Karmaveer Bhaurao Patil University, Satara

Faculty of Science and Technology

B. Sc. Nanoscience and Technology (Entire)

Programme and Credit Structure as per NEP 2020

{Ref. Government of Maharashtra letter no. □□□□□.□□□□/□□□.□.□□/□□□□-□□□ □□ □□ □□□□□□: □□ □□□□□ □□□□}

The degree shall be titled as 'Bachelor of Science in Nanoscience and Technology (Entire) 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. Nanoscience and Technology (Entire)

PO. No.	**Programme Outcomes** **After completing B. Sc. Nanoscience and Technology (Entire) Programme the students will be able to…….**
PO-1	To explain fundamental concepts of nanoscale phenomena and stay updated with recent advancements in the field of nanotechnology.
PO-2	To demonstrate the functioning of advanced instruments used for nanoscale characterization and ability to interpret data to study nanoscale properties.
PO-3	Appling the knowledge of nanomaterial synthesis design various nanostructures with specific properties
PO-4	To assess the potential applications of nanomaterials based on their unique properties and selecting nanomaterials for specific applications.
PO-5	To design and plan experiments to explore specific properties or behaviors of nanomaterials, considering appropriate methodologies and controls.
PSO. NO	**Programme Specific Outcomes** **The student will be able to…**
PSO-1	Learn the fundamental principles, concepts and recent development in Nanoscience and Technology.
PSO-2	Understand the properties of materials at nanoscale and working of sophisticated instruments to evaluate nanoscale properties.
PSO-3	Apply the knowledge of nanomaterial synthesis methods to design nanostructures and utilize the characterization techniques for analysis of nano structures.
PSO-4	Evaluate the effectiveness of specific nanomaterials for targeted applications, considering their unique properties
PSO-5	Design a nanoscale experiment to investigate a specific property or behaviour of nanomaterials. Develop nanotechnology based product considering its feasibility and potential impact.

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 Nanoscience and Technology (Entire)
2	Sem. III & IV	2025-26	2Year	88	5.0	UG Diploma in Nanoscience and Technology (Entire)
3	Sem. V &VI	2026-27	3Year	132	5.5	B. Sc. in Nanoscience and Technology (UG Three Year Degree)
4	Sem. VII & VIII	2027-28	4Year	176	6.0	B. Sc. in Nanoscience and Technology (Entire) [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):

- 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).
- Scheme of Examination & Standard of Passing for ESE and CCE:
- As per the decision of the concern Board of Studies or Competent Authority.
- 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

Faculty of Science and Technology

B. Sc. Part-I Nanoscience and Technology (Entire)

Semester I				
Sr. No.	**Components**	**Course**	**Name of the Paper**	**Credits**
1	Course 1	DSC -I	**BNTT 111:** Introduction to Nanoscience and Nanotechnology	2
		DSC -II	**BNTT 112:** Properties of Nanomaterials	2
		DSC **(P)** -I	**BNTP 113:** Practical: Based on DSC –I and DSC -II	2
2	Course 2	DSC -I	**BNTT 114:** Physics for Nanoscience I	2
		DSC -II	**BNTT 115:** Digital Electronics	2
		DSC **(P)** -I	**BNTP 116:** Practical : Based on DSC –I and DSC -II	2
3	Course 3	DSC -I	**BNTT 117:** Chemistry for Nanoscience I	2
		DSC -II	**BNTT 118:** Chemistry for Nanoscience II	2
		DSC **(P)** -I	**BNTT 119:** Practical : Based on DSC –I and DSC -II	2
4	Open Elective	OE-1	**BNTT-OE 1:** Astronomics Studies	2
5	IKS-I	Generic	**BNTT IKS 1**: Introduction to Indian Knowledge System	2
			Total	**22**

