



Maratha Vidya Prasarak Samaj's  
**Karmaveer Shantarambapu Kondaji Wavare**  
**Arts, Science and Commerce College, CIDCO, Nashik**  
**Uttamnagar, Nashik- 422 008 (Maharashtra)**

Affiliated to Savitribai Phule Pune University Id. No. PU/NS/ASC/047/1993  
AISHE C-42086 NAAC Re-accredited 'A' Grade (III Cycle 2017-22, CGPA 3.20)  
Best College Award of Savitribai Phule Pune University Pune in 2009-10 and 2021-22

Programme  
Outcomes (PO's)

Internal Quality Assurance Cell

Programme  
Specific Outcomes  
(PSO's)

Course Outcomes  
(CO's)

**Syllabus: 2013 Pattern**





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Principal

**Prof. (Dr) S. K. Kushare**  
 M.Sc., Ph. D.

**Programme Outcome (PO's), Programme Specific Outcome (PSO's), Course Outcome (CO's)**

**Department: Microbiology**

Syllabus: 2013 Pattern

Sr. No.	Name of the Programme	Year of introduction of programme	Duration of introduction of Programme
1	B.Sc. Microbiology	June 1994	3 Years

**Programme Specific Outcome of B. Sc Microbiology**

Sr. No.	Programme Specific Outcome (B.Sc Microbiology) After successful completion of B.Sc Microbiology , student will be able to
<b>PSO 1</b>	Identify pathogen from different clinical samples.
<b>PSO 2</b>	Operate microbial fermentor.
<b>PSO 3</b>	Diagnose diseases by serological techniques .
<b>PSO 4</b>	Purify and assay enzyme.
<b>PSO 5</b>	Carry out gene manipulations.
<b>PSO 6</b>	Carry out process of microbial fermentation
<b>PSO 7</b>	Identify plant pathogen and apply control measures.
<b>PSO 8</b>	Perform epidemiological survey
<b>PSO 9</b>	Perform various clinical pathological tests.
<b>PSO 10</b>	Estimate concentration of proteins and carbohydrates.

Course Specific Outcome:

Class	Subject code	Title	Cos: After successful completion of this course, student will be able to
<b>F.Y.B.Sc. Term -I</b>	MB 111	Introduction to Microbial World	CO 1 : describe Frontiers of Microbiology
			CO 2 : summarise contribution of different scientist in Microbiology.
CO 3 : write developments in 20 <sup>th</sup> and 21 <sup>st</sup> century.			
CO 4 : differentiate between different types of organisms.			
CO 5 : explain significance of normal flora.			
			CO 6: describe bio fertilizer and bio control agents.
	MB	Basic	CO 1: describe different types of microscopy.

	112	Techniques in Microbiology	CO 2 : sketch ray diagram of microscopes. CO 3 : illustrate principles and methods of different staining techniques. CO 4 : differentiate between sterilization and disinfection. CO 5 : compare effect of moist and dry heat on microorganisms. CO 6: state mode of action of different disinfectants.
<b>F.Y.B.Sc. Term II</b>	MB121	Bacterial Cell and Biochemistry	CO 1 : explain bacterial cell cytology.
			CO 2: describe ultra structure of different parts of bacterial cell.
			CO 3 : illustrate functions of different parts of bacterial cell.
			CO 4 : classify different biomolecules present in cell.
			CO 5 : sketch chemical structures of biomolecules
			CO 6: describe functions of different biomolecules
	MB122	Microbial cultivation and growth	CO 1 : classify bacteria based on nutritional requirement.
			CO 2 : explain design and preparation of media.
			CO 3 : write cultivation of extremophiles
			CO 4 : draw bacterial growth curve.
			CO 5 : compute number of microorganisms.
			CO 6: illustrate factors affecting bacterial growth.
	MB123	Practical Course based on theory paper I and II	CO 1 : apply safety measures and good laboratory practices and handle different instruments and glassware.
			CO 2: prepare laboratory media and check sterilization efficiency of autoclave.
			CO 3: demonstrate different parts of microorganism by staining.
			CO 4: identify different microorganisms on the basis of morphology
			CO 5: isolate bacteria and enumerate bacteria.
			CO 6: analyse effect of different environmental factor on bacteria.
<b>S.Y.B.Sc Sem I.</b>	<b>MB: 211</b>	<b>Bacterial systematics and physiology</b>	<b>CO 1 : define concept of species and chemotaxonomy.</b>
			CO 2 : describe numerical taxonomy
			CO 3 : explain autoradiography, phosphor imaging.
			CO 4: classify and explain different types of metabolic pathways.
<b>S.Y.B.Sc.</b>			


