

SRI KRISHNA ARTS AND SCIENCE COLLEGE

An Autonomous College Affiliated to Bharathiar University
Coimbatore-641008, Tamil Nadu, India.

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (LOCF)

**B.Sc. Microbiology
(I to VI Semester)**

for 2024-25 admitted Students

DEPARTMENT OF BIOSCIENCE



SRI KRISHNA ARTS AND SCIENCE COLLEGE
COIMBATORE – 641008

DEPARTMENT OF BIOSCIENCE
(2024-2025)

I. PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

Graduates from the B.Sc. Microbiology Programme are expected to achieve the following PEOs

PEO 1	Graduates will be equipped with skills and knowledge and get employment in Bio industries, Pharma Industry, Government departments by imparting the requisite technical skills.
PEO 2	Graduates will be able design, perform experiments, analyse and interpret data for investigating complex problems in that arise due to microbial community
PEO 3	Graduates will be motivated to pursue their higher studies and research in leading universities globally
PEO 4	Graduates will be able to design and innovate solution to biological problems by applying appropriate tools while keeping in mind the safety for environmental and society.
PEO 5	Graduates should understand the ethical, legal, and social implications of microbial technology and demonstrate responsible conduct in their professional practice.

II. PROGRAMME LEARNING OUTCOMES (PLOs)

The Graduates of B. Sc Microbiology programme will be able to:

PLO1	Knowledge: An ability to apply knowledge with facts and figures related to various subjects in pure sciences such as Cell biology, Biochemistry, Microbiology, Molecular biology, Bioinstrumentation, Biostatistics, etc. (Cognitive) .
PLO2	Critical Thinking Skills: To enable students to propose novel ideas in explaining facts and figures or providing new solution to the problems. (Cognitive)
PLO3	Practical Skills: An ability to acquire skills in handling scientific instruments, planning and performing in laboratory experiments to meet desired needs within realistic constraints such as economic, environmental, social, ethical, health and safety, manufacturability, and sustainability in Biotechnology (Psychomotor)
PLO4	Teamwork Skills: An ability to work as a member of multidisciplinary teams and understand team members. (Affective)
PLO5	Communication Skills: Students will communicate scientific concepts, experimental results and analytical arguments clearly and concisely, both verbally and in writing. (Affective)
PLO6	Digital Skills: Serve as the Programmers, with sound knowledge of practical and theoretical concepts for developing molecular imaging (Affective)
PLO7	Numeracy Skills: An ability to conduct experiments, as well as to analyze data with numeracy and statistical skills, understood the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life. (Cognitive)

PLO8	Leadership Skills: Ability to lead oneself and others in the achievement of organizational goals, contributing effectively to a team environment. (Affective)
PLO9	Lifelong Learning Skills: Interdisciplinary approach helps in providing better solutions and new ideas for the sustainable developments, recognition of the need for, and an ability to engage in life-long learning. (Affective)
PLO10	Entrepreneurial Skills: Ability to develop different functional aspects of business world and convert the opportunities in establishing the Bio-business (Affective)
PLO11	Ethics & Professional Skills: Apply ethical Principles and Commit to professional ethics, responsibilities and norms of the biological sciences practice. (Affective)

**III. PROGRAMME LEARNING OUTCOMES VS GRADUATE ATTRIBUTES
VSTAXONOMY OF VERBS**

PLO	Graduate Attributes											Blooms		
	Knowledge	Critical Thinking	Practical Skills	Team work	Communication skills	Digital skills	Numeracy	Leadership skills	Lifelong learning	Entrepreneurial skills	Ethics & Professionalism	Cognitive	Psychomotor	Affective
1	✓											✓		
2		✓										✓		
3			✓										✓	
4				✓										✓
5					✓									✓
6						✓								✓
7							✓					✓		
8								✓						✓
9									✓					✓
10										✓				✓
11											✓			✓

