



BIOLOGY FOR ENGINEERS AND OTHER NON-BIOLOGISTS

PROF. G. K. SURAIISKUMAR

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TYPE OF COURSE : Rerun | Elective | UG

INTENDED AUDIENCE : MBBS

COURSE DURATION : 4 weeks (29 Jul'19 - 23 Aug'19)

EXAM DATE : 29 Sep 2019

INDUSTRIES APPLICABLE TO : Any industry that wants to venture into a bio-related aspect.

COURSE OUTLINE :

It is well known that this is the century of biology in which significant advances in the understanding and application of biological systems are expected. The significant impact on the world is expected in terms of better healthcare, better processes, better products and an overall better quality of life. Thus, any person can be interested in knowing the fundamentals of biology to be able to understand, or participate in the biological revolution. For example, any engineer, irrespective of the parent discipline (mechanical, electrical, civil, chemical, metallurgical, etc.,) has a high probability of using the disciplinary skills toward designing/improving biological systems in the future. This course is designed to convey the essentials of cell and molecular biology to provide a frame-work for more specific understanding, and contribution by any interested person.

ABOUT INSTRUCTOR :

Prof. G. K. Suraishkumar is a Professor in the Department of Biotechnology, Indian Institute of Technology Madras (IITM). He has been at IITM as a Professor since May 2004, and was earlier a faculty member in the Department of Chemical Engineering at the Indian Institute of Technology Bombay (IITB) from April 1993 until mid-May 2004. He was also an Associate Faculty member in the erstwhile Centre for Biotechnology, which is now the Department of Biosciences and Bioengineering, at IITB, between 1995 and 2004. He earned his Ph.D. from Drexel University, Philadelphia, USA in 1993, and his B.Tech. in Chemical Engineering from IITM in 1986. He also did his Masters work at the University of Cincinnati, USA, between 1986 and 1988.

Prof. Madhulika Dixit is an Associate Professor in the Department of Biotechnology, Indian Institute of Technology Madras (IITM). She has been a faculty member in the Department since 2007. Prior to joining IIT Madras, she worked as Senior Scientist in the Institute of Cardiovascular Physiology, Goethe University, Frankfurt am Main, Germany from 2003-2006. She earned her PhD in Molecular Biology from IIT Bombay in 2001 and her Masters in Life Sciences from University of Mumbai in 1996. She did her post-doctoral training in Cardio-vascular Physiology at the University of Tennessee Health Science Center, Memphis, USA from 2001-2003.

COURSE PLAN :

Week 1: Introduction (G. K. Suraishkumar)

Week 2: Origin of life and Evolution (Madhulika Dixit)

Week 3: Water, Biomolecules, Enzymes, Introduction to metabolism (G. K. Suraishkumar)

Week 4: Cell structure, Cell cycle (Madhulika Dixit), Culture growth (G. K. Suraishkumar); Mendelian genetics (G. K. Suraishkumar) Chromatin, DNA structure, replication, transcription and translation (Madhulika Dixit)