

Undergraduate Programme (Multidisciplinary)

B.Sc. (Hons.) Life Sciences

[Certificate, Diploma, B.Sc. Degree, and B.Sc. (Hons.) Degree]

at



Faculty of Basic Sciences, SKUAST, Jammu

w.e.f. academic session 2026–27

**Under Learning Outcome Based Curriculum Framework-Choice
Based Credit System (LOCF-CBCS)**

aligned with

**NEP 2020 and in accordance with Curriculum and Credit
Framework of Undergraduate Programme of UGC and option to
Design Your Degree (DYD)**



1. INTRODUCTION

1.1 Background and Vision

India's National Education Policy 2020 has ushered in a transformative paradigm in higher education, advocating multidisciplinary learning, curricular flexibility, and the holistic development of learners. In alignment with these progressive principles, this proposal seeks to introduce a four-year undergraduate programme in the Faculty of Basic Sciences at Sher-e-Kashmir University of Agricultural Sciences and Technology of Jammu.

The proposed programme is designed to cultivate graduates with strong domain expertise in Life Sciences, complemented by the ability to integrate knowledge across disciplines. Emphasising research orientation, critical thinking, innovation, and ethical responsibility, the programme aims to equip students with the competencies required to excel in both professional careers and higher academic pursuits in an increasingly dynamic and interdisciplinary global landscape.

1.2 Rationale of the Programme

Higher education in India is undergoing a significant transformation, moving away from traditional, rigid pedagogies toward more dynamic, learner-centric approaches that address the demands of the 21st century. In this context, the proposed programme has been conceptualized with the following objectives:

- **Fostering Holistic Development:** By integrating core disciplinary courses with interdisciplinary components, the programme offers students a comprehensive learning experience that spans science and technology, as well as relevant aspects of humanities and social sciences. This approach promotes intellectual breadth, adaptability, and well-rounded personality development.
- **Enhancing Employability:** With a strong focus on skill development, digital literacy, experiential learning, and structured internship opportunities, the programme is designed to equip graduates with competencies aligned to evolving industry and research needs, thereby improving their career readiness.
- **Alignment with National Frameworks:** The programme is carefully structured in accordance with the principles of National Education Policy 2020 and the University Grants Commission's Curriculum and Credit Framework for Undergraduate Programmes, ensuring academic rigor, flexibility, and administrative coherence.

The introduction of the Life Sciences stream reflects the Faculty's commitment to academic excellence and responsiveness to emerging student interests and societal needs. The programme will focus on key disciplines such as Biochemistry, Microbiology, and Botany, enabling in-depth domain knowledge while fostering interdisciplinary linkages. This integrated approach not only caters to diverse academic aspirations but also promotes synergy across biological sciences, preparing students for careers in research, industry, and higher education.



2. PROGRAMME OBJECTIVES AND NOMENCLATURE

2.1 Educational Goals

The primary educational objectives of the proposed programme are to:

- Impart a comprehensive and in-depth understanding of the fundamental principles underpinning the Life Sciences, ensuring clarity of concepts and their applications.
- Cultivate critical thinking, quantitative reasoning, and problem-solving skills through rigorous academic training, practical exposure, and research-oriented learning.
- Familiarise students with contemporary advancements, emerging technologies, and interdisciplinary approaches through advanced coursework, laboratory training, and research opportunities.
- Instil a spirit of continuous learning, intellectual curiosity, scientific temper, and a strong sense of ethical and professional responsibility.

2.2 Skill Development and Holistic Growth

Beyond academic excellence, the programme seeks to:

- Develop effective oral and written communication, along with teamwork and leadership abilities, through group projects, seminars, presentations, and interactive learning platforms.
- Equip students with proficiency in modern software, data analysis tools, and emerging digital technologies essential for scientific inquiry and professional advancement.
- Encourage active participation in outreach and extension activities, fostering empathy, civic sense, and a commitment to societal well-being.
- Nurture innovative thinking by exposing students to multidisciplinary perspectives, experiential learning, and problem-based approaches that address real-world challenges.

2.3 The Nomenclature of the Certificate/Diploma/Degree will be as under:

- UG Certificate in Life Sciences
- UG Diploma in Life Sciences
- B.Sc. Life Sciences
- B.Sc. (Hons.) Life Sciences

3. OVERVIEW OF THE PROPOSED PROGRAMME

3.1 Programme Title: B.Sc. (Hons.) Life Sciences

The proposed **B.Sc. (Hons.) Life Sciences** is a four-year undergraduate programme structured in accordance with the principles of the National Education Policy 2020. The programme follows a semester-based system under the Choice-Based Credit System (CBCS), offering flexibility in



curriculum design and progression. In line with NEP provisions, it incorporates multiple entry and exit options, enabling students to earn appropriate certifications such as a certificate, diploma, or degree based on the duration of study completed.

The programme offers a major stream in **Life Sciences**, with a strong emphasis on the core disciplines of Biochemistry, Microbiology, and Botany. It is designed to provide a comprehensive understanding of living systems, ranging from molecular and cellular processes to organismal and ecological interactions. Through an integrated and interdisciplinary approach, the programme equips students with both theoretical knowledge and practical skills essential for careers in research, industry, and higher education.

3.2 Eligibility Criteria:

Candidates must have passed the 10+2 (or equivalent) examination with Physics, Chemistry, and Biology (PCB/PCBM) or Agriculture as core subjects from a recognized board or examining body, with English as a compulsory subject. Candidate must have scored 50% marks in aggregate for Open Merit (OM), NRI/OCI, and Self-Financing (All India Basis) categories, and 40% marks for reserved categories.

Note: Eligibility conditions are subject to change according to the implementation of the National Curriculum Framework (NCF) for school education or in accordance with any such guidelines issued by the Central/State Government or issued by the University from time to time.

3.3 No. of seats in UG Programme

The B.Sc. (Hons.) Life Sciences programme shall be introduced with an initial intake capacity of twenty-five (25) seats. The distribution of seats (seat matrix) is as follows:

Free (Normal) seats :	11
➤ Open Merit:	05
➤ Reserved categories:	06
Self-Financing:	14
➤ Self-Financing (UT of J&K and Ladakh domicile seats):	10
➤ Self-financing payment seats on All India Basis:	04
Total seats:	25

3.4 Programme duration, multiple entry and exit options

The proposed undergraduate programme shall have a duration of **four years (eight semesters)**, structured in accordance with the provisions of the National Education Policy 2020. To ensure flexibility and learner mobility, the programme incorporates multiple entry and exit options. Students may avail a break in their studies; however, the maximum permissible duration for completion of the programme shall not exceed **seven (07) years**.



