

VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM
CHOICE BASED CREDIT SYSTEM (CBCS)
SCHEME OF TEACHING AND EXAMINATION 2015-2016
B.E. Nano Technology

V SEMESTER

| Sl. No | Subject Code | Title | Teaching Hours /Week | | Examination | | | | Credits |
|--------------|--------------|--------------------------------------|----------------------|-----------------------|-------------|-------------------------------|---------------|----------------|-----------|
| | | | Theory | Practical/ Drawing | Duration | Theory/ Practical Marks | I.A. Marks | Total Marks | |
| 1 | 15NT51 | Management and Entrepreneurship | 04 | | 03 | 80 | 20 | 100 | 4 |
| 2 | 15NT52 | Synthesis of Nanomaterials | 04 | | 03 | 80 | 20 | 100 | 4 |
| 3 | 15NT53 | Characterization Techniques | 04 | | 03 | 80 | 20 | 100 | 4 |
| 4 | 15NT54 | Digital System Design | 04 | | 03 | 80 | 20 | 100 | 4 |
| 5 | 15NT55X | Professional Elective | 03 | | 03 | 80 | 20 | 100 | 3 |
| 6 | 15NT56X | Open Elective | 03 | | 03 | 80 | 20 | 100 | 3 |
| 7 | 15NTL57 | Nano Materials Synthesis Lab | | 1+2P | 03 | 80 | 20 | 100 | 2 |
| 8 | 15NTL58 | Characterization and Measurement Lab | | 1+2P | 03 | 80 | 20 | 100 | 2 |
| TOTAL | | | 22 | 06 | 24 | 640 | 160 | 800 | 26 |

| Professional Elective | | Open Elective | |
|-----------------------|----------------------------------|---------------|--|
| 15NT551 | Analog Circuit Design | 15NT561 | Introduction to Nanoscience and Nanotechnology |
| 15NT552 | Biomaterials | 15NT562 | Nanomaterials and Their Applications |
| 15NT553 | Fundamentals of Thermodynamics | 15NT563 | Nanodevices and Applications |
| 15NT554 | Nanostructures and Self-assembly | 15NT564 | Nanomaterials Synthesis and Characterization |

1. **Core subject:** This is the course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.
2. **Professional Elective:** Elective relevant to chosen specialization/ branch
3. **Open Elective:** Electives from other technical and/or emerging subject areas.

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VI SEMESTER

| Sl. No | Subject Code | Title | Teaching Hours /Week | | Examination | | | Credits | |
|--------------|--------------|---|----------------------|-----------------------|-------------|--------------------------------|---------------|------------|----------------|
| | | | Theory | Practical/ Drawing | Duration | Theory / Practical Marks | I.A. Marks | | Total Marks |
| 1 | 15NT61 | Quantum Mechanics and Simulation Techniques | 04 | | 03 | 80 | 20 | 100 | 4 |
| 2 | 15NT62 | Python Programming Language for Automation | 04 | | 03 | 80 | 20 | 100 | 4 |
| 3 | 15NT63 | Molecular Biology and Genetic Engineering | 04 | | 03 | 80 | 20 | 100 | 4 |
| 4 | 15NT64 | Micro Fluidics and Nanofluids | 03 | | 03 | 80 | 20 | 100 | 4 |
| 5 | 15NT65X | Professional Elective | 03 | | 03 | 80 | 20 | 100 | 3 |
| 6 | 15NT66X | Open Elective | 03 | 1I+2P | 03 | 80 | 20 | 100 | 3 |
| 7 | 15NTL67 | Molecular Biology and Genetic Engineering Lab | | 1I+2P | 03 | 80 | 20 | 100 | 2 |
| 8 | 15NTL68 | Quantum mechanics and Simulation lab | | 1I+2P | 03 | 80 | 20 | 100 | 2 |
| TOTAL | | | 22 | 6 | 24 | 640 | 160 | 800 | 26 |

| Professional Elective | | Open Elective | |
|-----------------------|---|---------------|--|
| 15NT651 | Hybrid Circuits and Packaging | 15NT661 | Nanotechnology in Electrical and Electronics Engineering |
| 15NT652 | Nanotechnology in Agriculture and Food Processing | 15NT662 | Nanotechnology in Civil and Environmental Engineering |
| 15NT653 | Ceramic Materials and Their Applications | 15NT663 | Nanotechnology in Mechanical Engineering |
| 15NT654 | Surface Science and Thin Film Technology | 15NT664 | Nanotechnology in Biomedical Engineering |

