Teaching Plan
Academic Year 2015-16

Class : **B.Sc III** **Semester: VI**

Subject : **Microbiology** **Paper No: XX**

Periods per week : **Th. ___ Pract.____** **Test** (Date):_____

Weeks (Total) : **15** **Tutorial** (Date):_____

Name: Dr Madhuri Sahasrabudhe

Week	Topic to be Covered
November 2	**Unit I:** Introduction to industrial microbiology, Historical events, Layout of fermentation industry- different units and departments and functions Design of typical fermenter, Types of fermenters
December 1	I.P. and WHO standards of sterility Screening- Definition, primary screening- screening of acid producers, antibiotic producers, growth factors and vitamin producers Screening: Secondary screening- characters of secondary isolates, secondary screening with help of streptomycin production Strain improvement methods: mutation, recombination and recombinant DNA technology Increasing product yield
4	Preservation methods: lyophilization, freezing, mineral oil, soil stalks Inoculum development
December 1	Fermentation media: raw materials, media formulation, pretreatment , sterilization, contamination and its control, inoculums media
2	Antifoam agents, precursors, scale up of fermentation, phage contamination and control, Down stream processing
3	Down stream processing

	Unit II: Antibiotioc fermentation- penicillin fermentation
4	Vitamin B12 fermentation, L-lysine direct and indirect fermentation, Alcohol fermentation
January 1	Alcohol fermentation, Citric acid fermentation **Unit III:** Enzymes – Alpha amylase- bacterial and fungal amylase
2	Baker's yeast production, Vaccines: Genetic recombinant vaccines
3	Biofertilizers- Azo, Rhizo and PSB
4	Methane fermentation
February1	Biopesticide production
2	Question and answer discussion, test
3	Tests

Teacher's Signature H.O.D.'s Signature

Teaching Plan
Academic Year 2015-16

Class **: B.Sc III year** **Semester:VI**

Subject **:**Microbiology **Paper No:XIX**

Periods per week **: Th. _3__Pract**._8___ **Test** (Date):_____

Weeks (Total) **: 15** **Tutorial** (Date):_____

Name of the teacher : Dr.Aditi Bhattacharya

Week	Topic to be Covered
1	November III week: Recombinant DNA technology : definition, tools used for cloning, restriction endonucleases (types, nomenclature, recognition sequences, with examples). DNA manipulating enzymes: Restriction endonucleases.
2	November IV week: (Types, nomenclature, recognition sequences, cleavage patterns with examples) ii) DNA ligase, iii)alkaline phosphatase
3	December I week : iv) Polynucleotide kinase v) reverse transcriptase. **Unit II:** Vectors : properties of good vector, cloning and expression vectors. (pBR322, pUC8, pSC101,)
4	December IIweek : Bacteriophage vectors (λ phage, cosmids, YAC) Properties of a good host (cloning organism). Uptake of DNA (Calcium chloride treatment, electroporation, protoplast fusion, liposome).
5	December III week : Selection of recombinant clones; Blue –white screening. **Unit III:** Genomic library (construction and identification of desired clones) . Probes (preparation and labelling) , its use PCR

6	December IV week : Nucleic acid and protein blotting techniques: Southern, Western and Northern blotting. Colony hybridization
7	January I week : , Nucleotide sequencing (Sanger method).
8	January II week : Gene therapy : Somatic cell and germline therapy Applications of genetic engineering :Agriculture (Golden rice, BT cotton)
9	January III week : Human and animal health(Interferon, HBV vaccines), Industries (strain improvement, recombinant protein insulin)
10	January IV week :Environment.(superbug, bioremediation using GEMS).
11	February I week : Ethical issues of genetic engineering
12	February II week : Revision
13	February III week : Revision
14	February IV week : Revision

Teaching Plan
Academic Year 2015-16

Class : B.Sc III year **Semester: Annual pattern**

Subject : Microbiology **Paper No: XVII, XVIII, XXI, XXII.**

Periods per week : Pract._8___

Number of weeks : 17

Name of the teacher : Dr.Aditi Bhattacharya

Week	Topic to be Covered
June III week :	**Paper XVIII**:Preparation of buffers and reagents.
June IV week :	Study of enzymes :- α-amylase, caseinase, catalase, desulfurase,
July 1 week :	Study of enzymes : Gelatinase, lecithinase, oxidase.
July II week :	Effect of pH , temp, substrate concentration on α- amylase activity.
July III week :	Demonstration of nitrate reduction. .
July IV week:	Demonstration of decarboxylation of amino acid
August I week	Isolation of photosynthetic bacteria by column method
August II	Primary screening for :

week	Starch hydrolyzers.
August III week	Organic acid producers.
August IV	Antibiotic producers.
August V week	**Paper XVII I**solation of total RNA from yeasts (Purification and concentration)
September I week:	Hyperchromicity study of chromosomal DNA using UV_Vis spectrophotometer .
September II week :	Isolation of spontaneous lac mutants of *E.coli* by Replica plating .
September III week:	Effect of UV radiations on DNA and photo reactivation of *E.coli*
September IVweek	Study of Transformation in *E.coli* a. Preparation of competent *E.coli* b. Enumeration of transformed cells c. Determination of Plasmid transfer efficiency.
October I week :	Isolation of Coliphages from sewage
October II week :	Study of Conjugation in E.coli (Plate method) .

Teacher's signature HOD's signature