# SARALA BIRLA UNIVERSITY
# RANCHI

Established under the Sarala Birla University Act 2017 Govt. of Jharkhand as per Section 2(f) of UGC Act. 1956

# CURRICULUM
# FOR

# B.Tech

# in

# Mechanical Engineering

## (Based on AICTE- CBCS)

## Effective from 2019-20

## Definition of Credit

| | |
|---|---|
| 1 Hr. Lecture (L) Per Week | 1 Credit |
| 1 Hr. Tutorial (T) Per Week | 1 Credit |
| 1 Hr. Practical (P) Per Week | 0.5 Credit |
| 2 Hr. Practical (P) Per Week | 1 Credit |

## Course Code Definitions

| Course code | Definitions |
|---|---|
| **BSC** | Basic Science Course |
| **ESC** | Engineering Science Course |
| **HSMC** | Humanities and Social Sciences including Management Course |
| **MC** | Mandatory Course |
| **PCC-ME** | Professional Core Course |
| **PEC-ME** | Professional Electives Course |
| **OEC** | Open Electives Course |
| **ME-P1** | Project Stage-I |
| **ME-P2** | Project Stage-II |
| **ME-P3** | Project Stage-III |
| **ME -P4** | Project Stage-IV |

# Structure of Mechanical Engineering

**(Breakup of Credits)**

| Sl. No. | Category | Breakup of Credits |
|---|---|---|
| 1 | Humanities and Social Sciences including Management courses | 12 |
| 2 | Basic Science courses | 23 |
| 3 | Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc | 29 |
| 4 | Professional core courses | 44.5 |
| 5 | Professional Elective courses relevant to chosen specialization/branch | 18 |
| 6 | Open subjects – Electives from other technical and /or emerging subjects | 18 |
| 7 | Project work, seminar and internship in industry or elsewhere | 15 |
| 8 | Mandatory Courses [Environmental Sciences, Induction Program, Indian Constitution, Essence of Indian Traditional Knowledge] | 4 |
| **Total Credits:** | | **163.5** |

## BASIC SCIENCE COURSES

| Sl. No. | Course Code | Course Title | Hours Per Week | | | Credits | Preferred Semester |
|---|---|---|---|---|---|---|---|
| | | | L | T | P | | |
| 1 | BSC-101 | Physics | 3 | 1 | 0 | 4 | I |
| 2 | BSC-102 | Physics Lab | 0 | 0 | 3 | 1.5 | I |
| 3 | BSC-103 | Chemistry | 3 | 1 | 0 | 4 | II |
| 4 | BSC-104 | Chemistry Lab | 0 | 0 | 3 | 1.5 | II |
| 5 | BSC-105 | Mathematics-I | 3 | 1 | 0 | 4 | I |
| 6 | BSC-106 | Mathematics-II | 3 | 1 | 0 | 4 | II |
| 7 | BSC-107 | Mathematics-III | 3 | 1 | 0 | 4 | III |
| | | | | | **Total Credit:** | **23** | |

# ENGINEERING SCIENCE COURSES

| Sl. No. | Course Code | Course Title | Hours per week | | | Credits | Preferred Semester |
|---|---|---|---|---|---|---|---|
| | | | L | T | P | | |
| 1 | ESC-101 | Basic Electrical & Electronics Engineering | 3 | 1 | 0 | 4 | I |
| 2 | ESC-102 | Basic Electrical & Electronics Engineering Lab | 0 | 0 | 2 | 1 | I |
| 3 | ESC-103 | Engineering Graphics & Design | 1 | 0 | 4 | 3 | I |
| 4 | ESC-104 | Programming for Problem Solving | 3 | 0 | 0 | 3 | II |
| 5 | ESC-105 | Programming for Problem Solving Lab | 0 | 0 | 4 | 2 | II |
| 6 | ESC-106 | Workshop/ Manufacturing Practices | 1 | 0 | 4 | 3 | II |
| 7 | ESC-107 | Engineeing Mechanics | 3 | 1 | 0 | 4 | III |
| 7 | ESC-108 | Electronics Devices | 3 | 0 | 0 | 3 | III |
| 8 | ESC-109 | Electronics Devices Lab | 0 | 0 | 2 | 1 | III |
| 9 | ESC-110 | Digital Electronics | 3 | 0 | 0 | 3 | IV |
| 10 | ESC-111 | Digital Electronics Lab | 0 | 0 | 2 | 1 | IV |
| 11 | ESC-112 | Programming using MATLAB | 0 | 0 | 2 | 1 | III |
| | | | | | **Total Credit:** | **29** | |

