



## SRI VANI DEGREE &PG COLLEGE

Affiliated to SK University

Kakkalapalli Cross, Near Sakshi Office, Ananthapuramu

Andhra Pradesh, India 515002



**Department profile of biotechnology & microbiology:** The department of biotechnology & microbiology are established in 2019 with an UG course Bt. m. c(biotechnology, microbiology, chemistry). The department has equipped with latest laboratory which enables students to have the best practical knowledge to complete with industrial needs. The department consistently encourages the students to participate in sports, NSS & other extra curricular activities.

**VISION** : "Attaining new heights in biotechnology research, shaping biotechnology into a premier precision tool of the future "

**MISSION** Enhance efficiency and productivity and cost effective ness of Agriculture, nutritional security, molecular medicine, environmentally sustainable technologies and empowerment of human resources.

### Courses / Programs offered:

Level	Course
Under Graduate	BtMC – Biotechnology, Microbiology, Chemistry.

### Course Structure under CBCS:

Year	Semester	Course	Title of the Course	Internal	Externa	Total
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				<b>Marks</b>	<b>I Marks</b>	<b>Marks</b>
I	I	I	Micro Biology And Cell Biology	25	75	100
			Practical Course – I	-	50	50
	II	II	Macromolecules, Enzymology And Bioenergetics	25	75	100
			Practical Course – II	-	50	50
II	III	III	Bio-Physical Techniques	25	75	100
			Practical Course – III	-	50	50
	IV	IV	Immunology	25	75	100
			Practical Course – IV	-	50	50
III	V	V	Molecular Biology	25	75	100
			Practical BTP – 502	-	50	50
		VI	Recombinant DNA Technology	25	75	100
			Practical BTP – 504	-	50	50
	VI		Animal And Plant Biotechnology	25	75	100
			Practical BTP – 602	-	50	50
			Industrial Biotechnology	25	75	100
			Practical BTP – 608	-	50	50
			Metabolism And Genetics	25	75	100
			Practical BTP-606	-	50	50

### Course Structure under CBCS:

<b>Year</b>	<b>Semester</b>	<b>Course</b>	<b>Title of the Course</b>	<b>Internal Marks</b>	<b>External Marks</b>	<b>Total Marks</b>
I	I	I	Introduction to Microbiology And Microbial Diversity	25	75	100
			Practical Course – I	-	50	50
	II	II	Microbial Biochemistry And Metabolism	25	75	100

			Practical Course – II	-	50	50
II	III	III	Microbial Genetics and Molecular Biology	25	75	100
			Practical Course – III	-	50	50
	IV	IV	Immunology And Medical Microbiology	25	75	100
			Practical Course – IV	-	50	50
III	V	V	Environmental And Agricultural Microbiology	25	75	100
			Practical MBP – 501	-	50	50
		VI	Food And Industrial Microbiology	25	75	100
			Practical MBP – 502	-	50	50
	VI		Microbial Biotechnology	25	75	100
			Practical MBP – 601	-	50	50
			Microbial Diagnosis in Health Clinics	25	75	100
			Practical MBP – 701	-	50	50
			Management of Human Microbial Diseases	25	75	100
			Project work	-	50	50

**Number of teaching posts:**

Post	Sanctioned	Filled
Teaching	01	01

**Program outcomes, Program specific outcomes, Course outcomes:**

Program outcomes	
<b>PO1</b>	<b>Critical Thinking:</b> The curriculum made for the betterment of the students; enhance the ability and thinking power of the students
<b>PO2</b>	<b>Effective Communication:</b> Acquire and apply better communication and know ledge of sciences and engineering fundamentals.

<b>PO3</b>	<b>Social Interaction:</b> Due to continuous interaction with students in terms of various program run by department i.e. Curiosity Thirsty For Knowledge program, Celebration of 'Birth Day' of Teaching Staff and Students, Extension activity. Helps to increase Social Interaction.
<b>PO4</b>	<b>Effective Citizenship:</b> Being the students of Bio Technology they have to communicate with people, They have developed skills in Interactions among themselves and participating in blood grouping test.
<b>PO5</b>	<b>Ethics:</b> The subject teaches students about the ethics and provide expert advice to society in science, technology and engineering..
<b>PO6</b>	<b>Environment and Sustainability:</b> Integrate information for life long learning.