In alignment with the provisions of the National Education Policy 2020, the undergraduate programme shall provide structured multiple entry and exit options as detailed below:

- **UG Certificate:** Awarded upon successful completion of the first academic year with a minimum of 52 credits, including a 4-credit internship of 4-6 weeks as per the programme structure (Table 1).
- **UG Diploma:** Awarded upon successful completion of two academic years with a minimum of 98 credits, including a 4-credit internship of 4-6 weeks, ensuring foundational and vocational competency in the discipline (Table 2).
- **Bachelor's Degree (Discipline):** Awarded upon successful completion of three academic years with a minimum of 136 credits, including at least 66 credits in the concerned discipline and a 4-credit internship of 4-6 weeks as per the prescribed scheme (Table 1 & 2).
- **Bachelor's Degree (Honours):** Awarded upon successful completion of four academic years with a minimum of 176 credits, including discipline-specific credits and a 4-credit internship of 4-6 weeks, as per the programme structure. Students must have completed three years of study in the discipline with at least 66 credits and 65% marks (or 6.5 OGPA)
- to be eligible for progression to the Honours year. Choice of Major subject in 7th Semester onward is at the discretion of the student (on merit basis), with a maximum of 10 students shall be permitted in either major, subject to change with change in the number of seats in the programme. Additionally, students are required to earn 8 extra credits through MOOCs/SWAYAM or other approved online platforms, along with 2 non-credit requirements as specified in the curriculum (Table 2).
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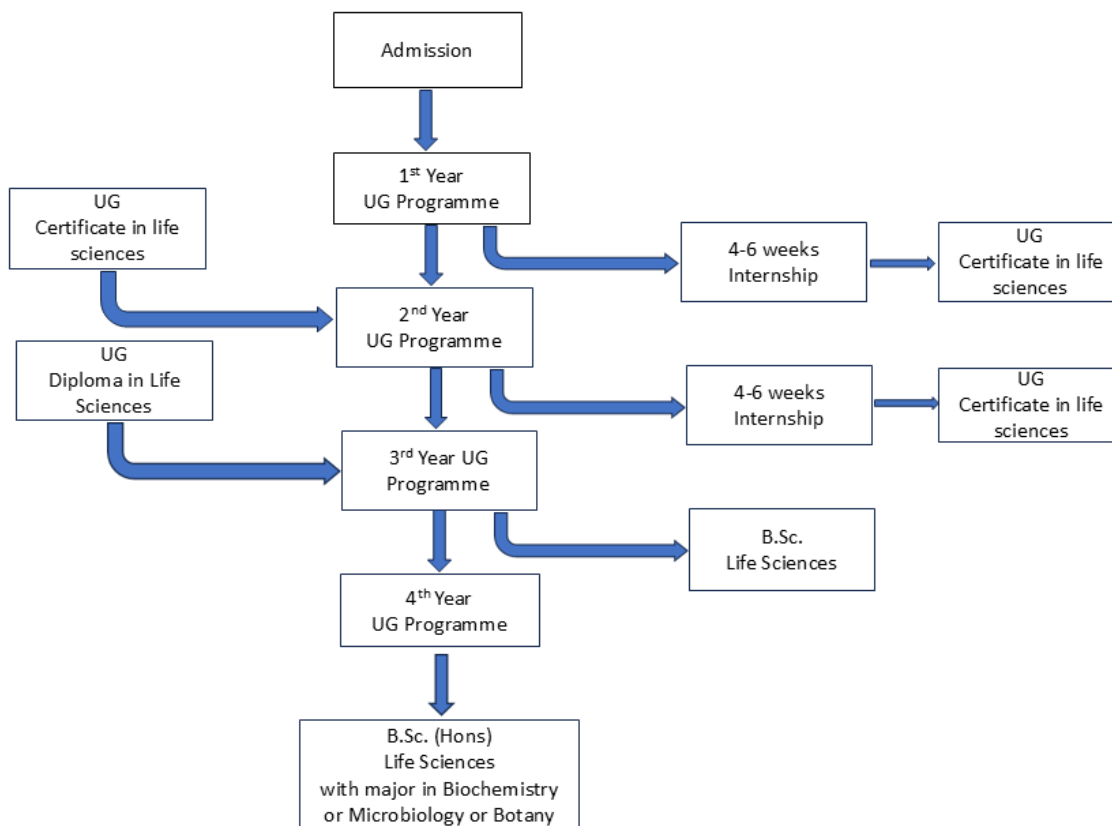


Fig. 1. Entry and exit options for the UG Programme in B.Sc. (Hons.) Life Sciences.

3.5 Streams and Specializations

To accommodate diverse academic interests and emerging career pathways, the programme is structured around a **Life Sciences Stream**.

- Within this stream, students will engage in three core major disciplines, namely **Biochemistry, Microbiology, and Botany**, which form the foundational pillars of the programme. In addition to the major subjects, students will have the flexibility to choose **minor courses** that complement and broaden their academic exposure. These may include **Zoology, Plant Physiology, Biotechnology, Statistics and Chemistry**, among other relevant areas.
- This integrated and flexible academic structure is designed to promote a holistic understanding of biological sciences, encourage interdisciplinary learning, and enable students to make informed and diverse career choices in academia, research, and industry.

3.6 Credit Structure and Curriculum Framework

The programme shall be implemented under the **Choice-Based Credit System (CBCS)** in accordance with the provisions of the National Education Policy 2020 and the relevant guidelines of the University Grants Commission. The curriculum is designed to ensure academic flexibility, interdisciplinary learning, and outcome-based education.

The total credit requirement is **136 credits for the three-year degree programme** and **176 credits for the four-year Honours programme**, distributed systematically across semesters to



ensure balanced academic progression and adequate exposure to theoretical, practical, and experiential learning components, as detailed in **Table 1**.

Table 1: Credit Point Table for 4-Year UG Programme (Multidisciplinary) – Semester System

Sr No	Broad Category of Course	Minimum credit requirement			Credits Earned after			
		3-Year Program me as per UGC guidelines	4-Year (Hons.) Program me as per UGC guideline	4-Year (Hons.) Program me as per ICAR 6th Deans Committe e Report	1-Year	2-Year	3- Yea r	4-Year (Honours)
1	Major/Core Subjects	60	80	102 (Major + Minor)	18	42	66	90
2	Minor Subjects	24	32		8	16	28	32
3	Multidisciplina ry Courses (MDC)	09	09	09	6	11	11	11
4	Ability Enhancement Courses (AEC)	08	08	08	6	10	10	10
5	Skill Enhancement Courses (SEC)	09	09	12	4	9	9	9
6	Value Added Courses (VAC)	06-08	06-08	06	6	6	6	6
7	Internship	02-04	02-04	4	4*	4*	4*	4
8	Research Project/RAWE etc.	-	12	20	-	-	-	12
9	Educational tour			02	0	0	02	02
9	Non-Gradial			02	02	02	02	02
10	MOOC/ SWAYAM			08	02	04	06	08
Total		120	160		52+2N C	98+2N C	136	176+2NC +8 MOOC

Note: Internship credits (marked as *) are added in case of Exit from the Programme.



