

**REPORT ON ONLINE SPECIAL LECTURE SERIES IN MATHEMATICS, 2020**  
**OSLSM 2020**

**Phase III; Lecture Codes: 03.A1 & 03.A2**

**Dates:** 12.09.2020 [for 03.A1] & 13.09.2020 [for 03.A2].

**Time:** 11:00am to 12:30 pm [IST].

**Topic 1:** Brief introduction to Mathematical Epidemiology (03.A1)

**Topic 2:** Mathematical Modelling of COVID-19 (03.A2)

**Target Audience:** The lectures are meant primarily for the UG/PG students of Department of Mathematics of Netaji Subhas Open University [NSOU]. However students of other universities and institutes, research scholars, faculties of different colleges/universities or any interested person were welcome to attend the lectures.

**Technical Platform:** The webinar was conducted using Zoom app through the LMS platform of ICT, NSOU. Technical Support was extended by M/s School Guru.

**Speaker:** Dr. Malay Banerjee, Professor, Department of Mathematics and Statistics, Indian Institute of Technology Kanpur, India.

**About the speaker:** After completing his M.Sc. in 1998 from the University of Calcutta, Dr. Banerjee did his Ph. D. from the same University in the year 2005. He has published several papers in reputed top-class international journals such as Mathematical Biosciences, Differential Equations and Dynamical Systems etc. His research areas are mainly Mathematical Ecology and Eco-epidemiology, Nonlinear Dynamics. He is reviewer of many international journals on Biomathematics and is also very enthusiastic in teaching.

**Abstract:** Mathematical epidemiology is a vast subject which deals with the mathematical modelling and analysis of various epidemic diseases and outcomes are capable of providing some guidelines to control measures. There is a wide range of modelling approach to effectively model the spread of various epidemic diseases. Simplest and well established modelling approach is through ordinary differential equations. Main objective of this talk is to explain various types of models like SI, SIR, SEIR, SEIQR consist of susceptible (S), exposed (E), infected (I), quarantined (Q) and recovered (R). Calculation of basic reproduction number and its implication in the context of disease propagation will be discussed.

COVID-19 epidemic has devastating effects on different sectors across the globe. As of now, any proper way out to control the aggressive spread of the pandemic can not be found. The intensity and fatality of the COVID-19 is not uniform rather it varies significantly from one country to another. Mathematical modelling of force of infection and the effect of behavioural change of humans on disease progression is a challenging issue. In this lecture, an interesting approach for modelling COVID-19 epidemic will be explained where the force of infection is time dependent and validate the model with some real data. Brief discussion will be made on the two-group epidemic model which can capture the possibility of a second wave based upon the human behaviour.

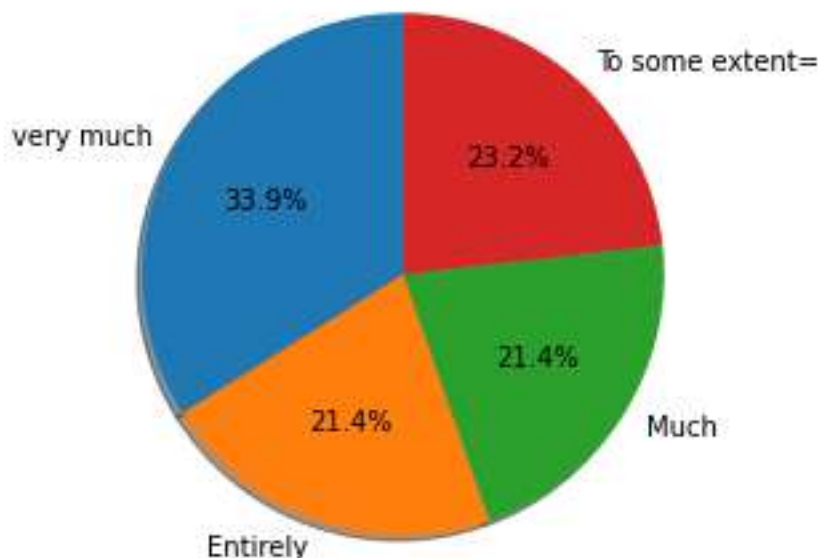
**A brief proceeding/ overview:** The arranged webinars were two days' online lectures. In these two lectures of Dr. Malay Banerjee were divided into two distinct topics taught in undergraduate and/ or post graduate mathematics with a huge scope of application.