<b>Program Specific outcomes</b>	
<b>PSO1</b>	Acquire knowledge on the fundamentals of biotechnology and sound and solid base which enables them to understand the emerging and advanced engineering.
<b>PSO2</b>	Students can know the basic terminology of molecular biology and genetics. Study bioreactors for environmental applications.
<b>PSO3</b>	Students should learn how to design a drug and different types of vaccines given to prevent from bacterial and viral diseases like tuberculosis, pertussis, tetanus, polio, influenza etc.,
<b>PSO4</b>	Students will develop the proficiency by doing different types of diagnosing tests using a variety of laboratory instruments and in the analysis and interpretation of such serological tests.
<b>PSO5</b>	Stlearn discover of microbial concepts in other discipline and study bioreactors for environmental applications.
<b>PSO6</b>	Students will learn tools and techniques in the field of environmental biotechnology.
<b>PSO7</b>	To know the role of microorganisms as biotechnological agents
<b>PSO8</b>	Learn to minimize contributing variables and recognize the limitations of Equipment. Discover of biotechnical concepts in other disciplines such as microbiology, biochemistry and chemistry.
<b>PSO9</b>	Discover of biotechnical concepts in other disciplines such as microbiology, biochemistry , and chemistry.
<b>PSO10</b>	Learn master the basic terminology of molecular biology and genetics and about different types of vaccines given for different types of diseases.
<b>PSO11</b>	Develop the following experimental instruments like Autoclave, incubator, laminar air flow, helpful for preparation of culture media and isolation of microorganisms.

## COURSE OUTCOMES

SEMISTER –I

TITLE OF THE COURSE-MICROBIOLOGY AND CELL BIOLOGY

On successful completion of this course student will

- 1.Understanding of development of microbiology
- 2.Evaluate and instrumentation of compound microscope
- 3.understand dark field microscope
- 4.understand transmission electron microscope
- 5.understand scanning electron microscope
- 6.understand about gram staining technique
- 7.About Acid fast staining

#### SEMISTER –II

#### TITLE OF THE COURSE-MACROMOLECULES,ENZYMOMOLOGY AND BIOENERGETICS

On succesfull completion of this course students will

- 1.Understand chemical structure of nucleic acids
- 2.Understand about watsons crick model
- 3.classification of carbohydrates
- 4.Explanation about lock and key model of enzymes
- 5.Brief account on LIPIDS classification
- 6.understand concept of free energy
7. About glycolysis pathway

#### SEMESTER-III

#### TITLE OF THE COURSE-BIOPHYSICAL TECHINIQUES

On successful completion of this course students will

- 1.understand spectrum of light
2. Understad beers lamberts law
- 3.Account on paper chromatography
- 4.understand electrophoresis
- 5.understand gel electrophoresis
- 6.SDS PAGE electrophoresis
- 7.types of centrifugation

#### SEMESTER-IV

## TITLE OF THE COURSE-IMMUNOLOGY

On successful completion of this course students will

- 1.Understand organs and cells of immune system
- 2.understand acquired immune system
- 3.understand antigen and antibody mechanism
4. Brief account on cell mediated immunity
- 5.understand hypersensitivity
- 6.Idea about ELISA test
- 7.understand HYBRIDOMA TECHNOLOGY

## SEMESTER- V

### TITLE OF THE COURSE –MOLECULAR BIOLOGY

On successful completion of this course students will

- 1.understand how to prove DNA as genetic material
- 2.Explanation on DNA replication
- 3.understand prokaryotic replication
- 4.About transcription of RNA
- 5.Account on REGULATION OF GENE EXPRESSION
- 6.Understand about lacoperon
- 7.About genetic code of protein synthesis

