

<b>Microbiology</b>	
<b>Name of Course</b>	<b>Course Outcomes</b>
CC1 - Introduction to Microbiology and Microbial Diversity	<p>CO1: Develop an understanding of the subject of microbiology, grasp the general concept on the history of microbiology along with the eukaryotic cell's life.</p> <p>CO2: Display an understanding of microbial diversity.</p> <p>CO3: Develop an elementary idea of viruses and its life cycle.</p>
CC2 - Bacteriology	<p>CO1: Demonstrate an understanding of bacteriology.</p> <p>CO2: Understand the concepts of bacterial anatomy and different methods of cultivation and handling techniques along with control.</p>
CC3 - Biochemistry	<p>CO1: Recognise and appraise the depth and diversity of biochemistry.</p> <p>CO2: Recognise basic functions of enzymes in cell.</p> <p>CO3: Develop an idea of the concepts of macromolecules in cell that are harnessed to synthesize cellular anatomy and metabolism.</p>
CC4 – Cell Biology	<p>CO1: Recognise the scope of Cell Biology.</p> <p>CO2: Grasp concepts of basic cell functions like transport signalling and its cycle.</p> <p>CO3: Comprehend the role of molecules in controlling cellular events.</p>
CC5: VIROLOGY	<p>CO1: Develop a detailed idea of viruses, its target cells and modes of infection to several host cells.</p> <p>CO2: Develop concepts on the life cycle of different viruses and its relation with host cells.</p>
CC6: MICROBIAL PHYSIOLOGY AND	<p>CO1: Recognise in detail the function of enzymes and other macromolecules in the ever-changing</p>

<p><b>METABOLISM</b></p>	<p>biochemical life of a cell.</p> <p>CO2: Study the metabolism, anabolism and catabolism to earn energy and synthesise several elements for the life of a cell.</p>
<p><b>CC7: MOLECULAR BIOLOGY</b></p>	<p>CO1: Develop concepts on central event of life such as central dogma that are mandatory for functioning of cell.</p> <p>CO2: Grasp the molecular interaction of several macromolecule in cell to pursue cell behaviour.</p>
<p><b>SEC A: Microbial Quality Control in Food and Pharmaceutical Industries</b></p>	<p>CO1: Grasp several methods and technique routinely used to evaluate, enumerate and quality check of food and pharmaceutical products.</p> <p>CO2: Learn to ensure microbiological standard and controlling growth of microbes in several items.</p>
<p><b>CC8: MICROBIAL GENETICS</b></p>	<p>CO1: Recognise the concepts of gene, DNA chromosomes and its relations to its expression to conduct several cellular mechanism.</p> <p>CO2: Understand the factor responsible of genetic expression.</p>
<p><b>CC9: ENVIRONMENTAL MICROBIOLOGY</b></p>	<p>CO1: Learn the role of microbes in several environmental conditions and their ecological existence.</p> <p>CO2: Recognise the relation of microbes with its microenvironment and their utilization for the betterment of nature.</p>
<p><b>CC10: RECOMBINANT DNA TECHNOLOGY</b></p>	<p>CO1: Develop the concepts of application of microbiology and molecular biology in modern times.</p> <p>CO2: Help to understand biological tools and technique to develop more sustainable and effective mode of technology for mankind.</p>

<p>SEC B: Microbiological Analysis of Air and Water</p>	<p>CO1: Understand the process of evaluating the existence of microbes in different environmental samples such as water and air.</p> <p>CO2: Understand techniques of purification of natural resources for our use.</p>
<p>CC11: FOOD AND DAIRY MICROBIOLOGY</p>	<p>CO1: Understand concepts of normal microflora of different types of food.</p> <p>CO2: Grasp techniques used to upgrade, evaluate and enumerate microbes for the production of different food products and ensuring its standard of quality.</p>
<p>CC12: INDUSTRIAL MICROBIOLOGY</p>	<p>CO1: Grasp application of RDT in developing several products of microbial fermentation.</p> <p>CO2: Learn the role of wild type microbes as well as genetically modified strains in the fermentation process.</p>
<p>DSEA1: MICROBIAL BIOTECHNOLOGY</p>	<p>CO1: Learn the application of genetical modification for the betterment of microbes not only in fermentation but also for other biotechnological application such as drugs, vaccines, the textile industry and others.</p>
<p>DSEB1: INHERITANCE BIOLOGY</p>	<p>CO1: Develop concepts of genetic traits and its expression in autosomal and germ cells.</p> <p>CO2: Recognise the link between the genetical features and its expressivity, genetical characters that we inherit from our previous generations</p>
<p>CC13: IMMUNOLOGY</p>	<p>CO1: Understand the defence mechanism of human cells from infectious agents and the role of body immunity to strengthen the fight against several commensal organisms mostly with medical importance.</p>
<p>CC14: MEDICAL MICROBIOLOGY</p>	<p>CO1: Recognise concepts of several normal commensal flora of human host and their relation with body defence cells.</p>

	CO2: Develop an understanding of the pathophysiology of several disease and the process of identifying them as well as concepts of antimicrobial agents to combat them.
DSEA3: PLANT PATHOLOGY	CO1: Recognise general concepts of plant microbe interactions and the event of disease development.  CO2: Understand several techniques to deal with such pathological conditions of plants with the help of friendly microbes.
DSEB3: INSTRUMENTATION AND BIOTECHNIQUES	CO1: Understand detailed mechanisms of visualizing microbes and their behaviour.  CO2: Grasp concepts of how bacterial activity, growth and control can be evaluated with the help of modern instruments and techniques.
<b>Microbiology General Course</b>	
CC1/ GE1 : Introduction and Scope of microbiology, Bacteriology	CO1: Introduction to the world of microbes and their behaviour in nature.  CO2: The scope and future of microbiology.
CC2/GE2: Bacteriology and Virology	CO1: Grasp in detail information regarding bacterial physiology, ecology and behaviour in nature.  CO2: Understand the world of virus and their relation with several hosts.
CC 3/GE3: Biomolecules and Microbial metabolism	CO1: Understand macromolecules, their metabolism and importance in cell.  CO2: Learn how macromolecules are synthesised and broken down to provide energy to a cell for its survival.
SEC A : Microbial Quality Control in Food and Pharmaceutical Industries	CO1: Like other industry, food, pharma and beverages industry use different strain of microbes for their production. Students understand the different aspects of this.

CC 4/GE4: Microbial Genetics and Molecular Biology	CO1: Understand genetical arrangements, possible role of mutation and central dogma of a cell's life and its importance in survival
SEC B: Microbiological Analysis of Air and Water	CO1: Understand the qualitative and quantitative aspects of microbial analysis of air and water and the process of its purification.
DSE A : Genetic Engineering and Biotechnology	CO1: Understand the manipulation of DNA in microbes to yield more product and their use in biotechnological fields such as food, fermentation, pharma, diagnostic etc.
SEC A: Biofertilizers and Biopesticides	CO1: Introduce the role of microorganisms in the development of soil fertility by manufacturing biofertilizers and biopetctides.
DSE B: Medical Microbiology and Immunology	CO1: Understand the role of microbes in development of disease and how competent immune system works against invaded pathogen.
SEC B: Food Fermentation Techniques	CO1: Understand the role of microbes and its potential in the use food fermentation techniques. CO2: Learn about several microbial food fermentative products.