MANGALORE UNIVERSITY
DEPARTMENT OF BIOSCIENCES

SCHEME and SYLLABUS for TWO YEAR (FOUR SEMESTERS) M.Sc. in BIOSCIENCES POST GRADUATE DEGREE PROGRAM UNDER CHOICE BASED CREDIT SYSTEM (CBCS)

Preamble:

Based on directions of the University Grants Commission, New Delhi and Karnataka State Higher Education Council, the Choice Based Credit System (CBCS Semester Scheme) has been implemented. Mangalore University directed the Board of Studies (BoS) to frame the syllabus as per the regulations governing the Choice Based Credit System for the Two Year (Four Semester) Post-Graduate Programme. Accordingly, a syllabus approved by the BoS wasin place since 2016.

This syllabus has now been revised keeping in mind the recent advancements in the field of Biological Sciences, the knowledge- and skill-based profile expected from a Master's in Biosciences along with fulfilling the requirement for the students' career prospects and was duly approved by the BoS in 2022.

The present M.Sc. in Biosciences Programme under CBCS Scheme has a total of 94 credits with 58 (59.09%) credits from the Hard Core courses, 30 (34.09%) credits from Soft Core coursesand 06 (6.97%) credits from Open Electives.

Programme Outcomes (PO)

PO1. Enhancement of state-of-the-art knowledge: Upgrade knowledge to develop general competencies and analytical skills on an advanced level required for teaching, research, industry, entrepreneurship and public administration in biological sciences.

PO2. Skill-based use of tools and techniques: Independently operate various tools and acquire skills for applying appropriate methods to assess samples and carry out innovative studies on basic or applied aspects of biology.

PO3. Social Responsibility: Apply the knowledge of life sciences to contextually address specific issues in society with special reference to health and the environment for well-being and sustainable development.

PO4. Effective Communication: Effectively communicate diverse aspects of biology through oral presentations, written proposals, dissertations, reports, data analysis, interpretation and documentation.

Programme Specific Outcomes (PSO)

PSO1. Gain basic to advanced level knowledge in various branches of life sciences thus enabling students to build the confidence to pursue careers in academics, and industries and become entrepreneurs in India and abroad.

PSO2. Empower with skill-based expertise and technical know-how in the field of biological sciences.

PSO3. Develop good communication skills with a sound technical background in biological sciences, thus providing a strong foundation for both academic and industrial placements as well as setting up entrepreneurial ventures.

PSO4. Evolve in-depth scientific knowledge in various branches of biology.

PSO5. Explore, analyze and interpret lab- and field-based data using state-of-the-art techniques and tools in planning and executing innovative projects in life sciences.