The detailed breakdown of courses offered each semester, along with their corresponding credit allocations and available exit pathways for students, has been systematically organized and outlined in Table 2 for Life Sciences stream.

Table 2: B.Sc. (Hons.) Life Sciences, 4-year Programme

**Semester-wise Course Structure
Undergraduate Programme in Life Sciences**

Course Type	Course Code/No.	Course Title	Credit Hours	Total Credit Hours
First Year				
Semester I				
Foundation Course	DRM-111	Deeksharambh (Annexure G*)	2(0+2) NC*	24+2 NC* Credits
Major/Core Courses	BICM-111	Elementary Biochemistry	3(2+1)	
	MICR-111	Introduction to Microbiology	3(2+1)	
	BOT-111	Diversity of Microbes, Algae, Fungi and Archegoniates	3(2+1)	
Minor Courses	Chemistry/ Zoology/ Plant Physiology/ Biotechnology/ Statistics	Annexure B*	4 credits	
Multidisciplinary Courses	MDC-111/FRTS-111	Farming-Based Livelihood Systems/ Fundamentals of Horticulture	3(2+1)	
Ability Enhancement Courses	AEC-111	Communication skills	2(1+1)	
	NCC-I/NSS-I	NCC-I/NSS-I	1(0+1)	
Skill Enhancement Courses	SECBS-111/ SECBS-112	Office Software Applications / Skills in Microbiology (Annexure E*)	2(1+1)	24+2 NC* Credits
Value-Added Courses	VAC-111/ VAC-112	Agriculture Informatics and Artificial Intelligence / Human Values and Professional Ethics	3(2+1)/ 3(2+1)	



		(Annexure F*)		
Semester II				
Major/Core Courses	BICM-121	Fundamentals of Molecular Biology	3(2+1)	24 Credits
	MICR-122	Principles of Soil Microbiology	3(2+1)	
	BOT-121	Diversity of Higher Cryptogams & Genetics Theory	3(2+1)	
Minor Courses	Chemistry/ Zoology/ Plant Physiology/ Biotechnology/ Statistics	Annexure B*	4 credits	
Multidisciplinary Courses	MDC-121	Entrepreneurship Development and Business Management	3 (2+1)	
Ability Enhancement Courses	AEC-121	Personality Development	2(1+1)	
	NCC-II/NSS-II	NCC-II/NSS-II	1(0+1)	
Skill Enhancement Courses	SECBS-121/ SECBS-122	Biofertilizer Production Technology/ Plant Tissue Culture Methods (Annexure E*)	2(1+1)	
Value-Added Courses	VAC-121/ VAC-122	Environmental Studies and Disaster Management / Gender Sensitization (Annexure F*)	3(2+1)	
EXIT OPTION-I: Internship, INTL-121 (4 credits [#]) of 4-6 weeks duration after 2 nd semester, if exit Undergraduate Certificate in Discipline with 52 (48+4 [#] +2NC) credits				
Second Year				
Semester III				
Major/Core Courses	BICM-211	Basic Enzymology	4(3+1)	
	MICR-211	Techniques in Microbiology	4(3+1)	
	BOT-211	Diversity of Seed Plants: Gymnosperms & Angiosperms	4(3+1)	
Minor Courses		Chemistry/ Zoology/ Plant	Annexure B*	



	Physiology/ Biotechnology/ Statistics			23 Credits
Multidisciplinary Courses	GPBR-211	Principles of Genetics	3(2+1)	
Ability Enhancement Courses	AEC-211	Physical education, first aid, yoga practices and meditation	2(0+2)	
Skill Enhancement Courses	SECDM-211/ SECBS-212	Disaster Risk Reduction and Management: Skills for Safety and Resilience/ Hydroponics Technology (Annexure E*)	2(1+1)/ 2(1+1)	
Semester IV				
Major/Core Courses	BICM-222	Intermediary Metabolism-I	4(4+0)	23 Credits
	MICR-222	Microbial Physiology & Metabolism	4(3+1)	
	BOT-221	Plant Anatomy & Embryology	4(3+1)	
Minor Courses	Chemistry/ Zoology/ Plant Physiology/ Biotechnology/ Statistics	Annexure B*	4 credits	
Multidisciplinary courses	BIOT-324	IPR, Biosafety and Bioethics (Annexure C*)	2(2+0)	
Ability Enhancement Courses	AEC-221 / AEC-222	Technical writing / Digital empowerment (Annexure D*)	2(1+1)/ 2(1+1)	
Skill Enhancement Courses	SECBS-221	Basic Laboratory Skills in Biochemistry (Annexure E*)	3(1+2)	
EXIT OPTION-II: Internship, INTL-221 (4 credits) of 4-6 weeks duration after 4 th semester, if exit Undergraduate Diploma in Life Sciences with 98 credits (94+4 [#] +2NC) credits Educational Tour [SEM IV-V break] [Credits 2 (0+2)] (10-15 days duration)				
Third Year				
Semester V				
Major/Core Courses	BICM-313	Intermediary Metabolism-II	4+0	
	MICR-312	Virology	4(3+1)	



	BOT-311	Plant Physiology, Metabolism & Ecology	4(3+1)	20 Credits
Minor Courses	Chemistry/ Zoology/ Plant Physiology/ Biotechnology/ Statistics	Annexure B*	4 credits	
	Chemistry/ Zoology/ Plant Physiology/ Biotechnology/ Statistics	Annexure B*	4 credits	
Semester VI				
Major/Core Courses	BICM-324	Plant Biochemistry	4(3+1)	20 Credits
	MICR-321	Bacteriology	4(3+1)	
	BOT-321	Plant Biotechnology and Economic Botany	4(3+1)	
Minor Courses	Chemistry/ Zoology/ Plant Physiology/ Biotechnology/ Statistics	Annexure B*	4 credits	
Internship	INTL-321	Internship (4-6 weeks)	4(0+4)	
EXIT OPTION-III: B.Sc. Life Sciences with 136 Credits (134+2 Educational Tour credits)				
Fourth Year				
Semester VII				
Major/Core Courses				
Biochemistry	BICM-411	Animal Biochemistry	4(4+0)	
	BICM-412	Fundamentals of Nutritional Biochemistry	4(3+1)	
	BICM-413	Techniques in Biochemistry	4(2+2)	
	BICM-414	Research Project	4(0+4)	
OR	MICR-411	Mycology	4(3+1)	
	MICR-412	Industrial Microbiology	4(3+1)	
	MICR-413	Biofertilizers and Biopesticides	4(2+2)	
	MICR-414	Research Project	4(0+4)	



