COURSE TEMPLATE

1.	**Department/Centre proposing the course**	Biochemical Engineering and Biotechnology
2.	**Course Title** *(< 45 characters)*	GENERAL MICROBIOLOGY
3.	**L-T-P structure**	3-0-3
4.	**Credits**	4.5
5.	**Course number**	BBL132
6.	**Status** (*category* for *program*)	Core

7.	**Pre-requisites** (course no./title)	

8.	**Status vis-à-vis other courses** *(give course number/title)*	
8.1	Overlap with any UG/PG course of the Dept./Centre	No
8.2	Overlap with any UG/PG course of other Dept./Centre	No
8.3	Supercedes any existing course	BEL103

9.	**Not allowed for** (indicate program names)	

10.	**Frequency of offering**	☐Every sem ☒1st sem ☐2nd sem ☐Either sem

11.	**Faculty who will teach the course**	V. S. Bisaria, Shilpi Sharma
12.	**Will the course require any visiting faculty?**	No

13. Course objective *(about 50 words)***:**

The course is designed to provide the student conceptual and experimental background in microbiology. The students will be introduced to microorganisms: their diversity in structure and function. Emphasis has also been laid on bacterial nutrition, growth and metabolism with special reference to their role in industrial production of metabolites

14. Course contents *(about 100 words) (Include laboratory/design activities)***:**

The topics include introduction to prokaryotic and eukaryotic cell structure; different groups of microorganisms; microbial nutrition and growth; metabolism including important pathways; reproduction and recombination; preservation and control of microbial cultures; viruses; microbial pathogenicity.

15. Lecture Outline *(with topics and number of lectures)*

Module no.	Topic	No. of hours
1	Introduction- aims and scope, Role of Microbes in agriculture, public health, medicine and industry	2
2	Organisation of prokaryotic and eukaryotic cells, Structure and function of cell organelles, surface structure and cellular reserve materials.	6
3	Distinguishing features of selected groups of microorganisms including microorganisms of extreme environment	5
4	Microbial nutrition and growth - principles of nutrition, growth measurement techniques, effect of environmental and cultural parameters on growth, assimilation of nitrogen and sulphur	7
5	Isolation and preservation of cultures	2
6	Bacterial reproduction and introduction to bacterial recombination	4
7	Energy transduction in microbial systems: fermentation, aerobic & anaerobic respiration and photosynthesis	6
8	Chemolithotrophy	1
9	Phosphoketolase, Entner-Doudoroff and glyoxalate pathways	2
10	Control of microbial growth - effect of heat, disinfectants and therapeutic agents	2
11	Microbial pathogenicity, Bioassays	2
12	Viruses	2
COURSE TOTAL *(14 times 'L')*		42

16. Brief description of tutorial activities

NA

17. Brief description of laboratory activities

Module no.	Experiment description	No. of hours
1	Preparation and sterilization of media, aseptic techniques	2.5
2	Microscopic examination of different groups of microorganisms	2.5
3	Isolation of pure culture and its preservation	2.5
4	Simple and differential staining of microorganisms	2.5
5	Growth and enumeration of microorganisms	7
6	Effect of physical and chemical environment on growth	5
7	Biochemical tests	5
8	Isolation of auxotrophic mutants	5
9	Microbial sensitivity of antibiotics	5
10	Characterization of microbial diversity in environmental samples	5
COURSE TOTAL *(14 times 'P')*		42

18. Suggested texts and reference materials

STYLE: Author name and initials, Title, Edition, Publisher, Year.

•Prescott's Microbiology by Willey, Sherwood and Woolverton
•Brock Biology of Microorganisms by Madigan, Martinko, Stahl and Clark
•General Microbiology by Stanier, Ingraham, Wheelis and Painter
•Todar's Online Textbook of Bacteriology

19. Resources required for the course *(itemized & student access requirements, if any)*

19.1	Software	
19.2	Hardware	
19.3	Teaching aides (videos, etc.)	
19.4	Laboratory	YES
19.5	Equipment	YES
19.6	Classroom infrastructure	LCD Projector
19.7	Site visits	

20. Design content of the course *(Percent of student time with examples, if possible)*

20.1	Design-type problems	
20.2	Open-ended problems	
20.3	Project-type activity	
20.4	Open-ended laboratory work	
20.5	Others (please specify)	

Date: 21st October 2013 (Signature of the Head of the Department)