

Regulation, Scheme and syllabus for B.Voc Degree Programme in Industrial Tool Manufacturing

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1. Introduction

It has been a long felt necessity to align higher education with the emerging needs of the economy so as to ensure that the graduates of higher education system have adequate knowledge and skills for employment and entrepreneurship. The higher education system has to incorporate the requirements of various industries in its curriculum, in an innovative and flexible manner while developing a holistic and well groomed graduate.

Under the National Skills Development Corporation, many Sector Skill Councils representing respective industries have/are being established. One of the mandates of Sector Skill Councils is to develop National Occupational Standards (NOSs) for various job roles in their respective industries. It is important to embed the competencies required for specific job roles in the higher education system for creating employable graduates.

The University Grants Commission (UGC) has launched a scheme on skills development based higher education as part of college/university education, leading to Bachelor of Vocation (B.Voc.) Degree with multiple exits such as Diploma/Advanced Diploma under the NSQF. The B.Voc. programme is focused on universities and colleges providing undergraduate studies which would also incorporate specific job roles and their NOSs alongwith broad based general education. This would enable the graduates completing B.Voc. to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge.

2. Objectives

2.1 To provide judicious mix of skills relating to a profession and appropriate content of General Education.

2.2 To ensure that the students have adequate knowledge and skills, so that they are work ready at each exit point of the programme.

2.3 To provide flexibility to the students by means of pre-defined entry and multiple exit points.

2.4 To integrate NSQF within the undergraduate level of higher education in order to enhance employability of the graduates and meet industry requirements. Such graduates apart from meeting the needs of local and national industry are also expected to be equipped to become part of the global workforce.

2.5 To provide vertical mobility to students coming out of 10+2 with vocational subjects.

3. Levels of Awards

The certification levels will lead to Diploma/Advanced Diploma/B. Voc. Degree in one or more vocational areas and will be offered under the aegis of the University. This is out-lined in Table I.

| Awards | Award Duration | Corresponding NSQF level |
|------------------|----------------|--------------------------|
| Diploma | 1 Year | 5 |
| Advanced Diploma | 2 Years | 6 |
| B.Voc. Degree | 3 Years | 7 |

Table I : Awards

4. Eligibility for admission in B.Voc

The eligibility condition for admission to B.Voc.programme shall be 10+2 or equivalent, in any stream.

5. CREDIT STRUCTURE

| NSQF Level | Skill Component Credits | General Educational Credits | Normal Calendar Duration | Exit Points/ Awards |
|--------------|-------------------------|-----------------------------|--------------------------|---------------------|
| Year 3 | 36 | 24 | Six Semester | B. Voc. |
| Year 2 | 36 | 24 | Four Semester | Advanced Diploma |
| Year 1 | 36 | 24 | Two Semester | Diploma |
| Total | 108 | 72 | | |

6. The class structure and pattern of the examination

- The Number of students in a theory class shall not exceed 25.
- Maximum number of students in a batch for practical in first four semesters shall consist of 20 students and for fifth & sixth semester the batch shall consist of 15 students.
- The rules for admission to the subsequent (next) semesters will be the same as per the University guidelines.
- The Theory (**ESE**) and Practical Examinations will be conducted by the University at the end of each semester.
- The marks of internal (**IA**) and practical exam (**ESE**) should be submitted to University in the prescribed format.
- Assessment of skill component should be done by sector skill council or industry partner.

7. PROGRAMME STRUCTURE

Semester I

| Sr. No | Course Code | Name of the Course | Teaching scheme | | | Evaluation Scheme | | | Credits | Total Marks |
|--|-------------|---|----------------------|---|---|-------------------|-----|-----|-----------|-------------|
| | | | L | T | P | IA | MSE | ESE | | |
| General Education | | | | | | | | | | |
| | | | Theory | | | | | | | |
| 1 | BVTMC101 | Machine Tool Technology | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 |
| 2 | BVTMC102 | General Mechanical Engineering - II | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 |
| 3 | BVTMC103 | Industrial Engineering | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 |
| 4 | BVTMC104 | Metrology and Measuring Instruments | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 |
| Total | | | | | | | | | 12 | 200 |
| Skill Components | | | | | | | | | | |
| | | | Lab/Practical | | | | | | | |
| 5 | BVTML105 | Metrology and Measuring Instruments Lab | 0 | 0 | 1 | 25 | 0 | 25 | 1.5 | 50 |
| 6 | BVTML106 | Machine Tool Technology Lab. | 0 | 0 | 1 | 25 | 0 | 25 | 1.5 | 50 |
| On-Job-Training (OJT)/Qualification Packs (Any One) | | | | | | | | | | |
| 7 | BVTME117 | Metal Arc Welding (CSC/Q0204) | 200 | | | | | | 15 | 200 |
| 8 | BVTME128 | MIG MAG or GMAW Welder (CSC/Q0209) | | | | | | | | |
| 9 | BVTME139 | Assistant TIG Welder (CSC/Q0212) | | | | | | | | |
| 10 | BVTME140 | CNC Setter Cum Operator (CSC/Q0120) | | | | | | | | |
| 11 | BVTME151 | CNC Operator – VMC (CSC/Q0116) | | | | | | | | |
| Total | | | | | | | | | 18 | 300 |

