



Sanjivani Rural Education Society's
SANJIVANI ARTS, COMMERCE AND SCIENCE COLLEGE

At: Sahajanandnagar, Post: Shingnapur, Tal: Kopergaon,

Dist: Ahmednagar (M.S.) Pin:423603

Recognized by Govt. of Maharashtra, Affiliated to University of Pune, ID.No.PU/AN/ACS/130/2012



SANJIVANI
GROUP OF INSTITUTES

Course Outcome: Bsc (Microbiology subjects)

Class	Course Title	Course Outcome
FY BSc Paper I	DSEC- MB 111: Introduction to Microbial World	CO1:Understand history of microbiology CO2:Acquire knowledge of different Eras of Microbiology and become acquainted with Nobel laureates in Life Sciences of 21st Century CO3:Gain knowledge about different types of Microorganism with their differentiating characters CO4:Understand beneficial and harmful effects of microorganisms in different fields of Microbiology
FYBSc Paper II	DSEC- MB 112: Basic Techniques in Microbiology	CO1:Get knowledge of Modern SI units CO2:Understand Principles and Working of different types of Microscopes CO3:Gain knowledge of different types of staining techniques and role of fixatives, mordants, decolourisers and accentuators in staining CO4:Understand the concept of sterilization and disinfection
FYBSc Paper III	DSEC-MB – 113: F. Y. B. Sc. Microbiology Practical Course	CO1:Describe the good lab practices and biosafety measures to be adopted while working in a microbiology lab and identify diferent instrument commonly used for microbiological experiments. CO2:Give example of different nutrient media popularly used in culturing microorganisms and campae different methods of sterilizing them. CO3:Explain morphological characteristics of different microbial life forms by microscopic observation.


PRINCIPAL
Sanjivani Arts, Commerce &
Science College, Kopergaon





Sanjivani Rural Education Society's
SANJIVANI ARTS, COMMERCE AND SCIENCE COLLEGE

At: Sahajanandnagar, Post: Shingapur, Tal: Kopergaon,
Dist: Ahmednagar (M.S.) Pin:423603

Recognized by Govt. of Maharashtra, Affiliated to University of Pune, ID.No.PU/AN/ACS/130/2012



SANJIVANI
GROUP OF INSTITUTES

FYBSc Paper I	DSEC- MB 121: Bacterial Cell and Biochemistry	CO1:Understand structure, chemical composition and functions of the components in bacterial cell CO2:Comprehend chemical basis of Microbiology CO3:Learn structure, organization and functions of carbohydrates, lipids, proteins & nucleic acids CO4:Be familiar with classification of bacteria (Bergey's Manual and Systemic Bacteriology) and Viruses (ICTV Nomenclature)
FYBSc Paper II	DSEC- MB 122: Microbial Cultivation and Growth	CO1:Gain knowledge of cultivation of microorganisms: Nutritional classification, Design and Preparation of media CO2:Comprehend isolation and maintenance of bacteria, algae, fungi, actinomycetes and viruses CO3:Understand the Role of National Biodiversity Authority for culture collection centres CO4:Become acquainted with Bacterial growth kinetics, Growth curve, Generation time and Diauxic growth CO5:Learn different methods of enumeration of bacterial growth with factors affecting bacterial growth.
FYBSc PaperIII	DSEC-MB – 123: F. Y. B. Sc. Microbiology Practical Course	CO1:Understand concept of microorganism with respect to its size, shape, occurrence and types. CO2:Differentiate between different types of microorganisms CO3:Understand principal and use of compound microscope and staining techniques to observe microorganisms CO4:Understand types of useful and harmful microorganisms
SYBSc Paper I	MB-231: Medical Microbiology and Immunology	CO1:Understanding the concept of epidemiology with respect to terms like Incubation period, Viability, Susceptibility, Pathogenicity, Virulence, Pathogenesis, Lab diagnosis, Epidemic, Sporadic, Endemic and Pandemic. CO2: Acquainted with human pathogens such as <i>Escherichia coli</i> ,


PRINCIPAL
Sanjivani Arts, Commerce &
Science College, Kopergaon





Sanjivani Rural Education Society's
SANJIVANI ARTS, COMMERCE AND SCIENCE COLLEGE

At: Sahajanandnagar, Post: Shingnapur, Tal: Kopergaon,
 Dist: Ahmednagar (M.S.) Pin:423603

Recognized by Govt. of Maharashtra, Affiliated to University of Pune, ID.No.PU/AN/ACS/130/2012



