



# INTRODUCTION TO ABSTRACT AND LINEAR ALGEBRA

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**INTENDED AUDIENCE :** Mathematics

### COURSE OUTLINE :

Abstract and Linear Algebra are applicable to every discipline, be it engineering and technology, economics or social sciences. It is essential for the students to get acquainted with the subject of Abstract and Linear Algebra at an early stage. The present course has been designed to introduce the subject to undergraduate/postgraduate students in science and engineering. The course contains a good introduction to each topic and an advance treatment of theory at a fairly understandable level to the students at this stage.

### ABOUT INSTRUCTOR :

Prof. Sourav Mukhopadhyay is an Associate Professor at Indian Institute of Technology Kharagpur. He has completed his B.Sc (Honours in Mathematics) in 1997 from University of Calcutta, India. He has done M.Stat (in statistics) and M.Tech (in computer science) from Indian Statistical Institute, India, in 1999 and 2001 respectively. He worked with Cryptology Research Group at Indian Statistical Institute as a PhD student and received his Ph.D. degree in Computer Science from there in 2007. He was a Research Assistant at the Computer Science department of School of Computing, National University of Singapore (NUS). He visited InriaRocquencourt, project CODES, France and worked as a post-doctoral research fellows at the School of Computer Engineering, Nanyang Technological University (NTU), Singapore. He was a post-doctoral research fellow and a part time Lecturer with School of Electronic Engineering, Dublin City University (DCU), Ireland.

### COURSE PLAN :

**Week 1 :** Basic set theory

**Week 2 :** Group Theory

**Week 3 :** Rings and Polynomial rings

**Week 4 :** Field and finite fields

**Week 5 :** Matrices and determinants

**Week 6 :** Vector spaces over fields

**Week 7 :** Linear transformations and their matrices

**Week 8 :** Linear equations