Semester II

| Sr. No | Course Code | Name of the Course | Teaching scheme | | | Evaluation Scheme | | | Credits | Total Marks |
|---|-------------|-------------------------------------|-----------------|---|---|-------------------|-----|-----|-----------|-------------|
| | | | L | T | P | IA | MSE | ESE | | |
| General Education | | | | | | | | | | |
| Theory | | | | | | | | | | |
| 1 | BVTMC201 | Industrial Management | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 |
| 2 | BVTMC202 | Total Quality Management | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 |
| 3 | BVTMC203 | Entrepreneurship | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 |
| | | Total | | | | | | | 9 | 150 |
| Skill Components | | | | | | | | | | |
| Lab/Practical | | | | | | | | | | |
| 5 | BVTML204 | Project | 0 | 0 | 3 | 75 | 0 | 75 | 6 | 150 |
| On-Job-Training (OJT)/Qualification Packs (Any one more QP to be opted from the QPs mentioned in the semester I) | | | | | | | | | | |
| 7 | BVTME117 | Metal Arc Welding (CSC/Q0204) | 200 | | | | | | 15 | 200 |
| 8 | BVTME128 | MIG MAG or GMAW Welder (CSC/Q0209) | | | | | | | | |
| 9 | BVTME139 | Assistant TIG Welder (CSC/Q0212) | | | | | | | | |
| 10 | BVTME140 | CNC Setter Cum Operator (CSC/Q0120) | | | | | | | | |
| 11 | BVTME151 | CNC Operator – VMC (CSC/Q0116) | | | | | | | | |
| | | Total | | | | | | | 21 | 350 |

Semester III

| Sr. No. | Course Code | Name of the Course | Teaching scheme | | | Evaluation Scheme | | | Credits | Total Marks | | |
|--------------------------|-------------|--|---|---|---|-------------------|-----|-----|-----------|-------------|-----|--|
| | | | L | T | P | IA | MSE | ESE | | | | |
| General Education | | | | | | | | | | | | |
| | | | Theory | | | | | | | | | |
| 1 | BVTMC301 | Tool Engineering - I | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 | | |
| 2 | BVTMC302 | Production Automation & Computer Integrated Mfg. | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 | | |
| 3 | BVTMC303 | Fundamentals of Mechatronics | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 | | |
| | BVTMC304 | Machining and Machine Tools | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 | | |
| Total | | | | | | | | | 12 | 200 | | |
| Skill Components | | | | | | | | | | | | |
| | | | Lab/Practical | | | | | | | | | |
| 4 | BVTML305 | Tool Engineering Lab | 0 | 0 | 1 | 25 | 0 | 25 | 1.5 | 50 | | |
| | BVTML306 | Mechatronics lab | 0 | 0 | 1 | 25 | 0 | 25 | 1.5 | 50 | | |
| | | | On-Job-Training (OJT)/Qualification Packs (Any One) | | | | | | | | | |
| 5 | BVTME317 | Service Engineer – Installation (CSC/Q0501) | 200 | | | | | | 15 | | 200 | |
| 6 | BVTME328 | Quality Inspector – Forged, Casted or Machined Component (CSC/Q0601) | | | | | | | | | | |
| 7 | BVTME339 | CNC Programmer (CSC/Q0401) | | | | | | | | | | |
| 8 | BVTME340 | Maintenance Fitter – Mechanical (CSC/Q901) | | | | | | | | | | |
| | BVTME351 | CNC Setter Cum Operator – VMC (CSC/Q0123) | | | | | | | | | | |
| Total | | | | | | | | | 18 | 300 | | |