IV. PROGRAMME LEARNING OUTCOMES VS PROGRAMME EDUCATIONAL OBJECTIVES

	PEO 1	PEO 2	PEO 3	PEO 4	PEO 5
PLO 1	✓				
PLO 2	✓				✓
PLO 3	✓			✓	✓
PLO 4		✓			
PLO 5			✓		
PLO 6			✓	✓	
PLO 7			✓		
PLO 8		✓			
PLO 9			✓	✓	✓
PLO 10		✓		✓	
PLO 11		✓		✓	✓

I. ADDITIONAL PROGRAMME OUTCOMES (APOs)

APO 1	Imparting knowledge of microbiological applications in core and related areas, including molecular immunology and genetic engineering, bioprocess and fermentation, enzyme and food technology, and bioinformatics.
APO 2	To equip students with concepts and research methodologies for their future careers in biotechnology while also developing their scientific curiosity.
APO 3	To provide students with in-depth practical expertise in several thrust areas of biotechnology in order to fulfil the demands of industry and academia.
APO 4	Enhancing the ability to think independently, engage in self-directed learning, and use problem-solving techniques
APO 5	Demonstrate ability to apply contemporary analytical tools/software/equipment, as well as analyse and solve issues in diverse life science courses.
APO 6	Implementing the principles of quality control and assurance in biological laboratories and industrial settings.
APO 7	Students will be able to develop sustainable solutions that minimize negative environmental effects.
APO 8	Enhance the basic entrepreneurial skills of students, by understanding the business principles, intellectual property rights, and technology transfer, to facilitate the commercialization of biotechnological innovations.

I. PROGRAMME SPECIFIC OUTCOMES (PSO's)

PSO 1	Apply knowledge to find innovative solution and for biological issues and provide valid solutions through industry – academic interface
PSO 2	Infer the potential impact from the bio science-based innovations for finding sustainable solutions for issues pertaining to health and public health including pandemic, environment, waste management and agriculture.
PSO 3	Demonstrate the ethical and professional conduct in their work, including respecting the rights and dignity of individuals, maintaining confidentiality, and adhering to relevant regulations and guidelines.

II. Mapping of PEOs with PSOs

	PSO 1	PSO 2	PSO 3
PEO 1	✓		
PEO 2	✓	✓	
PEO 3	✓	✓	✓
PEO 4		✓	
PEO 5	✓	✓	✓

VIII. Curriculum Structure for B.Sc. Microbiology**Course Components, Credits & Marks Distribution**

Part No	Group	Basic Structure: Distribution of Courses	Number of Courses	Total Marks	Total Credits
I – III	1	AEC – Ability Enhancement Courses	10	1000	30
III& IV	2	DSC – Discipline Specific Courses	19	1500	54
	3	DSE – Discipline Specific Electives	10	1000	40
	4	GEC – Generic Elective Courses	4	400	12
	5	SEC – Skill Enhancement Courses	2	100	4
IV	6	ANCC I & II – Audit Non-Credit Courses	2	Completed	
V		ANCC III – Audit Non-Credit Courses	1		
-	7	Drive Through Courses (DTCs) – (SWAYAM-NPTEL, Coursera, any courses certified by statutory bodies, etc.)	Any number	-	Additional Credits
Total				4000	140

Group 1. Ability Enhancement Courses (AECs) (10 Courses)– Part (I–IV)

AEC are the courses based upon the content that leads to knowledge enhancement. Ability Enhancement Courses (AEC) are the following:

