# DAYANANDA SAGAR UNIVERSITY

ShavigeMalleshwara Hills, Kumaraswamy Layout,

Bengaluru - 560078, Karnataka.

## SCHOOL OF ENGINEERING

# SCHEME & SYLLABUS
# FOR
# BACHELOR OF TECHNOLOGY (B.Tech.) –2020

## MECHANICAL ENGINEERING

## (WITH EFFECT FROM 2020 - 21)

## (CIA 60:40 EXAM SCHEME)

**SCHEME - B.TECH – 2020-21 ONWARDS**

**III SEM - MECHANICAL ENGINEERING**

| SL | PROGRAM CODE | COURSE CODE | COURSE TITLE | CR / AU | SCHEME OF TEACHING | | | | | PREREQUISITE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | L | T | P | S/ P | C | SEM | COURSE CODE |
| 1 | 105 | 20ME2301 | COMPLEX VARIABLES AND NUMERICAL METHODS | CR | 03 | 01 | -- | -- | 04 | * | *** |
| 2 | 105 | 20ME2302 | ENGINEERING MATERIALS | CR | 03 | -- | 02 | -- | 04 | * | *** |
| 3 | 105 | 20ME2303 | ENGINEERING MECHANICS | CR | 03 | -- | -- | -- | 03 | * | *** |
| 4 | 105 | 20ME2304 | THERMODYNAMICS | CR | 03 | -- | -- | -- | 03 | * | *** |
| 5 | 105 | 20ME2305 | COMPUTER AIDED MACHINE DRAWING | CR | 02 | -- | 04 | --- | 04 | II | 20EN1111 |
| 6 | 105 | 20ME2306 | MECHANICAL MEASUREMENTS | CR | 03 | -- | 02 | -- | 04 | * | *** |
| 7 | 105 | 20ME2307 | SPECIAL TOPICS – I | CR | 01 | -- | 02 | -- | 02 | * | *** |
| | | | | | **18** | **01** | **10** | **-** | **24** | | |

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**SCHEME - B.TECH – 2020-21 ONWARDS**

**IV SEM - MECHANICAL ENGINEERING**

| SL | PROGRAM CODE | COURSE CODE | COURSE TITLE | CR / AU | SCHEME OF TEACHING | | | | | PREREQUISITE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | L | T | P | S/P | C | SEM | COURSE CODE |
| 1 | 105 | 20ME2401 | APPLIED THERMODYNAMICS | CR | 02 | 01 | 02 | -- | 04 | III | 20ME2304 |
| 2 | 105 | 20ME2402 | MECHANICS OF MATERIALS | CR | 02 | 01 | -- | -- | 03 | III | 20ME2303 |
| 3 | 105 | 20ME2403 | FLUID MECHANICS AND MACHINES | CR | 03 | -- | 02 | -- | 04 | * | *** |
| 4 | 105 | 20ME2404 | MANUFACTURING PROCESS | CR | 03 | -- | 02 | -- | 04 | * | *** |
| 5 | 105 | 20ENC003 | ECONOMICS FOR ENGINEERS | CR | 02 | -- | -- | -- | 02 | * | *** |
| 6 | 105 | 20ME2405 | SPECIAL TOPICS – II | CR | 01 | -- | 02 | -- | 02 | * | *** |
| | | | | | **13** | **02** | **08** | **--** | **19** | | |

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## SCHEME - B.TECH – 2020-21 ONWARDS

## V SEM - MECHANICAL ENGINEERING

| SL | PROGRAM CODE | COURSE CODE | COURSE TITLE | CR / AU | SCHEME OF TEACHING | | | | | PREREQUISITE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | L | T | P | S/P | C | SEM | COURSE CODE |
| 1 | 105 | 20ME3501 | HEAT TRANSFER | CR | 03 | -- | 02 | -- | 04 | III | 20ME2304 |
| 2 | 105 | 20ME3502 | KINEMATICS & THEORY OF MACHINES | CR | 03 | 01 | -- | -- | 04 | * | *** |
| 3 | 105 | 20ME3503 | DESIGN OF MACHINE ELEMENTS – I | CR | 02 | 01 | 02 | -- | 04 | IV | 20ME2402 |
| 4 | 105 | 20ME3504 | MANUFACTURING TECHNOLOGY | CR | 03 | -- | 02 | -- | 04 | IV | 20ME2404 |
| 5 | 105 | 20ME35XX | PROFESSIONAL ELECTIVE – I | CR | 03 | -- | -- | -- | 03 | AS INDICATED IN PROGRAM ELECTIVE LIST | |
| 6 | 105 | 20OEXXXX | OPEN ELECTIVE – I | CR | 03 | -- | -- | -- | 03 | * | *** |
| 7 | 105 | 20ME3505 | SPECIAL TOPICS – III | CR | 02 | -- | -- | -- | 02 | * | *** |
| | | | | | **19** | **02** | **06** | **--** | **24** | | |

