MARIS STELLA COLLEGE (AUTONOMOUS), VIJAYAWADA

A College with Potential for Excellence

NAAC Accredited & ISO 9001: 2015 Certified

PROGRAMME REGISTER

2020-23

DEPARTMENT OF BIOCHEMISTRY

INDEX

UG PROGRAMMES OFFERED

S.No.	Programme	Combination offered	Programme Code
1	B.Sc.	Food Science and Technology, Microbiology, Biochemistry (FMBC)	311

PROGRAMME OUTCOMES (POs)

2020-23

At the end of the programme students will:

PO1: Essential Knowledge:

Have comprehensive discipline knowledge and understanding, the ability to engage with different schools of thought and to apply their knowledge in practice including in multi-disciplinary or multi-professional contexts.

PO2: Creative and critical thinking and problem-solving abilities:

Be effective problem solvers, able to apply critical and evidence-based thinking to conceive innovative responses to future challenges.

PO3: Teamwork and communication skills:

Be able to convey ideas and information effectively to a range of audiences for a variety of purposes and contribute in a positive and collaborative manner to achieving common goals.

PO4: Motivation and preparation in life-long learning:

Exhibit life-long skills; broad based multiple career oriented general skills; self and field-based learning skills; digital skills; social responsibility and compassionate commitment; preparedness for living, learning and working in any environment

PO5: Professionalism and leadership readiness:

Be able to engage in professional behaviour and have the potential to be entrepreneurial and take leadership roles in their chosen occupations and communities.

PO6: Intercultural and ethical competency:

Be responsible and effective global citizens whose personal values and practices are consistent with their roles as responsible members of society.

PO7: Self-awareness and emotional intelligence:

Be self-aware and reflective, flexible and resilient and act with integrity and take responsibility for their actions as empowered women.

PO8: Social responsibility:

Be sensitive to and demonstrate agency in matters of environment, gender and other social issues to promote an equitable society.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

2020-23

At the end of the programme students will be able to:

PSO1: Interpret principles, classifications, concepts, theories and mechanisms.

PSO2: Analyse hypothesis, procedures, properties, experimental facts and draw conclusions.

PSO3: Apply techniques in solving problems, results, sample analysis and production.

PSO4: Develop communicative competence, creative and critical thinking, practical, technical and employability skills, social sensibility and responsibility.

Course Outcomes (COs)
2020-23

S.No.	Sem	Course Code	Course Title	Course Outcomes (Cos)
1.	I	20BCCCBM13	Biomolecules	**CO1:** Represent the biomolecules in structural form
				CO2: Explain the classification of biomolecules
				CO3: Outline the physico-chemical properties of biomolecules
				CO4: Explain the importance of biomolecules in living organisms
2.		20BCP1QA12	Qualitative Analysis - Practical	**CO1:** Gain of knowledge for preparing all the reagents, buffer, and solutions by themselves
				CO2: Analysis of biological or non-biological sample biomolecules
				CO3: Identification of its chemical composition of biomolecules
3.	II	20BCCCBT23	Biophysical Techniques & Microbiological Methods	**CO1:** Explain the different types and construction of different biophysical Instruments
				CO2: Summarize the working principles of biophysical Instruments and microbiological methods
				CO3: Describe different biophysical techniques and microbiological methods
				CO4: Apply Biophysical techniques and Microbiological methods
4.		20BCP2BT22	Biophysical Techniques- Practical	**CO1:** Analyse the biomolecules using analytical techniques
				CO2: Test the biologically relevant samples by isolation techniques and identification methods.
				CO3: Evaluate of biological relevant samples
5.	III	20BCCCIM33	Enzymology, Bioenergetics & Intermediary Metabolism	**CO1:** Explain the physiological importance of enzymes and their role in metabolism.
				CO2: Summarize the concepts of thermodynamics and energy transformations in

				metabolism
				CO3: Outline the metabolism of different biomolecules
				CO4: Explain the pathophysiology of metabolic diseases
6.		20BCP3EN32	Enzymology - Practical	**CO1:** Perform assays for different enzymes
				CO2: Examine different biologically important parameters
7.	IV	20BCCCCB43		**CO1** Describe different components of blood, and different Physiological systems
				CO2: Classify the Physiological systems and Hormones based on functions

