Shri Sharda Bhavan Education Society's
Yeshwant Mahavidyalaya, Nanded
VIP Road, Nanded-431602 (M.S) India
PG Department of Microbiology
(Under graduate, Post graduate and Research centre)

COURSE OUTCOME (COs)

CCMB I – Introductory Microbiology P- I

Course learning outcomes: At the conclusion of this course the students –

Outcome 1. Have developed a good knowledge of the development of the discipline of Microbiology and the contributions made by prominent scientists in this field.

Outcome 2 . Have developed a very good understanding of the characteristics of different types of microorganisms, methods to organize/classify these into and basic tools to study these in the laboratory.

Outcome 3 . Are able to explain the useful and harmful activities of the microorganisms.

Outcome 4. Are able to perform basic experiments to grow and study microorganisms in the laboratory.

CCMB I – Fundamentals of Microbiology P-II

Course learning outcomes: At the completion of this course, the students are able to –

Outcome 1. Describe characteristics of bacterial cells, cell organelles, cell wall composition and various appendages like capsules, flagella or pili.

Outcome 2. Differentiate a large number of common bacteria by their salient characteristics; classify bacteria into groups.

Outcome 3 . Describe the nutritional requirements of bacteria for growth; developed knowledge and understanding that besides common bacteria there are several other microbes which grow under extreme environments.

Outcome 4. Perform basic laboratory experiments to study microorganisms; methods to preserve bacteria in the laboratory; calculate generation time of growing bacteria.

CCMB II – Basic Microbiology and Biomolecules-P-III

Course learning outcomes: By the end of this course the students-

Outcome 1. Developed a very good understanding of various biomolecules which are required for development and functioning of a bacterial cell.

Outcome 2. Have developed how the carbohydrates make the structural and functional components such as energy generation and as storage food molecules for the bacterial cells

Outcome 3. Well conversant about multifarious function of proteins; are able to calculate enzyme activity and other quantitative and qualitative parameters of enzyme kinetics; also knowledge about lipids and nucleic acids.

Outcome 4. Student are able to make buffers, study enzyme kinetics and calculate Vmax, Km, Kcat values.

CCMB II- Microbial Physiology – P-IV

Course learning outcomes: Major learning outcome of this course is that students develop a very good understanding of several microbiological techniques and instruments which are commonly used in a microbiology laboratory. The students have learnt-

Outcome 1. Principles which underlie sterilization of culture media, glassware and plastic ware to be used for microbiological work.

Outcome 2. Principles of a number of analytical instruments which the students have to use during the study and also later as microbiologists for performing various laboratory manipulations.

Outcome 3. Handling and use of microscopes for the study of microorganisms which are among the basic skills expected from a practicing microbiologist. They also get introduced a variety of modifications in the microscopes for specialized viewing.

Outcome 4. Several separation techniques which may be required to be handled later as microbiologists.

Programme Objectives (POS):

CCMB I – Introductory Microbiology P- I.

CCMB I – Fundamentals of Microbiology P-II.

CCMB II – Basic Microbiology and Biomolecules P-III.

CCMB II- Microbial Physiology P-IV.

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B.Sc. -II-year MICROBIOLOGY

COURSE OUTCOME (COs)

CCMB III – Applied Microbiology (P-VI).

Course learning outcomes: Students have-

Outcome 1. Understood what are viruses and the chemical nature of viruses, different types of viruses infecting animals, plants and bacteria (bacteriophages)

Outcome 2. Understanding about the biology of bacteriophages.

Outcome 3. Gained knowledge of a variety of plant viruses and animal viruses.

Outcome 4. The ability to describe role of viruses in the causation of the cancer'

CCMB III – Immunology(P-VII).

Course learning outcomes: By the completion of this course the students able to-

Outcome 1. Describe useful and harmful activities of fungi and algae.

Outcome 2. Identify commonly available fungi and algae and their characteristics.

Outcome 3. Discuss how fungi and algae are used as biofertilizers in agriculture and as biopesticides.

Outcome 4. Grow mushroom in the laboratory

CCMB IV- Food, Soil Microbiology and Microbial Ecology (PVIII)

Course learning outcomes: By the conclusion of this course, the students have –

Outcome 1. Understood genome organization of model organisms namely E. coli and Saccharomyces, and the molecular mechanisms that underlie mutations.