S. No.	Course Code	Course Title	Semester	Ownership Department	Contact Hours	Marks	Credits
1	24AEC02/ 24AEC07/ 24AEC11	AEC Part I: Language- I Tamil - I – Tamil Nila- I / Hindi - I/ French – I	I	Language	5	100	3
2	24AEC22	AEC Part II: English- I: English Language Dynamics	I	English	5	100	3
3	24AEC35	AEC Part III: Academic Skills for Bioscience	I	Bioscience	2	100	2
4	24AEC04/ 24AEC08/ 24AEC12	AEC Part I: Language-II Tamil - II –Tamil Nila- II / Hindi - II/ French – II	II	Language	5	100	3
5.	24AEC24	AEC Part II: English – II: Campus to Corporate	II	English	5	100	3
6.	24AEC05/ 24AEC09/ 24AEC13/	AEC Part I: Language-III: Tamil – III: Then Malar/ Hindi – III/ French – III/	III	Language	5	100	3
7.	24AEC25	AEC Part II: English-III: English Literary Horizons	III	English	5	100	3
8.	24AEC06/ 24AEC10/ 24AEC14/	AEC Part I: Language-IV Tamil – IV: Kavin Malar/ Hindi – IV/ French – IV/	IV	Language	5	100	3
9.	24AEC26	AEC Part II: English-IV: English Literary Insights	IV	English	5	100	3
10.	24AEC45	AEC Part III: Comprehensive Project for Bioscience	IV	Bioscience	-	100	4
Total						1000	30

Group 2. Discipline Specific Courses (DSCs) (19 Courses) – Part III

These courses are to be studied compulsorily by the students as a core requirement. The students are required to take DSCs across six semesters. The courses designed under this category aim to cover the basics that a student is expected to imbibe in the particular discipline. It includes major project.

S. No.	Course Code	Course Title	Semester	Contact Hours	Marks	Credits
1	24MBU01	DSC 1: Microbiology	I	4	100	3
2	24BSU01	DSC 2: Biochemistry	I	4	100	3
3	24BSU02	DSC 3: Biophysics and Bioinstrumentation	I	3	100	3
4	24MBU02	DSC 4: Lab in Microbiology and Biochemistry	I	5	50	3
5	24MBU03	DSC 5: Microbial Diversity	II	4	100	3
6	24MBU04	DSC 6: Microbial Physiology and Metabolism	II	4	100	3
7	24MBU05	DSC 7: Lab in Microbial Physiology and Metabolism	II	5	50	3
8	24MBU06	DSC 8: Microbial Genetics and Molecular Biology	III	3	100	3
9	24BSU03	DSC 9: Immunology	III	3	100	3
10	24MBU07	DSC 10: Lab in Immunology and Molecular Biology	III	5	50	3
11	24BSU04	DSC 11: rDNA Technology	III	3	100	3
12	24MBU08	DSC 12: Industrial Microbiology	IV	4	100	3
13	24MBU09	DSC 13: Lab in rDNA and Industrial Microbiology	IV	5	50	3
14	24BSU05	DSC 14: Internship Training	IV	Bioscience	Completed	
15	24MBU10	DSC - 15: Environmental and Agricultural Microbiology	V	4	100	3
16	24MBU11	DSC 16: Food Microbiology	V	4	100	3
17	24MBU12	DSC 17: Lab in Environmental, Agricultural and Food Microbiology	V	5	50	3
18	24MBU13	DSC 18: Lab in Medical Microbiology	V	6	50	3
19	24BSU06	DSC 19: Project Work	VI	5	100	3
Total					1500	54

Project Work

During the Sixth semester each student should undertake a project work and submit the report. A guide will be allotted to each student by the Department. A student can select any research topic in discussion with the guide. The project report shall be subject to internal evaluation followed by a Viva-Voce. The project should be demonstrated at the time of examination.

Internal Evaluation:

Reviews (2)	– 60 Marks
Report	– 20 Marks
Attendance	– 20 Marks
Total	– 100 Marks will be converted to 40 (Internal) Marks

End Semester Viva-Voce will be conducted for 60 Marks.

(Dissertation - 40 Marks & Viva-voce - 20 Marks)

Group 3. Discipline Specific Elective (DSEs) (10 Courses) – Part III

Discipline Specific Elective courses offered under the main discipline of study which may be specialized or advanced or supportive to the discipline of study. Students can choose any one course from two courses each in the list of following DSEs.