Semester IV

| Sr. No. | Course Code | Name of the Course | Teaching scheme | | | Evaluation Scheme | | | Credits | Total Marks | |
|--------------------------|-------------|---|---|---|---|-------------------|-----|-----|-----------|-------------|-----|
| | | | L | T | P | IA | MSE | ESE | | | |
| General Education | | | | | | | | | | | |
| | | | Theory | | | | | | | | |
| 1 | BVTMC401 | Good Manufacturing Concepts Practices–II | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 | |
| 2 | BVTMC402 | Manufacturing & Quality Norms | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 | |
| 3 | BVTMC403 | Good Manufacturing Concepts & Practices–III | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 | |
| 4 | BVTMC404 | Electronics Devices Circuit –II | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 | |
| | | Total | | | | | | | 12 | 200 | |
| Skill Components | | | | | | | | | | | |
| | | | | | | | | | | | |
| 5 | BVTML405 | Electronics Devices Circuit –II Lab | 0 | 0 | 1 | 25 | 0 | 25 | 1.5 | 50 | |
| 6 | BVTML406 | Manufacturing Practices | 0 | 0 | 1 | 25 | 0 | 25 | 1.5 | 50 | |
| | | | On-Job-Training (OJT)/Qualification Packs (Any One) | | | | | | | | |
| 7 | BVTME417 | Purchase Executive (ELE/Q5701) | 200 | | | | | | | 15 | 200 |
| 8 | BVTME428 | Quality Engineer (ELE/Q7901) | | | | | | | | | |
| | | Total | | | | | | | 18 | 300 | |

Semester V

| Sr. No. | Course Code | Name of the Course | Teaching scheme | | | Evaluation Scheme | | | Credits | Total Marks | | |
|---|-------------|--|-----------------|---|---|-------------------|-----|-----|-----------|-------------|-----|--|
| | | | L | T | P | IA | MSE | ESE | | | | |
| General Education | | | | | | | | | | | | |
| | | | Theory | | | | | | | | | |
| 1 | BVTMC501 | Valuation & Storage | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 | | |
| 2 | BVTMC502 | Shelf Life, Ware House Operations Management & Material Transactions | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 | | |
| 3 | BVTMC503 | Industrial Electronics Product Design | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 | | |
| 4 | BVTMC504 | Pre-Production Activities | 3 | 0 | 0 | 10 | 0 | 40 | 3 | 50 | | |
| Total | | | | | | | | | 12 | 200 | | |
| Skill Components | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| 5 | BVTML505 | Pre-Production Activities-Lab | 0 | 0 | 1 | 25 | 0 | 25 | 1.5 | 50 | | |
| 6 | BVTML506 | Valuation & Storage-Lab | 0 | 0 | 1 | 25 | 0 | 25 | 1.5 | 50 | | |
| On-Job-Training (OJT)/Qualification Packs (Any One) | | | | | | | | | | | | |
| 7 | BVTME517 | Product Engineer (ELE/Q4201) | 200 | | | | | | 15 | | 200 | |
| 8 | BVTME528 | Incoming QC Technician (ELE/Q4401) | | | | | | | | | | |
| 9 | BVTME539 | Assembly Supervisor (ELE/Q6305) | | | | | | | | | | |
| Total | | | | | | | | | 18 | 300 | | |

Semester VI

| Sr. No. | Course Code | Name of the Course | Teaching scheme | | | Evaluation Scheme | | | Credits | Total Marks |
|--------------------------|-------------|--|--|---|---|-------------------|-----|-----|-----------|-------------|
| | | | L | T | P | IA | MSE | ESE | | |
| General Education | | | | | | | | | | |
| | | | Theory | | | | | | | |
| 1 | BVTMC601 | Entrepreneurship/Accounting/Management | 3 | 1 | 0 | 20 | 0 | 80 | 3 | 100 |
| Total | | | | | | | | | 3 | 100 |
| Skill Components | | | | | | | | | | |
| | | | Lab/Practical | | | | | | | |
| 2 | BVTML602 | Project Work | 0 | 0 | 4 | 100 | 0 | 100 | 12 | 200 |
| | | | On-Job-Training (OJT)/Qualification Packs (Any One) | | | | | | | |
| 3 | BVTME613 | FPGA Design Engineer (ELE/Q8201) | 200 | | | | | | 15 | 200 |
| 4 | BVTME624 | Sales Executive-Consumer Electronics (ELE/Q3201) | | | | | | | | |
| Total | | | | | | | | | 27 | 400 |