

**B. K. BIRLA COLLEGE OF ARTS, SCIENCE AND COMMERCE (AUTONOMOUS),
KALYAN**

CERTIFICATE COURSE



Calculus of One Real Variable

Week 1:

- i. Lecture 1- Introduction to numbers
- ii. Lecture 2- Countability and uncountability
- iii. Lecture 3- Examples of irrational numbers
- iv. Lecture 4- Functions
- v. Lecture 5- Limits of functions-I

Week 2:

- i. Lecture 6- Limits of functions-II
- ii. Lecture 7- Continuous functions
- iii. Lecture 8- Intermediate value theorem
- iv. Lecture 9- Maximum value theorem
- v. Lecture 10- Supremum and Infimum

Week 3:

- i. Lecture 11- Derivative of a function
- ii. Lecture 12- Rules of differentiation
- iii. Lecture 13- Derivatives of maxima and minima
- iv. Lecture 14- Rolle's theorem and Lagrange MVT(Multi Value Theorem)

Week 4:

- i. Lecture 16: Newton's Method for solving Equations
- ii. Lecture 17: Optimization Problems
- iii. Lecture 18: Integration-I : In the style of Newton and Leibnitz
- iv. Lecture 19: Integration-II : In the spirit of Newton and Leibnitz
- v. Lecture 20: Integration-III : Newton and Leibnitz Style

Week 5:

- i. Lecture 21: Indefinite Integrals
- ii. Lecture 22: Integration by Parts
Lecture 23: Integration of Rational Functions
- iii. Lecture 24: Trapezoidal Rule for evaluating definite integral
- iv. Lecture 25: Simpson's Rule for evaluating definite integral

Week 6:

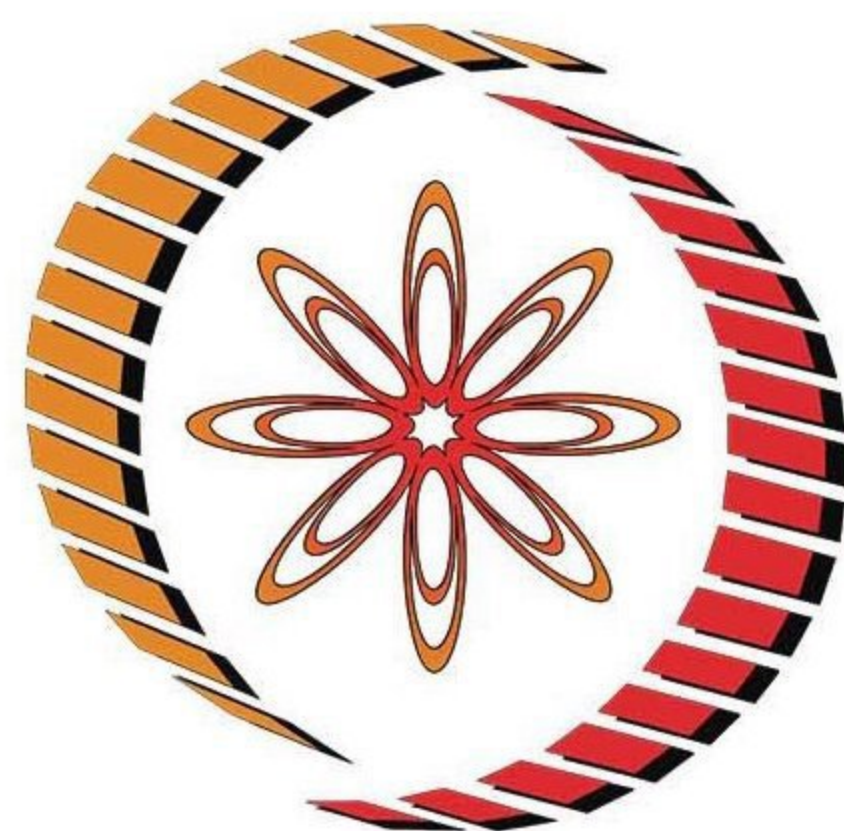
- i. Lecture 26: Applications of Definite Integral-I
- ii. Lecture 27: Applications of Definite Integral-II
- iii. Lecture 28: Applications of Definite Integral-III
- iv. Lecture 29: Applications of Definite Integral-IV
- v. Lecture 30: Transcendental Functions-I

Week 7:

- i. Lecture 31: Transcendental Functions-II
- ii. Lecture 32: Taylor's Expansion-I
- iii. Lecture 33: Taylor's Expansion-II
- iv. Lecture 34: Infinite Sequence-I
- v. Lecture 35: Infinite Sequence-II

Week 8:

- i. Lecture 36: Infinite series and their convergence
- ii. Lecture 37: Tests for Convergence of a series
- iii. Lecture 38: Absolute and conditional convergence
- iv. Lecture 39: Power Series
- v. Lecture 40: Historical Development of the Calculus



Elite

NPTEL Online Certification

(Funded by the MoE, Govt. of India)



This certificate is awarded to
CHAUHAN RAVINDRASINGH JIYALAL
for successfully completing the course

Calculus of One Real Variable

with a consolidated score of **81** %

Online Assignments	20/25	Proctored Exam	60.94/75
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Total number of candidates certified in this course: **77**

Prof. B. V. Ratish Kumar
Chairman, Centre for Continuing Education
IIT Kanpur

Jul-Sep 2022

(8 week course)

Prof. Satyaki Roy
NPTEL Coordinator
IIT Kanpur



Indian Institute of Technology Kanpur



शिक्षित भारत, उन्नत भारत

Roll No: NPTEL22MA49S23222242

To validate the certificate



No. of credits recommended: 2 or 3