## SEMISTER –V

### TITLE OF THE COURSE –RECOMBINANT DNA TECHNOLOGY

ON SUCCESSFUL COMPLITION OF COURSE STUDENTS WILL

- 1.Understand cutting and joining of dna
- 2.Brief Account on bacteriophages
- 3.methods of gene sequencing
- 4.methods of genetransfer
- 5.understand recombinant DNATECHNOLOGY in agriculture
- 6.understandPcR

SEMISTER –VI

TITLE OF THE COURSE –Animal and plant biotechnology

On successful completion of course students will

- 1.understand animal cell and tissue culture
- 2.Account on various techniques of plant and animal tissue culture
- 3.understand plant tissue
- 4.Idea about r.DNA PRODUCTS IN MEDICINE
- 5.UNDERSTAND IPR TECHNOLOGY

SEMISTER VI

TITLE OF THE COURSE –METABOLISM AND GENETICS

On successful completion of course students will

- 1.Understand carbohydrate metabolism
- 2.understand amino acid and lipid metabolism 3.understand mendels experiments
- 4.Account on gene mutation
- 5.Idea about giant chromosome

SEMISTER –VI

TITLE OF THE COURSE-INDUSTRIAL BIOTECHNOLOGY

On successful completion of course students will

- 1.UNDERSTAND isolation of indrustial microorganisms
- 2.Brief account on bioreactors
- 3.Account on fermentation technology
- 4.idea about source of industrial enzyme
- 5.Account on biotechnology products

**Program outcomes, Program specific outcomes, Course outcomes:**

<b>Program outcomes</b>	
<b>PO1</b>	<b>Critical Thinking:</b> The curriculum made for the betterment of the students; enhance the ability and thinking power of the students
<b>PO2</b>	<b>Effective Communication:</b>

	Students can develop communication by participating in social works and comprehensive technical expertise.
<b>PO3</b>	<b>Social Interaction:</b> Due to continuous interaction with students in terms of various program run by department i.e. Curiosity Thirsty For Knowledge program, Celebration of 'Birth Day' of Teaching Staff and Students, Extension activity. Helps to increase Social Interaction.
<b>PO4</b>	<b>Effective Citizenship:</b> Being the students of microbiology they have to communicate with people, They have developed skills in Interactions among themselves and participating in blood grouping test.
<b>PO5</b>	<b>Ethics:</b> The subject teaches students about the ethics and awareness about microbial diseases and loss of patent.
<b>PO6</b>	<b>Environment and Sustainability:</b> Integrate information for life long learning.

<b>Program Specific outcomes</b>	
<b>PSO1</b>	acquire knowledge on the fundamentals of biotechnology and sound and solid base which enables them to understand the emerging and advanced engineering.
<b>PSO2</b>	Students are also expected to develop and provide expert advice to society in science, technology and engineering.
<b>PSO3</b>	Students should learn how to conduct an experiment (or series of experiments) demonstrating their understanding of the scientific methods and comprehensive technical expertise.
<b>PSO4</b>	Students will develop the proficiency by doing different types of diagnosing tests using a variety of laboratory instruments and in the analysis and interpretation of such serological tests.
<b>PSO5</b>	Students will learn the applications of techniques for modeling microbiology for which analytical methods are inappropriate or of limited utility.
<b>PSO6</b>	Students can learn role of microorganisms as biotechnological agents.
<b>PSO7</b>	Describe the methodology of science and the relationship between observation and theory.
<b>PSO8</b>	Learn master the basis terminology of molecular biology and genetics and about different types of vaccines given for different types of diseases.
<b>PSO9</b>	Discover of microbial concepts in other disciplines and study bioreactors for environmental applications. y
<b>PSO10</b>	Develop the following experimental instruments : autoclave, incubator, laminar air flow helpful for preparation of culture media and isolation of microorganisms.
<b>PSO11</b>	Provide expert advice to society in science, technology and engineering.