Outcome 2. Developed a fairly good knowledge about the three well known mechanisms by which genetic material is transferred among the microorganisms namely transformation, transduction and conjugation.
Outcome 3.Are able to describe different types of the extrachromosomal elements or the plasmids; the nature of the transposable elements in the prokaryotic and the eukaryotic cells.

Outcome 4. Hands on skills of isolation of plasmid DNA from bacterial cells and its visualization by performing agarose gel electrophoresis.

CCMB IV- Medical microbiology (PIX)

Course learning outcomes: By the conclusion of this course, the students are capable of –

Outcome 1. Describing the growth characteristics of the microorganisms capable of growing under unusual environmental condition of temperature, oxygen, and solute and water activity.

Outcome 2. Describing the growth characteristics of the microorganisms which require different nutrient for growth and the associated mechanisms of energy generation for their survival like autotrophs, heterotrophs, chemolithoautotrophy etc.

Outcome 3. Differentiating concepts of aerobic and anaerobic respiration and how these are manifested in the form of different metabolic pathways in microorganisms.

Programme Objectives (POS):

CCMB III – Applied Microbiology (P-VI).

CCMB III – Immunology (P-VII).

CCMB IV- Food, Soil Microbiology and Microbial Ecology (PVIII)

CCMB IV- Medical microbiology (PIX)

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B.Sc. -III-year MICROBIOLOGY

COURSE OUTCOME (COs)

CCMB V -Microbial Genetics (P – XII)

Course learning outcomes: By the conclusion of this course, the students have –

Outcome 1. Understood genome organization of model organisms namely *E.coli* and *Saccharomyces,* and the molecular mechanisms that underlie mutations.

Outcome 2. Developed a fairly good knowledge about the three well known mechanisms by which genetic material is transferred among the microorganisms namely transformation, transduction and conjugation.

Outcome 3.Are able to describe different types of the extrachromosomal elements or the plasmids; the nature of the transposable elements in the prokaryotic and the eukaryotic cells.

Outcome 4. Hands on skills of isolation of plasmid DNA from bacterial cells and its visualization by performing agarose gel electrophoresis.

CCMB V - Microbial Metabolism (P – XIII A)

Course learning outcomes: By the conclusion of this course, the students are capable of –

Outcome 1. Describing the growth characteristics of the microorganisms capable of growing under unusual environmental condition of temperature, oxygen, and solute and water activity.

Outcome 2. Describing the growth characteristics of the microorganisms which require different nutrient for growth and the associated mechanisms of energy generation for their survival like autotrophs, heterotrophs, chemolithoautotrophy etc.

Outcome 3.Differentiating concepts of aerobic and anaerobic respiration and how these are manifested in the form of different metabolic pathways in microorganisms

CCMB VI - Molecular Biology (P-XIV)

Course learning outcomes: By the conclusion of this course, the students –

Outcome 1. Are capable of describing a large number of substrates that are used for the industrial fermentation processes.

Outcome 2.Have developed an understanding of different types of reactors or fermenters which are used for laboratory, pilot and industrial scale fermentations and their processes parameters.

Outcome 3. Have acquired a detailed knowledge of number of products which are produced by industrial fermentation processes

CCMB VI – Industrial Microbiology (P – XVA)

Course learning outcomes: By the completion of this course, the students –

Outcome 1. Have developed a fairly good knowledge and understanding of different types of environments and habitats where microorganisms grow including the microbiomes of the human gut and animal gut.

Outcome 2. Are able to identify the important role microorganisms play in maintaining healthy environment by degradation of solid/liquid wastes; how these activities of microorganisms are used in sewage treatment plants, production of activated sludge and functioning of septic tanks

Outcome 3.Have understood the significance of BOD/COD and various tests involving use of enumerating fecal *E.coli* for assessing quality of water.

Outcome 4. Have developed the practical skills for conducting experiments to assess the BOD/COD of wastewaters and their interpretation; practically assess the portability of drinking water by the use of standard microbiological tests.

Programme Objectives (POS):

CCMB V -Microbial Genetics (P – XII)

CCMB V - Microbial Metabolism (P – XIII A)

CCMB VI - Molecular Biology (P-XIV)

CCMB VI – Industrial Microbiology (P – XVA)