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| | ROBOTICS & AUTOMATION | ADDITIVE MANUFACTURING | HYBRID & ELECTRIC VEHICLES | GENERAL |
|---|---|---|---|---|
| ***PROFESSIONAL ELECTIVE – I** | Introduction to robotics and Automation | Additive Manufacturing Technology | Introduction to Hybrid & Electric Vehicles | Refrigeration and Air Conditioning |
| | Fundamentals to Machine Learning & Artificial Intelligence | Automated Manufacturing Systems | Autotronics | Tool Design |
| **OPEN ELECTIVE -I** | Automobile Engineering<br>Rapid Manufacturing Technologies | | | |

**SCHEME - B.TECH – 2020-21 ONWARDS**

**VI SEM - MECHANICAL ENGINEERING**

| SL | PROGRAM CODE | COURSE CODE | COURSE TITLE | CR / AU | SCHEME OF TEACHING | | | | | PREREQUISITE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | L | T | P | S/P | C | SEM | COURSE CODE |
| 1 | 105 | 20ME3601 | DESIGN OF MACHINE ELEMENTS – II | CR | 02 | 01 | 02 | -- | 04 | IV | 20ME2402 |
| 2 | 105 | 20ME3602 | FINITE ELEMENT ANALYSIS | CR | 02 | 01 | 02 | -- | 04 | I | 20EN1101 |
| 3 | 105 | 20ME3603 | MECHANICAL VIBRATIONS | CR | 03 | -- | 02 | -- | 04 | II | 20EN1201 |
| 4 | 105 | 20ME36XX | PROFESSIONAL ELECTIVE – II | CR | 03 | -- | -- | -- | 03 | AS INDICATED IN PROGRAM ELECTIVE LIST | |
| 5 | 105 | 20ME36XX | PROFESSIONAL ELECTIVE – III | CR | 03 | -- | -- | -- | 03 | | |
| 6 | 105 | 20OEXXXX | OPEN ELECTIVE – II | CR | 03 | -- | -- | -- | 03 | | |
| 7 | 105 | 20ENXXXX | LAW FOR ENGINEERS | CR | 02 | -- | - | -- | 02 | | |
| | | | | | **18** | **02** | **06** | **--** | **23** | | |

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| | ROBOTICS & AUTOMATION | ADDITIVE MANUFACTURING | HYBRID & ELECTRIC VEHICLES | GENERAL |
|---|---|---|---|---|
| ***PROFESSIONAL ELECTIVE – II** | Drives & Control systems | Materials for AM | Automotive Chassis & Transmission Systems | Renewable Energy Sources |
| | Electrical Machines and Power Systems | Processing of plastics & composites | Model-Based Embedded Control System Design | Product Design And Manufacturing |
| ***PROFESSIONAL ELECTIVE – III** | Robot Kinematics and Dynamics | Computational Tools for AM | HEV / xEV System Design Architecture | Internal Combustion Engines |
| | Industrial Automation-I | Micro and Nano fabrication technologies | Materials and Manufacturing processes for Automotive systems | MEMS (Micro Electro Mechanical Systems) |
| ***OPEN ELECTIVE – II** | Robotics<br>Product Design & Manufacturing | | | |