			Physiology, Nutrition & Clinical Biochemistry	**CO3:** Explain the details of nutrient requirements ,functioning of various physiological systems
				CO4: Understand the pathophysiology of different organs in health and disease
8.	IV	20BCP4CB42	Clinical Biochemistry - Practical	**CO1:** Diagnose and monitor diseased conditions
				CO2: Examine to compare the normal versus diseased condition
				CO1: Outline the different interdisciplinary fields
9.	IV	20BCCCMB43	Microbiology, Immunology & Molecular Biology	**CO2:** Identify the microorganisms involved in different biological processes
				CO3: Explain the biological processes
				CO4: Understand the different organisms , biological processes
10.	IV	20BCP5AB42	Applied Biochemistry Practical	**CO1:** Analyse biological samples
				CO2: Understand the different biological processes
11.	V/VI Set 1	20BCSEC11FB3	Forensic Biochemistry	**CO1:** Understand the underlying principles of DNA for use in forensic studies
				CO2: Develop scientific temper on DNA
				CO3: Analyse and evaluate of forensic problems using biochemical methods
				CO4: Identify and suggest means for forensic problems

12.	V/VI Set 1	20BCP611FB2	Forensic Biochemistry Practical	**CO1:** Apply the different types techniques that make use of DNA for analysing Forensic sample
				CO2: Analyse the Sample found as evidence.
13.	V/VI Set 1	20BCSEC12BI3	Bioinformatics	**CO1:** Understand the importance of Bioinformatics Tools in Research
				CO2: Acquire knowledge to collect, retrieve and process data from the available databases
				CO3: Analyse the data by using bioinformatics tools
				CO4: Develop Skills to collect, process, and obtain biological information
14.	V/VI Set 1	20BCP712BI2	Bioinformatics - Practical	**CO1:** Make use of skills to Retrieve, identify and align the sequences for research purpose
				CO2: Align and Construct Phylogenetic tree from the given sequences to identify related and unrelated species
15.	V/VI Set 2	20BCSEC21RM3	Research Methodology	**CO1:** Understand the primary and secondary data sources and fundamental principles for doing research
				CO2: Identify the possible research area
				CO3: Learn to write research project proposal (for grants)
				CO4: Acquire the skills of research design, collection and analysis
16.	V/VI Set 2	20BCP621RM2	Research Methodology Practical	**CO1:** Evaluate hypothesis through testing
				CO2: Compute, document, analyse and summarize their findings
17.	V/VI Set 2	20BCSEC22BS3	Biostatistics	**CO1:** Apply the principles of biological data management in real-life situations
				CO2: Correlate with the other sciences
				CO3: Understand the nature of variability
				CO4: Define some hypothesis testing concepts.
18.	V/VI Set 2	20BCP722BS2	Biostatistics Practical	**CO1:** Deriving general laws from small samples.
				CO2: Identify data relating to variable/variables

19.	V/VI Set 3	20BCSEC31DB3	Diagnostic Biochemistry	**CO1:** Acquire knowledge on the principles of biochemical diagnostic tests
				CO2: Understand their use in assessing health condition
				CO3: Analysis of samples using biochemical tests
				CO4: Utilize different techniques to draw improved inferences
20.	V/VI Set 3	20BCP622DB2	Diagnostic Biochemistry - Practical	**CO1:** Understand various tests involved in sample analysis
				CO2: Analysis of Blood parameters
21.	V/VI Set 3	20BCSEC32CE3	Clinical Endocrinology	**CO1:** Acquire knowledge on hormone activations both at hypo and hyper levels
				CO2: Identify the disease caused by impaired endocrine glands and hormonal actions
				CO3: Analyse the pathological conditions of the patients based on clinical reports
				CO4: Realize the importance of hormones in the reproductive biology
22.	V/VI Set 3	20BCP732CE2	Clinical Endocrinology – Practical	**CO1:** Acquire knowledge a performing different hormone specific assay
				CO2: Understand the biochemical basis of hormone-specific assay
				CO3: Interpret the results based on tests

Mapping of COs with PSOs & POs

S.No.	Sem	Course Code	Course Title	COs	PSOs	POs
1.	I	20BCCCBM14	Biomolecules	CO1	PSO1, PSO2, PSO3, PSO4	PO1, PO3, PO4,
				CO2	PSO1, PSO2, PSO3	PO1, PO3, PO4
				CO3	PSO1, PSO2	PO1, PO2
				CO4	PSO1, PSO2	PO1, PO3, PO4,
2.	I	20BCP1QA11	Qualitative Analysis - Practical	CO1	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4, PO5
				CO2	PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4, PO5
				CO3	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4, PO5
				CO4	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4, PO5
3.	II	20BCCCBT24	Biophysical Techniques & Microbiological Methods	CO1	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4,
				CO2	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4,
				CO3	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3,
				CO4	PSO1, PSO2, PSO3, PSO4	PO1, PO4,
4.	II	20BCP2BT21	Biophysical Techniques - Practical	CO1	PSO1, PSO3, PSO4	PO1, PO2, PO3, PO4, PO5,
				CO2	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO5
				CO3	PSO1, PSO2, PSO3, PO4	PO1, PO2, PO3, PO4, PO5
5	III	20BCCCIM34	Enzymology, & Intermediary Metabolism	CO1	PSO1, PSO2, PSO3	PO1, PO2, PO3, PO4,
				CO2	PSO1, PSO2	PO1, PO2, PO3, PO4,