			CO 5 : explain structure of active site with models of catalysis.
			CO 6: describe effect of different environmental factors on bacterial growth.
	MB: 212	Industrial and soil microbiology	CO 1 : explain concept of industrially important strain.
			CO 2: plan isolation of industrially important strains.
			CO 3: sketch and describe different types of fermentors.
			CO 4 : select media suitable for fermentation
			CO 5 : Classify soil with microorganisms.
			CO 6: Explain different microbial interaction
<b>S .Y.B.Sc Sem II</b>	MB: 221	Bacterial Genetics	CO 1 : describe experimental evidences for Nucleic acid as genetic material.
			CO 2 : describe different forms of DNA.
			CO 3 : Explain prokaryotic DNA replication process.
			CO 4 : illustrate concept of gene expression.
			CO 5 : summarise different types of mutations and reversions.
			CO 6: describe plasmid.
	MB: 222	Air and Water Microbiology	CO 1 : describe air microbiology.
			CO 2 : explain water microbiology.
			CO 3 : plan bacteriological analysis of water for potability.
			CO 4 : analyse waste water.
			CO 5 : describe methods of effluent treatment.
	CO 6: explain biodigestor.		
	MB: 223	Practical Course based on MB:211, MB:212, MB: 221 & MB: 222	CO 1 : calculate air flora and measure dimensions of microorganism
			CO 2 : detect different enzyme production.
			CO 3 : analyse portability of water.
CO 4 : calculate growth rate and generation time.			
CO 5 : isolate and biochemically characterise bacteria.			
CO 6: screen industrially important organisms and isolate mutant.			
<b>T.Y.B.Sc</b>	MB:331	Medical Microbiology - I	CO 1 : illustrate human body systems and pathogens.
			CO 2 : describe epidemiology of infectious disease.
			CO 3 :design case control and cohort study.

		CO 4 : classify pathogenic organisms using biochemical organisms.
		CO 5 : describe pathogenesis and symptoms of different disease.
		CO 6: explain laboratory diagnosis, prophylaxis and chemotherapy.
MB:332	Genetics	CO 1 : explain process of gene linkage and crossing over.
		CO 2 : Draw process of DNA replication.
		CO 3 : explain transcription process.
		CO 4 : explain recombinant DNA technology
		CO 5: explain translation in prokaryotes and eukaryotes
		CO 6 : explain various blotting techniques.
MB:333	Enzymology	CO 1 : predict role of vitamins in metabolism.
		CO 2: quantitate enzymes.
		CO 3 :design enzyme purification process
		CO 4: derive and plot equations of enzyme kinetics.
		CO 5 : explain metabolic regulation.
		CO 6: illustrate immobilization of enzyme.
MB:334	Immunology - I	CO 1: classify organs of immune system.
		CO 2 : describe second line of defence.
		CO 3 : illustrate antigen antibody.
		CO 4 : outlined structure and function of MHC complex.
		CO 5 : explain cell mediated immunity.
		CO 6: describe transplantation and immunity.
MB:335	Fermentation Technology -I	CO 1 : design process of strain improvement.
		CO 2 : optimize media of fermentation.
		CO 3 : design media sterilization process.
		CO 4 : draw flow sheet of scale up.
		CO 5 : select downstream processing method for fermentation product.
		CO 6: assure the quality of fermentation product.
MB336	Food and Dairy Microbiology	CO 1 : define different types of milk and sources of contamination.
		CO 2 : describe milk preservation techniques.
		CO 3 : explain preservation of milk , the quality of milk and milk product
		CO 4 : identify food spoilage.
		CO 5 : explain food preservation techniques.
		CO 6: describe food poisoning and food infection.