## COURSE OUTCOMES

### SEMISTER –I

TITLE OF THE COURSE-INTRODUCTION TO MICROBIOLOGY, MICROBIAL DIVERSITY



On successful completion of this course student will

1. Understanding of development of microbiology
2. explanation about Contributions of scientists
3. understand characters of bacteria
4. understand mycoplasma characteristics
5. understand gram staining
6. About HIV AND TMV
7. Isolation of microorganism by using various types of methods

SEMESTER –II

TITLE OF THE COURSE-MICROBIAL BIOCHEMISTRY AND METABOLISM

On successful completion of this course students will

1. Understand CARBOHYDRATES classification
2. explanation about calorimetry
3. understand chromatography techniques
4. About centrifugation and electrophoresis
5. understand classification of enzymes
6. Account on microbial nutrition
7. Explanation of HMP, GLYCOLYSIS pathways

SEMESTER-III

TITLE OF THE COURSE-MICROBIAL GENETICS AND MOLECULAR BIOLOGY

On successful completion of this course students will

1. understand DNA and RNA as genetic material
2. structure and organisation of prokaryotic DNA
3. Understand about MUTATIONS
4. understand concept of gene mutation
5. understand types of genes
6. About basic principles of genetic engineering
7. understand about gene cloning methods

## SEMESTER-IV

### TITLE OF THE COURSE-IMMUNOLOGY AND MEDICAL MICROBIOLOGY

On successful completion of this course students will

- 1.Understand TYPES OF IMMUNITY
- 2.understand ANTIGEN TYPES
- 3.understand normal flora of human body
- 4.About antibacterial agents
- 5.understand anti fungal agents
- 6.brief account on microbial diseases
- 7.understand on viral diseases

## SEMESTER- V

### TITLE OF THE COURSE –ENVIRONMENTAL AND AGRICULTURE MICROBIOLOGY

On successful completion of this course students will

- 1.understand aquatic environment
- 2.role of microbes in nutrient cycling
- 3.understand membrane filter techniques
- 4.Account on solid waste management
5. Account on liquid waste management
- 6.plant growth promoting micro organisms
- 7.Understand concept of diseases in plants

## SEMESTER –V

### TITLE OF THE COURSE –FOOD AND INDUSTRIAL MICROBIOLOGY

ON SUCCESSFUL COMPLETION OF COURSE STUDENTS WILL

- 1.Understand INTRINSIC microbial growth
- 2.understand food born diseases
- 3.food preservations
- 4.fermented dairy foods
- 5.understand types of fermentation processes

6. understand citric acid production

### SEMESTER –VI

#### TITLE OF THE COURSE –MICROBIAL BIOTECHNOLOGY

On successful completion of course students will

1. understand MICROBIAL BIOTECHNOLOGY

2. Account on Pharmaceutical industries

3. understand steroids and sterols

4. understand immobilization methods

5. UNDERSTAND bio ethanol products

### SEMESTER VI

#### TITLE OF THE COURSE –MICROBIAL DIAGNOSIS IN HEALTH CLINICS

On successful completion of course students will

1. Understand MICROBIAL diseases

2. collection of clinical samples

3. examination of sample by staining

4. Account on serological methods

5. About MIC of an antibiotic

### SEMESTER –VI

#### TITLE OF THE COURSE-MICROBIAL QUALITY CONTROL IN FOOD AND PHARMACEUTICAL INDUSTRIES

On successful completion of course students will

1. UNDERSTAND GOOD LABORATORY PRACTICES

2. Culture and microscopic methods

3. understand about molecular methods

4. Understand on enrichment techniques

5. explanation about hazard analysis

#### **Lecturer Profile:**

**Name** : Ms. Syed Rehana Sultana

**Qualification** : MSc Biochemistry

**Experience** : 02

**Other Position** : Swachhhta Action Plan Member

**Faculty Profile:**

Name	Qualification	Designation	Specialization	Teaching Experience
Ms. Syed Rehana Sultana	MSc	Lecturer in Biotechnology and Microbiology	Biochemistry	02