				CO3	PSO1, PSO2, PSO4	PO1, PO2, PO3,
				CO4	PSO1, PSO2, PSO3, PSO4	PO1, PO4,
6.	III	20BC P3EN31	Enzymology-Practical	CO1	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4, PO5
				CO2	PSO1,PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4, PO5
7.	IV	20BCCC CB44	Physiology, Nutrition & Clinical Biochemistry	CO1	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4, , PO6
				CO2	PSO1	PO1,PO2, PO3
				CO3	PSO1, PSO2, PSO4	PO1, PO2, PO3,
				CO4	PSO1, PSO2, PSO3,	PO1, PO2, PO4
8.	IV	20BC P4CB41	Clinical Biochemistry-Practical	CO1	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4, PO5
				CO2	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4, PO5
9.	IV	20BCCC MB44	Microbiology Immunology & Molecular Biology	CO1	PSO1, PSO2, PSO3, PSO4	PO1, PO2
				CO2	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4
				CO3	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4
				CO4	PSO1, PSO2, PSO3, PSO4	PO1,PO2, PO3,

10.	IV	20BC P4AB41	Applied Biochemistry-Practical	CO1	PSO1, PSO2, PSO3, PSO4	PO1,PO2,PO4,PO5
				CO2	PSO1, PSO2, PSO3, PSO4	PO1,PO2,PO3,PO4,PO5,
11.	V/ VI Set 1	20BCSEC 11FB3	Forensic Biochemistry	CO1	PSO1, PSO2,	PO1, PO2, PO4
				CO2	PSO1, PSO2,	PO1, PO2, PO4
				CO3	PSO1, PSO3	PO1, PO2, PO3, PO4,
				CO4	PSO3, PSO4	PO1, PO2, PO3, PO4,
12.	V/ VI Set 1	20BCP611 FB2	Forensic Biochemistry-Practical	CO1	PO1,PO2,PO3,PO4	PO1,PO2,PO4,PO5,PO6,PO8
				CO2	PSO2,PSO3,PSO4	PO2,PO3,PO4
13.	V/ VI Set 1	20BCSEC 12BI3	Bioinformatics	CO1	PSO1	PO1, PO2, PO3, PO4,
				CO2	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3,PO4,
				CO3	PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4,
				CO4	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4,
14.	V/ VI Set 1	20BCP712BI 2	Bioinformatics- Practical	CO1	PSO1,PSO2,PSO3, PSO4	PO1,PO2,PO3,PO4,PO5
				CO2	PSO1,PSO2,PSO3, PSO4	PO1,PO2,PO3,PO4,PO5
15.	V/ VI Set 2	20BCSEC 21RM3	Research Methodology	CO1	PSO1, PSO2	PO1, PO2, PO3, PO4, PO6
				CO2	PSO1, PSO2	PO1, PO2, PO4,

				CO3	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO6
				CO4	PSO1, PSO2	PO1, PO2, PO3, PO4, PO6
16	V/ VI Set 2	20BCP621RM2	Research Methodology-Practical	CO1	PSO1,PSO2,PSO3, PO4	PO1,PO2,PO3,PO4,PO5
				CO2	PSO1,PSO2,PSO3,PO4	PO1,PO2,PO3,PO4,PO5
				CO3	PSO1,PSO2,PSO3,PO4	PO1,PO2,PO3,PO4
				CO4	PSO1,PSO2,PSO3,PO4	PO1,PO2,PO3,PO4
17.	V/ VI Set 2	20BCSEC 22BS3	Biostatistics	CO1	PSO1, PSO3, PSO4	PO1, PO2, PO3,
				CO2	PSO4	PO1, PO2, PO3, PO4
				CO3	PSO1	PO1, PO2,
				CO4	PSO1, PSO2, PSO3	PO1, PO2, PO3,
18.	V/ VI Set 2	20BCP722BS2	Biostatistics - Practical	CO1	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO4, PO5
				CO2	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO3, PO5
19.	V/ VI Set 3	20BCSEC 31DB3	Diagnostic Biochemistry	CO1	PSO1, PSO2, PSO3	PO1, PO2, PO4, PO5, PO6, PO7
				CO2	PSO1, PSO2, PSO3, PSO4	PO1, PO2, PO4, PO5, PO6, PO7
				CO3	PSO1,PSO2, PSO3, PSO4	PO1, PO2, PO3,PO5
				CO4	PSO2, PSO3, PSO4	PO2, PO3, PO6,PO5
20.	V/ VI	20BCP631DB2	Diagnostic Biochemistry-	CO1	PSO1,PSO2,PSO3 PSO4	PO1, PO2, PO3, PO4.PO6 PO5