<b>T.Y.B.Sc</b>	MB:341	Medical Microbiology - II	CO 1 : list different routes of drug administration.
			CO 2 : explain mode of action of different antimicrobial agents.
			CO 3 : predict mechanism of drug resistance.
			CO 4 : describe viral human pathogens.
			CO 5 : explain human protozoal parasites.
			CO 6: describe fungal pathogens.
	MB:342	Genetics and Molecular Biology II	CO 1 : explain gene transfer by transformation , transduction and conjugation.
			CO 2: illustrate DNA damage and repair mechanism.
			CO 3 : explain genetics in Bacteriophages.
			CO 4 : describe different tools of recombinant DNA technology.
			CO 5 : draw and describe process of recombinant DNA technology.
			CO 6: explain process of molecular techniques used in RDT.
	MB:343	Metabolism	CO 1 : illustrate membrane transport mechanism.
			CO 2 : define terms in bioenergetics.
			CO 3 : draw electron transport chain.
			CO 4 : sketch biosynthesis pathways of macromolecules.
			CO 5 : draw degradation pathways of macromolecules.
			CO 6: explain bacterial photosynthesis.
	MB:344	Immunology II	CO 1 : describe structure of MHC class molecules.
			CO 2 : define properties and functions of cytokines
			CO 3 : explain antigen antibody interactions.
CO 4 : describe immunohematology			
CO 5 : classify hypersensitivity.			
CO 5 : describe classification and use of vaccines.			
MB:345	Fermentation Technology - II	CO 1 : differentiate solid state and submerged fermentation.	
		CO 2 : describe large scale production of primary metabolite.	
		CO 3 : illustrate production of secondary metabolite.	
		CO 4 : design large scale production of enzymes.	
		CO 5 : describe production of biomass based product.	
		CO 6: design production of vaccines and immune sera.	
MB:346		CO 1 : explain plant growth improvement.	




	Agricultural and environmental Microbiology	CO 2 : describe methods of plant disease control. CO 3 : explain production of bio fertilizer. CO 4 : describe bioremediation and waste water. CO 5 : illustrate bioleaching. CO 6: describe nanotechnology, biosensors, bio fuel cell.
MB 347	Applied microbiology	CO 1 : isolate pesticide degrading and lactic acid producing bacteria. CO 2 : carry out large scale production of ethanol. CO 3 :find out antibiotic and vitamin concentration by assay. CO 4 : assure quality of fermentation product. CO 5 : analyse milk and dairy products CO 6: prepare bioinoculant and identify plant pathogen.
MB 348	Biochemistry and molecular biology	CO 1: estimate blood sugar , urea, cholesterol and protein. CO 2: produce and purify enzyme. CO 3: prepare buffer and quantitate proteins and carbohydrate. CO 4: calculate phage titer. CO 5: isolate genomic DNA. CO 6: separate compounds by paper chromatography.
MB 349	Diagnostic microbiology and immunology	CO 1 : calculate blood cells and haematological indices CO 2 : estimate haemoglobin concentration. CO 3 : prepare epidemiological survey CO 4 : isolate pathogen from clinical samples. CO 5 : diagnose disease by agglutination test CO 6: perform immuno precipitation.

