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| **B.Sc MICROBIOLOGY (CBCS) SYLLABUS****FIRST YEAR – SEMESTER- II** |
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| **MBT- 201 : MICROBIAL BIOCHEMISTRY & METABOLISM** |
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| **TOTAL HOURS: 48** **CREDITS: 4** |
| **UNIT-I No. of hours: 10** |
|  |
| Outline classification and general characteristics of carbohydrates (monosaccharides, disaccharides and polysaccharides). General characteristics of amino acids and proteins. Structure of nitrogenous bases, nucleotides Fatty acids (saturated and unsaturated)  lipids (spingolipds, sterols and phospholipids).  |
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| **UNIT-II No. of hours: 8** |
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| Principle and applications of -Colorimerty Chromatography (paper and thin-layer)Spectrophotometry (UV & visible), Centrifugation  |
| **UNIT-III No. of hours: 10** |
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| Properties and classification of Enzymes. Biocatalysis- induced fit and lock and key models. Coenzymes and Cofactors. Factors affecting catalytic activity. Inhibition of enzyme activity- competitive, noncompetitive, uncompetitive and allosteric. |
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| **UNIT-IV No. of hours: 10** |
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| Microbial Nutrition –Nutritional requirements and uptake of nutrients by cells.Nutritional groups of microcroorganisms- autotrophs, heterotrophs, mixotrophs.Growth media- synthetic, complex, selective, enrichment and differential media. Microbial Growth- different phases of growth in batch cultures, Synchronous, continuous, biphasic growth. Factors influencing microbial growth. Methods for measuring microbial growth – Direct microscopy, viable count estimates, turbiodometry and biomass. |
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| **UNIT-V No. of hours: 10** |
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| Aerobic respiration -Glycolysis, HMP path way, ED path way, TCA cycle, Electron transport, oxidative and substrate level phosphorylation. Anaerobic respiration (Nitrate).  Fermentation - Alcohol and lactic acid fermentations.Outlines of oxygenic and anoxygenic photosynthesis in bacteria.  |

**MBP- 201: MICROBIAL BIOCHEMISTRY & METABOLISM**

**TOTAL HOURS: 48**  **CREDITS: 2**

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| 1. |  Qualitative Analysis of Carbohydrates |
| 2. | Qualitative Analysis of Aminoacids |
| 3. | Colorimetric estimation DNA by diphenylamine method |
| 4. | Colorimetric estimation of proteins by Biuret/Lowry method |
| 5. | Paper chromatographic separation of sugars and amino acids |
| 6. | Preparation of different media- Synthetic and Complex Media |
| 7. | Setting and observation of Winogradsky column. |
| 8. | Estimation of CFU count by spread plate method/pour plate method. |
| 9. | Bacterial growth curve. |
| 10. | Factors affecting bacterial growth – pH. |
| 11. | Factors affecting bacterial growth – Temperature. |
| 12. | Factors affecting bacterial growth –Salts |

**Learning Out comes:**

**Up on completion of this course students should able to :**

1. **Explain working principle and applications of Colorimetry, Chromatography, Spectrophotometry, Centrifugation and Gel Electrophoresis.**
2. **Knowledge on Microbial nutrition, bacterial growth, metabolism and Respiration.**
3. **The student will get first-hand experience on separation methods**