Botany	BOT-411	Reproduction in Higher Plants	4(3+1)	20 Credits
OR	BOT-412	Plant Taxonomy and Ecology	4(3+1)	
	BOT-413	Modern Plant Systematics	4(3+1)	
	BOT-414	Research Project	4(0+4)	
Minor Courses	Chemistry/ Zoology/ Plant Physiology/ Biotechnology/ Statistics	Annexure B*	4 credits	
VIII Semester				
Major/Core Courses				
Biochemistry	BICM-421	Clinical Biochemistry	4(3+1)	20 Credits
	BICM-422	Immunology	4(4+0)	
	BICM-423	Industrial and Environmental Biochemistry	4(3+1)	
OR	BICM-424	Research Project	8(0+8)	
Microbiology	MICR-421	Food and Dairy Microbiology	4(3+1)	
	MICR-422	Environmental Microbiology	4(3+1)	
	MICR-423	Artificial Intelligence in Microbiology	4(3+1)	
OR	MICR-424	Research Project	8(0+8)	
Botany	BOT-421	Natural Plant Products	4(3+1)	
	BOT-422	Natural Resources & Biodiversity	4(3+1)	
	BOT-423	Ethnobotany & Economic Botany	4(3+1)	
OR	BOT-424	Research Project	8(0+8)	
		Total Credits	176 credits + 2NC*+ 8 MOOCS [#]	

[#]Registration to MOOCs courses (8 credits) is at the discretion of students at any time during the degree programme. However, the Dean concerned shall identify the list of such online courses and inform students of registration under either of these, with a record on their Academic Bank of Credits

- ✓ **Annexure A*: Major Core Courses-** Students will study core courses of Biochemistry, Microbiology, and Botany as core courses from Semester I-VI with an option to select either one of these during Semester VII & VIII as Major subjects (**Page No. 14-15**)



- ✓ **Annexure B*: Minor Courses-** Students will have the option to study courses of their choice from the list of given courses of Chemistry, Zoology, Plant Physiology, Statistics, and Biotechnology, with a minimum of 12 credits mandatory from any one of these as minor subjects (**Page No. 15-16**)
- ✓ **Annexure C*: Multidisciplinary Courses-** Students may study MDC courses from the list (**Page No. 16**)
- ✓ **Annexure D*: AEC-** Students may study AEC courses from the list (**Page No. 17**)
- ✓ **Annexure E*: Skill Enhancement Courses-** Students may study SEC course from list (**Page No. 17**)
- ✓ **Annexure F*: Value-Added Courses-** Students may study VAC course from the list (**Page No. 17**)
- ✓ **Annexure G*: Foundation course (Compulsory, Page No. 17)**



LIST OF COURSES
(Detailed syllabus attached as ANNEXURE)

ANNEXURE A*: Major Courses

Course Code	Course Title	Credit Hours	Semester
BIOCHEMISTRY			
BICM-111	Elementary Biochemistry	3 (2+1)	I
BICM-121	Fundamentals of Molecular Biology	3 (2+1)	II
BICM-211	Basic Enzymology	4 (3+1)	III
BICM-222	Intermediary Metabolism-I	4 (4+0)	IV
BICM-313	Intermediary Metabolism-II	4 (3+1)	V
BICM-324	Plant Biochemistry	4 (3+1)	VI
BICM-411	Animal Biochemistry	4 (4+0)	VII
BICM-412	Fundamentals of Nutritional Biochemistry	4 (3+1)	VII
BICM-413	Techniques in Biochemistry	4(2+2)	VII
BICM-414	Research Project	4(0+4)	VII
BICM-421	Clinical Biochemistry	4(3+1)	VIII
BICM-422	Immunology	4(4+0)	VIII
BICM-423	Industrial and Environmental Biochemistry	4(3+1)	VIII
BICM-424	Research Project	8(0+8)	VIII
BOTANY			
BOT-111	Diversity of Microbes, Algae, Fungi and Archegoniates	3(2+1)	I
BOT-121	Diversity of Higher Cryptogams & Genetics Theory	3(2+1)	II
BOT-211	Diversity of Seed Plants: Gymnosperms & Angiosperms	4(3+1)	III
BOT-221	Plant Anatomy & Embryology	4(3+1)	IV
BOT-311	Plant Physiology Metabolism & Ecology	4(3+1)	V
BOT-321	Plant Biotechnology & Economic Botany	4(3+1)	VI
BOT-411	Reproduction in Higher Plants	4(3+1)	VII
BOT-412	Plant Taxonomy and Ecology	4(3+1)	VII
BOT-413	Modern Plant Systematics	4(3+1)	VII
BOT-414	Research Project	4(0+4)	VII
BOT-421	Natural Plant Products	4(3+1)	VIII
BOT-422	Natural Resources & Biodiversity	4(3+1)	VIII
BOT-423	Ethanobotany & Economic Botany	4(3+1)	VIII
BOT-424	Research Project	8(0+8)	VIII
MICROBIOLOGY			
MICR-111	Introduction to Microbiology	3 (2+1)	I
MICR-122	Principles of Soil Microbiology	3 (2+1)	II
MICR-211	Techniques in Microbiology	4 (3+1)	III



MICR-222	Microbial Physiology & Metabolism	4 (3+1)	IV
MICR-312	Virology	4 (3+1)	V
MICR-321	Bacteriology	4 (3+1)	VI
MICR-411	Mycology	4 (3+1)	VII
MICR-412	Industrial Microbiology	4 (3+1)	VII
MICR-413	Biofertilizers and Biopesticides	4 (2+2)	VII
MICR-414	Research Project	4 (0+4)	VII
MICR-421	Food and Dairy Microbiology	4 (3+1)	VIII
MICR-422	Environmental Microbiology	4 (3+1)	VIII
MICR-423	Artificial Intelligence in Microbiology	4 (3+1)	VIII
MICR-424	Research Project	4 (0+8)	VIII