S. No.	Course Code	Course Title	Ownership Department	Contact Hours	Marks	Credits
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1	24BMU14	DSE 1: Clinical Biochemistry	Microbiology	3	100	3
	24MBU15	DSE 2: Immunodiagnosics				
2	24BSU07	DSE 3: Industrial Exposure Training	Biotechnology/ Microbiology	4 Weeks	100	4
3	24BSU08	DSE 4: Molecular Diagnostics	Microbiology	3	100	3
	24MBU16	DSE 5: Microbial Therapeutics				
4	24BSU09	DSE 6: Ayurveda	Biotechnology	4	100	4
	24BSU10	DSE 7: Pharmaceutical technology				
5	24BSU11	DSE 8: Bionanotechnology	Biotechnology	4	100	4
	24BSU12	DSE 9: Biomimetics and Bionics				
6	24MBU17	DSE 10: Marine Microbiology	Microbiology	3	100	3
	24BSU13	DSE 11: Marine Biodiversity and Aquaculture				
7	24MBU18	DSE 12: Medical Bacteriology and Mycology	Microbiology	5	100	5
	24MBU19	DSE 13: Toxicology				
8	24MBU20	DSE 14: Medical Virology and Parasitology	Microbiology	5	100	5
	24MBU21	DSE 15: Molecular Virology				
9	24BSU14	DSE 16: Bioinformatics	Bioinformatics	5	100	5
	24BSU15	DSE 17: Proteomics and Genomics				
10	24BSU16	DSE 18: Quality control in Bioindustries	Microbiology	4	100	4
	24BSU17	DSE 19: Bioentrepreneurship				
Total					1000	40

Industrial Exposure Training (IET)

Students can opt for Industrial Exposure Training during fifth semester for a period of 4 weeks.

The Continuous Internal Assessment mark distribution for IET is as follows:

Component	Mode of Conduct	Project Coverage	Marks
2 Reviews	Presentation	Phase by Phase	60
Work Diary	Written	Phase by Phase	20
Report	Submission	Entire Process	20
Total			100*

*100 Marks will be converted to 40 (Internal) Marks

The end semester examination of the Industrial Exposure Training will be given based on the report and viva-voce for 60 marks, conducted by the Department.

Report: 40 Marks **Viva-voce:** 20 Marks

Group 4. Generic Elective Courses (GECs) (4 Courses)– Part III

Generic Elective Courses are interdisciplinary in nature. They are additional courses based on expertise, specialization, requirements, scope, and need of the department.

Sl. No.	Course Code	Course Title	Semester	Ownership Department	Contact Hours	Marks	Credits
1	24GEU17A	GEC 1: Biostatistics	II	Mathematics	3	50	2
	24GEU17B	Practical -Biostatistics Lab			2	50	2
	24GEU18A	Statistics for Bioscience			3	50	2
	24GEU18B	Practical- Statistics for Bioscience Lab			2	50	2
2	24GEU24	GEC 2: English for	III	English	3	100	

		Research Writing					2
	24GEU25	English for Persuasive Communication					
3	24GEU50	GEC 3: Basics of Textile Processing - Practical	III	Costume Design & Fashion	3	100	2
	24GEU51	Basics of Design – Practical					
4	24GEU45A	GEC 4: Programming in ANSI C	IV	Computer Technology & Data Science	3	50	2
	24GEU45B	Practical: Programming in ANSI C			2	50	2
	24GEU46A	PERL Programming			3	50	2
	24GEU46B	Practical: PERL Programming			2	50	2
Total						400	12

Group 5. Skill Enhancement Courses (SECs) (2 Courses)

SEC I: Compulsory Course: Talent Enhancement Course: Career Guidance

SEC II: A Bucket of Skill based Courses are offered for the Under Graduate programmes by the departments aimed at imparting skill. A Student has to subscribe one course from list offered by the department.

S. No	Course Code	Course Title	Ownership Department
1.	24SEC01D	SEC 1: Mathematics for Competitive Examination	Mathematics
2.	24SEC22	SEC 2: Enzyme Technology	Bioscience
	24SEC23*	Tissue Culture Techniques *	

Group 6. Audit Non-Credit Courses (ANCC)– Part IV & V

Non-Credit Courses are intended for students who want to gain general knowledge, learn a new skill, upgrade existing skills, enrich their understanding of a wide range of topics, or develop personal interests. A student has to complete any two courses during Semester I and II.