# HUMANITIES & SOCIAL SCIENCES INCLUDING MANAGEMENT COURSE

| Sl. No. | Course Code | Course Title | Hours per week | | | Credits | Preferred Semester |
|---|---|---|---|---|---|---|---|
| | | | L | T | P | | |
| 1 | HSMC-101 | English | 3 | 0 | 0 | 3 | II |
| 2 | HSMC-102 | Technical Communication | 2 | 0 | 0 | 2 | IV |
| 3 | HSMC-103 | Technical Communication Lab | 0 | 0 | 2 | 1 | IV |
| 5 | HSMC-105 | French Through Communicative Approach-I | 2 | 0 | 0 | 2 | V |
| 6 | HSMC-106 | French Through Communicative Approach-II | 2 | 0 | 0 | 2 | VI |
| 7 | HSMC-107 | Professional Practice, Law & Ethics | 2 | 0 | 0 | 2 | VII |
| | | | | | **Total Credit:** | **12** | |

# Mandatory Courses

| Sl. No. | Course Code | Course Title | Hours per week | | | Credits | Preferred Semester |
|---|---|---|---|---|---|---|---|
| | | | L | T | P | | |
| 1 | MC-101 | Induction Program | 0 | 0 | 0 | 0 | I |
| 2 | MC-102 | Environmental Science | 2 | 0 | 0 | 2 | IV |
| 3 | MC-103 | Values & Ethics | 2 | 0 | 0 | 2 | IV |
| | | | | **Total Credit:** | | **4** | |

# Professional Core Courses

**Branch: Mechanical Engineering(B.Tech)**

| Sl. No. | Course Code | Course Title | Hrs. /Week L: T: P | Credits | Preferred Semester |
|---|---|---|---|---|---|
| 1 | PCC-ME-201 | Thermodynamics | 03:00:00 | 3 | III/IV |
| 2 | PCC-ME-202 | Thermodynamics Lab | 00:00:02 | 1 | III/IV |
| 3 | PCC-ME-203 | Material Engineering | 03:00:00 | 3 | III/IV |
| 4 | PCC-ME-204 | Material Testing Lab | 00:00:02 | 1 | III/IV |
| 5 | PCC-ME-205 | Strength of Material | 03:00:00 | 3 | III/IV |
| 6 | PCC-ME-206 | Fluid Mechanics & Fluid Machine | 03:00:00 | 3 | III/IV |
| 7 | PCC-ME-207 | Fluid Mechanics Lab | 00:00:02 | 1 | III/IV |
| 8 | PCC-ME-208 | Applied Thermodynamics | 03:00:00 | 3 | III/IV |
| 9 | PCC-ME-209 | Production Practice Lab | 00:00:02 | 1 | III/IV |
| | | | **Total Credits:** | **19** | |

# Professional Core Courses

**Branch: Mechanical Engineering(B.Tech)**

| Sl. No. | Course Code | Course Title | Hrs. /Week L: T: P | Credits | Preferred Semester |
|---|---|---|---|---|---|
| 1 | PCC-ME-301 | Heat Transfer | 03:00:00 | 3 | V/VI |
| 2 | PCC-ME-302 | Solid Mechanics | 03:00:00 | 3 | V/VI |
| 3 | PCC-ME-303 | Manufacturing Process | 03:00:00 | 3 | V/VI |
| 4 | PCC-ME-304 | Kinetimatics & Theory of Machines | 03:00:00 | 3 | V/VI |
| 5 | PCC-ME-305 | Mechanical Engineering Lab(Thermal) | 00:00:03 | 1.5 | V/VI |
| 6 | PCC-ME-306 | Manufacturing Technology | 03:00:00 | 3 | V/VI |
| 7 | PCC-ME-307 | Design of Machine Elements | 03:00:00 | 3 | V/VI |
| 8 | PCC-ME-308 | Mechanical Engineering Lab(Design) II | 00:00:03 | 1.5 | V/VI |
| | | | **Total Credits:** | **21** | |