  
HoD, Botany

  
IQAC Coordinator



  
Principal  
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**Programme  
Specific Outcomes  
(PSO's)**



**Course Outcomes  
(CO's)**

**Syllabus: 2019 Pattern**







**Programme Outcome (PO's), Programme Specific Outcome (PSO's), Course Outcome (CO's)**

**Department: Microbiology**

Syllabus: 2019 Pattern

Sr. No.	Name of the Programme	Year of introduction of programme	Duration of introduction of Programme
1	B.Sc. Microbiology	June 1994	3 Years

Programme Specific Outcome of ( B. Sc Microbiology)

Sr. No.	Programme Specific Outcome (B.Sc Microbiology) After successful completion of B.Sc Microbiology , student will be able to
PSO 1	identify pathogen from different clinical samples.
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PSO 4	purify and assay enzyme.
PSO 5	carry out gene manipulations.
PSO 6	carry out process of microbial fermentation
PSO 7	identify plant pathogen and apply control measures.
PSO 8	perform epidemiological survey
PSO 9	perform various clinical pathological tests.
PSO 10	estimate concentration of proteins and carbohydrates.

Class	Subject code	Title	Cos: After successful completion of this course, student will be able to
F.Y.B.Sc . Sem I	MB 111	Introduction to Microbial World	CO 1 :describe development of Microbiology as discipline.
			CO2 :summarise contribution of different scientist in Microbiology.
			CO 3 : write recent developments in life sciences.
			CO 4 :differentiate between different types of organisms.
			CO 5 :explain beneficial microorganism used in different fields.
			CO 6 :describe harm caused by microorganism.

Class	Subject code	Title	Cos: After successful completion of this course, student will be able to
<b>F.Y.B.Sc . Sem I</b>	MB 112	Basic Techniques in Microbiology	CO 1 :describe different types of microscopy.
			CO 2 :sketch ray diagramme of microscopes.
			CO 3 :illustrate principles and methods of different staining techniques.
			CO 4 :differentiate between sterilization and disinfection.
			CO 5 :compare effect of moist and dry heat on microorganisms.
			CO 6 :state mode of action of different disinfectants.
<b>F.Y.B.Sc . Sem I</b>	MB113	Practical Course based on theory paper I and II	CO 1 :apply safety measures and good laboratory practices.
			CO 2 :identify different microorganisms on the basis of morphology.
			CO 3 :handle different instruments and glasswares.
			CO 4 :describe morphology of bacteria by using different staining technique.
			CO 5 :demonstrate the motility of bacteria.
			CO 6 :check the efficiency of chemical disinfectant.
<b>F.Y.B.Sc . Sem II</b>	MB121	Bacterial Cell and Biochemistry	CO 1 :explain bacterial cell cytology.
			CO 2 :describe ultra structure of different parts of bacterial cell.
			CO 3 :illustrate functions of different parts of bacterial cell.
			CO 4 :classify different biomolecules present in cell.
			CO5:sketch chemical structures of biomolecule
			CO6:describe functions of different biomolecule
<b>F.Y.B.Sc . Sem II</b>	MB122	Microbial cultivation and growth	CO 1 :classify bacteria based on nutritional requirement.
			CO 2 :explain design and preparation of media.
			CO 3 :write cultivation of extremophiles
			CO 4 :draw bacterial growth curve.
			CO 5 :compute number of microorganisms.
			CO6:illustrate factors affecting bacterial growth.
<b>F.Y.B.Sc . Sem II</b>	MB123	Practical Course based	CO 1 :prepare laboratory media.
			CO2:check sterilization efficiency of autoclave.