Annexure B*: Minor Courses

Course Code/No.	Course Title	Credit Hours	Semester
CHEMISTRY			
CHEM-111	Chemistry-I	4(3+1)	I
CHEM-121	Chemistry-II	4(3+1)	II
CHEM-211	Chemistry-III	4(3+1)	III
CHEM-221	Chemistry-IV	4(3+1)	IV
CHEM-311	Chemistry-V	4(3+1)	V
CHEM-321	Chemistry-VI	4(3+1)	VI
CHEM-322/ CHEM -323/ CHEM -324	Physical Chemistry-1/ Organic Chemistry-1/ Inorganic Chemistry-1	4(4+0)	VI
CHEM-411/ CHEM-412/ CHEM-413	Physical Chemistry-2/ Organic Chemistry-2/ Inorganic Chemistry-2	4(4+0)	VII
ZOOLOGY			
ZOO-111	Diversity of Non-Chordates	4(3+1)	I
ZOO-121	Diversity of Chordates	4(3+1)	II
ZOO-211	Cell Biology and Animal Genetics	4(3+1)	III
ZOO-221	Animal Physiology and Biochemistry	4(3+1)	IV
ZOO-311	Ecology and Environment	4(3+1)	V
ZOO-321	Developmental Biology and Evolution	4(3+1)	VI
ZOO-322	Comparative Anatomy of vertebrates	4(3+1)	VI
ZOO-411	Principles of Animal Taxonomy and Systematics	4(3+1)	VII
PLANT PHYSIOLOGY			
PPHY-111	Fundamentals of Plant Physiology	4(4+0)	I
PPHY-122	Plant hormones and Growth Regulation	4(4+0)	II
PPHY-213	Plant Water Relations	4(3+1)	III
PPHY-221	Mineral Nutrition and Nutrient Uptake	4(3+1)	IV
PPHY-313	Photosynthesis and Respiration	4(3+1)	V



PPHY-321	Plant Stress Physiology	4(3+1)	VI
PPHY-322	Techniques in Plant Physiology	4(3+1)	VI
PPHY-411	Plant Phenomics	4(3+1)	VII
BIOTECHNOLOGY			
BIOT-114	Introductory Cell Biology	4(4+0)	I
BIOT-122	Introduction to Biotechnology	4(4+0)	II
BIOT-211	Recombinant DNA Technology	2(2+0)	III
SECB-5	Methods in Recombinant DNA Technology	2(0+2)	III
BINF-221	Introductory Bioinformatics	4(3+1)	IV
BIOT-313	Nanobiotechnology	4(3+1)	V
BIOT-325	Industrial Biotechnology	4(4+0)	VI
BINF-322	Computational Biology	4(3+1)	VI
EMICR-412	Microbial Biotechnology	4(4+0)	VII
STATISTICS			
MATH-113	Mathematics for the beginners	4(4+0)	I
COMP-121	Introduction to Computer Applications	4(3+1)	II
STAT-211	Basic and Applied Statistics for Life Sciences	4(3+1)	III
MATH-221	Biomathematics	4(4+0)	IV
STAT-311	Survival Analysis and Biostatistics	4(2+2)	V
STAT-321	Bioinformatics	4(3+1)	VI
STAT-323	Computational and Advanced Statistics	4(2+2)	VI
STAT-411	Industrial Statistics and Optimization	4(2+2)	VII

ANNEXURE C*: Multidisciplinary Compulsory courses

Course Code	Course Title	Credit Hours	Semester
MDC-111	Farming-Based Livelihood Systems	3(2+1)	I
FRTS-111	Fundamentals of Horticulture	3(2+1)	I
MDC-121	Entrepreneurship Development and Business Management	3 (2+1)	II
GPBR-211	Principles of Genetics	3(2+1)	III
BIOT-324	IPR, Biosafety and Bioethics	2(2+0)	IV

ANNEXURE D*: Ability Enhancement courses

Course Code	Course Title	Credit Hours	Semester
AEC-111	Communication Skills	2(1+1)	I
AEC-121	Personality Development	2(1+1)	II
AEC-211	Physical Education, First Aid and Yoga Practices and Meditation	2(0+2)	III
AEC-221	Technical writing	2(1+1)	IV
AEC-222	Digital empowerment	2(1+1)	IV
NCC-I/NSS-I	NCC-I/NSS-I	1(0+1)	I



NCC-II/NSS-II	NCC-II/NSS-II	1(0+1)	II
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ANNEXURE E* Skill enhancement Elective Courses (SEC)

Course Code	Course Title	Credit Hours	Semester
SECBS-111	Office Software Applications	2(1+1)	I
SECBS-112	Skills in Microbiology	2(1+1)	I
SECBS-121	Biofertilizer Production Technology	2(1+1)	II
SECBS-122	Plant Tissue Culture Methods	2(1+1)	II
SECDM-211	Disaster Risk Reduction and Management: Skills for Safety and Resilience	2(1+1)	III
SECBS-212	Hydroponics Technology	2(1+1)	III
SECBS-221	Basic Laboratory Skills in Biochemistry	3(1+2)	IV

Annexure F*: Value-added Courses

Course Code	Course Title	Credit Hours	Semester
VAC-111	Agriculture Informatics and Artificial Intelligence	3(2+1)	I
VAC-112	Human Values and Professional Ethics	3(2+1)	I
VAC-121	Environmental Studies and Disaster Management	3(2+1)	II
VAC-122	Gender Sensitization	3(2+1)	II

Annexure G*: Foundation Course

Course Code	Course Title	Credit Hours	Semester
DRM-111	Deeksharambh	2 (0+2) NC*	I

Internship [Sem II/IV]: In case of EXIT-I & EXIT-II

Educational Tour [SEM IV-V break] [Credits 2 (0+2)]

MOOC courses 08 credits

Each course within the programme is carefully designed with clearly defined learning outcomes that contribute to both domain-specific knowledge and transferable skills. The inherent flexibility of the Choice-Based Credit System (CBCS) enables students to customise their academic pathways to align with their interests, aptitudes, and career aspirations, thereby fostering a learner-centric and outcome-oriented educational experience.