# Professional Core Courses

**Branch: Mechanical Engineering(B.Tech)**

| Sl. No. | Course Code | Course Title | Hrs. /Week L: T: P | Credits | Preferred Semester |
|---|---|---|---|---|---|
| 1 | PCC-ME-401 | Automation in Manufacturing | 03:00:00 | 3 | VII/VIII |
| 2 | PCC-ME-402 | Mechanical Engineering Lab (Manufacturing) III | 00:00:03 | 1.5 | VII/VIII |
| | | | **Total Credits:** | **4.5** | |

# Professional Elective Courses

**Branch: Mechanical Engineering(B.Tech)**

| Sl. No. | Course Code | Course Title | Hrs./ Week L: T: P | Credits | Preferred Semester |
|---|---|---|---|---|---|
| 1 | PEC-ME-301 | Internal Combustion Engines | 03:00:00 | 3 | V/VI |
| 2 | PEC-ME-302 | Mechatronic Systems | 03:00:00 | 3 | V/VI |
| 3 | PEC-ME-303 | Microprocessors in Automation | 03:00:00 | 3 | V/VI |
| 4 | PEC-ME-304 | Composite Materials | 03:00:00 | 3 | V/VI |
| 5 | PEC-ME-305 | Computer Aided Design | 03:00:00 | 3 | V/VI |

# Professional Elective Courses

**Branch: Mechanical Engineering(B.Tech)**

| Sl. No. | Course Code | Course Title | Hrs./ Week L: T: P | Credits | Preferred Semester |
|---|---|---|---|---|---|
| 1 | PEC-ME-401 | Refrigeration and Air Conditioning | 03:00:00 | 3 | VII/VIII |
| 2 | PEC-ME-402 | Finite Element Analysis | 03:00:00 | 3 | VII/VIII |
| 3 | PEC-ME-403 | Power Plant Engineering | 03:00:00 | 3 | VII/VIII |
| 4 | PEC-ME-404 | Gas Dynamics and Jet Propulsion | 03:00:00 | 3 | VII/VIII |
| 5 | PEC-ME-405 | Process Planning and Cost Estimation | 03:00:00 | 3 | VII/VIII |
| 6 | PEC-ME-406 | Principles of Management | 03:00:00 | 3 | VII/VIII |
| 7 | PEC-ME-407 | Automobile Engineering | 03:00:00 | 3 | VII/VIII |
| 8 | PEC-ME-408 | Design of Transmission Systems | 03:00:00 | 3 | VII/VIII |
| 9 | PEC-ME-409 | Total Quality Management | 03:00:00 | 3 | VII/VIII |
| 10 | PEC-ME-410 | Energy Conservation and Management | 03:00:00 | 3 | VII/VIII |

