



Karmaveer Bhaurao Patil University, Satara
Faculty of Science & Technology
B. Sc. (Bioinformatics)

Programme and Credit Structure as per NEP 2020

{Ref. Government of Maharashtra letter no. एनइपी.२०२२/प्र.क.०९/विशि-इशि का ना दिनांक: १३ मार्च २०२४}
The degree shall be titled as 'Bachelor of Science (Bioinformatics) under the faculty of Science and Technology

B. Sc. Sem. I & II from Academic Year 2024-25

B. Sc. Sem. III & IV from Academic Year 2025-26

B. Sc. Sem. V & VI from Academic Year 2026-27

B. Sc. Sem. VII&VIII from Academic Year 2027-28

Programme Outcomes for B. Sc.

PO. No.	Programme Outcomes After completing B. Sc. Programme the students will be able to.....
PO-1	Provide students with a strong foundation of knowledge in their chosen field of study, including fundamental concepts, theories, and principles.
PO-2	Encourage community engagement and a sense of social responsibility, inspiring students to use their knowledge and skills for the betterment of society.
PO-3	Develop a scientific attitude among the students and to make the students open minded, critical, and curious.
PO-4	Evolve skills in practical work, experiments, and laboratory materials.
PO-5	Equip students with quantitative and analytical skills necessary for data analysis, modelling, and interpretation in their field of study.
PO-6	Enhance students' written and oral communication skills, enabling them to effectively convey scientific concepts, research findings, and ideas to diverse audiences.
PO-7	Equip students with quantitative and analytical skills necessary for data analysis, modelling, and interpretation in their field of study.
PO-8	Develop proficiency in using relevant technology and tools that are essential for their field, including software, laboratory equipment, and data analysis tools.
PO-9	Competent in designing and managing biological databases, ensuring data integrity and accessibility for research purposes.
PO-10	Integrate techniques into biological research, contributing to advancements in fields such as genetics, drug discovery, and disease modelling.
PSO. NO	Programme Specific Outcomes After completing B. Sc. Bioinformatics Programme the students will be able to.....
PSO-1	Discuss related to the different aspects of bioinformatics.
PSO-2	Perform experiments and projects related to bioinformatics.
PSO-3	Provide students with a strong foundation in bioinformatics principles, algorithms, and methodologies, enabling them to understand and address biological challenges using

	computational tools.
PSO-4	Teach students how to design and manage biological databases, ensuring efficient data storage and retrieval for research purposes
PSO-5	Enable students to explore protein structure and function, including the prediction of protein structures, protein-protein interactions, and structural analysis.
PSO-6	Present their research findings in research conglomerations like conferences and in research journals in the form of publications.
PSO-7	Graduates will be proficient in analysing and interpreting biological sequences, including DNA, RNA, and protein sequences, using relevant algorithms and tools.
PSO-8	Ability to predict protein structures, analyse protein-ligand interactions, and model three-dimensional structures using computational methods.
PSO-9	Skilled in mining large biological datasets for patterns, associations, and insights, enabling them to make data-driven discoveries.
PSO-10	Skilled in assessing data quality, implementing data validation procedures, and ensuring the reliability of biological data.

Semester, Credit Framework, NSQF Level and Exit Points

Sr. No.	Semester	Year	Year	Credits	Level	Exit Points & Award
1	Sem. I & II	2024-25	1Year	44	4.5	UG Certificate in Bioinformatics
2	Sem. III & IV	2025-26	2Year	88	5.0	UG Diploma in Bioinformatics
3	Sem. V & VI	2026-27	3Year	132	5.5	B. Sc. in Bioinformatics (UG Three Year Degree)
4	Sem. VII & VIII	2027-28	4Year	176	6.0	B. Sc. in Bioinformatics [Honors/Research] (UG Four Year Degree)

Credit Distribution

Sr. No.	Course	3 Year Degree Programme			4 Year Honors Degree Programme			4 Year Honors with Research Degree Programme		
		Courses (3 Yr)	Credits (3 Yr)	%	Courses (4 Yr)	Credits (4 Yr)	%	Courses (4 Yr)	Credits (4 Yr)	%
1	Major	26	52	39.39	34	80	45.45	32	72	40.91
2	Elective	04	08	6.06	08	16	9.09	08	16	9.09
3	IKS	02	04	3.03	02	04	2.27	02	04	2.27
4	VSC	04	08	6.06	04	08	4.55	04	08	4.55
5	FP	01	02	1.52	01	02	1.14	01	02	1.14
6	OJT	01	04	3.03	02	08	4.55	01	04	2.27
7	RP	00	00	0.00	00	00	00	02	12	6.82
8	SEC	03	06	4.55	03	06	3.41	03	06	3.41
9	CEP	01	02	1.52	01	02	1.14	01	02	1.14
Total (Major) (A)		42	86	65.15	55	126	71.59	54	126	71.59
1	Minor & RM	12	24	18.18	13	28	15.91	13	28	15.91
Total (Minor) (B)		12	24	18.18	12	28	15.91	13	28	15.91
1	OE	04	08	6.06	04	08	4.55	04	08	4.55
2	AEC	04	08	6.06	04	08	4.55	04	08	4.55