Class	Subject code	Title	Cos: After successful completion of this course, student will be able to
		on theory paper I and II	CO3:demonstrate different parts of microorganism by staining. CO 4 :isolate bacteria. CO 5 :enumerate bacteria. CO6 :analyse effect of different environmental factor on bacteria.
<b>S.Y.B.Sc Sem III</b>	MB: 231	Medical Microbiology & Immunology	CO 1 : define various terminologies in medical microbiology.
			CO 2 :Describe common pathogenic organisms
			CO 3 : Illustrate different concept related to chemotherapy.
			CO 4 : classify different types of immunity.
			CO 5 :describe concept of antigen and antibodies
			CO 6 :explain immunohematology.
<b>S.Y.B.Sc Sem III</b>	MB: 232	Bacterial Physiology and Fermentation Technology	CO 1 :classify enzymes.
			CO 2 :explain models for enzyme catalysis.
			CO 3 :draw metabolic pathways with structure.
			CO 4 :plan isolation of industrially important strains.
			CO 5 :sketch and describe different types of fermentors.
			CO 6 :select media suitable for fermentation.
<b>S.Y.B.Sc Sem III</b>	MB: 233	Practical Course based on MB:231, MB:232,	CO 1 :measure dimension of microorganism.
			CO 2 :Identify blood group.
			CO 3 interpret biochemical characteristic.
			CO 4 detect different enzyme production.
			CO 5 identify pathogenic organism from clinical sample.
			CO 6 Screen industrially important organisms.
<b>S.Y.B.Sc Sem IV</b>	MB: 241	Bacterial Genetics	CO 1 describe experimental evidences for Nucleic acid as genetic material.
			CO 2 differentiate between types of nucleic acid.
			CO 3 Explain prokaryotic DNA replication process.
			CO 4 illustrate concept of gene expression.
			CO 5 summaries different types of mutations and reversions.
			CO 6 describe plasmid.
<b>S.Y.B.Sc</b>	MB: 242	Air and Water	CO 1 describe air microbiology.

Class	Subject code	Title	Cos: After successful completion of this course, student will be able to	
<b>Sem IV</b>		Microbiology	CO 2	explain water microbiology.
			CO 3	plan bacteriological analysis of water for portability.
			CO 4 :	describe role of microorganism in soil.
			CO 5 :	plan the production of biofertilizer.
			CO 6 :	design process of production of biocontrol agent.
<b>S .Y.B.Sc Sem IV</b>	MB: 243	Practical Course based on MB:241, MB:242	CO 1 :	calculate air flora.
			CO 2 :	compute microbial diversity of air.
			CO 3 :	analyze portability of water.
			CO 4 :	prepare bioinoculant.
			CO 5 :	isolate mutant.
			CO 6 :	predict treatment required for mutant isolation.
<b>T.Y.B.Sc Sem-V</b>	MB:351	Medical Microbiology - I	CO 1 :	illustrate human body systems and pathogens.
			CO 2 :	describe epidemiology of infectious disease.
			CO 3 :	design case control and cohort study.
			CO 4 :	classify pathogenic organism using biochemical tests.
			CO 5 :	describe pathogenesis and symptoms of different disease.
			CO 6 :	explain laboratory diagnosis, prophylaxis and chemotherapy.
<b>T.Y.B.Sc Sem-V</b>	MB:352	Immunology - I	CO 1 :	classify organs of immune system.
			CO 2 :	describe second line of defense.
			CO 3 :	illustrate antigen antibody.
			CO 4 :	identify different antigen antibody interaction.
			CO 5 :	outline structure and function of MHC complex.
			CO 6 :	write monoclonal antibody preparation.
<b>T.Y.B.Sc Sem-V</b>	MB:353	Enzymology	CO 1 :	predict role of vitamins in metabolism.
			CO 2 :	quantitative enzymes.
			CO 3 :	design enzyme purification process
			CO 4 :	derive and plot equations of enzyme kinetics.
			CO 5 :	explain metabolic regulation.
			CO 6 :	illustrate immobilization of enzyme.