# Open Elective Course

**Branch: Mechanical Engineering(B.Tech)**

| Sl. No. | Course Code | Course Title | Hrs./ Week L: T: P | Credits |
|---|---|---|---|---|
| 1 | OEC-EEE-301 | Line Commutated and Active Rectifiers | 03:00:00 | 3 |
| 2 | OEC-EEE-302 | Electrical Drives | 03:00:00 | 3 |
| 3 | OEC-EEE-303 | Electrical Machine Design | 03:00:00 | 3 |
| 4 | OEC-EEE-304 | High Voltage Engineering | 03:00:00 | 3 |
| 5 | OEC-EEE-305 | Electrical Energy Conservation and Auditing | 03:00:00 | 3 |
| 6 | OEC-EEE-306 | Industrial Electrical Systems | 03:00:00 | 3 |
| 7 | OEC-EEE-307 | Digital Control Systems | 03:00:00 | 3 |
| 8 | OEC-EEE-310 | Computational Electromagnetics | 03:00:00 | 3 |
| 9 | OEC-EEE-311 | Control Systems Design | 03:00:00 | 3 |
| 10 | OEC-EEE-401 | Wind and Solar Energy Systems | 03:00:00 | 3 |
| 11 | OEC-EEE-402 | Electrical and Hybrid Vehicles | 03:00:00 | 3 |
| 12 | OEC-EEE-403 | Power System Protection | 03:00:00 | 3 |
| 13 | OEC-EEE-404 | HVDC Transmission Systems | 03:00:00 | 3 |
| 14 | OEC-EEE-405 | Power Quality and FACTS | 03:00:00 | 3 |
| 15 | OEC-EEE-406 | Power System Dynamics and Control | 03:00:00 | 3 |
| 16 | OEC-EEE-407 | Advanced Electric Drives | 03:00:00 | 3 |
| 17 | OEC-CSE-303 | Artificial Intelligence | 03:00:00 | 3 |
| 18 | OEC-CSE-304 | Cryptography & Network Security | 03:00:00 | 3 |
| 19 | OEC-CSE-305 | Internet-of-Things | 03:00:00 | 3 |
| 20 | OEC-CSE-307 | Machine Learning | 03:00:00 | 3 |
| 21 | OEC-CSE-308 | Cloud Computing | 03:00:00 | 3 |
| 22 | OEC-CSE-309 | Computer Graphics | 03:00:00 | 3 |
| 23 | OEC-CSE-311 | Web App Development | 03:00:00 | 3 |
| 24 | OEC-CSE-401 | Soft Computing | 03:00:00 | 3 |
| 25 | OEC-CSE-403 | Data Mining Concepts and Techniques | 03:00:00 | 3 |
| 26 | OEC-CSE-404 | Natural Language Processing | 03:00:00 | 3 |
| 27 | OEC-CSE-405 | Mobile Computing | 03:00:00 | 3 |
| 28 | OEC-CSE-408 | Big Data Analytics | 03:00:00 | 3 |
| 29 | OEC-CSE-409 | Image Processing | 03:00:00 | 3 |

# Project

**Branch: Mechanical Engineering(B.Tech)**

| Sl. No. | Course Code | Course Title | Hrs. /Week L: T: P | Credits | Preferred Semester |
|---|---|---|---|---|---|
| 1 | ME-P1 | Project Stage-I | 00:00:02 | 1 | V |
| 2 | ME-P2 | Project Stage-II | 00:00:06 | 3 | VI |
| 3 | ME-P3 | Project Stage-III | 00:00:10 | 5 | VII |
| 4 | ME-P4 | Project Stage-IV | 00:00:12 | 6 | VIII |
| | | | **Total Credits:** | **15** | |

# COURSE STRUCTURE

## SEMESTER I (1st YEAR)

**Branch: Mechanical Engineering(B.Tech)**

| Sl. No. | Category | Course Code | Course Title | Hours | | | Credit | Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | IA | ESE | Total |
| Theory | | | | | | | | | | |
| **1** | Basic Science Course | BSC-101 | Physics | 3 | 1 | 0 | 4 | 30 | 70 | 100 |
| **2** | Basic Science Course | BSC-105 | Mathematics – I | 3 | 1 | 0 | 4 | 30 | 70 | 100 |
| **3** | Engineering Science Course | ESC-101 | Basic Electrical & Electronics Engineering | 3 | 1 | 0 | 4 | 30 | 70 | 100 |
| | | | | | | **Total(A)** | **12** | **90** | **210** | **300** |
| **Practical/Drawing/Design** | | | | | | | | | | |
| **1** | Engineering Science Course | ESC-103 | Engineering Graphics & Design | 1 | 0 | 4 | 3 | 30 | 20 | 50 |
| **2** | Basic Science Course | BSC-102 | Physics Lab | 0 | 0 | 3 | 1.5 | 30 | 20 | 50 |
| **3** | Engineering Science Course | ESC-102 | Basic Electrical & Electronics Engineering Lab | 0 | 0 | 2 | 1 | 30 | 20 | 50 |
| | | | | | | **Total(B)** | **5.5** | **90** | **60** | **150** |
| **Grand Total (A+B)** | | | | | | | **17.5** | **180** | **270** | **450** |