Part IV- ANCC			
S. No.	Course Code	Course Title	Ownership Department
ANCC 1 (Semester I)			
1	24ANC01	Environmental Studies	Bioscience
ANCC 2 - Values & Ethics (Semester II)			
2	24ANC02	Human Rights	Social Work
3	24ANC03	Women's Rights	Social Work
4	24ANC04	Yoga for Human Excellence	Psychology
5	24ANC05	Indian Culture and Heritage	English
6	24ANC06	Introduction to Cyber Security	CS
7	24ANC07	Consumer Protection	Commerce
8	24ANC08	Constitution of India	Commerce
9	24ANC09	Waste Management	Bioscience
10	24ANC10	Sustainable Development Goals	Management

Student has to take part in any one extension activity during their course of study.

Part V- ANCC		
ANCC 3 - Extension Activities		
S. No.	Course Code	Course Name
1	24ANC11	National Service Scheme
2	24ANC12	National Cadet Corps
3	24ANC13	Youth Red Cross
4	24ANC14	Red Ribbon Club
5	24ANC15	Rotaract Club
6	24ANC16	Sports
7	24ANC17	Association Activities
8	24ANC18	Club Activities

Group 7.

i) Drive-Through Courses (DTCs) I & II– Additional Credits

These courses are intended to bring out and promote the self-learning initiative of the students – where their own motivation is what drives them to complete the course and not external compulsions. This fosters the habit of keeping oneself updated always by means of self-study. It gives opportunities to the students to explore new areas of interest and earn additional credits. Students can take any number of courses under this cafeteria system. The credits will not be taken for CGPA calculation. Additional 4/3/2 credits per course will be given on submission of certificate.

1. Coursera
2. NPTEL
3. Any courses certified by statutory bodies.

ii) Drive-Through Course (DTC – III)

Internship Training/Mini Project/ Spoken Tutorial/etc.

Students individually or with the maximum of four members per batch should take up either Internship training or mini project for a period of fifteen days during IV Semester vacation. The report will be evaluated and viva-voce examination will be conducted during V semester. Otherwise, the students have to complete one spoken tutorial course or any certification course suggested by the department.

VIII. Semester-wise Scheme

Semester I										
Course Code	Course Title	T/P/E	Ins. Hrs/ Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/ EM/ EN	L/ R/ N/ G
24AEC02/ 24AEC07/ 24AEC11/	AEC 1: Language I Tamil I- Tamil Nila- I / Hindi I / French I	T	5	3	25	75	100	3	SD	L/ N/ G/
24AEC22	AEC 2: English I: English Language Dynamics	T	5	3	25	75	100	3	SD	G
24AEC35	AEC Part III: Academic Skills for Bioscience	T	2	2	100	-	100	2	SD	G
24MBU01	DSC 1: Microbiology	T	4	3	25	75	100	3	SD	G
24BSU01	DSC 2: Biochemistry	T	4	3	25	75	100	3	SD	N
24BSU02	DSC 3: Biophysics and Bioinstrumentation	T	3	3	25	75	100	3	SD	G
24MBU02	DSC 4: Lab in Microbiology and Biochemistry	P	5	3	20	30	50	3	EM	N
24ANC01	ANCC1 (NF2F) Environmental Studies	T	2	-	-	-	Completed		SD	G
Drive Through Course I: Additional Credit Courses							Additional Credits			
Total			30				650	20		
Semester II										
Course Code	Course Title	T/P/E	Ins. Hrs/ Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/ EM/ EN	L/ R/ N/ G
24AEC04/ 24AEC08/ 24AEC12	AEC 3: Language II Tamil - II – Tamil Nila II/ Hindi - II/ French - II	T	5	3	25	75	100	3	SD	L/ N/ G
24AEC24	AEC PART II: English II: Campus to Corporate	T	5	3	25	75	100	3	SD	G
24MBU03	DSC 5: Microbial Diversity	T	4	3	25	75	100	3	SD	G
24MBU04	DSC 6: Microbial Physiology and Metabolism	T	4	3	25	75	100	3	SD	G
24MBU05	DSC 7: Lab in Microbial Physiology and Metabolism	P	5	3	20	30	50	3	EM	G
24GEU17A*	GEC 1: Biostatistics	T	3	3	10	40	50	2	EN	G
24GEU17B*	Practical- Biostatistics Lab	P	2	3	10	40	50	2		
24GEU18A	Statistics for Bioscience	T	3	3	10	40	50	2		
24GEU18B	Practical-Statistics for Bioscience Lab	P	2	3	10	40	50	2		
24ANC02 24ANC03 24ANC04 24ANC05 24ANC06 24ANC07 24ANC08 24ANC09* 24ANC10	ANCC2 (NF2F) Human Rights Women's Rights Yoga for Human Excellence Indian Culture and Heritage Introduction to Cyber Security Consumer Protection Constitution of India Waste Management* Sustainable Development Goals	T	2	-	-	-	Completed		SD	G
Drive Through Course II: Additional Credit Courses							Additional Credits			
Total			30				550	19		

