**BIRLA INSTITUTE OF TECHNOLOGY- MESRA, RANCHI**

NEWCOURSE STRUCTURE - To be effective from academic session 2018- 19 Based on CBCS &OBEmodel

Recommended scheme ofstudy

***(For BioEngg, Chemical, Chemical (Plastics and Polymer, Civil Mechanical & Production Engineering Branches)***

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| **Semester/ Session of Study (Recommended)** | **Course Level** | **Category of course** | **Course Code** | **Courses** | **Mode of delivery & credits** *L-Lecture; T-Tutorial;P- Practicals* | | | | | **Total Credits** *C-*  *Credits* | | |
| **L**  **(*Periods/ week*)** | | **T**  ***(Periods/ week)*** | **P**  ***(Periods/ week)*** | | **C** | | |
| **THEORY** | | | | | | | | | | | |
| **FIRST**  **Monsoon** | **FIRST** | **FS**  ***Foundation Sciences*** | MA103 | Mathematics - I | 3 | | 1 | 0 | | 4 | | |
| PH113 | Physics | 3 | | 1 | 0 | | 4 | | |
| **GE**  ***General Engineering*** | EE101 | Basics of Electrical Engineering | 3 | | 1 | 0 | | 4 | | |
| CS101 | Programming for Problem Solving | 3 | | 1 | 0 | | 4 | | |
| **LABORATORIES** | | | | | | | | | | | |
| **FIRST** | **FS** | PH114 | Physics Lab | 0 | | 0 | 3 | | 1.5 | | |
| **GE** | CS102 | Programming for Problem Solving Lab | 0 | | 0 | 3 | | 1.5 | | |
| **GE** | PE101 | Workshop Practice | 0 | | 0 | 3 | | 1.5 | | |
| **MC**  **Mandatory Course** | MC101/102/103/ 104 | Choice of : NCC/NSS/  PT & Games/ Creative Arts (CA) | 0 | | 0 | 2 | | 1 | | |
| **TOTAL** | | | | | | | | | | **21.5** | | |
| **SECOND**  **Spring** | **THEORY** | | | | | | | | | | | |
| **FIRST** | **FS** | MA107 | Mathematics - II | 3 | | 1 | 0 | | 4 | | |
| CH101 | Chemistry | 3 | | 1 | 0 | | 4 | | |
| **GE** | ME101 | Basics of Mechanical Engineering | 3 | | 1 | 0 | | 4 | | |
| EC101 | Basics of Electronics & Communication Engineering | 3 | | 1 | 0 | | 4 | | |
| **LABORATORIES** | | | | | | | | | | | |
| **FIRST** | **FS** | CH102 | Chemistry Lab | | 0 | | | 0 | | 3 | 1.5 |
| **GE** | EC102 | Electronics & Communication Lab | | 0 | | | 0 | | 3 | 1.5 |
| ME102 | Engineering Graphics | | 0 | | | 0 | | 4 | 2 |
| **MC** | MC105/106/107/ 108 | Choice of : NCC/NSS/  PT & Games/ Creative Arts (CA) | | 0 | | | 0 | | 2 | 1 |
| **TOTAL** | | | | | | | | | | | | **22** |
| **GRAND TOTAL FOR FIRST YEAR** | | | | | | | | | | | | **43.5** |

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| **Semester/ Session of Study (Recomended)** | **Course Level** | **Category of course** | **Course Code** | **Courses** | **Mode of delivery & credits** *L-Lecture; T-Tutorial;P- Practicals* | | | **Total Credits**  *C- Credits* |
| **L**  **(*Periods/ week* )** | **T**  ***(Periods/ week)*** | **P**  ***(Periods/ week)*** | **C** |
| **THEORY** | | | | | | | |
| **THIRD**  **Monsoon** | **SECOND** | **FS** | MA203 | Numerical Methods | 2 | 0 | 0 | 2 |
| **FIRST** | CE101 | Environmental Sciences | 2 | 0 | 0 | 2 |
| **SECOND** | **PC** | ME201 | Thermodynamics | 3 | 0 | 0 | 3 |
| ME203 | Fluid Mechanics & Hydraulic Machines | 3 | 0 | 0 | 3 |
| PE213 | Manufacturing Processes | 3 | 0 | 0 | 3 |
| ME205 | Strength of Materials | 3 | 1 | 0 | 4 |
| **LABORATORIES** | | | | | | | |
| **SECOND** | **GE** | IT202 | Basic IT Workshop | 0 | 0 | 2 | 1 |
| **FS** | MA204 | Numerical Methods Lab | 0 | 0 | 2 | 1 |
| **MC** | MC201/2 02/203/2  04 | Choice of : NCC/NSS/  PT & Games/ Creative Arts (CA) | 0 | 0 | 2 | 1 |
| PC | ME202 | Fluid Mechanics & Hydraulic Machines Lab | 0 | 0 | 3 | 1.5 |
| ME204 | Mechanical Engineering Lab I | 0 | 0 | 3 | 1.5 |
| **TOTAL** | | | | | | | | **23** |
|  | **THEORY** | | | | | | | |
| **SECOND** | **GE** | IT201 | Basics of Intelligent Computing | 3 | 0 | 0 | 3 |
| **FIRST** | **FS** | BE101 | Biological Science for Engineers | 2 | 0 | 0 | 2 |