Class	Subject code	Title	Cos: After successful completion of this course, student will be able to
<b>T.Y.B.Sc Sem-V</b>	MB:354	Genetics	CO 1 : Draw process of DNA replication.
			CO 2 : explain transcription process.
			CO 3 : correlate prokaryote and eukaryote transcription.
			CO 4 : explain translation in prokaryotes and eukaryotes.
			CO 5 : illustrate gene transfer by transformation, conjugation and transduction.
			CO 6 : map the genes.
<b>T.Y.B.Sc Sem-V</b>	MB:355	Fermentation Technology -I	CO 1 : design process of strain improvement.
			CO 2 : optimize media of fermentation.
			CO 3 : design media sterilization process.
			CO 4 : draw flow sheet of scale up.
			CO 5 : select downstream processing method for fermentation product.
			CO 6 : assure the quality of fermentation product.
<b>T.Y.B.Sc Sem-V</b>	MB:356	Agricultural Microbiology	CO 1 : explain stages in development of plant disease.
			CO 2 : classify plant diseases based on symptoms.
			CO 3 : describe methods of plant disease control.
			CO 4 : correlate role of organism in sustainable agriculture.
			CO 5 : illustrate role of role of plant biofilm.
			CO 6 : determine role of microorganisms in plant genetic engineering.
<b>T.Y.B.Sc Sem-V</b>	MB 357	Practical course based on MB351 &MB352	CO 1 : examine clinical samples.
			CO 2 : isolate pathogen from clinical sample.
			CO 3 : diagnose disease by agglutination test
			CO 4 : prepare epidemiological survey report.
			CO 5 : estimate hemoglobin concentration.
			CO 6 : calculate blood cells and hematological indices.
<b>T.Y.B.Sc Sem-V</b>	MB 358	Practical course based on MB353 &MB354	CO 1 : determine molar extinction coefficient and absorption spectra.
			CO 2 : detect presence of protein and carbohydrate.
			CO 3 : prepare buffer.



Class	Subject code	Title	Cos: After successful completion of this course, student will be able to
			CO 4 : separation of compound by paper chromatography.
			CO 5 : estimate amount of carbohydrate or protein.
			CO 6 : check the purity and concentration of DNA.
<b>T.Y.B.Sc Sem-V</b>	MB 359	Practical course based on MB355 &MB356	CO 1 : test the sterility of pharmaceutical.
			CO 2 : calculate minimum inhibitory concentration.
			CO 3 : assay antibiotic and vitamin.
			CO 4 : isolate plant pathogen.
			CO 5 : identify pathogen based on symptoms.
			CO 6 : prepare bioinoculant.
<b>T.Y.B.Sc Sem-V</b>	MB3510	Marine Microbiology	CO 1 : define different marine habitats.
			CO 2 : correlate role of marine organisms in nutrient cycling.
			CO 3 : illustrate water sampling and culturing methods.
			CO 4 : describe role of microbes in bioremediation and bio perspectives.
			CO 5 : isolate marine organism.
			CO 6 : isolate extremophile.
<b>T.Y.B.Sc Sem-V</b>	MB3511	Dairy Microbiology	CO 1 : define different types of milk and sources of contamination.
			CO 2 : describe milk preservation techniques.
			CO 3 : illustrate spoilage of milk.
			CO 4 : assure the quality of milk and milk product.
			CO 5 : analyze milk by microbiological examination.
			CO 6 : check quality of dairy product.
<b>T.Y.B.Sc Sem-VI</b>	MB:361	Medical Microbiology- II	CO 1 : list different routes of drug administration.
			CO 2 : explain mode of action of different antimicrobial agents.
			CO 3 : predict mechanism of drug resistance.
			CO 4 : describe viral human pathogens.
			CO 5 : explain human protozoal parasites.
			CO 6 : describe fungal pathogens.
<b>T.Y.B.Sc Sem-VI</b>	MB:362	Immunology II	CO 1 : define properties and functions of cytokines.
			CO 2 : express humoral immune response.

