

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM
CHOICE BASED CREDIT SYSTEM (CBCS)
SCHEME OF TEACHING AND EXAMINATION 2016-2017

M.Tech. in NANO TECHNOLOGY

I SEMESTER

Sl. No	Subject Code	Title	Teaching Hours /Week		Examination				Credit
			Theory	Practical/Field Work/ Assignment	Duration	I.A. Marks	Theory/ Practical Marks	Total Marks	
1	16NT11	Quantum Mechanics and Mathematical Modeling	4	2	3	20	80	100	4
2	16NT12	Nanomaterials and Properties	4	2	3	20	80	100	4
3	16NT13	Synthesis and Processing Techniques	4	2	3	20	80	100	4
4	16NT14	Nanobiotechnology	4	2	3	20	80	100	4
5	16NT15X	Elective-1	3	2	3	20	80	100	3
6	16NTL16	Synthesis and Characterization Lab		3	3	20	80	100	2
7	16NT17	Seminar	-	3	-	100	-	100	1
TOTAL			19	16	18	220	480	700	22

Elective	
16NT151	Micro and Nanofluidics
16NT152	Thin Film Technologies
16NT153	Nanocomposites and its applications
16NT154	Industrial Applications of Nanotechnology

- Following activities are to be assigned to students under 2 hours Practical/ Field Work/ Assignment/ Tutorials for the papers mentioned.
16NT11 Quantum mechanics and Mathematical modeling: Practical classes on modelling and Simulation.
16NT12 Nanomaterials and Properties: Assignment to each student on advanced topic in Nanomaterials and properties and Group discussion
16NT13 Synthesis and Processing Techniques: Experimental activities on Synthesis and Processing Techniques and result analysis
16NT14 Nanobiotechnology: Assignment to each student on topics in Nanobiotechnology and Group discussion.
16NT15X Elective I: Mini project to be assigned to each student on the elective subject he/she has opted.
- Seminar topics on recent advances in the subjects of the study to be assigned to the students.

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II SEMESTER

Sl. No	Subject Code	Title	Teaching Hours /Week		Examination				Credit
			Theory	Practical/Field Work/Assignment	Duration	I.A. Marks	Theory/Practical Marks	Total Marks	
1	16NT21	Design and Fabrication Techniques	4	2	3	20	80	100	4
2	16NT22	Nanoelectronics	4	2	3	20	80	100	4
3	16NT23	Advanced Materials	4	2	3	20	80	100	4
4	16NT24	Characterization Techniques	4	2	3	20	80	100	4
5	16NT25X	Elective-2	3	2	3	20	80	100	3
6	16NTL26	Device Fabrication and Characterization Lab		3	3	20	80	100	2
7	16NT27	Seminar	-	3	-	100	-	100	1
TOTAL			19	16	18	220	480	700	22

Elective	
16NT251	Sensors and Actuators
16NT252	MEMS and NEMS
16NT253	Nanotechnology and Drug Delivery
16NT254	Nanophotonics

- Following activities are to be assigned to students under 2 hours Practical/ Field Work/ Assignment/ Tutorials for the papers mentioned.
16NT21 Design and Fabrication Techniques: Lab activity in Design and Fabrication Techniques and result analysis
16NT22 Nanoelectronics: Assignment to each student on advanced topic in Nanoelectronics and Group discussion
16NT23 Advanced Materials: Assignment to each student on advanced topic in Advanced Materials and Group discussion
16NT24 Characterization Techniques: Hands on Lab activity in Characterization Techniques and data analysis.
16NT25X Elective II: Mini project to be assigned to each student on the elective subject he/she has opted.
- Seminar topics on recent advances in the subjects of the study to be assigned to the students.

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III SEMESTER: Internship

Sl. No	Subject Code	Title	Teaching Hours /Week		Examination			Credit	
			Theory	Practical/Field Work/Assignment	Duration	I.A. Marks	Theory/Practical Marks		Total Marks
1	16NT31	Seminar / Presentation on Internship (After 8 weeks from the date of commencement)	-	-	-	25	-	25	20
2	16NT32	Report on Internship	-	-	-	25	-	25	
3	16NT33	Evaluation and Viva-Voce of Internship	-	-	-	-	50	50	
4	16NT34	Evaluation of Project phase -1	-	-	-	50	-	50	1
TOTAL			-	-	-	100	50	150	21

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IV SEMESTER

Sl. No	Subject Code	Title	Teaching Hours /Week		Examination			Credit	
			Theory	Practical/Field Work/ Assignment	Duration	I.A. Marks	Theory/ Practical Marks		Total Marks
1	16NT41	Nanomaterials and Energy Systems	4	-	3	20	80	100	4
2	16NT42	Elective-3	3	-	3	20	80	100	3
3	16NT43	Evaluation of Project phase -2	-	-	-	50	-	50	3
4	16NT44	Evaluation of Project and Viva-Voce	-	-	3	-	100+100	200	10
TOTAL			-	-	9	90	360	450	20

Elective	
16NT421	Advances in Nanodevices
16NT422	Nanobioelectronic and Applications
16NT423	Nanotechnology and Environment
16NT424	Micro-Nano Packaging

Note:

- Each theory paper will be of 4 credits. There will be 4 hours of lecture per week for each paper and 2 hours of Practical/ Field Work/ Assignment/ Tutorials for each paper including the elective paper.
- Following activities to be done under 2 hours Practical/ Field Work/ Assignment/ Tutorials for the papers mentioned.
16NT41 Nanomaterials and Energy Systems: Assignment/device fabrication exercise to students on the topics in Nanomaterials and Energy Systems.
16NT42X Elective III: Assignment/Tutorials to each student on advanced topic in the elective subject which he/she opted.
1. Project Phase-1: 6-week duration shall be carried out between 2nd and 3rd Semester vacation. Candidates in consultation with the guide shall carry out literature survey/ visit industries to finalize the topic of Project.
2. Project Phase-2: 16-week duration during 4th semester. Evaluation shall be done by the committee constituted comprising of HoD as Chairman, Guide and Senior faculty of the department.
3. Project Evaluation: Evaluation shall be taken up at the end of 4th semester. Project work evaluation and Viva-Voce examination shall conducted
4. Project evaluation:
 - a. Internal Examiner shall carry out the evaluation for 100 marks.
 - b. External Examiner shall carry out the evaluation for 100 marks.
 - c. The average of marks allotted by the internal and external examiner shall be the final marks of the project evaluation.
 - d. Viva-Voce examination of Project work shall be conducted jointly by Internal and External examiner for 100 marks.