Semester II				
Sr. No.	**Components**	**Course**	**Name of the Paper**	**Credits**
1	Course 1	DSC -I	**BNTT 121:**Synthesis of Nanomaterials I	2
		DSC -II	**BNTT 122:**Synthesis of Nanomaterials II	2
		DSC **(P)** -I	**BNTT 123:**Practical II: Based on DSC –III and DSC -IV	2
2	Course 2	DSC -I	**BNTT 124:**Physics for Nanoscience II	2
		DSC -II	**BNTT 125:**Semiconductor Devices	2
		DSC **(P)** -I	**BNTT 126:**Practical II: Based on DSC –III and DSC -IV	2
3	Course 3	DSC -I	**BNTT 127:**Nanobiology I	2
		DSC -II	**BNTT 128:**Nanobiology II	2
		DSC **(P)** -I	**BNTT 129:**Practical II: Based on DSC –III and DSC -IV	2
4	Open Elective	OE-2	**BNTT OE 2:**Astronomicas Studies	2
5	VEC	VEC I	**BNTT VEC 1:** Democracy, Election and Indian Constitution	2
			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. Part-II Nanoscience and Technology (Entire)

Semester III			
Sr. No.	**Components**	**Course**	**Credits**
1	Major	Basic Characterization Techniques for Nanomaterials	02
		Advance Characterization Techniques for Nanomaterials	02
		Practical Based on Major Course	02
2	Minor	Electricity and Magnetism	02
		Transducer for Applied Nanotechnology	02
		Practical Based on Minor Course	02
3	OE	Astronomical Studies P-III	02
4	VSC	Thin Film Coating Techniques I	02
5	SEC	UV-Vis Spectrophotometry Techniques	02
6	AEC	English P- I	02
7	IKS	IKS P-II	02
		Total	**22**
Semester IV			
Sr. No.	**Components**	**Course**	**Credits**
1	Major	Nanoscience (Major P-VII, P-VIII, Lab based on P-VII, P-VIII)	06
2	Minor	Nanoscience (Minor P-VII, P-VIII, Lab based on P-VII, P-VIII)	06
3	OE	Astronomical Studies P-IV	02
4	VSC	Thin Film Coating Techniques II	02
5	SEC	IR Spectrophotometry Techniques	02
6	AEC	English P-II	02
7	VEC	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. Part-III Nanoscience and Technology (Entire)

Semester V			
Sr. No.	**Components**	**Course**	**Credits**
1	Major	Nanoscience (P-IX)	02
2	Major	Nanoscience (P-X)	02
3	Major	Nanoscience (P-XI)	02
4	Electives	Nanoscience (P-XIIE1)/Nanoscience (P-XIIE2)	02
5	Major Lab	Nanoscience Lab Course	02
6	Elective Lab	Elective course Lab - I	02
7	VSC	HPLC Techniques	02
8	AEC	English P-III	02
9	OJT	On Job Training in Nanoscience I	04
10	CEP	Community Engagement Programme in Nanoscience	02
		Total	**22**
Semester VI			
Sr.	**Components**	**Course**	**Credits**
1	Major	Nanoscience (P-XIII)	02
2	Major	Nanoscience (P-XIV)	02
3	Major	Nanoscience (P-XV)	02
4	Electives	Nanoscience (P-XVIE1)/ Nanoscience (P-XVIE2)	02
5	Major Lab	Nanoscience Lab Course	02
6	Elective Lab	Elective course Lab - II	02
7	VSC	Instrumental Methods for Nanofiber Preparation	02
8	SEC	Scientific and Technical writing	02
9	FP	Field Project in Nanoscience	02

10	CC	Co-curricular Course in Nanoscience	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. Nanoscience and Technology (Entire) Part-IV Honors Degree

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

B. Sc. Nanoscience and Technology (Entire) Part-IV Honors with Research Degree

Semester VII			
Sr. No.	**Components**	**Course**	**Credits**
1	Major	Nanoscience (P-XVII)	04
2	Major	Nanoscience (P-XVIII)	04
3	Electives	Nanoscience (P-XIXE1)/Nanoscience (P-XIXE2)	04
4	Major Lab	Lab – VII	02
5	Minor	Research Methodology	04
6	RP	Research Project in Nanoscience I	04
		Total	**22**
Semester VIII			
Sr.	**Components**	**Course**	**Credits**
Sr. No.	**Components**	**Course**	**Credits**
1	Major	Nanoscience (P-XX)	04
2	Major	Nanoscience (P-XXI)	04
3	Electives	Nanoscience (P-XXIIE1)/Nanoscience (P-XXIIE2)	04
4	Major Lab	Lab – VIII	02
5	RP	Research Project in Nanoscience II	08
		Total	**22**
Award of Four year UG Honors Degree in Major and Minor with 176 credits.			

Chairman
BoS in Nanoscience

Secretary
Academic Council

Chairman
Academic Council