

Block

2

FUNDAMENTALS OF MATHEMATICS-II

UNIT 5

Limit and Continuity **5**

UNIT 6

Differentiation **29**

UNIT 7

Indefinite Integration **59**

UNIT 8

Definite Integration **81**

Curriculum and Course Design Committee

Prof. K.R. Srivathsan
Pro-Vice Chancellor
IGNOU, New Delhi

Prof. Parvin Sinclair
Pro-Vice Chancellor
IGNOU, New Delhi

Prof. Geeta Kaicker
Director, School of Sciences
IGNOU, New Delhi

Prof. R.M. Pandey
Department of Bio-Statistics
All India Institute of Medical Sciences
New Delhi

Prof. Jagdish Prasad
Department of Statistics
University of Rajasthan, Jaipur

Prof. Rahul Roy
Maths and Stat. Unit
Indian Statistical Institute, New Delhi

Dr. Diwakar Shukla
Department of Mathematics and Statistics
Dr. Hari Singh Gaur University, Sagar(MP)

Prof. G.N. Singh
Department of Applied Mathematics
I.S.M. Dhanbad

Prof. Rakesh Srivastava
Department of Statistics
M.S. University
Vadodara (Gujarat)

Dr. Gulshan Lal Taneja
Department of Mathematics
M.D. University, Rohtak

Faculty Members, School of Sciences, IGNOU

Statistics

Dr. Neha Garg
Dr. Nitin Gupta
Mr. Rajesh Kaliraman
Dr. Manish Trivedi

Mathematics

Dr. Deepika
Prof. Poornima Mital
Prof. Sujatha Varma
Dr. S. Venkataraman

Block Preparation Team

Content Writer

Dr. Manish Trivedi
Reader in Statistics
School of Sciences
IGNOU, New Delhi

Content Editor

Dr. Gulshan Lal Taneja
Associate Professor
Department of Mathematics
M.D. University, Rohtak

Language Editor

Dr. Parmod Kumar
Assistant Professor
School of Humanities, IGNOU

Formatted By

Mr. Rajesh Kaliraman
School of Sciences, IGNOU.

Secretarial Support

Ms. Preeti

Course Coordinator: Mr. Rajesh Kaliraman

Programme Coordinator: Dr. Manish Trivedi

Block Production

Mr. Y. N. Sharma, SO (P), School of Sciences, IGNOU
CRC prepared by Mr. Rajesh Kaliraman, SOS, IGNOU and Ms. Preeti

Acknowledgement: We gratefully acknowledge Prof. Geeta Kaicker, Director, School of Sciences and Prof. Parvin Sinclair, Director, NCERT for reading the course material and providing their valuable suggestions to improve the Course.

March, 2012

© Indira Gandhi National Open University, 2012

ISBN – 978-81-266-5973-9

All rights reserved. No part of this work may be reproduced in any form, by mimeograph or any other means, without permission in writing from the Indira Gandhi National Open University.

Further information on the Indira Gandhi National Open University courses may be obtained from the University's office at Maidan Garhi, New Delhi-110 068.

Printed and published on behalf of the Indira Gandhi National Open University, New Delhi by Director, School of Sciences.

Printed at: Gita Offset Printers Pvt. Ltd., C-90, Okhla Indl. Area-I, New Delhi-20

BLOCK 2 FUNDAMENTALS OF MATHEMATICS-II

This is the second block of the course MST-001. The aim of this block is to provide sufficient material which will be needed in order to study course MST-003 and some sections of other courses of the programme.

Using the knowledge provided by the previous block of this course. The follow of the block is maintained by the following four units.

Unit 5: Limit and Continuity

In this unit concept of limit, evaluation of certain limits using factorisation, L.C.M., rationalisation and some standard rules have been discussed. Concept of left hand, right hand limits and infinite limit have been also introduced. The unit ends with the brief introduction of continuity.

Unit 6: Differentiation

This unit discusses a very important branch of calculus known as differentiation. In this unit, you will learn how differentiations of some commonly used functions are evaluated. Differentiations of functions using product rule, quotient rule and chain rule have been also discussed in this unit. Differentiation of parametric and implicit functions also takes place in the unit. Unit ends by giving a brief induction of higher order derivatives and maxima and minimum of functions.

Unit 7: Indefinite Integration

Another important branch of calculus known as integration is discussed in this unit. It discusses indefinite integral of some commonly used functions. It also discusses how we can evaluate an integral by using substitution method, partial fractions and integration by parts.

Unit 8: Definite Integration

This unit starts with the geometrical interpretation of the definite integral. Definite integral of some commonly used functions and properties of definite integral also have been discussed. Some examples based on first kind of improper integral also have been evaluated.

Notations and Symbols

$x \rightarrow a$: x approaches to a

L.H.S. : left hand limit

R.H.S. : right hand limit

∞ : infinity

$|x|$: modules of x or absolute value of x

+ ve : positive

- ve : negative

\int : sign of integration

\int_a^b : definite integral within limits a to b