**Student-Teacher Ratio:**

Level	Class	Number of Teachers	Student Teacher Ratio
UG	I BtMC	01	20:1
	II BtMC		20:1
	III BtMC		-

**Number of Academic Staff (technical) and Administrative Staff:**

	Sanctioned	Filled
Lab Assistants	01	01
Lab Attendants	01	-

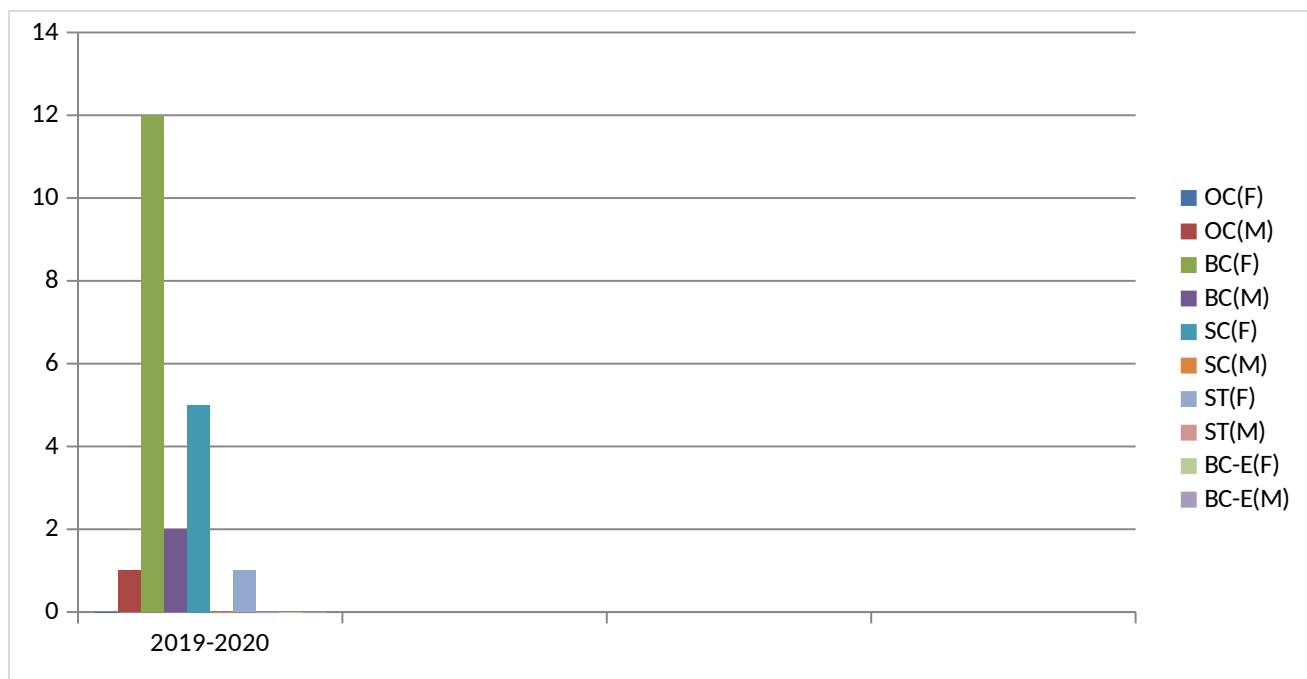
**Qualification of Teaching Faculty:**

PDF	PhD	M.Phil	PG with NET/SLET	PG
-	-	-	-	01

**Student Profile program wise:**

Name of the Course	Year	Total Seats	Enrolled		Total
			Male	Female	
BtMC	2019-2020	50	04	16	20
	2020-2021	50	04	16	20





**Diversity of Students:**

Name of Course	% of students from the same state	% of students from other state	% of students from abroad
UG	100	-	-