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| **FOURTH**  **Spring** | **SECOND** | **PC** | ME207 | Kinematics & Dynamics of Machines | 3 | 0 | 0 | 3 |
| ME209 | Energy Conversion Systems | 3 | 0 | 0 | 3 |
| ME211 | Machine Design | 3 | 0 | 0 | 3 |
| **SECOND** | **PE** |  | Program Elective I | 3 | 0 | 0 | 3 |
| **LABORATORIES** | | | | | | | |
| **FIRST** | **GE** | EE102 | Electrical Engineering Lab | 0 | 0 | 3 | 1.5 |
| **SECOND** | **MC** | MC205/2 06/207/2  08 | Choice of : NCC/NSS/  PT & Games/ Creative Arts (CA) | 0 | 0 | 2 | 1 |
| **PC** | ME208 | Dynamics of Machine Lab | 0 | 0 | 3 | 1.5 |
| PE205 | Manufacturing Processes Lab | 0 | 0 | 3 | 1.5 |
| **TOTAL** | | | | | | | | **22.5** |
| **FIFTH**  **Monsoon** | **THEORY** | | | | | | | |
| **FIRST** | **HSS** | MT123 | Business Communications | 2 | 0 | 2 | 3 |
| **THIRD** | **PC** | ME301 | I C Engines & Gas Turbines | 3 | 0 | 0 | 3 |
| ME303 | Mechanical Vibration | 3 | 0 | 0 | 3 |
| ME315 | Heat & Mass Transfer | 3 | 0 | 0 | 3 |
| **PE** |  | Program Elective 2 | 3 | 0 | 0 | 3 |
| **OE** |  | Open Elective 1 | 3 | 0 | 0 | 3 |
| **LABORATORIES** | | | | | | | |
| **THIRD** | **PC** | ME302 | Heat Transfer Lab | 0 | 0 | 3 | 1.5 |
| ME304 | Internal Combustion Engine Lab | 0 | 0 | 3 | 1.5 |
| ME 306 | Mechanical Engineering Lab II | 0 | 0 | 2 | 1 |
| **TOTAL** | | | | | | | | **22** |

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| **SIXTH**  **Spring** | **THEORY** | | | | | | | |
| **THIRD** | **PC** | ME305 | Automobile Engineering | 3 | 0 | 0 | 3 |
| ME307 | Robotics Engineering | 3 | 0 | 0 | 3 |
| **PE** |  | Program Elective 3 | 3 | 0 | 0 | 3 |
|  | Program Elective 4 | 3 | 0 | 0 | 3 |
| **OE** |  | Open Elective 2 | 3 | 0 | 0 | 3 |
|  |  | Open Elective 3/MOOC I | 3 | 0 | 0 | 3 |
| **MC** | MC300 | Summer Training- Mandatory | N/A | | | 3 |
| **LABORATORIES** | | | | | | | |
| **THIRD** | **PC** | ME308 | Robotics & Automation Lab | 0 | 0 | 3 | 1.5 |
| ME310 | Automobile Engineering Lab | 0 | 0 | 3 | 1.5 |
| **TOTAL** | | | | | | | | **24** |
|  | **THEORY** | | | | | | | |
| **SEVENTH**  **Monsoon** | **FOURTH** | **HSS** | ME413 | Professional Practice, Law and Ethics | 2 | 0 | 0 | 2 |
| **PC** | ME401 | Refrigeration & Air Conditioning | 3 | 0 | 0 | 3 |
| ME403 | Hydraulic & Pneumatic Control | 3 | 0 | 0 | 3 |
| ME409 | Industrial Management | 3 | 0 | 0 | 3 |
| ME411 | Computer Aided Design | 3 | 0 | 0 | 3 |
|  | **OE** |  | Open Elective 4/MOOC II | 3 | 0 | 0 | 3 |
| **SECOND** | **MC** | MT204 | Constitution of India | 2 | 0 | 0 | NC |
| **LABORATORIES** | | | | | | | |

