

### Lesson Plan

**Name** : S.S. Lamba  
**Discipline** : Common for all branches  
**Year** : 1<sup>st</sup>  
**Subject** : Applied Mathematics  
**Duration** : 39 weeks (30/7/2018 to 30/04/2019)  
**Work Load** : 3 Lectures and 2 Tutorials per week

Week	Theory	
	Lecture/ Tutorial day	Topic
1 <sup>st</sup>	1 <sup>st</sup>	Law of Indices and basics
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Formula of Factorisation and expansion with some solved problems.
	4 <sup>th</sup>	<b>Tutorial/Problem Solving</b>
2 <sup>nd</sup>	1 <sup>st</sup>	Partial fraction:- Definition of Polynomial fraction proper & improper fractions and definition of partial fractions with examples.
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	To resolve proper fraction into partial fraction with denominator containing non-repeated linear factors, only. (L-1)
	4 <sup>th</sup>	To resolve proper fraction into partial fraction with denominator containing non-repeated linear factors, only. (L-2)
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
3 <sup>rd</sup>	1 <sup>st</sup>	Complex numbers: definition of complex number, real and imaginary parts of a complex number.
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Addition, subtraction, multiplication and division of complex numbers.
	4 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
4 <sup>th</sup>	1 <sup>st</sup>	Conjugate of a complex number, modulus and amplitude of complex numbers.
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Polar and Cartesian Form and their inter conversion.
	4 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
5 <sup>th</sup>	1 <sup>st</sup>	Logarithm and its basic properties (L-1)
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Logarithm and its basic properties (L-2)
	4 <sup>th</sup>	Definition of Matrix and its types with examples.
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
6 <sup>th</sup>	1 <sup>st</sup>	Addition and subtraction of Matrices, Multiplication of Matrices (upto 2 <sup>nd</sup> order).
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Determinants : Evaluation of determinants (up to 3 order) by Laplace method.
	4 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
7 <sup>th</sup>	1 <sup>st</sup>	Solution of equations (upto 3 unknowns) by Cramer's Rule.
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Permutation and value of ${}^n P_r$ with solved examples.
	4 <sup>th</sup>	Combination and value of ${}^n C_r$ with solved examples.
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
8 <sup>th</sup>	1 <sup>st</sup>	Binomial theorem for positive integral index with simple problems.
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	General term from binomial expansion and related problems.
	4 <sup>th</sup>	Some solved problems on Binomial theorem.
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
9 <sup>th</sup>	1 <sup>st</sup>	Concept of angle: measurement of angle in degrees, grades, radians.
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Conversions of angles.
	4 <sup>th</sup>	T-Ratios of standard angle ( $0^\circ$ , $30^\circ$ , $45^\circ$ etc.) and fundamental Identities.
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
10 <sup>th</sup>	1 <sup>st</sup>	Allied angles (without proof) Sum, Difference formulae and their applications (without proof). (L-1)
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	<b>Sessional test as mentioned in Academic Calander/Revision</b>
	4 <sup>th</sup>	<b>Sessional test as mentioned in Academic Calander/Revision</b>
11 <sup>th</sup>	1 <sup>st</sup>	<b>Sessional test as mentioned in Academic Calander/Revision</b>
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Allied angles (without proof) Sum, Difference formulae and their applications (without proof). (L-2)
	4 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
12 <sup>th</sup>	1 <sup>st</sup>	Product formulae (Transformation of product to sum, difference and vice versa)
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Applications of Trigonometric terms in engineering problems such as to find an angle of elevation, height, distance etc. (L-1)
	4 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
13 <sup>th</sup>	1 <sup>st</sup>	Applications of Trigonometric terms in engineering problems (L-2)
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Point: Distance Formula, Mid Point Formula.
	4 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
14 <sup>th</sup>	1 <sup>st</sup>	Centroid of triangle and area of triangle.
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Straight line: Slope of a line, equation of straight line in various standards forms (without proof).
	4 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>