3	VEC	02	04	3.03	02	04	2.27	02	04	2.27
4	CC	01	02	1.52	01	02	1.14	01	02	1.14
Total (C)		11	22	16.67	11	22	12.50	11	22	12.50
Grand Total (A+B+C)		65	132	100	79	176	100	78	176	100

Duration:

- The program shall be a full-time program.
- The duration of program shall be three years for Bachelor of Science and four years for Bachelor of Science with Honors or Bachelor of Science with Research.
- Every year students will have exist option with:
- (1st Year: Certificate, 2nd Year: Diploma, 3rd Year: Degree, 4th Year: Honors / Research)
- These students are allowed to re-enter the degree program within three years and complete the degree program within the stipulated maximum period of Seven Years.

Eligibility: 12th Pass with Science, or equivalent.

Medium of Instruction: The medium of instructions shall be in English.

Scheme of Examination & Standard of Passing (CCE and ESE):

As per the decision of the concern Board of Studies

- End Semester Exam (ESE): 30 Marks (Min 12 Marks for Passing)
- Continuous Comprehensive Evaluation (CCE): 20 Marks (Min 08 Marks for Passing)
- Total Marks = 50 Marks
- Minimum 40% Marks Required for Passing and there is separate head of Passing for End Semester Examination (ESE) and Continuous Comprehensive Evaluation (CCE).
- A candidate who acquire 32 credits or more during semester – I & II shall be admitted to B. Sc. II (appear for semester – III & IV examination).
- However the candidate shall not be admitted to B.Sc. III (Semester - V) unless he/she passed in all the subjects at B.Sc. I (Semester - I & Semester - II) and acquire 32 credits or more during semester – III & IV.
- However the candidate shall not be admitted to B. Sc. IV (Semester - VII) unless he/she passed in all the subjects at B. Sc. III (Semester - V & Semester - VI).
- However under the National Education Policy the rules extended by KBP University, time to time regarding ATKT will be applicable.

Eligibility of the Core Faculty:

- As per rules and regulations of Karmaveer Bhaurao Patil University, Satara and Govt. of Maharashtra.

Eligibility for Professor of Practice or Professional Trainer:

- Any other eligibility as per the guidelines and regulations passed by concern board of studies, academic council of the autonomous college and rules & regulations of Karmaveer Bhaurao Patil University, Satara and Government of Maharashtra and UGC norms.



Karmaveer Bhaurao Patil University, Satara

B. Sc. (Bioinformatics) Part-I

Semester I				
Sr. No	Components	Course code	Course Title	Credits
1	Course-I (Bioinformatics)	BBiT 111	Fundamental of Bioinformatics	02
		BBiT 112	Bioinformatics for Plant sciences	02
		BBiP 113	Lab I (Based on Paper BBiT 111 & BBiT 112)	02
2	Course-II (Computer Sciences)	BBiT 114	Fundamental of Computer Sciences	02
		BBiT 115	C Programming	02
		BBiP 116	Lab I (Based on Paper BBiT 114 & BBiT 115)	02
3	Course-III (Data Sciences)	BBiT 117	Fundamental of Data Sciences	02
		BBiT 118	Bioinformatics for Data Sciences	02
		BBiP 119	Lab I (Based on Paper BBiT 117 & BBiT 118)	02
4	OE (Music Studies)	BBiT OE I	Indian Musical Instrument	02
5	IKS	BBiT IKS I	Introduction to Indian Knowledge System	02
Total				22
Semester II				
Sr. No	Components	Course code	Course Title	Credits
1	Course-I (Bioinformatics)	BBiT 121	Biological Sequence and Protein Sequence Analysis	02
		BBiT 122	Bioinformatics for Animal sciences	02
		BBiP 123	Lab I (Based on Paper BBiT 121 & BBiT 122)	02
2	Course-II	BBiT	Database Management System	02

	(Computer Sciences)	124		
		BBiT 125	R Programming	02
		BBiP 126	Lab I (Based on Paper BBiT 124 & BBiT 125)	02
3	Course-III (Data Sciences)	BBiT 127	Data Mining	02
		BBiT 128	Data Visualization	02
		BBiP 129	Lab I Based on Paper BBiT 127 & BBiT 128)	02
4	OE	BBiT OE II	History of Indian Music	02
5	VEC	BBiT IKS I	Democracy, Election and Indian Constitution	02
			Total	22
EXIT OPTION: Award of UG Certificate in Major with 44 credits & an additional 4 credits core NSQF Course/Internship OR Continue with Major & Minor.				