Semester III										
Course Code	Course Title	T/P/E	Ins. Hrs/ Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/ EM/ EN	L/ R/ N/ G
24AEC05/ 24AEC09/ 24AEC13	AEC Part I: Language – III: Tamil-III -Then Malar/ Hindi - III/ French – III	T	5	3	25	75	100	3	SD	L/ N/ G
24AEC25	AEC Part II: English - III: English Literary Horizons	T	5	3	25	75	100	3	SD	G
24MBU06	DSC 6: Microbial Genetics and Molecular Biology	T	3	3	25	75	100	3	SD	G
24BSU03	DSC 7: Immunology	T	3	3	25	75	100	3	SD	G
24MBU07	DSC 8: Lab in Immunology and Molecular Biology	P	5	5	20	30	50	3	EM	G
24MBU14	DSE 1: Clinical Biochemistry	T	3	3	25	75	100	3	EM	N
24MBU15	DSE 2: Immunodiagnosics								EM	
24GEU24	GEC 2: English for Research Writing	T	3	3	25	75	100	2	SD/ EM	G
24GEU25	English for Persuasive Communication									
24GEU50	GEC 3: Basics of Textile Processing- Practical	P	3	3	40	60	100	2	EN	N
24GEU51	Basics of Design-Practical									
Total			30				750	22		
Semester IV										
Course Code	Course Title	T/P/E	Ins. Hrs/ Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/ EM/ EN	L/ R/ N/ G
24AEC06/ 24AEC10/ 24AEC14	AEC Part I: Language IV: Tamil- IV- Kavin Malar/ Hindi - IV/ French – IV	T	5	3	25	75	100	3	SD	L/ N/ G
24AEC26	AEC Part II: English - IV: English Literary Insights	T	5	3	25	75	100	3	SD	G
24AEC45	AEC Part III: Comprehensive Project for Bioscience	T	-	3	100	-	100	4	EM	N
24BSU04	DSC 11: rDNA Technology	T	3	3	25	75	100	3	SD	G
24MBU08	DSC 12: Industrial Microbiology	T	4	3	25	75	100	3	EN	G
24MBU09	DSC 13: Lab in rDNA and Industrial Microbiology	P	5	5	20	30	50	3	EN	G
24BSU05	DSC - 14: Internship Training				Completed					
24GEU45A	GEC 4: Programming in ANSI C	T	3	3	10	40	50	2	EM	G
24GEU45B	Practical: Programming in ANSI C	P	2	3	10	40	50	2		
24GEU46A	PERL Programming	T	3	3	10	40	50	2	EM	G
24GEU46B	Practical: PERL Programming	P	2	3	10	40	50	2		
24SEC22	SEC 2: Enzyme Technology	T	3	3	10	40	50	2	SD	N
24SEC23*	Tissue Culture Techniques*									