SANJIVANI
 GROUP OF INSTITUTES

		<p><i>Staphylococcus aureus</i> and Fungi like Yeast- <i>Candida</i> as well as Dermatophytes.</p> <p>CO3: Principles of Chemotherapy are introduced based on Selective toxicity, Bioavailability, MIC, MBC, LD50.</p> <p>Accustomed with the terms Antagonism and synergism in drug administration., Antibiotic sensitivity, Antibiotic misuse/antibiotic overuse and Concept of drug resistance (e.g., MRSA, ESBL)</p> <p>CO4:Comprehend the term immunity with its types get knowledge of haematopoiesis, Antigens and antibodies, Immunohematology, Inheritance of ABH antigens, Medico legal applications of blood groups</p> <p>CO5:Acquainted with Active and Passive immunization</p>
<p>SYBSc Paper II</p>	<p>MB-232: Bacterial Physiology and Fermentation Technology</p>	<p>CO1:Acquainted with the term Enzymes, its nomenclature and classification and models for catalysis</p> <p>CO2:Understand the effect of pH, temperature, substrate concentration, enzyme concentration, activators and inhibitors on enzymes</p> <p>CO3:Understanding the concept of Bacterial Physiology with reference to metabolism, catabolism, anabolism, respiration and fermentation</p> <p>CO4:Comprehend the different metabolic pathways with structures</p> <p>CO5:Acquainted with design of a fermenter, fermentation parameters, use of media for industrial fermentations</p> <p>CO6:Understand the sources of contamination during fermentations</p>
<p>SY BSc</p>	<p>MB-241: Bacterial</p>	<p>CO1:Understanding the different experimental evidence for</p>


 PRINCIPAL
 Sanjivani Arts, Commerce &
 Science College, Kopergaon





Sanjivani Rural Education Society's
SANJIVANI ARTS, COMMERCE AND SCIENCE COLLEGE

At: Sahajanandnagar, Post: Shingnapur, Tal: Kopargaon,
 Dist: Ahmednagar (M.S.) Pin:423603

Recognized by Govt. of Maharashtra, Affiliated to University of Pune, ID.No.PU/AN/ACS/130/2012



SANJIVANI
 GROUP OF INSTITUTES

<p>Paper I</p>	<p>Genetics</p>	<p>nucleic acid as genetic material</p> <p>CO2:Comprehend the different types of nucleic acids, Structure of DNA and Prokaryotic DNA replication.</p> <p>CO3:Understand the different models and modes of DNA replication with its basic rules of DNA replication</p> <p>CO4:Get knowledge of Gene expressions, Mutations and reversions</p> <p>CO5:Acquainted with Plasmid genetics</p>
<p>SYBSc Paper II</p>	<p>MB-242: Air, Water and Soil Microbiology</p>	<p>CO1:The course will help them to get knowledge of the Air Microbiology, methods of air sampling, different types of air samplers, air sanitation and airborne infections.</p> <p>CO2:Deals with water microbiology including bacteriological analysis of water, methods of water purification, water borne infections and bacteriological standards of water quality.</p> <p>CO3:Understand Soil Microbiology, rhizosphere, composting and humus formation, biofertilizers, biocontrol agents and microbial interactions.</p> <p>CO4:Acquire knowledge of carbon and nitrogen cycles with role of microorganisms</p>
<p>TYBSc Paper I</p>	<p>DSEC-MB 351: Medical Microbiology- I And DSEC-MB 361: Medical Microbiology II</p>	<p>CO1:Understand the human anatomy, pathogens associated with diseases.</p> <p>CO2:Acquire knowledge of principles underlying establishment of pathogens in human body.</p> <p>CO3:Comprehend of pathogenesis of specific pathogens causing microbial diseases.</p> <p>CO4:Assess epidemiological patterns of microbial disease transmission as various modes, intensity at local and global level.</p> <p>CO5:Gain Knowledge principles of chemotherapy of microbial</p>


 PRINCIPAL
 Sanjivani Arts, Commerce &
 Science College, Kopargaon





Sanjivani Rural Education Society's
SANJIVANI ARTS, COMMERCE AND SCIENCE COLLEGE

At: Sahajanandnagar, Post: Shingnapur, Tal: Kopergaon,

Dist: Ahmednagar (M.S.) Pin:423603

Recognized by Govt. of Maharashtra, Affiliated to University of Pune, ID.No.PU/AN/ACS/130/2012