	Set 3		Practical	CO2	PSO1,PSO2,PSO3 PSO4	PO1, PO2, PO3, PO4,PO6PO5
21.	V/ VI Set 3	20BCSEC 32CE3	Clinical Endocrinology	CO1	PSO1	PO1,PO4,PO5
				CO2	PSO1, PSO2, PSO3, PSO4	PO1, PO2,PO4,PO5
				CO3	PSO1, PSO2	PO1, PO2,PO4,PO5
				CO4	PSO3, PSO4	PO1, PO2,PO4,PO5
22.	V/ VI Set 3	20BCP732C E2	Clinical Endocrinology - Practical	CO1	PSO1, PSO2, PSO3, PSO4	PO1, PO2,PO4,PO5
				CO2	PSO1, PSO2, PSO3, PSO4	PO1, PO2,PO4,PO5
				CO3	PSO1	PO1,PO2

Mapping of Courses with PSOs

Course Title	PSO1	PSO2	PSO3	PSO4
Biomolecules	✓	✓	✓	✓
Qualitative Analysis Practical	✓	✓	✓	✓
Biophysical Techniques & Microbiological Methods	✓	✓	✓	✓
Biophysical Techniques Practical	✓	✓	✓	✓
Enzymology, & Intermediary Metabolism	✓	✓	✓	✓
Enzymology Practical	✓	✓	✓	✓
Physiology, Nutrition & Clinical Biochemistry	✓	✓	✓	✓
Clinical Biochemistry -Practical	✓	✓	✓	✓
Microbiology, Immunology & Molecular Biology	✓	✓	✓	✓
Applied Biochemistry - Practical	✓	✓	✓	✓
Forensic Biochemistry	✓	✓	✓	✓
Forensic Biochemistry - Practical	✓	✓	✓	✓
Bioinformatics	✓	✓	✓	✓

Bioinformatics - Practical	✓	✓	✓	✓
Research Methodology	✓	✓	✓	✓
Research Methodology – Practical	✓	✓	✓	✓
Biostatistics	✓	✓	✓	✓
Biostatistics -Practical	✓	✓	✓	✓
Diagnostic Biochemistry	✓	✓	✓	✓
Diagnostic Biochemistry - Practical	✓	✓	✓	✓
Clinical Endocrinology	✓	✓	✓	✓
Clinical Endocrinology - Practical	✓	✓	✓	✓

Mapping of Courses with Pos

Course	PO1 Essential Knowledge	PO2 Creative and critical thinking and problem solving abilities	PO3 Teamwork and communication skills	PO4 Motivation and preparation in life-long learning	PO5 Professionalism and leadership readiness	PO6 Intercultural and ethical competency	PO7 Self-awareness and emotional intelligence	PO8 Social

Biomolecules	✓	✓	✓	✓				
Qualitative Analysis - Practical	✓	✓	✓	✓	✓			
Biophysical Techniques & Microbiological Methods	✓	✓	✓	✓				
Biophysical Techniques - Practical	✓	✓	✓	✓	✓			
Enzymology, & Intermediary Metabolism	✓	✓	✓	✓				
Enzymology - Practical	✓	✓	✓	✓	✓			
Physiology, Nutrition & Clinical Biochemistry	✓	✓	✓	✓		✓		
Clinical Biochemistry -Practical	✓	✓	✓	✓	✓			
Microbiology, Immunology & Molecular Biology	✓	✓	✓	✓				
Applied Biochemistry - Practical	✓	✓	✓	✓	✓			
Forensic Biochemistry	✓	✓	✓	✓				
Forensic Biochemistry - Practical	✓	✓	✓	✓	✓	✓		
Bioinformatics	✓	✓	✓	✓				
Bioinformatics - Practical	✓	✓	✓	✓	✓			
Research Methodology	✓	✓	✓	✓		✓		

Research Methodology – Practical	✓	✓	✓	✓	✓			
Biostatistics	✓	✓	✓	✓				
Biostatistics -Practical	✓	✓	✓	✓	✓			
Diagnostic Biochemistry	✓	✓	✓	✓	✓	✓	✓	
Diagnostic Biochemistry - Practical	✓	✓	✓	✓	✓	✓		
Clinical Endocrinology	✓	✓	✓	✓	✓			
Clinical Endocrinology - Practical	✓	✓	✓	✓	✓			