The webinars were commenced by the organizing Secretary Dr. Ushnish Sarkar, Assistant Professor of Mathematics, NSOU. After a brief introduction of the speaker Dr. Banerjee by Dr. Sarkar, the welcome address was delivered by Chairperson Prof. Kajal De, HOD Mathematics & Director, School of Sciences, NSOU. Later Dr. Banerjee took over the session. On day 1, the lecture was about understanding several concepts related mathematical modelling in particular SIR model. In the 2nd day, the lecture revolved around the pandemic caused by Covid-19. He discussed thoroughly how to describe the pandemic situation in mathematical modelling. Both the sessions saw active interactions between the speaker and the participants in the Q & A slots after the lectures were delivered.

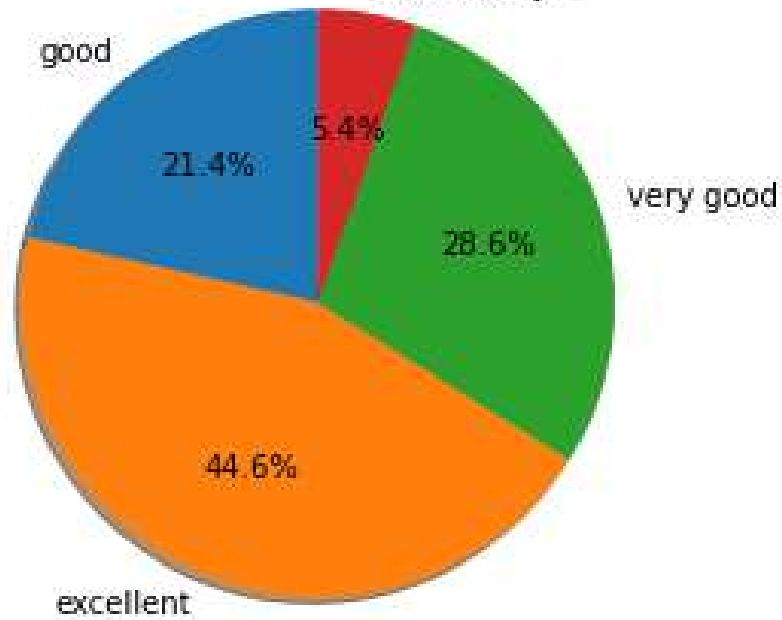
The programme ended with the concluding remarks of Prof. Kajal De and Dr. Ushnish Sarkar, followed by the vote of thanks by Mr. Chandan Kumar Mondal, Assistant Professor of Mathematics, who is also Organizing Secretary of this series. A special thanks was given to the Honourable Vice Chancellor, Prof. Subha Shankar Sarkar of Netaji Subhas Open University (NSOU) for his exemplary and inspirational leadership and support towards materializing this event into a reality.

### Feedbacks at a glance

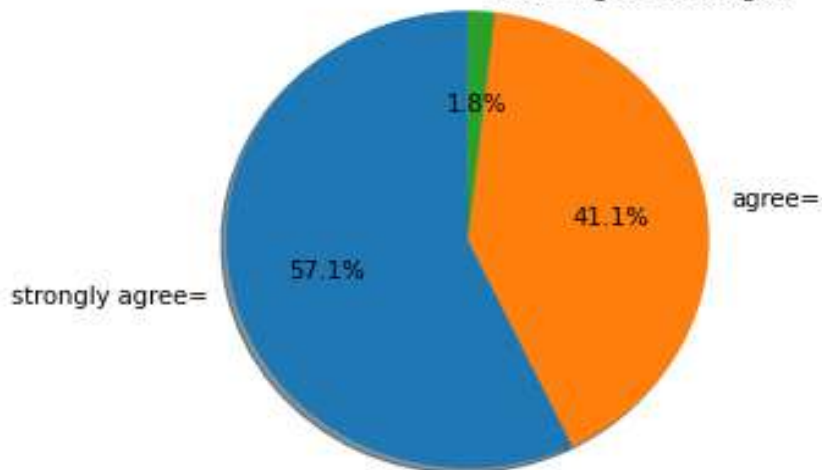
Feedback on the basis of familiarities with the topic



Feedback on the basis of exposure with the topic  
satisfactory=



Feedback on the basis of teaching of the topic  
neither agree nor disagree=



**Remarks:** The lectures were a huge success and received a positive response from the participants.