**L-Lecture, T-Tutorial, P-Practical**

**IA- Internal Assessment, ESE-End Semester Examination**

# COURSE STRUCTURE

## SEMESTER II (1st YEAR)

**Branch: Mechanical Engineering(B.Tech)**

| Sl. No. | Category | Course Code | Course Title | Hours | | | Credit | Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | IA | ESE | Total |
| Theory | | | | | | | | | | |
| 1 | Basic Science Course | BSC-103 | Chemistry | 3 | 1 | 0 | 4 | 30 | 70 | 100 |
| 2 | Basic Science Course | BSC-106 | Mathematics –II | 3 | 1 | 0 | 4 | 30 | 70 | 100 |
| 3 | Engineering Science Course | ESC-104 | Programming for Problem Solving | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 4 | Humanities and Social Sciences including Management Courses | HSMC-101 | English | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | | | | | **Total(A)** | **14** | **120** | **280** | **400** |
| **Practical/Drawing/Design** | | | | | | | | | | |
| 1 | Engineering Science Course | ESC-106 | Workshop/ Manufacturing Practices | 1 | 0 | 4 | 3 | 30 | 20 | 50 |
| 2 | Basic Science Course | BSC-104 | Chemistry Lab | 0 | 0 | 3 | 1.5 | 30 | 20 | 50 |
| 3 | Engineering Science Course | ESC-105 | Programming for Problem Solving Lab | 0 | 0 | 4 | 2 | 30 | 20 | 50 |
| | | | | | | **Total(B)** | **6.5** | **90** | **60** | **150** |
| **Grand Total (A+B)** | | | | | | | **20.5** | **210** | **340** | **550** |

**L-Lecture, T-Tutorial, P-Practical**

**IA- Internal Assessment, ESE-End Semester Examination**

# COURSE STRUCTURE

**SEMESTER III (2nd YEAR)**

**Branch: Mechanical Engineering(B.Tech)**

| Sl. No. | Category | Course Code | Course Title | Hours | | | Credit | Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | IA | ESE | Total |
| **Theory** | | | | | | | | | | |
| **1** | Basic Science Course | BSC-107 | Mathematics –III | 3 | 1 | 0 | 4 | 30 | 70 | 100 |
| **2** | Professional Core Courses | PCC-ME-201 | Thermodynamics | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **3** | Engineering Science Course | ESC-108 | Electronics Devices | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **4** | Professional Core Courses | PCC-ME-203 | Material Engineering | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **5** | Engineering Science Course | ESC-107 | Engineering Mechanics | 3 | 1 | 0 | 4 | 30 | 70 | 100 |
| | | | | | | **Total(A)** | **17** | **150** | **350** | **500** |
| **Practical/Drawing/Design** | | | | | | | | | | |
| **1** | Professional Core Courses | PCC-ME-202 | Thermodynamics Lab | 0 | 0 | 2 | 1 | 30 | 20 | 50 |
| **2** | Professional Core Courses | PCC-ME-204 | Material Testing Lab | 0 | 0 | 2 | 1 | 30 | 20 | 50 |
| **3** | Engineering Science Course | ESC-112 | Programming using MATLAB | 0 | 0 | 2 | 1 | 30 | 20 | 50 |
| **4** | Engineering Science Course | ESC-109 | Electronics Devices Lab | 0 | 0 | 2 | 1 | 30 | 20 | 50 |
| | | | | | | **Total(B)** | **4** | **120** | **80** | **200** |
| **Grand Total (A+B)** | | | | | | | **21** | **270** | **430** | **700** |

