Karmaveer Bhaurao Patil University, Satara

Yashavantrao Chavan Institute of Science, Satara

B. Sc. (Computer Science)

Programme and Credit Structure as per NEP 2020

{Ref. Government of Maharashtra letter no. एनइपी.२०२२/प्र.क.०९/विशि-३शि का ना दिनांक: १३ मार्च २०२४}

The degree shall be titled as 'Bachelor of Science [Computer Science] 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. (Computer Science)

PO. No.	Programme Outcomes After completing B. Sc. (Computer Science) Programme the students will be able to…….
PO-1	Foundational Knowledge: Graduates should demonstrate a strong understanding of the foundational principles, theories, and concepts in computer science, including algorithms, data structures, programming languages, and computer architecture.
PO-2	Problem Solving: Graduates should be able to analyze complex problems, identify potential solutions, and apply algorithmic and computational techniques to develop effective solutions.
PO-3	Programming Proficiency: Graduates should be proficient in programming languages commonly used in the field of computer science, with the ability to design, implement, test, and debug software applications.
PO-4	Software Development: Graduates should be able to apply software engineering principles and practices to effectively develop, deploy, and maintain software systems, adhering to industry standards and best practices.
PO-5	Database Management: Graduates should be competent in database design, implementation, and management, with the ability to use database management systems to store, retrieve, and manipulate data efficiently.
PO-6	Computer Networking: Graduates should understand the fundamentals of computer networking, including network architecture, protocols, and security, and be able to design and configure network systems to meet organizational needs.
PO-7	Operating Systems: Graduates should have a solid understanding of operating systems concepts, including process management, memory management, file systems, and be able to work with different operating systems.
PO-8	Web Development: Graduates should be proficient in web development technologies and frameworks, with the ability to design and develop dynamic and interactive web applications.
PO-9	Software Testing and Quality Assurance: Graduates should understand the principles of software testing and quality assurance and be able to design and implement testing strategies to ensure the reliability and quality of software systems.
PO-10	Cybersecurity Awareness: Graduates should be aware of cybersecurity threats and vulnerabilities, understand security measures and protocols, and be able to implement security controls to protect computer systems and data.
PO-11	Ethical and Professional Responsibility: Graduates should understand the ethical and legal issues related to computer science, including privacy, intellectual property, and cybercrime, and demonstrate ethical and professional behaviour in their work.

PO-12	Communication and Collaboration: Graduates should possess strong communication and collaboration skills, both verbal and written, and be able to work effectively in multidisciplinary teams to solve complex problems.

PSO. NO	**Programme Specific Outcomes The student will be able to…**
PSO-1	Proficiency in Programming: Graduates should demonstrate proficiency in programming languages such as Java, Python, C/C++, and others, with the ability to develop, debug, and maintain software applications.
PSO-2	Problem-Solving Skills: Graduates should possess strong problem-solving skills and be able to apply computational thinking to analyze and solve complex problems in diverse domains.
PSO-3	Understanding of Algorithms and Data Structures: Graduates should have a solid understanding of fundamental algorithms and data structures, including their design, analysis, and implementation, to efficiently solve computational problems.
PSO-4	Software Development Lifecycle: Graduates should be familiar with the software development lifecycle, including requirements analysis, design, implementation, testing, deployment, and maintenance, and be able to apply relevant methodologies and best practices.
PSO-5	Database Management: Graduates should have knowledge of database management systems (DBMS) and be able to design, implement, and manage databases, as well as write complex SQL queries for data retrieval and manipulation.
PSO-6	Web Development Skills: Graduates should be proficient in web development technologies such as HTML, CSS, JavaScript, and web frameworks, and be able to develop interactive and dynamic web applications.
PSO-7	Computer Networking: Graduates should understand the principles of computer networks, including network architecture, protocols, security, and be able to design and configure network systems.
PSO-8	Operating Systems: Graduates should have a deep understanding of operating systems concepts, including process management, memory management, file systems, and be able to work with different operating systems.
PSO-9	Software Engineering Principles: Graduates should understand software engineering principles and practices, including software design patterns, software testing, version control, and be able to work effectively in a team-based development environment.
PSO-10	Cybersecurity Awareness: Graduates should be aware of cybersecurity threats and vulnerabilities, understand security measures and protocols, and be able to implement security controls to protect computer systems and data.
PSO-11	Ethical and Professional Responsibility: Graduates should understand the ethical and legal issues related to computer science, including privacy, intellectual property, and cybercrime, and demonstrate professional responsibility in their work.
PSO-12	Communication and Presentation Skills: Graduates should possess strong communication and presentation skills, both verbal and written, and be able to effectively communicate technical concepts to diverse audiences.