4. CURRICULUM DESIGN

4.1 Core Components of the Curriculum

The curriculum is built around the following key components:

a) Major/Core Courses:

For the Life Sciences stream, Major courses in Biochemistry, Microbiology, and Botany will be offered with a strong emphasis on experimental techniques, field-based learning, and exposure to contemporary advancements in biological sciences. The curriculum is designed to build domain-specific knowledge, analytical skills, and research aptitude.

b) Minor Courses:

Students will have the flexibility to opt for Minor courses from disciplines such as Plant Physiology, Biotechnology, Chemistry, Statistics, and Zoology, based on their interests and career goals. These courses are intended to complement the Major discipline, broaden academic perspectives, and enhance employability by incorporating applied and skill-oriented components.

c) Multidisciplinary Courses (MDCs):

To promote interdisciplinary learning, students will be required to undertake introductory courses from disciplines outside their primary stream. These may include allied sciences, computer applications, and environmental studies, thereby fostering a holistic and well-rounded educational experience.

d) Ability Enhancement Courses (AEC) and Skill Enhancement Courses (SEC):

These courses are designed to strengthen language proficiency, communication skills, digital literacy, and overall personality development. Components such as NCC/NSS, Physical Education, and Yoga are also integrated, in alignment with the NEP-2020 vision of holistic and value-based education.

e) Value Added Courses (VAC):

These encompass areas such as ethics, environmental sustainability, Human Values, health and wellness, and digital competencies. These courses aim to inculcate social responsibility, ethical values, and a commitment to sustainable development.

f) Internship and Field Work:

A mandatory internship of 4-6 weeks will be undertaken during the summer break after the second or fourth semester. This experiential component will provide practical exposure to industry and research environments, thereby bridging the gap between academic learning and real-world applications. Detailed guidelines, including defined objectives, reporting requirements, and evaluation criteria, will be prescribed to ensure quality and consistency.

g) Foundation Course

A Foundation Course (Deeksharambh, 2 credits, non-graded) will be offered at the commencement of the programme to orient students to the academic environment, institutional values, and learning expectations, in line with other undergraduate programmes at SKUAST-Jammu.

h) MOOC Courses

Students shall be required to register for and successfully complete a minimum of 08 credits through MOOC courses of their choice. Registration for these MOOC courses may be undertaken at any stage during the degree programme, at the discretion of the student. However, the Dean shall notify an approved list of eligible online courses and guide students regarding registration. All such credits earned shall be duly recorded in the students' Academic Bank of Credits (ABC).



4.2 Integration of Multidisciplinary Learning

The curriculum is designed to break disciplinary silos and promote meaningful cross-disciplinary integration:

- **Multidisciplinary Electives:** Students will have the opportunity to opt for electives beyond their Major and Minor disciplines, enabling them to broaden their knowledge base and develop interdisciplinary competencies.
- **Collaborative Academic Engagements:** Regular seminars, workshops, and interdisciplinary projects will be organized to reinforce the application of knowledge across domains and to cultivate a holistic, problem-solving approach.

5. PEDAGOGICAL APPROACH AND TEACHING METHODOLOGIES

5.1 Learning Outcome Based Curriculum (LOCF) and Choice Based Credit System (CBCS)

The programme is designed within a Learning Outcome-Based Curriculum Framework (LOCF), wherein Course Learning Outcomes (CLOs) are systematically aligned with Programme Learning Outcomes (PLOs). This alignment ensures constructive coherence across courses, so that each component meaningfully contributes to the attainment of defined knowledge, skills, and competencies expected at the time of graduation. The Choice-Based Credit System (CBCS) provides academic flexibility by enabling students to select elective courses based on their interests, aptitude, and career aspirations. This approach supports a learner-centric, multidisciplinary, and holistic academic experience, ensuring both depth and breadth in learning.

5.2 Interactive and Student-Centric Learning

To move beyond conventional, teacher-centric approaches, the programme will adopt the following learner-focused strategies:

- **Lectures and Interactive Sessions:** Teaching will be delivered through interactive lectures supplemented with periodic question-answer sessions, formative assessments, and digital tools to enhance student engagement and participation.
- **Tutorials and Small Group Discussions:** These sessions will emphasize problem-solving, analytical reasoning, and conceptual clarity. The use of case studies, real-life examples, and peer discussions will foster critical thinking and collaborative learning.
- **Laboratory and Practicum Sessions:** Hands-on training in well-equipped laboratories will provide experiential learning in experimentation, data analysis, and interpretation. Each practical module will be carefully designed to bridge theoretical concepts with real-world applications.
- **Seminars and Workshops:** Regular seminars by experts from academia, industry, and research organizations will expose students to contemporary developments and emerging technologies. Periodic workshops focusing on soft skills—such as communication, teamwork, leadership, and problem-solving—will also be organized.
- **Blended Learning:** A blended teaching-learning approach integrating face-to-face instruction with digital platforms will be adopted to ensure flexibility and inclusivity. Online platforms such as SWAYAM and other e-learning resources will be utilized to provide supplementary content, self-paced learning modules, and interactive tutorials.



5.3 Assessment and Evaluation Strategies

- Each student shall be assessed in the prescribed course(s) to facilitate their progression through the programme, as defined in the scheme, syllabus, and specified learning outcomes, through a system of Continuous Comprehensive Assessment (CCA). This will comprise a balanced combination of internal evaluation and end-term (external) examinations.
- **Internal Assessment:** This will comprise quizzes, assignments, class participation, group discussions, and mid-term examinations. The mid-term examination will be conducted as a class test during the designated mid-term week, in accordance with the University academic calendar. The weightage assigned to internal assessment shall be as per the provisions of the RRI-2025 of SKUAST-Jammu. The assessment framework will be systematically structured to evaluate conceptual understanding and provide timely, constructive feedback to students.
- **End-Term Examinations:** These examinations are designed to comprehensively assess both the depth of theoretical understanding and the ability to apply concepts in practical contexts. The mode, conduct, and weightage of end-term examinations shall be governed in accordance with the University academic calendar and the provisions of the RRI-2025 of SKUAST-Jammu for undergraduate programmes.
- **Practical and Laboratory Examinations:** Regular laboratory assessments, field-based evaluations, and practical demonstrations will be conducted to ensure that students effectively translate theoretical knowledge into real-world applications and develop requisite hands-on competencies.
- The examination system and declaration of results for the programme shall be governed by the provisions of the RRI-2025 of SKUAST-Jammu applicable to undergraduate programmes.
- The criteria for promotion to higher semesters, as well as the rules governing re-appear/supplementary examinations, shall be regulated in accordance with the RRI-2025 of SKUAST-Jammu for undergraduate programmes.

5.4 Mentoring and Student Support

- **Peer Learning Groups and Faculty Mentorship:** Structured peer learning groups will be constituted to promote collaborative learning and academic support. Each group will be assigned a faculty mentor to provide continuous academic guidance, monitor progress, and facilitate informed career planning.
- **Counselling and Remedial Programs:** A dedicated Counselling and Placement Cell of the University provides professional support to students facing academic or personal challenges. In addition, remedial classes and supplementary tutorials will be organized for students requiring additional academic assistance.