**L-Lecture, T-Tutorial, P-Practical**

**IA- Internal Assessment, ESE-End Semester Examination**

# COURSE STRUCTURE

**SEMESTER IV (2nd YEAR)**

**Branch: Mechanical Engineering(B.Tech)**

| Sl. No. | Category | Course Code | Course Title | Hours | | | Credit | Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | IA | ESE | Total |
| **Theory** | | | | | | | | | | |
| **1** | Professional Core Courses | PCC-ME-205 | Strength of Material | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **2** | Humanities and Social Sciences including Management Courses | HSMC-102 | Technical Communication | 2 | 0 | 0 | 2 | 30 | 70 | 100 |
| **3** | Engineering Science Course | ESC-110 | Digital Electronics | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **4** | Professional Core Courses | PCC-ME-206 | Fluid Mechanics & Fluid Machine | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **5** | Professional Core Courses | PCC-ME-208 | Applied Thermodynamics | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **6** | Mandatory Courses | MC-103 | Values & Ethics | 2 | 0 | 0 | 2 | 30 | 70 | 100 |
| **7** | Mandatory Courses | MC-102 | Environmental Science | 2 | 0 | 0 | 2 | 30 | 70 | 100 |
| | | | | | | **Total(A)** | **18** | **210** | **490** | **700** |
| **Practical/Drawing/Design** | | | | | | | | | | |
| **1** | Engineering Science Course | ESC-111 | Digital Electronics Lab | 0 | 0 | 2 | 1 | 30 | 20 | 50 |
| **2** | Professional Core Courses | PCC-ME-207 | Fluid Mechanics Lab | 0 | 0 | 2 | 1 | 30 | 20 | 50 |
| **3** | Professional Core Courses | PCC-ME-209 | Production Practice Lab | 0 | 0 | 2 | 1 | 30 | 20 | 50 |
| **3** | Humanities and Social Sciences including Management Courses | HSMC-103 | Technical Communication Lab | 0 | 0 | 2 | 1 | 30 | 20 | 50 |
| | | | | | | **Total(B)** | **4** | **120** | **80** | **200** |
| **Grand Total (A+B)** | | | | | | | **22** | **330** | **570** | **900** |

**L-Lecture, T-Tutorial, P-Practical**

**IA- Internal Assessment, ESE-End Semester Examination**

# COURSE STRUCTURE

## SEMESTER V (3rd YEAR)

**Branch: Mechanical Engineering(B.Tech)**

| Sl. No. | Category | Course Code | Course Title | Hours | | | Credit | Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | IA | ESE | Total |
| **Theory** | | | | | | | | | | |
| **1** | Professional Core Courses | PCC-ME-301 | Heat Transfer | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **2** | Professional Core Courses | PCC-ME-302 | Solid Mechanics | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **3** | Professional Core Courses | PCC-ME-303 | Manufacturing Process | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **4** | Professional Core Courses | PCC-ME-304 | Kinetimatics & Theory of Machines | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **5** | Open Elective Course | | Open Elective Course-I (Humanities) | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **6** | Humanities and Social Sciences including Management Courses | | Foreign Languages-I | 2 | 0 | 0 | 2 | 30 | 70 | 100 |
| | | | | | | **Total(A)** | **17** | **180** | **420** | **600** |
| **Practical/Drawing/Design** | | | | | | | | | | |
| **1** | Professional Core Courses | PCC-ME-305 | Mechanical Engineering Lab(Thermal) | 0 | 0 | 3 | 1.5 | 30 | 20 | 50 |
| **2** | Project | ME-P1 | Mini Project-I | 0 | 0 | 2 | 1 | 75 | 25 | 100 |
| | | | | | | **Total(B)** | **2.5** | **105** | **45** | **150** |
| **Grand Total (A+B)** | | | | | | | **19.5** | **285** | **465** | **750** |