Drive Through Course III – Internship Training / Mini Project/ Spoken Tutorial								Completed			
Total				30				700	25		
Semester V											
Course Code	Course Title	T/P/E	Ins. Hrs/Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	L/ R/ N/ G	
24BSU07	DSE 3: Industrial Exposure Training	-	4 Weeks	-	40	60	100	4	EM	G	
24MBU10	DSC 15: Environmental and Agricultural Microbiology	T	4	3	25	75	100	3	SD	G	
24MBU11	DSC 16: Food Microbiology	T	4	3	25	75	100	3	SD	G	
24MBU12	DSC 17: Lab in Environmental Agricultural and Food Microbiology	P	5	5	20	30	50	3	EM	G	
24BSU08	DSE 4: Molecular Diagnostics	T	3	3	25	75	100	3	SD	G	
24MBU16	DSE 5: Microbial Therapeutics								SD	G	
24BSU09	DSE 6: Ayurveda	T	4	3	25	75	100	4	EM	N	
24BSU10	DSE 7: Pharmaceutical technology										
24BSU11	DSE 8: Bionanotechnology	T	4	3	25	75	100	4	SD	G	
24BSU12	DSE 9: Biomimetics and Bionics										
24MBU17	DSE 10: Marine Microbiology	T	3	3	25	75	100	3	SD	G	
24BSU13	DSE 11: Marine Biodiversity and Aquaculture										
24SEC01D	SEC 1: Mathematics for Competitive Examination	T	3	-	50	-	50	2	SD	N	
Drive Through Course III – Internship Training /Mini Project/Spoken Tutorial								Completed			
Total				30				800	29		
Semester VI											
Course Code	Course Title	T/P/E	Ins. Hrs/Week	ESE Dur. Hrs	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	L/ R/ N/ G	
24MBU13	DSC 18: Lab in Medical Microbiology	P	6	9	20	30	50	3	EM	G	
24BSU06	DSC 19: Project Work	P	5	3	40	60	100	3	EM	G	
24MBU18	DSE 12: Medical Bacteriology and Mycology	T	5	3	25	75	100	5	SD	G	
24MBU19	DSE 13: Toxicology										
24MBU20	DSE 14: Medical Virology and Parasitology	T	5	3	25	75	100	5	SD	G	
24MBU21	DSE 15: Molecular Virology										
24BSU14	DSE 16: Bioinformatics	T	5	3	25	75	100	5	SD	G	
24BSU15	DSE 17: Proteomics and Genomics										
24BSU16	DSE 18: Quality control in Bioindustries	T	4	3	25	75	100	4	SD	G	
24BSU17	DSE 19: Bioentrepreneurship								EN		

24ANC11/ 24ANC12/ 24ANC13/ 24ANC14/ 24ANC15/ 24ANC16/ 24ANC17/ 24ANC18/	ANCC 3 Extension Activities National Service Scheme / National Cadet Corps / Youth Red Cross / Red Ribbon Club / Rotaract Club / Sports / Association Activities / Club Activities	-	-	-	-	-	Grade	-	SD	G	
Total			30				550	25			
Total							4000	140			
Drive-Through Courses (DTCs): Courses offered in Coursera OR NPTEL OR Any courses certified by statutory bodies.		Additional 4 credits per course will be given on submission of Certificate					During Semester I to Semester VI				

The courses focus on the following needs	
SD	Skill Development
EM	Employability
EN	Entrepreneurship
L	Local
R	Regional
N	National
G	Global

Semester-wise Distribution of Marks and Credits

Semester	Total Marks	Total Credits
I	650	20
II	550	19
III	750	22
IV	700	25
V	800	29
VI	550	25
Total	4000	140

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List of Courses Offered by Mathematics Department