SANJIVANI
GROUP OF INSTITUTES

		<p>diseases and development of drug resistance among pathogens and strategies to mitigate.</p> <p>CO6:Develop identification systems for microbial disease diagnosis, disease treatment and prevention measures</p>
TYBSc Paper II	DSEC-MB-352 Immunology- I and	<p>CO1:Understand immune system structure, composition, function and comparison of different types of immunity.</p> <p>CO2:Acquire knowledge about antigens, Recognition of pathogens; antigen processing and presentation; Immunity to infection and pathological consequences of immunod efficiencies.</p> <p>CO3:To learn the applications of Immunology in monoclonal antibodies, vaccines production and Immunotherapy. □</p> <p>CO4:Understand abnormal working of Immune system in hypersensitivity, auto immune diseases, immune tolerance and transplantaion immunology.</p> <p>CO5:To develop strategies for Diagnosis of diseases based on antigen and antibody reactions with emphasis on prevailing communicable diseases.</p>
TYBSc Paper III	DSEC-MB 353: Enzymology And DSEC-MB 363: Metabolism	<p>CO1:To understand methods of active site determination, role of enzymes and its cofactors in microbial physiology.</p> <p>CO2:To learn to perform enzyme assay, purification and quantification of enzymes activity, enzyme kinetics in terms of initial, final velocity, mathematical expression of enzyme kinetic parameters.</p> <p>CO3:To correlate regulation of metabolism at enzymatic levels and apply, methodology for commercial applications of enzymes</p> <p>CO4:To learn mechanisms of transport of solutes across the membrane</p> <p>CO5:To get acquainted with mechanism of biosynthesis and</p>


PRINCIPAL
Sanjivani Arts, Commerce &
Science College, Kopergaon





Sanjivani Rural Education Society's
SANJIVANI ARTS, COMMERCE AND SCIENCE COLLEGE

At: Sahajanandnagar, Post: Shingnapur, Tal: Kopergaon,
Dist: Ahmednagar (M.S.) Pin:423603

Recognized by Govt. of Maharashtra, Affiliated to University of Pune, ID.No.PU/AN/ACS/130/2012



SANJIVANI
GROUP OF INSTITUTES

		<p>degradation of biomolecules</p> <p>CO6To comprehend basic concept of autotrophic mode of metabolism of prokaryotes</p>
<p>TYBSc Paper IV</p>	<p>DSEC -MB 354: Genetics and DSEC -MB- 364: Molecular Biology</p>	<p>CO1:To exhibit a knowledge base in Genetics and Molecular Biology</p> <p>CO2:To understand the central dogma of Molecular Biology</p> <p>CO3:To construct genetic map of bacteria and fungi</p> <p>CO4:To get introduced to concept of recombination and bacteriophage Genetics</p> <p>CO5:To understand the concept cloning in bacteria</p> <p>CO6:To demonstrate the knowledge of common and advanced laboratory practices in Molecular Biology</p>
<p>TYBSc Paper V</p>	<p>DSEC -MB 355 Fermentation Technology I and DSEC - MB 365 Fermentation Technology – II</p>	<p>CO1:To impart technical understanding of commercial fermentations.</p> <p>CO2:To apply classical, advanced strain improvement and isolation techniques for fermentation processes.</p> <p>CO3:To optimize and sterilize media used in fermentation industry for commercially economical and efficient fermentations.</p> <p>CO4:To recover the product using suitable methods and ensuring quality of the finished product by quality assurance tests.</p> <p>CO5:To acquaint fermentation economics, process patentability, process validation.</p> <p>CO6:To comprehend the large-scale productions of commercially significant fermentation products of classical and recent significance</p>


PRINCIPAL
Sanjivani Arts, Commerce &
Science College, Kopergaon





Sanjivani Rural Education Society's
SANJIVANI ARTS, COMMERCE AND SCIENCE COLLEGE

At: Sahajanandnagar, Post: Shingnapur, Tal: Kopergaon,

Dist: Ahmednagar (M.S.) Pin:423603

Recognized by Govt. of Maharashtra, Affiliated to University of Pune, ID.No.PU/AN/ACS/130/2012



