**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Even Semester**

**Session (2018-19)**

Class: B.Sc. Biotech. (Hons.) 4th Sem.

Name of the Teacher: SUMIT DABHI

Subject: Agro & Industrial Biotechnology

Period : V(MON) IV(TUE) II(WED) & V (SAT)

Room No: 110, 111, 122 & 110

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| **S. No** | **Dates** | | **Topics to be covered** |
| Week 1 | 14 /01/2019 – 19/01/2019 | | Basic concept of agriculture as industry: Industrially important microbes, its screening, selection and identification. |
| Week 2 | 21/01/2019 –  25/01/2019 | | Maintenance and preservation of industrially important microbial cultures. |
| Week 3 | 28/01/2019 –  2/02/2019 | | Differences between microbial industrial process and chemical industrial process |
| Week 4 | 4/02/2019 –  9/02/2019 | | Improvement programme of industrial microbes, mutational programme of penicillin producing microorganisms. |
| Week 5 | 11/02/2019 –  16/02/2019 | | selection pressure in maintaining the hyper producer, lowering of production due to reversal of mutations |
| Week 6 | 18/02/2019 –  23/02/2019 | | media formulation and process optimization of industrial and agro industrial microbes. |
| Week 7 | 25/02/2019 –  02/03/2019 | | media formulation and process optimization of industrial and agroindustrial microbes. |
| **Mid Semester Exam** | | | |
| Week 8 | 11/03/2019 –  16/03/2019 | Microbes in agro industries and industrial biotechnology: Introduction of primary and secondary metabolites, production of vitamin B12,  antibiotics (penicillin), | |
| Week 9 | 18 /03/2019 – 22/03/2019 | alcohol, wine, beer, cheese, | |
| Week 10 | 25/03/2019 –  30/03/2019 | bread, citric acid, gluconic acid, | |
| Week 11 | 1/04/2019 –  6/04/2019 | enzymes (amylases, cellulases, lipases and proteases) and their industrial applications. | |
| Week 12 | 8/04/2019 –  12/04/2019 | Emerging technologies in agro industries: production of vermiculture, composting, herbicides and biopesticides, production of biofertilizers: | |
| Week 13 | 15/04/2019 –  20/04/2019 | Emerging technologies in agro industries: production of vermiculture, composting, | |
| Week 14 | 22/04/2019 –  27/04/2019 | herbicides and biopesticides, production of  biofertilizers: | |
| Week 15 | 29 /04/2019 – 3/05/2019 | Blue green algae, azolla, fungi, mycorrhiza (VAM), bacteria – *Azospirrilum*, microbial biotransformations. single cell proteins (bacterial, fungal and algal). | |

**PG.GOVT COLLEGE FOR GIRLS, SECTOR-42, CHANDIGARH**

**Teaching Plan Even Semester**

**Session (2018-19)**

Class: B.Sc. Biotech. (Elective) 6th Sem.

Name of the Teacher: SUMIT DABHI

Subject: Environment & Fermentation Biotechnology

Period: VI (MON-FRI)

Room No: 110

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| **S. No** | **Dates** | **Topics to be covered** |
| Week 1 | 14 /01/2019 – 19/01/2019 | Isolation and screening of microbes of industrial importance, Preservation of  Microbes. |
| Week 2 | 21/01/2019 –  25/01/2019 | Strain Improvement : mutations and genetic manipulations. Metabolites: Primary and secondary metabolic designs (expansion of substrate  spectrum, product yield). |
| Week 3 | 28/01/2019 –  2/02/2019 | Introduction to fermentation processes: Inoculum development for industrialfermentation. |
| Week 4 | 4/02/2019 –  9/02/2019 | Substrates for fermentation media.  Sterilization: Principles and practices; |
| Week 5 | 11/02/2019 –  16/02/2019 | Substrates for fermentation media.  Sterilization: Principles and practices; |
| Week 6 | 18/02/2019 –  23/02/2019 | fermenters and their accessories,  Types of industrial fermentations: Submerged, surface, continuous, bubble,cap bed batch etc. |
| Week 7 | 25/02/2019 –  02/03/2019 | Fermentation equipment: Design of fermenters, tank construction materials, control panels, Antifoams, autoclaving. |
| **Mid Semester Exam** | | |
| Week 8 | 11/03/2019 –  16/03/2019 | Fermentation equipment: Design of fermenters, tank construction materials, control panels, Antifoams, autoclaving. |
| Week 9 | 18 /03/2019 – 22/03/2019 | Energetics of microbial growth in fermenters: Reaction rates, heat and mass transfer, transport phenomenon in reactors, macroscopic balances of energy and energy flow |
| Week 10 | 25/03/2019 –  30/03/2019 | Upstream and downstream processing of industrial fermentations: Cell  disruption, centrifugation, flocculation, filtration, ultrafiltration, ultra- centrifugation,gel filtration, chromatographic methods, and two phase aqueous separations |
| Week 11 | 1/04/2019 –  6/04/2019 | Upstream and downstream processing of industrial fermentations: Cell  disruption, centrifugation, flocculation, filtration, ultrafiltration, ultra- centrifugation,gel filtration, chromatographic methods, and two phase aqueous separations |
| Week 12 | 8/04/2019 –  12/04/2019 | Degradation of pesticides and toxic organic compounds by microorganism.  BT toxin as a natural pesticide. |
| Week 13 | 15/04/2019 –  20/04/2019 | Degradation of pesticides and toxic organic compounds by microorganism.  BT toxin as a natural pesticide. |
| Week 14 | 22/04/2019 –  27/04/2019 | Biological control of other insects swarming the agricultural fields.  Enrichment of ores by microorganisms. |
| Week 15 | 29 /04/2019 – 3/05/2019 | Biofertilizers – Nitrogen fixing micro- organisms (types and mode of action) |