**L-Lecture, T-Tutorial, P-Practical**

**IA- Internal Assessment, ESE-End Semester Examination**

# COURSE STRUCTURE

## SEMESTER VI (3rd YEAR)

**Branch: Mechanical Engineering(B.Tech)**

| Sl. No. | Category | Course Code | Course Title | Hours | | | Credit | Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | IA | ESE | Total |
| **Theory** | | | | | | | | | | |
| 1 | Professional Core Courses | PCC-ME-306 | Manufacturing Technology | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 2 | Professional Core Courses | PCC-ME-307 | Design of Machine Elements | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 3 | Professional Elective Course | | Professional Elective Course-I | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 4 | Professional Elective Course | | Professional Elective Course-II | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 5 | Open Elective Course | | Open Elective Course-II (Humanities) | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 6 | Humanities and Social Sciences including Management Courses | | Foreign Languages-II | 2 | 0 | 0 | 2 | 30 | 70 | 100 |
| | | | | | | **Total(A)** | **17** | **180** | **420** | **600** |
| **Practical/Drawing/Design** | | | | | | | | | | |
| 1 | Professional Core Courses | PCC-ME-308 | Mechanical Engineering Lab(Design) II | 0 | 0 | 3 | 1.5 | 30 | 20 | 50 |
| 2 | Project | ME-P2 | Mini Project-II | 0 | 0 | 6 | 3 | 75 | 25 | 100 |
| | | | | | | **Total(B)** | **4.5** | **105** | **45** | **150** |
| **Grand Total (A+B)** | | | | | | | **21.5** | **285** | **465** | **750** |

**L-Lecture, T-Tutorial, P-Practical**
**IA- Internal Assessment, ESE-End Semester Examination**

# COURSE STRUCTURE

## SEMESTER VII (4th YEAR)

**Branch: Mechanical Engineering(B.Tech)**

| Sl. No. | Category | Course Code | Course Title | Hours | | | Credit | Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | IA | ESE | Total |
| **Theory** | | | | | | | | | | |
| **1** | Professional Core Courses | PCC-ME-401 | Automation in Manufacturing | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **2** | Professional Elective Course | | Professional Elective Course-III | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **3** | Professional Elective Course | | Professional Elective Course-IV | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **4** | Open Elective Course | | Open Elective Course-III | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **6** | Humanities and Social Sciences including Management Courses | HSMC-107 | Professional Practice, Law & Ethics | 2 | 0 | 0 | 2 | 30 | 70 | 100 |
| | | | | | | **Total(A)** | **14** | **150** | **350** | **500** |
| **Practical/Drawing/Design** | | | | | | | | | | |
| **1** | Project Stage-III | ME-P3 | Project Work | 0 | 0 | 10 | 5 | 150 | 50 | 200 |
| **2** | Professional Core Courses | PCC-ME-402 | Mechanical Engineering Lab (Manufacturing) III | 0 | 0 | 3 | 1.5 | 30 | 20 | 50 |
| | | | | | | **Total(B)** | **6.5** | **180** | **70** | **250** |
| **Grand Total (A+B)** | | | | | | | **20.5** | **330** | **420** | **750** |

**L-Lecture, T-Tutorial, P-Practical**

**IA- Internal Assessment, ESE-End Semester Examination**

# COURSE STRUCTURE

## SEMESTER VIII (4th YEAR)

**Branch: Mechanical Engineering(B.Tech)**

| Sl. No. | Category | Course Code | Course Title | Hours | | | Credit | Marks | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | IA | ESE | Total |
| **Theory** | | | | | | | | | | |
| **1** | Professional Elective Course | | Professional Elective Course-V | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **2** | Professional Elective Course | | Professional Elective Course-VI | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **3** | Open Elective Course | | Open Elective Course-IV | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **4** | Open Elective Course | | Open Elective Course-V | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| **5** | Open Elective Course | | Open Elective Course-VI | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | | | | | **Total(A)** | **15** | **150** | **350** | **500** |
| **Practical/Drawing/Design** | | | | | | | | | | |
| **1** | Project Stage-IV | ME-P4 | Project & Dissertation | 0 | 0 | 12 | 6 | 150 | 50 | 200 |
| | | | | | | **Total(B)** | **6** | **150** | **50** | **200** |
| **Grand Total (A+B)** | | | | | | | **21** | **300** | **400** | **700** |

**L-Lecture, T-Tutorial, P-Practical**

**IA- Internal Assessment, ESE-End Semester Examination**