Semester	Course Code	Course Name	Programme	T/P/E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/ EM/ EN	L/ R/ N/ G
II	24GEU17A*	Biostatistics*	B.Sc. MB/BT	T	3	10	40	50	2	EN	G
II	24GEU17B*	Practical – Biostatistics Lab*	B.Sc. MB/BT	P	2	10	40	50	2		
II	24GEU18A	Statistics for Bioscience	B.Sc. BT/MB	T	3	10	40	50	2		
II	24GEU18B	Practical- Statistics for Bioscience Lab	B.Sc. BT/MB	P	2	10	40	50	2		

List of Courses Offered by English Department

Semester	Course Code	Course Name	Programme	T/P/E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/ EM/ EN	L/ R/ N/ G
III	24GEU24	English for Research Writing	B.Sc. MB/BT	T	3	25	75	100	2	SD/ EM	G
III	24GEU25	English for Persuasive Communication	B.Sc. MB/BT	T	3	25	75	100	2		

List of Courses Offered by Costume Design and Fashion Department

Semester	Course Code	Course Name	Programme	T/P/E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/ EM/ EN	L/ R/ N/ G
III	24GEU50	Basics of Textile Processing- Practical	B.Sc. MB/BT	P	3	40	60	100	2	EN	G
III	24GEU51	Basics of Design-Practical	B.Sc. MB/BT	P	3	40	60	100	2		

List of Courses Offered by Computer Technology and Data Science Department

Semester	Course Code	Course Name	Programme	T/P/E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/ EM/ EN	L/ R/ N/ G
IV	24GEU45A	Programming in ANSIC	B.Sc. MB/BT	T	3	10	40	50	2	EM	G
IV	24GEU45B	Practical: Practical: Programming in ANSIC	B.Sc. MB/BT	P	2	10	40	50	2		
IV	24GEU46A	PERL Programming	B.Sc. MB/BT	T	3	10	40	50	2	EM	G
IV	24GEU46B	Practical: PERL Programming Lab	B.Sc. MB/BT	P	2	10	40	50	2		

List of Courses Offered by Bioinformatics Department

Semester	Course Code	Course Name	Programme	T/P/E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/ EM/ EN	L/ R/ N/ G
VI	24BSU14	Bioinformatics	B.Sc. MB/BT	T	5	25	75	100	5	SD	G
VI	24BSU15	Proteomics and Genomics	B.Sc. MB/BT	T	5	25	75	100	5	SD	G

List of Courses Offered by Biotechnology Department

Semester	Course Code	Course Name	Programme	T/P/E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/ EM/ EN	L/ R/ N/ G
V	24BSU09	Ayurveda	B. Sc MB/BT	T	4	25	75	100	4	EM	N
V	24BSU10	Pharmaceutical technology	B. Sc MB/BT	T	4	25	75	100	4	EM	G
V	24BSU11	Bionanotechnology	B. Sc MB/BT	T	4	25	75	100	4	SD	G
V	24BSU12	Biomimetics and Bionics	B. Sc MB/BT	T	4	25	75	100	4	SD	G

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List of Courses Offered to Biotechnology Department

Semester	Course Code	Course Name	Programme	T/P/E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/ EM/ EN	L/ R/ N/ G
V	24BSU08	Molecular Diagnostics	B. Sc BT/MB	T	3	25	75	100	3	SD	G
V	24BTU16	Molecular Therapeutics	B. Sc BT	T	3	25	75	100	3	SD	G
V	24BTU17	Marine Biotechnology	B. Sc BT	T	3	25	75	100	3	SD	G
V	24BSU13	Marine Biodiversity and Aquaculture	B. Sc BT/MB	T	3	25	75	100	3	SD	G
VI	24BSU16	Quality control in Bioindustries	B. Sc BT/MB	T	4	25	75	100	4	EM	G
VI	24BSU17	Bio entrepreneurship	B. Sc BT/MB	T	4	25	75	100	4	EN	G

List of Courses Offered to Costume Design and Fashion Department

Semester	Course Code	Course Name	Programme	T/P/E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/ EM/ EN	L/ R/ N/ G
VI	24GEU55	Bio textiles	B. Sc. CDF	T	4	25	75	100	3	EN	G