Class	Subject code	Title	Cos: After successful completion of this course, student will be able to	
			CO 3 :	describe cell mediated immune response.
			CO 4 :	classify hypersensitivity.
			CO 5 :	illustrate autoimmunity and autoimmune diseases.
			CO 6 :	explain immunodeficiency.
<b>T.Y.B.S c Sem- VI</b>	MB:363	Metabolism	CO 1 :	illustrate membrane transport mechanism.
			CO 2 :	define terms in bioenergetics.
			CO 3 :	draw electron transport chain.
			CO 4 :	sketch biosynthesis pathways of macromolecules.
			CO 5 :	draw degradation pathways of macromolecules.
			CO 6 :	explain bacterial photosynthesis.
<b>T.Y.B.S c Sem- VI</b>	MB:364	Molecular Biology	CO 1 :	map genome in eukaryotes.
			CO 2 :	explain genetics in Bacteriophages.
			CO 3 :	illustrate DNA damage and repair mechanism.
			CO 4 :	describe different tools of recombinant DNA technology.
			CO 5 :	draw and describe process of recombinant DNA technology.
			CO 6 :	explain molecular techniques used in RDT.
<b>T.Y.B.S c Sem- VI</b>	MB:365	Fermentation Technology -II	CO 1 :	differentiate solid state and submerged fermentation.
			CO 2 :	describe large scale production of primary metabolite.
			CO 3 :	illustrate production of secondary metabolite.
			CO 4 :	design large scale production of enzymes.
			CO 5 :	describe production of biomass based product.
			CO 6 :	design production of vaccines and immune sera.
<b>T.Y.B.S c Sem- VI</b>	MB:366	Food Microbiology	CO 1 :	classify food.
			CO 2 :	identify factors affecting microbial growth in food.
			CO 3 :	describe food spoilage by microorganism.
			CO 4 :	apply principles of food preservation.
			CO 5 :	describe food poisoning and food infection.

Class	Subject code	Title	Cos: After successful completion of this course, student will be able to	
			CO 6 :	define prebiotic, probiotic and fermented food.
<b>T.Y.B.S c Sem- VI</b>	MB 367	Practical course based on MB361 &MB362	CO 1 :	describe microbial pathogens from microscopic observation.
			CO 2 :	isolate fungal pathogen.
			CO 3 :	find out antibiotic sensitivity of bacterial pathogen.
			CO 4 :	predict compatibility of blood groups of donor and recipient.
			CO 5 :	quantitative antibodies for disease diagnosis.
			CO 6 :	describe antigen antibody detection by ELISA or by diffusion assay.
<b>T.Y.B.S c Sem- VI</b>	MB 368	Practical course based on MB363 &MB364	CO 1 :	estimate blood sugar , urea, cholesterol and protein.
			CO 2 :	produce and purify enzyme.
			CO 3 :	immobilize enzyme.
			CO 4 :	calculate phage titer.
			CO 5 :	isolate plasmid DNA.
			CO 6 :	draw meiotic cell division.
<b>T.Y.B.Sc Sem-VI</b>	MB 369	Practical course based on MB365 &MB366	CO 1 :	prepare fermentation product on laboratory scale.
			CO 2 :	produce fermentation product by solid state fermentation.
			CO 3 :	identify probiotic microorganism.
			CO 4 :	prepare SOPs for pharmaceutical industry.
			CO 5 :	determine TDP,TDT,TDR and D value.
			CO 6 :	detect aflatoxin.
<b>T.Y.B.S c Sem- VI</b>	MB 3610	Waste Management	CO 1 :	describe principles of waste water treatment.
			CO 2 :	correlate role in waste water treatment.
			CO 3 :	draw and describe operation of waste treatment plant.
			CO 4 :	classify different types of waste
			CO 5 :	determine solid content in waste water.
			CO 6 :	determine DO, BOD, COD in waste water.
<b>T.Y.B.S c Sem- VI</b>	MB 3611	Nano-biotechnology	CO 1 :	define different terms in nano-biotechnology.
			CO 2 :	explain synthesis process of metallic nanoparticle.
			CO 3 :	characterize nano material by different techniques.
			CO 4 :	describe application of nano particle.

Class	Subject code	Title	Cos: After successful completion of this course, student will be able to
			CO 5 : synthesize nanoparticle using microbe.
			CO 6 : characterize nanoparticle.

*Jms*

HoD, Botany

*Pawar*

IQAC Coordinator



*Kshir*

Principal

Maratha Vidya Prasarak Samaj's  
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