M.Sc. BIOSCIENCES – SCHEME

I SEMESTER	Hrs/week	Credits
HARD CORE COURSES – THEORY		
BSH401 Biochemistry	4	4
BSH402 Cell Biology	4	4
BSH403 Basic Microbiology	4	4
SOFT CORE COURSES – THEORY (Any ONE to be opted)		
BSS404 Genetics	3	3
BSS405 Biochemical Techniques	3	3
PRACTICAL COURSES		
BSP406 Biochemistry Lab	4	2
BSP407 Cell Biology Lab	4	2
BSP408 Basic Microbiology Lab	4	2
BSP409 Genetics Lab	4	2
BSP410 Biochemical Techniques Lab	4	2
II SEMESTER	**Hrs/week**	**Credits**
HARD CORE COURSES – THEORY		
BSH451 Molecular Biology	4	4
BSH452 Plant and Animal Systematics	4	4
SOFT CORE COURSES – THEORY (Any TWO to be opted)		
BSS453 Applied Microbiology	3	3
BSS454 Aquatic Biology	3	3
BSS455 Metabolism and Bioenergetics	3	3
PRACTICAL COURSES		
BSP456 Molecular Biology Lab	4	2
BSP457 Plant and Animal Systematics Lab	4	2
BSP458 Applied Microbiology Lab	4	2
BSP459 Aquatic Biology Lab	4	2
BSP460 Metabolism and Bioenergetics Lab	4	2
OPEN ELECTIVE COURSES (Any ONE to be opted)		
BSE461 Biodiversity and Conservation	3	3
BSE462 Eco-friendly Practices	3	3
III SEMESTER	**Hrs/week**	**Credits**
HARD CORE COURSES – THEORY		
BSH501 Animal Physiology	4	4
BSH502 Plant Physiology	4	4
SOFT CORE COURSES – THEORY (Any TWO to be opted)		
BSS503 Applied Ecology	3	3
BSS504 Immunology	3	3
BSS505 Ecotoxicology	3	3
PRACTICAL COURSES		
BSP506 Animal Physiology Lab	4	2
BSP507 Plant Physiology Lab	4	2
BSP508 Applied Ecology Lab	4	2
BSP509 Immunology Lab	4	2
BSP510 Ecotoxicology Lab	4	2
OPEN ELECTIVE COURSES (Any ONE to be opted)		
BSE511 Pollution and Bioremediation	3	3
BSE512 Stem Cell Biology and Regenerative Medicine	3	3
BSE513 Behavioural biology	3	3
IV SEMESTER	**Hrs/week**	**Credits**
HARD CORE COURSES – THEORY		
BSH551 Biotechnology	4	4
BSH552 Biostatistics and Bioinformatics		
SOFT CORE COURSES – THEORY (Any ONE to be opted)		
BSS552 Environmental Physiology	3	3
BSS553 Developmental Biology	3	3
BSS554 Nutritional Biology		
PRACTICAL COURSES		
BSP555 Biotechnology Lab	4	2
BSP556 Environmental Physiology Lab	4	2
BSP557 Developmental Biology Lab	4	2
BSP558 Nutritional Biology Lab	4	2
BSP 559 Biostatistics and Bioinformatics Lab	4	2
PROJECT WORK		
BSP560 Project Work (Report/Dissertation and Viva-Voce/Presentation	4	4

M.Sc. BIOSCIENCES (CBCS) – SCHEME

I SEMESTER

Code	Title	Teaching Hrs/week	Exam Hrs	Marks Exams	Marks IA	Total Marks	Credits
HARD CORE COURSES – THEORY							
BSH 401	Biochemistry	4	3	70	30	100	4
BSH 402	Cell Biology	4	3	70	30	100	4
BSH 403	Basic Microbiology	4	3	70	30	100	4
SOFT CORE COURSES – THEORY (Any ONE to be opted)							
BSS 404	Genetics	3	3	70	30	100	3
BSS 405	Biochemical Techniques	3	3	70	30		
PRACTICAL COURSES							
BSP 406	Biochemistry Lab	4	3	35	15	50	2
BSP 407	Cell BiologyLab	4	3	35	15	50	2
BSP 408	Basic MicrobiologyLab	4	3	35	15	50	2
BSP 409	Genetics Lab	4	3	35	15	50	2
BSP 410	BiochemicalTechniques Lab	4	3	35	15		
			Total			**600**	**23**

II SEMESTER

Code	Title	Teaching Hrs/week	Exam Hrs	Marks Exams	Marks IA	Total Marks	Credits
HARD CORE COURSES – THEORY							
BSH 451	Molecular Biology	4	3	70	30	100	4
BSH 452	Plant & Animal Systematics	4	3	70	30	100	4
SOFT CORE COURSES – THEORY (Any TWO to be opted)							
BSS 453	Applied Microbiology	3	3	70	30	100	3
BSS 454	Aquatic Biology	3	3	70	30	100	3
BSS 455	Metabolism and Bioenergetics	3	3	70	30		
PRACTICAL COURSES							
BSP 456	Molecular Biology Lab	4	3	35	15	50	2
BSP 457	Plant & Animal Systematics Lab	4	3	35	15	50	2
BSP 458	Applied Microbiology Lab	4	3	35	15	50	2
BSP 459	Aquatic Biology Lab	4	3	35	15	50	2
BSP 460	Metabolism and Bioenergetics Lab	4	3	35	15		
OPEN ELECTIVE COURSES (Any ONE to be opted)							
BSE 461	Biodiversity and Conservation	3	3	70	30	100	3
BSE 462	Eco-friendly Practices	3	3	70	30		
			Total			**700**	**25**