6. INFRASTRUCTURE AND FACULTY: EXISTING STATUS AND REQUIREMENTS

6.1 Infrastructure Development: Initially, the undergraduate programme will be launched utilizing the existing facilities within the Faculty and across the University. These facilities will be progressively expanded and strengthened in a phased manner in the Faculty as the programme evolves.

6.1.1 Laboratory Facilities

- **State-of-the-Art Laboratories:** Excellent laboratory facilities in the disciplines of Biochemistry, Plant Physiology, Microbiology, Statistics and Biotechnology are available within the Faculty and across the University. In the initial phase, support from neighbouring institutions will be leveraged for Botany and Zoology, with dedicated facilities in these disciplines to be developed within the Faculty in due course of time.
- **Safety and Maintenance:** All existing labs adhere to strict safety protocols, and periodic maintenance is ensured to keep equipment in optimal condition.

6.1.2 Library and Digital Resources

- **Extensive Collection:** The Central Library at SKUAST-Jammu is well-equipped with a rich and diverse collection of textbooks, reference books, national and international journals, research publications, theses, and reports covering core disciplines as well as emerging areas of science and technology.
- **Digital Access:** The library provides access to a wide range of e-resources, including international databases, e-journals, e-books, and consortia-based subscriptions (such as CeRA and other national initiatives), ensuring availability of up-to-date scientific literature for teaching, learning, and research.
- **E-Library and Remote Access:** Facilities for digital learning, including computer terminals, high-speed internet, and remote access to subscribed resources, are available to support students and faculty both on-campus and off-campus.
- **Research Support Services:** The library offers services such as literature search assistance, plagiarism checking, reference management support, and access to institutional repositories to facilitate high-quality research output.
- **Reading and Learning Spaces:** Well-furnished reading halls, discussion areas, and a conducive academic environment are available for individual and collaborative learning.

6.1.3 Computer and Digital Labs

- **Modern Computer Facilities:** The computer laboratories equipped with computing systems and internet connectivity to support academic and research activities are available.
- **E-Learning Support:** Basic e-learning support, including digital teaching aids and multimedia resources, is available to facilitate classroom instruction.

6.1.4 Seminar Halls and Collaborative Spaces

- **Multi-Functional Spaces:** Dedicated seminar halls and discussion rooms are available within the Faculty as well as across the University. However, there is a need to further augment these

facilities by developing additional dedicated spaces within the Faculty to effectively support academic discussions, seminars, and interactive learning activities.

- **Collaborative work areas:** The development of dedicated spaces within the Faculty that foster collaborative and interdisciplinary learning will significantly enhance the effectiveness of the teaching–learning process.

6.2 Faculty Recruitment and Development

6.2.1 Faculty Recruitment

- **Qualified Faculty:** Qualified faculty members with substantial teaching and research experience are available within the Faculty and across the University to effectively deliver both discipline-specific and interdisciplinary courses for the initiation of the undergraduate programme. However, in the due course, additional manpower will be required to further strengthen the Faculty and enhance its academic programmes. It is pertinent to mention here that upgradation of faculty of Basic Sciences to Faculty of Basic Sciences and Humanities already stands approved by the Board of Management of the University and notified vide notification no. 7 (Secy.) of 2025 dated 8.4.2025. Furthermore, the postwise requirement of teaching/non-teaching staff in a phased manner already stands submitted to registrar office for onward submission to Finance Department, J&K Govt. through Agriculture Production Department, J&K Govt., for concurrence.

6.2.2 Faculty Development Programs

- **Faculty improvement:** Regular workshops, seminars, and capacity-building programmes will be organized to update faculty on contemporary pedagogical approaches, emerging technologies, and outcome based teaching–learning practices.

6.2.3 Collaborative and Visiting Faculty

- **Guest Lecturers:** Eminent experts from academia, industry, and research organizations will be invited to deliver guest lectures and special sessions, thereby enriching the academic experience with contemporary insights and practical perspectives.
- **Inter-Institutional Collaborations:** Strategic collaborations with reputed national and international institutions will be promoted to facilitate faculty exchange programmes, joint research initiatives, and knowledge-sharing activities, thereby strengthening academic and research outcomes. Scientific staff from relevant disciplines across other faculties and institute within the University will also be inducted as adjunct faculty to provide teaching inputs and research support for the programme.

7. ADMINISTRATIVE AND GOVERNANCE STRUCTURE

7.1 Organizational Structure and Programme Committee

7.1.1 Programme Committee Composition: The Programme Committee comprises key members constituted vide Memorandum no. AUJ/FBSc/25-26/F-2/128-129 dated 23.6.2025 (copy enclosed as Annexure–A). The Dean of the Faculty served as the Chairperson. The Committee includes senior faculty representatives from various divisions of the Faculty of Basic Sciences, along with an external member serving as Professor, Department of Basic Sciences, SKUAST–



Kashmir. Faculty members from the Departments of Botany, Zoology, and Chemistry at GGM Science College, Jammu having substantial experience in curriculum design and research reviewed the course content and provided their inputs through the Principal, GGM Science College, Jammu (Letter No. AUJ/FBSc/25-26/F-02/1138 dated 8.12.2025 enclosed as Annexure–B). In addition, administrative personnel associated with academic affairs were part of the Committee to ensure effective coordination and implementation. The Committee also periodically invited external experts in education and research to review the programme and provide constructive inputs for its continuous improvement.

7.1.2 Roles and Responsibilities of the Programme Committee: The Programme Committee has several key responsibilities. It oversees the development, implementation, and periodic review of the curriculum, ensuring alignment with the guidelines of NEP–2020. The Committee will also be responsible for maintaining quality assurance by regularly monitoring academic standards and student performance through internal audits and structured feedback mechanisms. In addition, it will facilitate effective communication among faculty members, address emerging issues, and coordinate training programmes, workshops, and capacity-building initiatives. The Committee will closely monitor student progress, address grievances, and ensure the availability of robust support systems, including mentoring and counselling services. Furthermore, it will manage the optimal utilization of resources, to ensure the smooth and efficient functioning of the programme.

7.2 Administrative Procedures and Policies

7.2.1 Admission and Registration: Candidates must have passed the 10+2 examination with Physics, Chemistry, and Biology/Mathematics (PCB/PCBM) or Agriculture from a recognized Board/examining body, besides English subject. A minimum of 50% aggregate marks is required for candidates under the Open Merit (OM), NRI/OCI, and Self-financing/Payment Seats (All India Basis) categories, and 40% for candidates belonging to reserved categories, as per University norms. Admissions shall be made through a Common Entrance Test or in accordance with the prevailing admission guidelines of SKUAST-Jammu.