**Details of Infrastructure facilities:**

**Library:**

**Internet facility for Staff and students:**

**Classroom with ICT facility:**

**Laboratories:**

**Teaching methods adopted to improve student learning:**

**Facilities:**

- Laboratories with equipments and full fledge space

**Equipment:**

- UV Spectrophotometer
- Hot air oven
- Autoclave
- Colorimeter

- Centrifuge
- Water bath
- Laminar air flow
- Incubator
- Rotatory shaker
- Fluorometer
- Mini Spectrometer
- Binocular microscope
- Compound Microscopes
- Physical Balance
- Weighing Machine
- TLC
- Blood group Antisera
- Widal kit
- VDRL kit
- Hb meter
- Sphygmomanometer
- Weight machine
- Stethoscope
- Syringe

**Glassware:**

- Petri dishes
- Glass chambers
- Conical flask
- Beakers
- Volumetric flask
- Vials
- Centrifuge tubes
- Standard flask
- Burettes
- Pipettes
- Pipettes stands
- Test tubes
- Holders
- Spatula
- Test tube stands
- Watch glass
- Thermometer
- Motor & pestle
- Burettes stands
- Whatman no.1 filter paper
- Funnels
- Glass slides
- Histological slides

- Reagent Bottles
- Measuring jar
- Cover slips
- Neubar's chamber
- Lancet
- Inoculating Loop
- Needles

**Chemicals:**

- Acetone
- Acetic acid
- n-Amyl alcohol
- Ammonium oxalate
- Ammonium peroxide
- Ammonium persulphate
- Ammonium ferrous sulphate
- Ammonium molybdate
- Ammonium dihydroxy orthophosphate
- Ammonium acetate
- Ammonium nitrate
- Ammonium chloride
- Ammonium thiocyanate
- Ammonium sulphate
- di Ammonium oxalate
- Aluminium sulphate
- Aluminium oxide
- Anthrone
- Alanine
- Agar agar
- Acetaldehyde
- Acrylamide
- 4-amino 3-hydroxy naphthalene sulphanic acid
- Ascorbic acid
- Amyl alcohol
- Acetyl acetone(2,4 pentanedone)
- Acetophenone
- Acetonitrile
- Ammonia solution
- Aminophenol
- Acetamide
- Ammonium sulphide
- Ammonium carbonate
- Ammonium dihydrogen
- Ammonium cerium
- Ammonium ceric sulphate



- Ammonium metavanadate
- Ammonium fluoride
- Ammonium bromide
- Ammonium nickel sulphate
- Ammonium nitrite
- Ammonium nitrate
- ANSA reagent
- Acetocaramine solution
- Butanol
- Bromine water
- Benedicts reagent
- Benzene
- Benzoic acid
- Beef extract
- Barium acetate
- Barium chloride
- Barium hydroxide
- Barbuturic acid
- Bipyridyle
- Bromophenol blue
- Bromothymol blue
- Bromocresol green
- Bromocresol purple
- Boric acid
- Bovine serum albumin
- Benzoin for synthesis
- Benzal thuronium chloride
- Bismuth nitrate
- Buffer tablets
- Benzophenone
- Barium nitrate
- Barfoed's reagent
- Benzyl benzoate
- Benzaldehyde
- Benzyl chloride
- Biuret reagent
- Casein
- Calcium chloride
- Carbonate
- Calcium fluoride
- Calcium hydroxide
- Calcium oxide
- Carbon tetrachloride
- Carbinol
- Citric acid

- Charcoal
- Chloroform
- Cellulose powder
- Cholesterol
- Copper metal
- Copper acetate
- Cupric sulphate
- Creatinine
- Cresol red
- Crystal violet
- Comousive Brilliant blue
- Cytosine
- Cysteine hydrochloride
- Cobalt chloride
- Chlorophenol
- O-Cresol
- P-Cresol
- M-Cresol
- P-Chloro benzoic acid
- Chloroactaic acid
- Calcium sulphate
- Calcon carboxylic acid
- Cobaltous chloride
- Calcium nitrate
- Cupric acetate
- Carbol fuschin powder
- Cedar wood oil
- Congo red indicator
- Cyclohexane
- Copper sulphate
- D-Glucose
- 3,5 Dinitrosalicylic acid
- DNA
- D-mannitol
- Dichlorophenol Indophenol
- Diphenylamine
- 2,6 Dichlorophenol
- Diethyl ether
- EDTA
- Ethanol
- Ferric chloride
- Ferrous ammonium sulphate
- Fructose
- Ferric sulphate
- Glycine

