

IT- 768 : Omics Sciences (2 credit course, Total 30 hours)

Objective of the Course: Several high-throughput technologies are now available to analyze specific aspects of genes, transcripts, proteins and metabolites and these are named by appending the suffix 'Omics' as in genomics, transcriptomics, proteomics and metabolomics. The huge amount of data generated using these technologies provides an unprecedented opportunity to computational biologists for creating predictive models for real life problems. This course will acquaint the students with basic principles, technologies and applications of Omics technologies.

Content of the Course:

- Introduction to Omics Sciences: Genomics, Transcriptomics, Proteomics, Metabolomics etc. (2 hours)
- Introduction to methods and data types in genomics (5 hours)
- Methods and key features of Transcriptomic technologies (8 hours)
- Methods and data structure in Proteomics (5 hours)
- Methods and Data structure in Metabolomics (5 hours)
- Omics Databases and Cross-Omics Studies (3 hours)
- Applications of Omics sciences in crop improvement (2 hours).

Suggested readings:

- Bioinformatics for Omics Data: Methods and Protocols. Edited by Bernd Mayer. Springer Protocols. Humana Press.
- Omics: Applications in Biomedical, Agricultural, and Environmental Sciences Edited by Debmalya Barh, Vasudeo Zambare and Vasco Azevedo. CRC Press. Taylor and Francis Group.
- Wilson and Wilsons: Comprehensive Analytical Chemistry Edited by D. Barcello. Applications of Advances Omics Technologies: from Genes to Metabolites
- Genomics, Proteomics and Metabolomics in Nutraceuticals and Functional Foods, Edited by Debasis Bagchi, Anand Swaroop and Manashi Bagchi. Wiley Blackwell.