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 (Computer Science)
2	Sem. III & IV	2025-26	2Year	88	5.0	UG Diploma (Computer Science)
3	Sem. V &VI	2026-27	3Year	132	5.5	B.Sc. (Computer Science)
4	Sem. VII & VIII	2027-28	4Year	176	6.0	B.Sc. (Honors/Research)

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:
- (1^{st} Year: Certificate, 2^{nd} Year: Diploma, 3^{rd} Year: Degree, 4^{th} 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: 12^{th} 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 or Competent Authority.
- 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 acquires 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. II & B. Sc. III (Semester - III & Semester - VI).
- However, under the National Education Policy the rules extended by KBP University, time to time regarding ATKT will be applicable.

Teachers Qualification:

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 College and Rules and Regulations of KBP University, Satara, Government of Maharashtra and UGC norms

As per rules and regulations of KBP University, Satara and Govt. of Maharashtra &UGC

Eligibility of the Core Faculty: Master of Science Computer Science with NET/ SET / Ph.D. (Computer Science)

Eligibility of the Other Faculty: Master of Science in Mathematics/Statistics/Electronics with NET or SET or Ph.D.

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B. Sc. (Computer Science) Part-I

Semester: I				
Sr. No.	**Components**	**Course Code**	**Name of the Paper**	**Credits**
1	DSC -I	BCST 111	C- Programming I	2
	DSC -II	BCST 112	Database Management Systems	2
	DSC **(P)** -I	BCSP 113	Lab Based on BCST 111 and BCST 112	2
2	DSC -I	BCST 114	Fundamental of Electronics and Network Analysis	2
	DSC -II	BCST 115	Digital Electronics-I	2
	DSC **(P)** -I	BCSP 116	Lab Based on BET 114 and BET 115	2
3	DSC -I	BCST 117	Discrete Mathematics	2
	DSC -II	BCST 118	Descriptive Statistics	2
	DSC **(P)** -I	BCSP 119	Lab Based on BCST 117 and BCST 118	2
4	Open Elective	BCSTOE 1	Public Administration-I	2
5	Generic	BCSTIKS 1	Introduction to Indian knowledge System	2
			Total	**22**

Semester: II				
Sr. No.	**Components**	**Course Code**	**Name of the Paper**	**Credits**
1	DSC –III	BCST 121	C- Programming II	2
	DSC –IV	BCST 122	Relational Database Management Systems	2
	DSC **(P)** -II	BCSP 123	Lab Based on BCST 121 and BCST 122	2
2	DSC –III	BCST 124	Semiconductor Devices	2
	DSC –IV	BCST 125	Digital Electronics-II	2
	DSC **(P)** -II	BCST 126	Lab Based BET 124 and BET 125	2
3	DSC –III	BCST 127	Graph Theory	2
	DSC –IV	BCST 128	Probability and probability distribution	2
	DSC **(P)** -II	BCSP 129	Lab Based on BCST 127 and BCST 128	2
4	Open Elective	BCSTOE2	Public Administration-II	2
5	VEC I	BCSTVEC 1	Democracy, Election and Indian Constitution	2
			Total	**22**
EXIT OPTION: Award of UG Diploma in Major and Minor with 44 Credits & an additional 4 credits core NSQF Course/ Internship OR Continue with Major & Minor				

B. Sc. (Computer Science) Part-II

Semester III				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**
1	Major	BCST 231	Data Structure using C	02
		BCST 232	Computational Mathematics	02
2	Major Practical III	BCSP 233	Lab Based on BCST 231 and BCST 232	02
3	Minor	BCST 234	Fundamental of Analog Circuit Design	02
		BCST 235	Computer Organization and 8085 Microprocessor	02
4	Minor Practical III	BCSP 236	Lab Based on BET 234 and BET 235	02
5	Open Elective	BCSTOE 3	Public Administration III	02
6	VSC	BCSTVSC 1	Object Oriented Programming using C++	02
7	SEC	BCSTSEC 1	System analysis and design	02
8	AEC	BCSTAEC 1	English for Communication I	02
9	IKS	BCSTIKS 2	Computer Science for Environmental awareness	02
			Total	**22**

Semester IV				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**
1	Major	BCST 241	Object Oriented Concept using Java	02
		BCST 242	Computational Statistics	02
2	Major Practical IV	BCSP 243	Lab Based on BCST 241 and BCST 242	02
3	Minor	BCST 244	Operational Amplifier and its applications	02
		BCST 245	Fundamental of 8085 Microcontroller	02
4	Minor Practical IV	BCSP 246	Lab Based on BET 244 and BET 245	02
5	Open Elective	BCSTOE 3	Public Administration IV	02
6	VSC	BCSTVSC 2	Fundamental of Cyber Security	02
7	SEC	BCSTSEC 2	XML Programming	02
8	AEC	BCSTAEC 2	English for Communication II	02
9	VEC	BCSTVEC	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. (Computer Science) Part-III

