

MTH 1001: CALCULUS- I

(Classes will start from:13.8.2019)

REQUIRED COURSE TEXTBOOKS:

1. CALCULUS EARLY TRANSCENDENTALS BY JAMES STEWART(7th Edition)

Course format : 4hours/ week =4credits

Grading - external: 60 % theory Exam

Grading - internal : 35 % assignments + 5% attendance = 40 %

Lecture hour	Topics	Lecture/ hours	Chapter	Problems to be covered(class/ assignment)
1	2.1- The tangents and velocity 2.2- The limit of a function	1	2.1 2.2	6 2,33,3(A),17(A),34(A)
2	2.3- Calculating limits using limit laws	1	2.3	12,25,37,42, 1(A),14(A),38(A),44(A)
3	2.4- The precise definition of limit	1	2.4	15,19,25, 16(A),24(A),27(A)
4	2.5- Continuity	1	2.5	8,12,19, 5(A),7(A),13(A),18(A)
5	2.6- Limits at infinity;Horizontal Asymptotes	1	2.6	15,19,35, 16(A),22(A),26(A),34(A)
6	2.7- Derivatives and rates of change	1	2.7	13,14,19,39, 5(A),8(A),15(A),18(A),40(A)
7	2.8- The derivative as a function	1	2.8	23,53,21(A),29(A),52(A)
8	3.1- Differentiation rules 3.2- The product and the quotient rules	1	3.1 3.2	19,35,55,69,23(A), 36(A),51(A) 57(A),70(A) 21,45,22(A),46(A)
9	3.3- Derivatives of trigonometric functions	1	3.3	13,40,49,55,12(A),42(A), 46(A),50(A),54(A)
10	3.4- The chain rule	1	3.4	3,28,62,4(A), 29(A),61(A)
11	3.5- Implicit Differentiation	1	3.5	14,27,49,74, 16(A),30(A),50(A),75(A)
12	3.6- Derivatives of logarithmic functions	1	3.6	4,22,28,52, 6(A),20(A),30(A),48(A)
13	3.7- Rates of change in the natural and social sciences	1	3.7	9,19,8(A),26(A)
14	3.8- Exponential growth and decay	1	3.8	3,5,16, 4(A),9(A),15(A)
15	4.1- Maximum and minimum values	1	4.1	4,10,28,33,47, 5(A),7(A),18(A),24(A),48(A)
16	4.2- The Mean Value Theorem	1	4.2	1,5,11,23, 2(A),10(A),15(A),24(A),36(A)
17	4.3- How derivatives affect the shape of a graph	1	4.3	16,21,38,47, 13(A),19(A),39(A),52(A)
18	4.4- Intermediate forms and L'Hospital rules	1	4.4	10,20,41,

				11(A),13(A),19(A),42(A)
19	4.7- Optimization problems	1	4.7	3,20,26, 4(A),6(A),22(A),30(A)
20	4.8- Newton's Method	1	4.8	11,19,36, 5(A),12(A),23(A),35(A)
21	5.1- Integrals 5.2- The definite integrals	1	5.1	5,8,4(A),7(A)
			5.2	1,9,48,55, 2(A),10(A),47(A),56(A)
22	5.3- The Fundamental theorem of calculus	1	5.3	13,35,46,55,62, 2(A),12(A),36(A),47(A),56(A)
23	5.4- Indefinite integrals and net change theorem	1	5.4	1,17,34,64, 2(A),18(A),32(A),69(A)
24	5.5- The substitution rules	1	5.5	18,64,81,85, 6(A),17(A),24(A),42(A)69(A)
25	6.1- Areas between curves	1	6.1	3,10,13,1(A),9(A),25(A)
26	6.2- Volumes	1	6.2	3,15,5(A),9(A),16(A)
27	6.4- Work		6.4	2,15,3(A),7(A),19(A)
	6.5- Average values of a function	1	6.5	2,9,3(A)
28	7.1- Integration by parts	1	7.1	19,38,62,28(A),42(A),61(A)
	7.2- Trigonometric integrals		7.2	1,16,58,69,2(A),57(A)
29	7.3- Trigonometric substitution	1	7.3	2,5,24,3(A),6(A),28(A)
	7.4- Integration of rational functions by partial fractions		7.4	11,47,1(A),3(A),13(A),51(A)
30	7.7- Approximate integration	1	7.7	5,18,11(A)
31	7.8- Improper integrals	1	7.8	2,34,1(A),25(A),32(A)
32	8.1- Arc length	1	8.1	20,23,11(A),17(A),26(A)
33	8.2- Area of a surface of revolution	1	8.2	2,13,4(A),15(A)
34	8.3- Applications to Physics and Engineering	1	8.3	23,32,34,24(A),30(A),35(A)
35	10.1- Curves defined by parametric equations	1	10.1	6,20,7(A),19(A)
	10.2- Calculus with parametric curves		10.2	17,29,43,18(A),30(A),42(A)
36	10.3- Polar Coordinates	1	10.3	24,57,62,5(A),6(A),23(A), 58(A),63(A)
37	11.1- Sequences	1	11.1	13,72,14(A),24(A),33(A),
	11.2- Series		11.2	56(A),75(A) 5,19,28,51,7(A),20(A),33(A),53(A)
38	11.3- The integral tests	1	11.3	3,14,25,4(A),14(A),24(A)
	11.4- The comparison test		11.4	3,29,9(A),15(A)
39	11.10- Taylor and Maclaurin series	1	11.10	6,13,9(A),16(A)
	11.11- Applications of Taylor polynomials		11.11	5,10,6(A),9(A)

Co-ordinator

*Chapter- 1 is included in the syllabus of 1st sem. Calculus-I (B.Tech) paper. This chapter includes the different representations of functions, some essential functions, transformation of new functions from old one, exponential

functions, logarithmic functions and inverse functions. As the course contains limits, derivatives and integration of functions, all are requested to discuss on the above mentioned functions wherever those are required.