

# Sree Chaitanya Mahavidyalaya

Habra-Prafullanagar, Dist. North 24 Parganas, PIN-743268

[www.scmhabra.org](http://www.scmhabra.org)

## DEPARTMENT OF MICROBIOLOGY

### COURSE OUTCOME:

| Semester | Paper Code                 | Paper Name                               | Course Outcome   |
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| SEM I    | MCBGCOR01T&P               | BACTERIOLOGY AND VIROLOGY                | By the end of this course, the students will be able to:<br>1. Compare prokaryotic organism with eukaryotic organism<br>2. Understand the importance of methane producing bacteria<br>3. Write the method of reproduction in algae fungi and protozoa<br>4. Understand and compare the characteristics properties of virus with other microbes<br>5. Understand various kinds of positive and negative interactions of different microbes  |
| SEM II   | MCBGCOR02T&P               | INDUSTRIAL & FOOD MICROBIOLOGY           | By the end of this course, the students will be able to:<br>1. Understand and describe scope of industrial microbiology<br>2. Understand and operate fermenters in various industries<br>3. Explain the process of commercial production and ethanol Vitamin B2 Beer, Wine Penicillin etc.<br>4. Perform the methods and harvesting and product recovery in industrial fermentations<br>5. Work out the maintenance of ferment or plant.   |
| SEM III  | MCBGCOR03T&P /MCBHGEC03T&P | MICROBIAL GENETICS AND MOLECULAR BIOLOGY | By the end of this course, the students will be able to:<br>1. A fair concept on genomic organization of cell.<br>2. Concept of chromosome.<br>3. Compare DNA and RNA and Understand the mechanism of enzyme.<br>4. Discuss importance and applications of different genes (structural genes, functional genes etc)<br>5. Discuss importance and applications of various enzymes in the processes viz. replication transcription and translations etc<br>6. Describe various types of RNA and their role during translation, tRNA activations etc<br>8. Discuss mutation, its types and related effects like |

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|        |                            |  | <p>loss of function and gain of functions etc</p> <p>9. Explain re-combinations- transduction, conjugation with types and transformations etc</p>   |
|        | MCBSSEC01M                 | <p>FOOD<br/>FERMENTATION<br/>TECHNIQUE</p>             | <p>At the end of the course, the students will be able to:</p> <ol style="list-style-type: none"> <li>1: Elaborate various aspects of industrial technology related to Microbiology</li> <li>2: Screen industrially important strains</li> <li>3: State and explain principles of fermenter design and computer assisted fermentation control</li> <li>4: Discuss fermentation process and downstream processing</li> <li>5: Formulate media, aspects of raw material used, methods of strain improvement</li> <li>6: Describe industrial production of enzyme, antibiotics, amino acids and vitamins</li> <li>7: Produce, purify and estimate various products, like enzymes, ethanol, acids, and antibiotics with the help of microbes</li> </ol>   |
| SEM IV | MCBGCOR04T&P /MCBHGEC04T&P | <p>MEDICAL<br/>MICROBIOLOGY<br/>AND<br/>IMMUNOLOGY</p> | <p>At the end of the course, the students will be able to:</p> <ol style="list-style-type: none"> <li>1. Explain concept of Immunity, Antigen, Antibody, Immune system</li> <li>2. Describe structure, Classes, biological activity and gene Organization of antibodies and their diversity</li> <li>3. Rationalize Expression of Ig genes, Monoclonal antibody (Chimeric Antibody and Humanized Antibody) and its formation and applications</li> <li>4. Describe Lymphocyte (T and B cell) Activation and Regulation, Effector Mechanism, Complement System: Activation and its Regulation</li> <li>5. Discuss Diagnostic application of immunology: Practical aspects of Antigen-Antibody Interaction: Precipitation and Agglutination</li> <li>6. Perform Blood grouping, isolation of bacterial Antigen and Ag-Ab reactions</li> </ol> |

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|        | MCBSSEC02M   | MICROBIOLOGICAL ANALYSIS OF AIR AND WATER           | At the end of the course, the students will be able to: <ol style="list-style-type: none"> <li>1. Determine sources of Air, Water and Soil pollution and their effects</li> <li>2. Describe processes involved in purification of sewage and portable water</li> <li>3. Determine Air sampling techniques and its effectiveness</li> <li>4. Classify Enterobacter by various Biochemical tests: IMViC, MPN, Elevated temperature test</li> <li>5. Calculate BOD, COD, Chlorine in water</li> </ol>   |
| SEM V  | MCBGDSE01T&P | INSTRUMENTATION AND BIOTECHNIQUES                   | At the end of the course, the students will be able to: <ol style="list-style-type: none"> <li>1. Understand the use of basic biomedical instrumentation, principles and techniques of preparative analytical centrifugation, include ultracentrifugation, sedimentation analysis and gradient centrifugation.</li> <li>2. Understand the theory and application of Chromatography techniques, Gel filtration, ion exchange, affinity, HPLC and electrophoresis.</li> <li>3. Understand and explain the principles, methodology and application of various bio instruments like spectrophotometer, electrophoresis, chromatography, centrifuge etc.</li> </ol> |
|        | MCBSSEC003   | BIOFERTILIZER AND BIOPESTICIDES                     | By the end of this course, the students will be able to: <ol style="list-style-type: none"> <li>1. Understand the soil biochemical cycles and how microbial interactions related with them.</li> <li>2. Clearly to know the source of organic waste and problems in traditional composting.</li> <li>3. Also able to understand different types of vermicomposting methods with problems in vermicomposting. Also understand the value and importance of vermicomposting in modern agriculture.</li> </ol>   |
| SEM VI | MCBGDSE03T&P | MICROBES IN SUSTAINABLE AGRICULTURE AND DEVELOPMENT | At the end of the course, the students will be able to: <ol style="list-style-type: none"> <li>1. Understand the soil layering, and texture and maintaining its quality to developing agricultures plant-microbial interactions.</li> <li>2. Understand the soil biochemical cycles and how microbial interactions related with them.</li> <li>3. The student will gain knowledge in utilization of the commonly available resources for commercial application.</li> <li>4. The student will get an idea about the exploitation of readily available resources and issues associated with product development, which will be useful for</li> </ol>            |

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|  |            |   | <p>developing entrepreneurship skills.</p> <p>5. The student will get an overview about the fundamentals of molecular biology and the biotechnological tools in tissue cultures, application of biotechnology in agriculture, recombinant DNA technology and biodiversity and conservation.</p>  |
|  | MCBSSEC004 | MICROBIAL QUALITY CONTROL IN INDUSTRIES | <p>The course –</p> <ol style="list-style-type: none"> <li>1. Allows microbiologists to monitor and protect against microbial impurities in bio manufacturing production systems.</li> <li>2. Protocols must be adhered to in order to control the environmental factors in production and maintain a sterile environment throughout the process.</li> <li>3. Basic concept of microbiological quality control</li> <li>4. Design SOPs and related laboratory infrastructure.</li> <li>5. Basic knowledge of microbiological aspects such as- Media preparation, Sterilization, Culturing or microorganisms, Handling of microbes etc.</li> <li>6. Understand how to maintaining food safety during food preparation and packaging.</li> </ol> |