Semester V				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**
1	Major	BCST 351	Software Engineering	02
		BCST 352	Introduction to .NET using C#	02
		BCST 353	Advanced Java Programming	02
2	Electives	BCST 354	Programming Essentials in Python (Elective 1)	02
		BCST 355	Multimedia Computing (Elective 2)	02
3	Major Lab	BCSP 356	Based on BCST 351, BCST 352 and BCST 353	02
4	Electives Lab	BCSP 357	Based on BCST 354 or BCST 355	02
5	VSC	BCSTVSC 3	Programming with Scilab	02
6	AEC	BCSTAEC 3	English P-III	02
7	OJT	BCSTOJT	On Job Training in Computer Science - I	04
8	CEP	BCSTCEP 1	Community Engagement Programme in Computer Science	02
			Total	**22**

Semester VI				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**
1	Major	BCST 361	E-Commerce	02
		BCST 362	Advanced C# Programming	02
		BCST 363	Software Project Management	02
2	Electives	BCST 364	Fundamentals of Artificial Intelligence (Elective 1)	02
		BCST 365	Web technology (Elective 2)	02
3	Major Lab	BCSP 366	Based on BCST 361, BCST 362 and BCST 363	02
4	Elective Lab	BCSP 367	Based on BCST 364 or BCST 365	02
5	VSC	BCSTVSC 4	Computer Graphics	02
6	SEC	BCSTSEC 3	JavaScript Algorithms	02
7	FP	BCSTFP	Field Project in Computer Science	02
8	CC	BCSTCC	Co-curricular Course in Computer Science	02
9	AEC	BCSTAEC 4	English P-IV	02
			Total	**22**
EXIT OPTION: Award of UG Degree in Major with 132 credits OR Continue with Major & Minor.				

B. Sc. (Computer Science) Part IV Honors Degree

Semester VII				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**
1	Major	BCST 471	Design and Analysis of Algorithm	04
		BCST 472	Principle of programming Languages	04
		BCST 473	Advanced Database Management Systems	04
4	Electives	BCST 474	Advanced Networking (Elective 1)	02
		BCST 475	Blockchain Technology (Elective 2)	02
5	Major Lab	BCSP 476	Lab Based on BCST 471, BCST 472 and BCST 473	02
6	Elective Lab	BCSP 477	Lab Based on BCST 474 or BCST 475	02
7	Minor	BCST 478	Research Methodology	04
			Total	**22**

Semester VIII				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**
1	Major	BCST 481	Python programming	04
		BCST 482	Cloud Computing	04
		BCST 483	Cyber Security and Laws	04
2	Electives	BCST 484	Digital Image Processing (Elective 1)	02
		BCST 485	Mathematical and Statistical Foundation (Elective2)	02
5	Major Lab	BCSP 486	Lab Based on BCST 481, BCST 482 and BCST 483	02
6	Elective Lab	BCSP 487	Based on BCST 484 or BCST 485	02
7	OJT	BCSTOJT	On Job Training in Computer Science II	04
			Total	**22**
Award of Four-year UG Honors Degree in Major and Minor with 176 credits.				

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

Semester VII				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**
1	Major	BCST 471	Design and Analysis of Algorithm	04
		BCST 472	Principle of programming Languages	04
2	Electives	BCST 473	Advanced Database Management Systems (Elective 1)	04
		BCST 474	Advanced Networking (Elective 2)	04
3	Major Lab	BCSP 475	Lab Based on BCST 471 and BCST 472	02
4	Minor	BCST 476	Research Methodology	04
5	RP	BCSP 477	Research Project in Computer Science I	04
			Total	**22**

Semester VIII				
Sr. No.	**Components**	**Course Code**	**Course**	**Credits**
1	Major	BCST 481	Python programming	04
		BCST 482	Cloud Computing	04
2	Electives	BCST 483	Cyber Security and Laws (Elective 1)	04
		BCST 484	Digital Image Processing (Elective 2)	04
3	Major Lab	BCSP 485	Lab Based on BCST 481 and BCST 482	02
4	RP	BCSP 486	Research Project in Computer Science II	08
			Total	**22**
Award of Four-year UG Honors Degree in Major and Minor with 176 credits.				

Chairman	**Secretary**	**Chairman**
BoS in Computer Science	Academic Council	Academic Council