bali N. P and Manish Goyal, "Text book of Engineering Mathematics", Third edition, Laxmi Publications (P) Ltd.,(2008).

2. Grewal. B.S, "Higher Engineering Mathematics", 40th Edition, Khanna Publications, Delhi,(2007).

3. William Embleton and Leslie Jackson, "Mathematics for Engineers Vol- I", 7th Edition, Reed's Marine Engineering Series, Thomas Reed Publications, (1997).

REFERENCES:

4. Ramana B.V, "Higher Engineering Mathematics", Tata McGraw Hill Publishing Company, New Delhi, (2007).

5. Glyn James, "Advanced Engineering Mathematics", 7th Edition, Pearson Education, (2007).

6. Jain R.K and Iyengar S.R.K," Advanced Engineering Mathematics", 3rd Edition, Narosa Publishing House Pvt. Ltd., (2007).

	Prepared by	Approved by
Signature		
Name	Dr. R.SURESH	Dr. R. MUTHUCUMARASWAMY
Designation	Assistant Professor	Professor & Head
Date	07.12.2020	07.12.2020

Remarks *:
The same Lesson Plan may be used for MA18152 / MATHEMATICS FOR MARINE ENGINEERING -I in the subsequent semester.

Remarks *:

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD