Timetable for the course
MATHEMATICAL ANALYSIS 2 (MAT001690)

Lecture	Date	Topic
1	28.02	Functions of several variables, their domains and graphs. Partial and directional derivatives. The gradient. The plane tangent to the graph of a function of two variables. The differential of multivariate function and its applications.
2	07.03	Higher order partial derivatives. Schwarz's Theorem. Second order derivatives and convexity. Sylvester's criterium for positive/negative definiteness
3	14.03	Local and global extrema of two-variable function. Necessary and sufficient conditions for the existence of minimum /maximum. Examples of extremal problems in geometry and engineering.
4	21.03	Conditional extrema. Applications. Examples of optimization problems.
5	28.03	Double integral, its definition and interpretation. Methods of calculation of double integrals over normal and regular regions.
6	04.04	Properties of double integrals. Jacobian determinant. Change of variables in double integrals. Double integrals in polar coordinates.
7	11.04	Integrals dependent on parameter, Euler's Gamma-function, the Poisson integral. **Midterm test.**
8	15.04	Introduction to theory of ordinary differential equations. Laplace transform.
9	25.04	Laplace inverse transform and its applications in ordinary differential equations
10	09.05	Fourier transform and its applications.
11	16.05	Improper integrals. Absolute and conditional convergence. Cauchy principal value.
12	23.05	Infinite series. Absolute and conditional convergence. The integral test. The alternating series test (Leibniz's theorem).
13	30.05	Functional and power series. The radius and interval of convergence. Cauchy-Hadamard theorem. Taylor-Macloren series.
14	06.06	Fourier series
15	06.13	Final test

Pr. Class	Date a	Date b	Date c	Topic
1	28.02	28.02	28.02	Calculation of partial and directional derivatives. Equation of the plane tangent to the graph of a function of two variables. Approximate calculations using the gradient and differential of multivariate function.
2	14.03	14.03	07.03	Calculation of higher order partial derivatives. Second order derivatives and convexity. Types of critical points: hill, well, saddle. Local extrema.
3	28.03	28.03	21.03	Conditional extrema: Lagrange's multipliers method. **Quiz 1**(Z01-04a,b)
4	11.04	11.04	04.04	Calculation of double integrals over normal and regular regions. **Quiz 1**(Z01-04c)
5	09.05	09.05	15.04	Change of variables in double integrals. Polar coordinates. **Quiz 2**
6	23.05	23.05	25.04	Improper integrals and infinite series: absolute and conditional convergence, Cauchy principal value. **Quiz 3**
7	06.06	06.06	16.05	Power series. Taylor formula and Taylor-Maclaurin series.
8	13.06	13.06	30.05	Laplace and Fourier transforms, Fourier series **Quiz 4**

Quiz No.	Topics
1	Calculation of partial and directional derivatives. Equation of the plane tangent to the graph of a function of two variables. Approximate calculations using the gradient and differential of multivariate function. Calculation of higher order partial derivatives.
2	Second order derivatives and convexity. Types of critical points: hill, well, saddle. Sylvester's criterion. Local and global extrema. Conditional extrema: Lagrange's multipliers method.
3	Calculation of double integrals over normal and regular regions. Performing change of variables in double integrals. Change of variables to polar coordinates.
4	Power series. Taylor formula and Taylor-Maclaurin series. Improper integrals and infinite series.