15 <sup>th</sup>	1 <sup>st</sup>	Examples based on slope intercept form, intercept form and one-point form of straight line.
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Examples based on two-point form, normal form and general form of straight line.
	4 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
16 <sup>th</sup>	1 <sup>st</sup>	Angle between two straight lines.
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Circle: General equation of a circle and identification of centre and radius of circle.
	4 <sup>th</sup>	To find the equation of a circle when centre and radius are given and when coordinates of end points of a diameter are given.
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
17 <sup>th</sup>	1 <sup>st</sup>	Definition of function and some solved problems.
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Concept of limits (Introduction only) and some simple problems.
	4 <sup>th</sup>	Standard limits and related problems. (L-1)
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
18 <sup>th</sup>	1 <sup>st</sup>	Standard limits and related problems. (L-2)
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Standard limits and related problems. (L-3)
	4 <sup>th</sup>	Miscellaneous problems on Limits.
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
19 <sup>th</sup>	1 <sup>st</sup>	Differentiation of standard function (Only formulas).
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Differentiation of sum and subtraction of functions and some simple problems.
	4 <sup>th</sup>	Differentiation of product of functions and some simple problems.
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
20 <sup>th</sup>	1 <sup>st</sup>	Differentiation of quotient of functions and some simple problems.
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Differentiation of Algebraic functions.
	4 <sup>th</sup>	Differentiation of Trigonometric functions. (L-1)
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
21 <sup>st</sup>	1 <sup>st</sup>	Differentiation of Trigonometric functions. (L-2)
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Differentiation of Trigonometric functions. (L-3)
	4 <sup>th</sup>	<b>Sessional test as mentioned in Academic Calander/Revision</b>
	5 <sup>th</sup>	<b>Sessional test as mentioned in Academic Calander/Revision</b>
22 <sup>nd</sup>	1 <sup>st</sup>	<b>Sessional test as mentioned in Academic Calander/Revision</b>
23 <sup>rd</sup>	1 <sup>st</sup>	Differentiation of Exponential function. (L-1)
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Differentiation of Exponential function. (L-2)
24 <sup>th</sup>	1 <sup>st</sup>	Differentiation of Logarithmic function. (L-1)
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Differentiation of Logarithmic function. (L-2)
	4 <sup>th</sup>	Successive differentiation (up to 2nd order). (L-1)
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
25 <sup>th</sup>	1 <sup>st</sup>	Successive differentiation (up to 2nd order). (L-2)
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Successive differentiation (up to 2nd order). (L-3)
	4 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
26 <sup>th</sup>	1 <sup>st</sup>	Application of differential calculus in: Rate measures. (L-1)
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Application of differential calculus in: Rate measures. (L-2)
	4 <sup>th</sup>	<b>Test/</b> Application of differential calculus in: Rate measures. (L-3)
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
27 <sup>th</sup>	1 <sup>st</sup>	Application of differential calculus in: Maxima and minima. (L-1)
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Application of differential calculus in: Maxima and minima. (L-2)
	4 <sup>th</sup>	Integration as inverse operation of differentiation i.e. Indefinite Integral with simple examples. (L-1)
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
28 <sup>th</sup>	1 <sup>st</sup>	Indefinite Integral. (L-2)
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Indefinite Integral. (L-3)
	4 <sup>th</sup>	Indefinite Integral. (L-4)
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
29 <sup>th</sup>	1 <sup>st</sup>	Simple standard integrals and related Simple problems. (L-1)
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Simple standard integrals and related Simple problems. (L-2)
	4 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
30 <sup>th</sup>	1 <sup>st</sup>	Simple standard integrals and related Simple problems. (L-3)
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Integrations by parts and related Simple problems. (L-1)
	4 <sup>th</sup>	<b>Test/</b> Integrations by parts and related Simple problems. (L-2)
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
31 <sup>st</sup>	1 <sup>st</sup>	Integrations by parts and related Simple problems. (L-3)
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Evaluation of definite integrals with given limits.
	4 <sup>th</sup>	Evaluation of $\int_0^{\pi} \sin^m x dx$ and $\int_0^{\pi} \cos^m x dx$ and related problems.

	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
32 <sup>nd</sup>	1 <sup>st</sup>	Evaluation of $\int_0^{\frac{\pi}{2}} \sin^m x \cos^n x dx$ and related problems.
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Applications of integration: for evaluation of area under a curve and axes. <b>(L-1)</b>
	4 <sup>th</sup>	Applications of integration: for evaluation of area under a curve and axes. <b>(L-2)</b>
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
33 <sup>rd</sup>	1 <sup>st</sup>	Applications of integration: for evaluation of area under a curve and axes. <b>(L-3)</b>
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Numerical integration by Trapezoidal Rule existing mathematical models. <b>(L-1)</b>
	4 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
34 <sup>th</sup>	1 <sup>st</sup>	Numerical integration by Trapezoidal Rule existing mathematical models. <b>(L-2)</b>
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Numerical integration by Simpson's 1/3 <sup>rd</sup> existing mathematical models. <b>(L-1)</b>
	4 <sup>th</sup>	<b>Test/</b> Numerical integration by Simpson's 1/3 <sup>rd</sup> existing mathematical models. <b>(L-2)</b>
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
35 <sup>th</sup>	1 <sup>st</sup>	Definition, order, degree and linearity of an ordinary differential equation.
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Solution of I <sup>st</sup> order and I <sup>st</sup> degree differential equation by variable separable method. <b>(L-1)</b>
	4 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
36 <sup>th</sup>	1 <sup>st</sup>	Solution of I <sup>st</sup> order and I <sup>st</sup> degree differential equation by variable separable method. <b>(L-2)</b>
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Measures of Central Tendency: Mean and related problems.
	4 <sup>th</sup>	Measures of Central Tendency: Median and related problems.
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
37 <sup>th</sup>	1 <sup>st</sup>	Measures of Central Tendency: Mode and related problems.
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Measures of Dispersion: Mean deviation from mean. <b>(L-1)</b>
	4 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
38 <sup>th</sup>	1 <sup>st</sup>	Measures of Dispersion: Mean deviation from mean. <b>(L-2)</b>
	2 <sup>nd</sup>	<b>Tutorial/ Problem Solving</b>
	3 <sup>rd</sup>	Measures of Dispersion: Standard deviation. <b>(L-1)</b>
	4 <sup>th</sup>	Measures of Dispersion: Standard deviation. <b>(L-2)</b>
	5 <sup>th</sup>	<b>Tutorial/ Problem Solving</b>
39 <sup>th</sup>	1 <sup>st</sup>	Correlation coefficient and Coefficient of rank correlation.
	2 <sup>nd</sup>	<b>Test/</b> Statistics revision