- Glucose
- Glacial acetic acid
- Gelatin
- Hydrochloric acid
- Histidine
- Hydrogen peroxide
- Hydroxy Quinoline
- Iodine resublimed
- Inoistol
- Isopropanol
- Isoamyl alcohol
- L-Glucose
- Leucine
- Lysine
- Methyl red
- Molybdenum
- Methyl orange indicator
- Mercuric sulphate
- Maltose
- Methylene bisacrylamide
- Methyl cellosolve
- Manganous sulphate
- Molisch reagent
- Manganous sulphate
- Magnesium sulphate
- Malate 3 acetic acid
- 2-Mercaptoethanol
- Millon's reagent
- Methyl propanol
- Magnesium carbonate
- Magnesium chloride
- Methanol
- Naphthalene
- 1-Naphthol
- Naphthyl acetate
- Ninhydrin
- Potassium hydroxide pellets
- Phenol
- Potassium iodide
- Peptone
- Trichlorobenzene
- Trichloro acetic acid
- Toulene
- Tri sodium citrate
- Urea

## Library books:

- ❖ Immunology and Microbiology
- ❖ Microbiology fundamentals and applications
- ❖ Microbiology Introduction
- ❖ Text book of Microbiology
- ❖ Laboratory experiments in Microbiology
- ❖ Industrial Microbiology
- ❖ A text book of Pathology
- ❖ Practical Microbiology
- ❖ Medical bacteriology
- ❖ Microbiology MLT
- ❖ Microbiology
- ❖ Microbial technology
- ❖ A text book of Microbiology
- ❖ Principles of fermentation technology
- ❖ Introduction to Modern Virology
- ❖ An introduction to viruses
- ❖ Text book of Medical physiology
- ❖ Industrial Microbiology
- ❖ Biogas technology
- ❖ Modern food technology
- ❖ General Microbiology
- ❖ Handbook of laboratory
- ❖ Laboratory named in Microbiology
- ❖ An introduction to Microbiology
- ❖ Microbiology (International Edition)
- ❖ Pathology
- ❖ Genetics
- ❖ Molecular Genetics
- ❖ Basic Genetics
- ❖ Microbial Genetics
- ❖ Concepts of Genetics
- ❖ Genetic Engineering
- ❖ Molecular cloning
- ❖ The Genetics of bacteria and their viruses
- ❖ Cell biology, Genetics

## SWOC analysis of the department and future plans:

### Strength:

- ✚ Qualified and highly credentialed faculty .
- ✚ Good equipments in laboratories and expensive uv spectroscopy in lab
- ✚ Excellent support from the administration.
- ✚ Equal emphasis both on theory and practical

- ✦ Goods results and other circular activities
- ✦ Finance support and good laboratories with sufficient glasswares.

#### Weakness:

- ✦ Limited number students in the classrooms.

#### Opportunities:

- ✦ Students can know the role of microorganisms as biotechnological agents and about bioreactors for fermentation of products like vitamins, antibiotics, alcohols etc.
- ✦ Creation of a vibrant academic atmosphere in the department with the help of reputed and experienced teachers.
- ✦ To prepare our students for entrance exam for PG courses & competitive exams with campus placement every year.

#### Challenges:

- ✦ To maintain the academic standard of the department and bringing competition from biosimilars.
- ✦ To increase the loss of patent.
- ✦ To link the curricula and teaching learning process with need of industries. Motivating students to take projects
- ✦ Motivating students to take jobs in industry, defense research laboratories, pharmaceutical companies, on low Rand D productivity.

