Indian Institute of Technology Guwahati
Proposal for a New Course / Revision of a Course

Course Number & Title: BT 629 & Metagenomics	
L-T-P-C:3-0-0-6	
Type of Letter Grading (Regular Letter Grades / PP or NP Letter Grades): Regular Letter Grades	
Kind of Proposal (New Course / Revision of Existing Course): Revision of Existing Course	
Offered as (Compulsory / Elective):Electives	
Offered to: B Tech/M Tech/PhD	
Offered in (Odd/ Even / Any):Any	
Offered by (Name of Department/ Center):BSBE	
Pre-Requisite: Nil	
Preamble / Objectives (Optional): The unfathomable microbial number makes it difficult to study them. Metagenomics is the genome analysis of a community of microbes that can be harnessed to access the untapped diversity and biotechnological potential of the microbial world in a non-culturable way. Recent developments like high-throughput sequencing technologies and bioinformatics tools to process and interpret data is impacting the fields of genomics and metagenomics and has opened up new possibilities of global analysis of biological systems and the ecological role of microbial Communities. Apart from introducing the students to the basic concepts this course would introduce students with the recent advances in theoretical, methodological and applied areas of metagenomics.	
Course Content/ Syllabus The microbial world-statistics and variations;Introduction: genomics to metagenomics; Different metagenomic milieu; Viral,bacterial, fungal, algal and protozoan metagenomics; Basic methods and techniques for metagenomics study: sequencing technology, gene-expression systems, single-cell analyses; Analysis of metagenomics data: metagenomics analysis servers, metadata, preprocessing, identifying genes, annotations Comparative metagenomics; Ecological metagenomics; Metabolic reconstructions and models; Applications of metagenomics: metagenomics of the human microbiome,bio-prospecting novel genes, metagenomics for industrial bioproducts, metagenomics for bioremediation, plant-microbe interactions, metagenomics and ecosystems biology;Major stakeholders in metagenomics;Metagenomics and the convention on biological diversity; Biosafety and IPR issues in metagenomics.	
Books (In case UG compulsory courses, please give it as “Text books” and “Reference books”. Otherwise give it as “References”.	
Text book and references: (Format: Authors, *Book Title in Italics font,* Volume/Series, Edition Number, Publisher, Year.)	
1.	D. Marco (Ed.), Metagenomics: Theory,Methods and Applications,1st Edn., Caister Academic Press, 2010.
2.	W. R. Streit and R. Daniel (Eds.),Metagenomics: Methods and Protocols, 1st Edn., Humana Press, 2010
3.	K. E. Nelson (Ed.), Metagenomics of the Human Body, 1st Edn., Springer, 2010.
4.	D. Marco (Ed.), Metagenomics: Current Innovations and Future Trends,1st Edn., Caister Academic Press, 2011