

**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	16INT11	Quantum Mechanics and Mathematical Modeling	4	2	3	20	80	100	4
2	16INT12	Nanomaterials and Properties	4	2	3	20	80	100	4
3	16INT13	Synthesis and Processing Techniques	4	2	3	20	80	100	4
4	16INT14	Nanobiotechnology	4	2	3	20	80	100	4
5	16INT15X	Elective-1	3	2	3	20	80	100	3
6	16INTL16	Lab		3	3	20	80	100	2
7	16INT17	Seminar	-	3	-	100	-	100	1
<b>TOTAL</b>			<b>19</b>	<b>16</b>	<b>18</b>	<b>220</b>	<b>480</b>	<b>700</b>	<b>22</b>

<b>Elective</b>	
16INT151	Micro and Nanofluidics
16INT152	Thin Film Technologies
16INT153	Nanocomposites and its applications
16INT154	Industrial Applications of Nanotechnology

- Following activities are to be assigned to students under 2 hours Practical/ Field Work/ Assignment/ Tutorials for the papers mentioned.  
**16INT11** Quantum mechanics and Mathematical modeling: Practical classes on modelling and Simulation.  
**16INT12** Nanomaterials and Properties: Assignment to each student on advanced topic in Nanomaterials and properties and Group discussion  
**16INT13** Synthesis and Processing Techniques: Experimental activities on Synthesis and Processing Techniques and result analysis  
**16INT14** Nanobiotechnology: Assignment to each student on topics in Nanobiotechnology and Group discussion.  
**16INT15X** 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	16INT21	Design and Fabrication Techniques	4	2	3	20	80	100	4
2	16INT22	Nanoelectronics	4	2	3	20	80	100	4
3	16INT23	Advanced Materials	4	2	3	20	80	100	4
4	16INT24	Characterization Techniques	4	2	3	20	80	100	4
5	16INT25X	Elective-2	3	2	3	20	80	100	3
6	16INTL26	Lab		3	3	20	80	100	2
7	16INT27	Seminar	-	3	-	100	-	100	1
<b>TOTAL</b>			<b>19</b>	<b>16</b>	<b>18</b>	<b>220</b>	<b>480</b>	<b>700</b>	<b>22</b>

<b>Elective</b>	
16INT251	Sensors and Actuators
16INT252	MEMS and NEMS
16INT253	Nanotechnology and Drug Delivery
16INT254	Nanophotonics

- Following activities are to be assigned to students under 2 hours Practical/ Field Work/ Assignment/ Tutorials for the papers mentioned.  
**16INT21** Design and Fabrication Techniques: Lab activity in Design and Fabrication Techniques and result analysis  
**16INT22** Nanoelectronics: Assignment to each student on advanced topic in Nanoelectronics and Group discussion  
**16INT23** Advanced Materials: Assignment to each student on advanced topic in Advanced Materials and Group discussion  
**16INT24** Characterization Techniques: Hands on Lab activity in Characterization Techniques and data analysis.  
**16INT25X** 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	16INT31	Seminar / Presentation on Internship (After 8 weeks from the date of commencement)	-	-	-	25	-	25	20
2	16INT32	Report on Internship	-	-	-	25	-	25	
3	16INT33	Evaluation and Viva-Voce of Internship	-	-	-	-	50	50	
4	16INT34	Evaluation of Project phase -1	-	-	-	50	-	50	1
<b>TOTAL</b>			-	-	-	<b>100</b>	<b>50</b>	<b>150</b>	<b>21</b>

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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	16INT41	Nanomaterials and Energy Systems	4	-	3	20	80	100	4
2	16INT42	Elective-3	3	-	3	20	80	100	3
3	16INT43	Evaluation of Project phase -2	-	-	-	50	-	50	3
4	16INT44	Evaluation of Project and Viva-Voce	-	-	3	-	100+100	200	10
<b>TOTAL</b>			-	-	<b>9</b>	<b>90</b>	<b>360</b>	<b>450</b>	<b>20</b>

<b>Elective</b>	
16INT421	Advances in Nanodevices
16INT422	Nanobioelectronics and Applications
16INT423	Control Environment and Quality Control
16INT424	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.  
**16INT41** Nanomaterials and Energy Systems: Assignment/device fabrication exercise to students on the topics in Nanomaterials and Energy Systems.  
**16INT42X** 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 2<sup>nd</sup> and 3<sup>rd</sup> 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 4<sup>th</sup> 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 4<sup>th</sup> 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.