B. Sc. (Bioinformatics) Part-II

Semester III				
Sr. No.	Components	Course Code	Course Title	Credits
1	Major	BBiT 231	Database Management System	02
		BBiT 232	Genomics, Proteomics & Transcriptomics	02
		BBiP 233	Lab I (Based on Paper BBiT 231 & BBiT 232)	02
2	Minor	BBiT 234	DSC V, DSC VI, DSP III	02
3	OE	BBiTOE III	Music Studies P-III	02
4	VSC	BBiT VSC I	Bioinformatics Method I	02
5	SEC	BBiT SEC I	Web Programming I	02
6	AEC	BBiT AEC I	English for Communication I	02
		BBiT AEC II	English for Communication II	02
			Total	22
Semester IV				
Sr. No.	Components		Course	Credits
1	Major	BBiT 241	Python Programming for Bioinformatics	02
		BBiT 242	Biological Sequence and Protein Sequence Analysis	02
		BBiP 243	Lab Based on (BBiT 241 & BBiT 242)	02
2	Minor	BBiT 244	DSC VII, DSC VIII, DSP IV	02

3	OE	BBiTOE IV	Music studies IV	02
4	VSC	BBiTVSC II	Bioinformatics method II	02
5	SEC	BBiTSEC II	Web programming II	02
6	AEC	BBiT AEC III	English for Communication III	02
		BBiT AEC IV	English for Communication IV	02
7	VEC	BBiT VEC I	Environmental Studies	02
			Total	22
EXIT OPTION: Award of UG Diploma in Major and Minor with 88 Credits & an additional 4 credits core NSQF Course/ Internship OR Continue with Major & Minor				

B. Sc. (Bioinformatics) Part-III

Semester V				
Sr. No.	Components	Course	Credits	
1	Major	Bioinformatics (P-IX)	02	
2	Major	Bioinformatics (P-X)	02	
3	Major	Bioinformatics (P-XI)	02	
4	Electives	Bioinformatics (P-XIIE1)/ Bioinformatics (P-XIIE2)	02	
5	Major Lab	Lab - V	02	
6	Elective Lab	Lab - I	02	
7	VSC	Bioinformatics Method III	02	
8	AEC	English P-III	02	
9	OJT	On Job Training in Bioinformatics I	04	
10	CEP	Community Engagement Programme in Bioinformatics	02	
			Total	22
Semester VI				
Sr.	Components	Course	Credits	
1	Major	Bioinformatics (P-XIII)	02	
2	Major	Bioinformatics (P-XIV)	02	
3	Major	Bioinformatics (P-XV)	02	
4	Electives	Bioinformatics (P-XVIE1)/ Bioinformatics (P-XVIE2)	02	
5	Major Lab	Lab - VI	02	
6	Elective Lab	Lab - II	02	
7	VSC	Bioinformatics Method III	02	
8	SEC	Web Programming III	02	

9	FP	Field Project in Bioinformatics	02
10	CC	Co-curricular Course in Bioinformatics	02
11	AEC	English P-IV	02
		Total	22
EXIT OPTION: Award of UG Degree in Major with 132 credits OR Continue with Major & Minor.			

B. Sc. (Bioinformatics) Part-IV Honors Degree

Semester VII			
Sr. No.	Components	Course	Credits
1	Major	Bioinformatics (P-XVII)	04
2	Major	Bioinformatics (P-XVIII)	04
3	Major	Bioinformatics (P-XIX)	04
4	Electives	Bioinformatics (P-XXE1)/ Bioinformatics (P-XXE2)	02
5	Major Lab	Lab – VII	02
6	Elective Lab	Lab - III	02
7	Minor	Research Methodology	04
		Total	22
Semester VIII			
Sr.	Components	Course	Credits
1	Major	Bioinformatics (P-XXI)	04
2	Major	Bioinformatics (P-XXII)	04
3	Major	Bioinformatics (P-XXIII)	04
4	Electives	Bioinformatics (P-XXIVE1)/ Bioinformatics (P-XXIVE2)	02
5	Major Lab	Lab – VIII	02
6	Elective Lab	Lab - IV	02
7	OJT	On Job Training in Bioinformatics II	04
		Total	22
Award of Four year UG Honours Degree in Major and Minor with 176 credits.			

B. Sc. (Bioinformatics) Part-IV Honors with Research Degree

Semester VII			
Sr. No.	Components	Course	Credits
1	Major	Bioinformatics (P-XVII)	04
2	Major	Bioinformatics (P-XVIII)	04
3	Electives	Bioinformatics (P-XIXE1)/ Bioinformatics (P-XIXE2)	04
4	Major Lab	Lab – VII	02
5	Minor	Research Methodology	04
6	RP	Research Project in Bioinformatics I	04
		Total	22

Semester VIII			
Sr.	Components	Course	Credits
Sr. No.	Components	Course	Credits
1	Major	Bioinformatics (P-XX)	04
2	Major	Bioinformatics (P-XXI)	04
3	Electives	Bioinformatics (P-XXIIE1)/ Bioinformatics (P-XXIIE2)	04
4	Major Lab	Lab – VIII	02
5	RP	Research Project in Bioinformatics II	08
		Total	22
Award of Four year UG Honors Degree in Major and Minor with 176 credits.			

Chairman

BoS in Bioinformatics

Secretary

Academic Council

Chairman

Academic Council