7.2.2 Examination and Evaluation Policies: The examination and evaluation framework will be clearly articulated to ensure fairness, transparency, and consistency. Eligibility criteria, including attendance requirements for appearing in End-Term Examinations, shall be governed in accordance with the provisions of the RRI–2025 of SKUAST-Jammu for undergraduate programmes. The process for internal assessment will be standardized, with clearly defined components, weightages, and evaluation criteria. The schedule, methodology, and weightage of internal assessments, along with end-term examinations, will be communicated to students in advance to ensure clarity and uniformity. Provisions for re-evaluation, rechecking, and remedial measures, including supplementary support for academically underperforming students, shall be implemented as per the RRI–2025 of SKUAST-Jammu.

7.2.3 Student Record Management and Academic Bank of Credits (ABC): Each student will be assigned a digital Academic Bank of Credits (ABC) account, wherein all academic credits and



achievements will be systematically recorded. This mechanism will enable transparent tracking of academic progress and facilitate seamless credit transfer, in line with national guidelines. The Academic Bank of Credits will be updated at the end of each semester by the concerned faculty and administrative authorities, ensuring accuracy, integrity, and real-time availability of academic records.

7.3 External Linkages and Accreditation

7.3.1 Industry and Research Collaborations: The Faculty will establish structured and formalized collaborations with relevant industries, research institutions, and government organizations to enhance experiential learning. These partnerships will facilitate student internships, expert lectures, field exposure, and collaborative research opportunities.

7.3.2 Accreditation: Requisite approvals and accreditations for the undergraduate programme will be obtained from the appropriate regulatory and statutory bodies, ensuring compliance with prescribed academic and quality standards.

8. IMPLEMENTATION TIMELINE AND WORK PLAN

8.1 Phased Implementation Approach

The rollout of the four-year multidisciplinary UG programme will occur in carefully planned phases to ensure smooth execution and quality assurance.

- The planning for the new four-year UG programme is well underway. First, the Programme Committee was constituted which met periodically to finalize the undergraduate curriculum following NEP 2020 and in accordance with UGC guidelines. For admission in the UG programme, the entrance test pattern and fee structure will be as per University norms.
- The programme will be continuously monitored through internal reviews and students' feedback. Regular performance audits and annual external reviews ensure that the curriculum is updated in line with emerging trends and that teaching quality remains high. This ongoing process of monitoring and evaluation allows for continuous improvements throughout the programme.

8.2 Detailed Work Plan and Milestones

A comprehensive work plan has been prepared with clear milestones for each semester:

- In Semester 1 & 2, students will be introduced to fundamental concepts through core, minor and multidisciplinary courses. Students will also be introduced to ability enhancement, skill enhancement and value-added courses.
- In Semesters 3 & 4, the curriculum will expand on major-specific and minor subjects through interactive laboratory sessions that enhance practical understanding. Students will also pursue skill and ability-augmenting courses.
- In Semesters 5 & 6, there will be an increased focus on higher-level courses in order to gain in-depth knowledge in the major and minor courses. The program structure will also



enable the students to gain sufficient skills to meet the industry/society requirements through the internship programme.

- In Semesters 7 & 8, students will study advanced-level courses in major subjects to get a UG degree (Hon.) in the Life Sciences.

9. FINAL IMPLEMENTATION STRATEGIES AND STAKEHOLDER ENGAGEMENT

9.1 Stakeholder Engagement and Communication Plan

- **Internal Stakeholders:** Regular meetings will be organized with faculty, administrative staff, and students to discuss progress, challenges, and suggestions. Workshops and training sessions will be conducted to ensure the smooth adoption of the new curriculum.
- **External Stakeholders:** Collaboration will be established with industry partners, alumni, and research organizations to enhance practical learning and research opportunities. Public seminars and open days will be organized to showcase the programme's offerings and benefits.

9.2 Risk Management and Contingency Planning

- Identification of potential risks related to infrastructure delays, faculty recruitment challenges, or accreditation hurdles.
- Formulation of contingency plans such as alternative online teaching modules, temporary faculty appointments, or phased infrastructure upgrades to ensure continuity of the programme wherever needed.

9.3 Programme Outcome

The programme envisages that students must possess comprehensive knowledge, coherent understanding, and emerging developments associated with the discipline-specific and multidisciplinary areas of study. The graduates would be able to demonstrate the skills that enable them to express thoughts and ideas effectively in writing and communicate with others using appropriate media. The students would be acquainted with advanced and organisational skills to set self-defined goals and targets with timelines for undertaking self-employment initiatives.

9.4 Long-Term Vision and Sustainability

- An innovation centre will be established within the Faculty to support ongoing research projects and collaborative initiatives.
- The curriculum and teaching methodologies will be continuously refined in response to technological advancements and evolving industry standards.
- The programme will be progressively scaled up through the introduction of additional elective courses and interdisciplinary streams in the future.

The proposed four-year multidisciplinary undergraduate programme represents a transformative academic initiative aimed at addressing the evolving demands of contemporary higher education



while aligning with the vision and framework of NEP–2020. By integrating a strong foundation in basic sciences with experiential learning, research exposure, skill development, and industry engagement, the programme is designed to develop graduates who are academically competent, professionally adaptable, innovative, and capable of contributing effectively to both academia and industry.

The proposal is underpinned by systematic planning, a competency-based and outcome-oriented curriculum, well-established infrastructure, and robust quality assurance and monitoring mechanisms. These provisions will enable the Faculty of Basic Sciences, SKUAST-Jammu, to establish a benchmark in multidisciplinary science education. The programme is envisaged to provide a holistic and learner-centric academic environment, thereby contributing significantly to the development of skilled human resources in science and technology at the national level.

10. FEE STRUCTURE (Subject to change by the University)

Fee structure for normal seats (Open Merit & Reserved seats): Semester-wise fee already applicable to normal seats under B.Sc. (Hons.) Agriculture/Horticulture programmes shall also apply to such seats under B.Sc. (Hons.) Life Sciences, subject to any change by the University.

Fee structure for self-financing seats in addition to normal fees (on a semester basis)

- Self-Financing payment seats on All India Basis: Rs. 30,000/-
- Self-Financing (UT of J&K and Ladakh domicile seats): Rs. 20,000/-

Medical & Accidental Insurance, any other fees: As applicable to other undergraduate programmes of the University