**SCHEME - B.TECH – 2020-21**

**ONWARDSVII SEM -**

**MECHANICAL ENGINEERING**

| SL | PROGRAM CODE | COURSE CODE | COURSE TITLE | CR / AU | SCHEME OF TEACHING | | | | | PREREQUISITE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | L | T | P | S/P | C | SEM | COURSE CODE |
| 1 | 105 | 20ME4701 | CONTROL SYSTEMS ENGINEERING | CR | 03 | -- | 02 | -- | 04 | II | 20EN1201 |
| 2 | 105 | 20ME47XX | PROFESSIONAL ELECTIVE – IV | CR | 03 | -- | -- | -- | 03 | AS INDICATED IN PROGRAM ELECTIVE LIST | |
| 3 | 105 | 20ME47XX | PROFESSIONAL ELECTIVE – V | CR | 03 | -- | -- | -- | 03 | | |
| 4 | 105 | 20OEXXXX | OPEN ELECTIVE – III | CR | 03 | -- | -- | -- | 03 | * | *** |
| 5 | 105 | 20ME4702 | MAJOR PROJECT PHASE – I | CR | -- | -- | -- | 04 | 02 | * | *** |
| | | | | | **12** | **-** | **02** | **04** | **15** | | |

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| | ROBOTICS & AUTOMATION | ADDITIVE MANUFACTURING | HYBRID & ELECTRIC VEHICLES | GENERAL |
|---|---|---|---|---|
| ***PROFESSIONAL ELECTIVE – IV** | Industrial Automation-II | Industry 4.0 and IoT | Vehicle Dynamics Advanced Powertrain | Computational Fluid Dynamics |
| | Automation System Design | CAD/CAM for AM | Advanced Energy Storage | Operations Management |
| ***PROFESSIONAL ELECTIVE – V** | Robot Vision Systems | Intelligent Manufacturing Systems | Powertrain Integration in HEV | Automobile Engineering |
| | Robot Programming | Powder Metallurgy Manufacturing | Energy management and control strategies | Tribology And Bearing Design |
| ***OPEN ELECTIVE – II I** | Renewable Engineering<br>MEMS (Micro Electro Mechanical Systems) | | | |

**SCHEME - B.TECH – 2020-21**

**ONWARDS VIII SEM -**

**MECHANICAL ENGINEERING**

| SL | PROGRAM CODE | COURSE CODE | COURSE TITLE | CR / AU | SCHEME OF TEACHING | | | | | PREREQUISITE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | L | T | P | S/P | C | SEM | COURSE CODE |
| 1 | 105 | 20ME48XX | PROFESSIONAL ELECTIVE – VI | CR | 03 | -- | -- | -- | 03 | AS INDICATED IN PROGRAM ELECTIVE LIST | |
| 2 | 105 | 20ME4801 | MAJOR PROJECT PHASE– II | CR | -- | -- | -- | 20 | 10 | VII | 20ME4702 |
| | | | | | **03** | **-** | **-** | **10** | **13** | | |

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| | ROBOTICS & AUTOMATION | ADDITIVE MANUFACTURING | HYBRID & ELECTRIC VEHICLES | GENERAL |
|---|---|---|---|---|
| ***PROFESSIONAL ELECTIVE – VI** | Advanced AI for Robotics | Additive Manufacturing for Medical Applications | Advanced Propulsion Systems for Hybrid Electric Drive Vehicles | FEM- Structural Mechanics Applications |
| | Robot Simulation & offline Programming | Sustainable Manufacturing | Automotive Electronics for xEV's | Organizational Behaviour And Professional Communication |

| MINORS FOR OTHER PROGRAMS | | | | |
|---|---|---|---|---|
| **Sl. No** | **Course Name** | **Credit Pattern (L:T:P)** | **Credits** | **Semester** |
| 1 | Engineering Materials (Theory & Practice) | 2 : 0 : 2 | 3 | 3 |
| 2 | Solid Mechanics (Theory & Practice) | 2: 0 : 2 | 3 | 4 |
| 3 | Fluids & Thermal Engineering (Theory & Practice) | 3: 0 : 2 | 4 | 5 |
| 4 | Digital Manufacturing (Theory & Practice) - | 3 : 0 : 2 | 4 | 5 |
| 5 | Product Design and development(Theory & Practice) - | 2: 0 : 2 | 3 | 6 |
| 6 | Recent Trends in Mechanical Engineering | 3: 0 : 0 | 3 | 7 |
| | | Total | 20 | |