SANJIVANI
GROUP OF INSTITUTES

TYBSc Paper VI	DSEC - MB 356: Agricultural Microbiology	<p>CO1:To understand plant growth improvement with respect to disease resistance, environment tolerance.</p> <p>CO2:To correlate stages of plant disease development, epidemiology, symptom based classification, control methods.</p> <p>CO3:To understand the importance of microorganisms in sustainable agriculture, biotechnological application of bio films, edible vaccines.</p> <p>CO4:To correlate Soil Micro biome and Role of microorganisms in soil health</p> <p>CO5:To determine the use of Microorganisms as tools in plant genetic engineering.</p>
TYBSC Paper VII	Skilled Base Elective MB 3510 Marine Microbiology	<p>CO1:To impart the awareness of unseen and unexplored niche of marine ecosystem of microbes.</p> <p>CO2:To acquire advances in the knowledge of marine microbes and marine ecology.</p> <p>CO3:To learn the field research on marine processes and laboratory research on microorganisms.</p> <p>CO4:To comprehend the role of marine microbes in bioremediation and bioprospecting.</p> <p>CO5:To avail career opportunities in marine education, industry and research.</p>
TYBSc Paper VIII	Skilled Base Elective MB 3511 Dairy Microbiology	<p>CO1:To understand prospects of dairying at commercial marketing.</p> <p>CO2:To acquire skills of processing of milk and dairy products.</p> <p>CO3:To assess quality control in dairy industry.</p> <p>CO4:To comprehend production of dairy products of commercial significance with emphasis to local and global market demand.</p>


PRINCIPAL
Sanjivani Arts, Commerce &
Science College, Kopergaon





Sanjivani Rural Education Society's
SANJIVANI ARTS, COMMERCE AND SCIENCE COLLEGE

At: Sahajanandnagar, Post: Shingnapur, Tal: Kopergaon,

Dist: Ahmednagar (M.S.) Pin:423603

Recognized by Govt. of Maharashtra, Affiliated to University of Pune, ID.No.PU/AN/ACS/130/2012



SANJIVANI
GROUP OF INSTITUTES

TY BSc Sem II	DSEC - MB 366: Food Microbiology	<p>CO1:To describe food safety problems and solutions in India and global scale.</p> <p>CO2: Identify and classify types of microorganisms in food processing and compare their Characteristics and behaviour</p> <p>CO3:To learn food classification based on their perishability, intrinsic and extrinsic factors affecting the growth of microbes in foods, role of microorganisms in food fermentation.</p> <p>CO4: To acquire knowledge about food spoilage, food borne diseases, predisposition and preventive and control measures.</p> <p>CO5: To apply principles of sanitation, heat treatment, irradiation, modified atmosphere, antimicrobial preservatives and combination of method (hurdle concept) to control microbial growth with emphasis on HACCP guidelines.</p>
TY BSc Sem II	Semester VI Skilled Base Elective MB 3610 Waste Management	<p>CO1:To understand waste management and it practicable applicability.</p> <p>CO2:To assess the magnitude and influence of hazardous content of waste, pollution of waters and waste water treatment technologies.</p> <p>CO3:To learn the design and working of treatment plants and methods used for liquid and solid waste treatment.</p> <p>CO4:To impart the understanding of kinetic biological systems used in waste treatment.</p> <p>CO5: To learn the standards of waste management and competent authorities involved at National and international level.</p>
TY BSc Sem II	Skilled Base Elective MB 3611 Nano- biotechnology	<p>CO1:To understand design, development and application of Nanomaterials and their application in Nanodevices.</p> <p>CO2:To learn fundamentals of nanotechnology as to Synthesis and characterization techniques of nanoparticles.</p>


PRINCIPAL
Sanjivani Arts, Commerce &
Science College, Kopergaon





Sanjivani Rural Education Society's
SANJIVANI ARTS, COMMERCE AND SCIENCE COLLEGE

At: Sahajanandnagar, Post: Shingnapur, Tal: Kopergaon,

Dist: Ahmednagar (M.S.) Pin:423603

Recognized by Govt. of Maharashtra, Affiliated to University of Pune, ID.No.PU/AN/ACS/130/2012



SANJIVANI
GROUP OF INSTITUTES

		<p>CO3: To acquire knowledge of applications of nanomaterials in different disciplines of human life.</p> <p>CO4: To compare the merits of using nanotechnology with existing technologies.</p>
TYBSc Practical I	DSEC-MB – 357: Diagnostic Microbiology and Immunology	<p>CO1: Gain hands on experience of hematology, immunotechniques.</p> <p>CO2: Illustrate the data obtained from biochemical analyzes of sample such as whole blood, serum, urine etc. With clinical symptoms and possible pathologies.</p>
TYBSc Practical II	Enzymology and Genetics	<p>CO1: Understand to handle microorganisms for isolation and amplication of DNA and transform host cells</p> <p>CO2: Understands principles and application of various chromatographic techniques, UV- spectroscopy</p>
TYBSc Practical III	Agriculture microbiology and Fermentation technology	<p>CO1: Understands MIC and MBC principal and how to perform</p> <p>CO2: Analyze the potency of antibiotics using bioassay technique.</p> <p>CO3: To Identify various diseases of plants.</p>


PRINCIPAL
Sanjivani Arts, Commerce &
Science College, Kopergaon