III SEMESTER

Code	Title	Teaching Hrs/week	Exam Hrs	Marks Exams	MarksIA	Total Marks	Credits
HARD CORE COURSES – THEORY							
BSH 501	Animal Physiology	4	3	70	30	100	4
BSH 502	Plant Physiology	4	3	70	30	100	4
SOFT CORE COURSES – THEORY (Any TWO to be opted)							
BSS 503	Applied Ecology	3	3	70	30	100	3
BSS 504	Immunology	3	3	70	30	100	3
BSS 505	Ecotoxicology	3	3	70	30		
PRACTICAL COURSES							
BSP 506	Animal Physiology Lab	4	3	35	15	50	2
BSP 507	Plant Physiology Lab	4	3	35	15	50	2
BSP 508	Applied Ecology Lab	4	3	35	15	50	2
BSP 509	Immunology Lab	4	3	35	15	50	2
BSP 510	Ecotoxicology Lab	4	3	35	15		
OPEN ELECTIVE COURSES (Any ONE to be opted)							
BSE 511	Pollution and Bioremediation	3	3	70	30		
BSE 512	Stem Cell Biology and Regenerative Medicine	3	3	70	30	100	3
BSE 513	Behavioural Biology	3	3	70	30		
			Total			**700**	**25**

IV SEMESTER

Code	Title	Teaching Hrs/week	Exam Hrs	Marks Exams	Marks IA	Total Marks	Credits
HARD CORE COURSES – THEORY							
BSH 551	Biotechnology	4	3	70	30	100	4
BSH 552	Biostatistics and Bioinformatics	4	3	70	30	100	4
SOFT CORE COURSES – THEORY (Any ONE to be opted)							
BSS 552	Environmental Physiology	3	3	70	30	100	3
BSS 553	Developmental Biology	3	3	70	30		
BSS 554	Nutritional Biology						
PRACTICAL COURSES							
BSP 555	Biotechnology Lab	4	3	35	15	50	2
BSP 559	Biostatistics and Bioinformatics Lab	4	3	35	15	50	2
BSP 556	Environmental Physiology Lab	4	3	35	15	50	2
BSP 557	Developmental Biology Lab	4	3	35	15		
BSP 558	Nutritional Biology Lab	4	3	35	15		
PROJECT WORK							
BSP 560	Project Work (Report/Dissertation & Presentation/Viva-voce)	4 (Guidance)	-	70	30	100	4
			Total			**550**	**21**
			Grand Total			**2,950**	**82 + 6***

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NOTE:

BASIS FOR INTERNAL ASSESSMENT: Internal Assessment marks in theory papers shall be awarded on the basis of theory tests (70 Marks), Objective tests (15 Marks), Seminars, and Assignments (15 Marks). The marks obtained shall be reduced to 30. Practical Internal Assessment marks shall be based on practical tests and records. 30 marks for Practical Test and 05 marks for Class Records. The marks obtained shall be reduced to 15. 30 marks for Project Work (Report/Dissertation and Presentation/Viva).

THEORY QUESTION PAPER PATTERN: Question Papers in all four semesters consist of three sections (The model question paper is enclosed). Part -A: Write short notes on any eight out of 10: (8x2=16 Marks). Part - B: Answer any five questions out of 7 (5x6=30 Marks). Part - C: Answer any three questions out of 5: (3x8=24 Marks). Questions are tobe framed from all the units of the syllabus by giving equal weightage.

PRACTICAL QUESTION PAPER PATTERN: 30 marks for practical exam proper (Major experiment - 10 marks, Minor experiments - 5x2=10 marks, Identity and Comment - 5x2=10 marks) and 05 marks for Class Record.

PROJECT WORK to be conducted either in the Department or any other Institution or in an Industry under the supervision of a teaching faculty. Evaluation is based on Project Report/Dissertation and Presentation/Viva carry, which carry 70 marks.