FUNDAMENTALS OF SPECTROSCOPY

PROF. SAYAN BAGCHI
Department of Chemistry
NCL Pune

TYPE OF COURSE : Rerun | Core | UG
COURSE DURATION : 12 weeks (18 Jan’ 21 - 09 Apr’ 21)
EXAM DATE : 25 Apr’ 2021

PROF. ANIRBAN HAZRA
Department of Chemistry
IISER Pune

PRE-REQUISITES : Nil
INTENDED AUDIENCE : Interested Learners

COURSE OUTLINE :
Spectroscopy is the study of the interaction of light (electromagnetic radiation) with matter. In this course, the fundamental principles of the different forms of spectroscopy will be elaborated in a unified way from both theoretical and experimental viewpoints. Application of these different spectroscopic methods for the elucidation of molecular structure will also be discussed. The structural and dynamic aspects of spectroscopy are fundamental to Physics, Chemistry and Biology.

ABOUT INSTRUCTOR :
Prof. Sayan Bagchi joined NCL Pune as a Senior Scientist and Assistant Professor (AcSIR) in December, 2012. Prof. Bagchi works on understanding the roles of interactions and dynamics in molecular systems using novel spectroscopic techniques.

Prof. Anirban Hazra obtained his integrated M.Sc. from IIT Bombay in 1999. He then joined Princeton University for Ph.D. in Theoretical Chemistry. He went for postdoctoral research at Pennsylvania State University. He then joined IISER Pune as an Assistant Professor in 2011. He became Associate Professor in 2018. Prof. Hazra’s research is primarily on understanding excited state phenomena in molecules.

COURSE PLAN :
Week 1: Origin of a spectrum
Week 2: Different Forms of Spectroscopy
Week 3: Rotational Spectroscopy
Week 4: Rotational Spectroscopy (continued)
Week 5: Vibrational Spectroscopy
Week 6: Vibrational Spectroscopy (continued)
Week 7: Raman Spectroscopy
Week 8: Raman Spectroscopy (continued)
Week 9: Electronic Spectroscopy
Week 10: Electronic Spectroscopy (continued)
Week 11: Electronic Spectroscopy (continued)
Week 12: Combination of different spectroscopic methods to solve complex problems