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VII SEMESTER

| Sl. No | Subject Code | Title | Teaching Hours /Week | | Examination | | | | Credits |
|--------------|--------------|---|----------------------|--------------------|-------------|------------|-------------------------|-------------|-----------|
| | | | Theory | Practical/ Drawing | Duration | I.A. Marks | Theory/ Practical Marks | Total Marks | |
| 1 | 15NT71 | Nanocomposites and Their Applications | 04 | | 03 | 20 | 80 | 100 | 4 |
| 2 | 15NT72 | Microcontrollers and Interface | 04 | | 03 | 20 | 80 | 100 | 4 |
| 3 | 15NT73 | MEMS and NEMS | 04 | | 03 | 20 | 80 | 100 | 4 |
| 4 | 15NT74X | Professional Elective | 03 | | 03 | 20 | 80 | 100 | 3 |
| 5 | 15NT75X | Professional Elective | 03 | | 03 | 20 | 80 | 100 | 3 |
| 6 | 15NTL76 | Nano - Composites, Device Fabrication, and Characterization Lab | | 1I+2P | 03 | 20 | 80 | 100 | 2 |
| 7 | 15NTL77 | MEMS Simulation Lab | | 1I+2P | 03 | 20 | 80 | 100 | 2 |
| 8 | 15NTP78 | Project Phase – I + Seminar | | - | | 100 | - | 100 | 2 |
| TOTAL | | | 18 | 6 | 21 | 240 | 560 | 800 | 24 |

| Professional Elective | | Professional Elective | |
|-----------------------|---|-----------------------|---|
| 15NT741 | Data Analytics in Nanoscience | 15NT751 | Signal and Image Processing |
| 15NT742 | Nanotechnology for Health Care | 15NT752 | Nanotechnology for Energy and Environment |
| 15NT743 | Engineering Materials and Surface Coating | 15NT753 | 3D Printing Technology |
| 15NT744 | Facilitation, Validation, QC, and QA | 15NT754 | Nano Toxicology |

- 1. Core subject:** This is the course which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.
- 2. Professional Elective:** Elective relevant to chosen specialization / branch
- 3. Project Phase –I + Seminar:** Literature Survey, Problem Identification, objectives and Methodology. Submission of synopsis and seminar.

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VIII SEMESTER

| Sl. No | Subject Code | Title | Teaching Hours /Week | | Examination | | | | Credit |
|--------------|--------------|---|----------------------|--------------------|-------------|------------|-------------------------|-------------|-----------|
| | | | Theory | Practical/ Drawing | Duration | I.A. Marks | Theory/ Practical Marks | Total Marks | |
| 1 | 15NT81 | Nano-Electronics | 4 | - | 3 | 20 | 80 | 100 | 4 |
| 2 | 15NT82 | Bio-Nanotechnology | 4 | - | 3 | 20 | 80 | 100 | 4 |
| 3 | 15NT83X | Professional Elective | 3 | - | 3 | 20 | 80 | 100 | 3 |
| 4 | 15NT84 | Internship / Professional Practice | Industry Oriented | | 3 | 50 | 50 | 100 | 2 |
| 5 | 15NTP85 | Project Work Phase –II | - | 6 | 3 | 100 | 100 | 200 | 6 |
| 6 | 15NTS86 | Seminar | - | 4 | - | 100 | - | 100 | 1 |
| TOTAL | | | 11 | 10 | 15 | 310 | 390 | 700 | 20 |

| Elective | |
|----------|--------------------------------------|
| 15NT831 | Nano-Photonics |
| 15NT832 | Nanomedicines and Biomedical Imaging |
| 15NT833 | Mechanical Operations |
| 15NT834 | Green Nanotechnology |

1. **Core subject:** This is the course, which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.
2. **Professional Elective:** Elective relevant to chosen specialization/ branch
3. **Internship / Professional Practice:** To be carried between the 6th and 7th semester vacation or 7th and 8th semester vacation period.