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|  | **FOURTH** | **PC** | ME404 | Refrigeration & Air Conditioning Lab | 0 | 0 | 3 | 1.5 |
| ME406 | Computer Aided Design & Drafting Lab | 0 | 0 | 3 | 1.5 |
| **TOTAL** | | | | | | | | **20** |
| **EIGTH**  **Spring** | **FOURTH** | **PC** | ME400 | Research Project / Industry Internship | **Total** | | | **12** |
| **GRAND TOTAL**  ***Minimum requirement for Degree award*** | | | | | | | | **167** |

**PROGRAMME ELECTIVES (PE)**

**OFFERED FOR LEVEL 1-4**

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| **PE / LEVEL** |  | **Code no.** | **Name of the PE courses** | **L** | **T** | **P** | **C** |
| 2 | PE 1 | ME 251 | Thermo Fluid Engineering | 3 | 0 | 0 | 3 |
| 2 | ME 253 | Composite Materials | 3 | 0 | 0 | 3 |
| 2 | ME 255 | Renewable Energy Resources | 3 | 0 | 0 | 3 |
| 2 | ME 257 | Non Destructive Testing | 3 | 0 | 0 | 3 |
| 3 | PE 2 | ME 347 | Advanced Thermodynamics | 3 | 0 | 0 | 3 |
| 3 | ME 349 | Turbo Machinery | 3 | 0 | 0 | 3 |
| 3 | ME 351 | Finite Element Methods | 3 | 0 | 0 | 3 |
| 3 | ME 353 | Computational Fluid Dynamics | 3 | 0 | 0 | 3 |
| 3 | ME 355 | Advanced Solid Mechanics | 3 | 0 | 0 | 3 |
| 3 | ME 357 | Measurement & Instruments | 3 | 0 | 0 | 3 |
|  | PE 3 | ME 359 | Power Plant Engineering | 3 | 0 | 0 | 3 |
| 3 | ME 361 | Combustion | 3 | 0 | 0 | 3 |
| 3 | ME 363 | Vehicle Dynamics | 3 | 0 | 0 | 3 |
| 3 | ME 365 | Design of Mechanisms | 3 | 0 | 0 | 3 |
| 3 | ME 367 | Industrial Tribology | 3 | 0 | 0 | 3 |
| 3 | ME 369 | Gas Dynamics | 3 | 0 | 0 | 3 |
| 3 | PE 4 | ME 373 | Design, Modeling and  Application of Solar Energy | 3 | 0 | 0 | 3 |
| 3 | ME 375 | Power Gear Train | 3 | 0 | 0 | 3 |
| 3 | ME 377 | Mechatronics | 3 | 0 | 0 | 3 |
| 3 | ME 379 | Reliability in MechanicalDesign | 3 | 0 | 0 | 3 |
| 3 | ME 381 | Design of Brake System | 3 | 0 | 0 | 3 |
| 3 | ME 383 | Automation in Manufacturing | 3 | 0 | 0 | 3 |
| 3 | ME 385 | Theory of Elasticity | 3 | 0 | 0 | 3 |
| 3 | ME 387 | Advanced Heat Transfer | 3 | 0 | 0 | 3 |

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| **DEPARTMENT OF MECHANICAL ENGINEERING OPEN ELECTIVES (OE)\***  **OFFERED FOR LEVEL 1-4** | | | | | | | |
| **OE / LEVEL** | **Code no.** | **Name of the OE courses** | **Prerequisites courses**  **with code** | **L** | **T** | **P** | **C** |
| 2 | ME 291 | Renewable Energy Sources | NIL | 3 | 0 | 0 | 3 |
| 2 | ME 292 | Smart & New Materials | NIL | 3 | 0 | 0 | 3 |
| 3 | ME 387 | Motor Vehicle Acts | NIL | 3 | 0 | 0 | 3 |
| 3 | ME 391 | Elements of Nuclear & Diesel  Power Plant | NIL | 3 | 0 | 0 | 3 |
| 3 | ME 393 | Elements of Hydel & Thermal  Power Plant | NIL | 3 | 0 | 0 | 3 |
| 4 | ME 397 | Industrial Robotics & Automation | NIL | 3 | 0 | 0 | 3 |
| 4 | ME 389 | Mechatronics & its Applications | NIL | 3 | 0 | 0 | 3 |

\* OPEN ELECTIVES TO BE OPTED ONLY BY OTHER DEPARTMENT STUDENTS