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# JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR
*(Established by Govt. of A.P., Act. No. 30 of 2008)*
## ANANTHAPURAMU – 515 002 (A.P.) INDIA.

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### Course Structure for B.Tech-R15 Regulations

## Mechanical Engineering

### B.Tech I – I Semester (ME)

| S.No | Course code | Subject | L | T | P | C |
|------|-------------|---------|---|---|---|---|
| 1. | 15A52101 | Functional English | 3 | 1 | - | 3 |
| 2. | 15A54101 | Mathematics – I | 3 | 1 | - | 3 |
| 3. | 15A05101 | Computer Programming | 3 | 1 | - | 3 |
| 4. | 15A51101 | Engineering Chemistry | 3 | 1 | - | 3 |
| 5. | 15A01101 | Environmental Studies | 3 | 1 | - | 3 |
| 6. | 15A52102 | English Language Communication Skills Lab | - | - | 4 | 2 |
| 7. | 15A51102 | Engineering Chemistry Lab | - | - | 4 | 2 |
| 8. | 15A05102 | Computer Programming Lab | - | - | 4 | 2 |
| | | Total | 15 | 5 | 12 | 21 |

### I-II Semester

| S.No | Course code | Subject | L | T | P | Drg | C |
|------|-------------|---------|---|---|---|-----|---|
| 1. | 15A52201 | English for Professional Communication | 3 | 1 | - | - | 3 |
| 2. | 15A54201 | Mathematics – II | 3 | 1 | - | - | 3 |
| 3. | 15A03201 | Material Science and Engineering | 3 | 1 | - | - | 3 |
| 4. | 15A56101 | Engineering Physics | 3 | 1 | - | - | 3 |
| 5. | 15A03101 | Engineering Drawing | - | - | - | 6 | 3 |
| 6. | 15A03202 | Material Science and Engineering Lab | - | - | 4 | - | 2 |
| 7. | 15A56102 | Engineering Physics Lab | - | - | 4 | - | 2 |
| 8. | 15A99201 | Engineering & IT Workshop | - | - | 4 | - | 2 |
| | | Total | 12 | 4 | 12 | 6 | 21 |

* L   -   **Lecture hours**
*T   -   **Tutorial hours**
*P   -    **Practical hours**
*Drg -   **Drawing**
*C   -    **Credits**

_____R15

## II B. Tech – I Sem

| S.No. | Course Code | Subject | L | T | P | C |
|---|---|---|---|---|---|---|
| 1 | 15A54301 | Mathematics - III | 3 | 1 | - | 3 |
| 2 | 15A52301 | Managerial Economics & Financial Analysis | 3 | 1 | - | 3 |
| 3 | 15A01308 | Mechanics of Solids | 3 | 1 | - | 3 |
| 4 | 15A03301 | Engineering Drawing for Mechanical Engineers | 3 | 1 | - | 3 |
| 5 | 15A03302 | Engineering Mechanics | 3 | 1 | - | 3 |
| 6 | 15A03303 | Thermodynamics | 3 | 1 | - | 3 |
| 7 | 15A01309 | Mechanics of Solids Lab | - | - | 4 | 2 |
| 8 | 15A03304 | Computer Aided Drafting Lab | - | - | 4 | 2 |
| | | Total | 18 | 06 | 08 | 22 |

## II B. Tech – II Sem

| S.No. | Course Code | Subject | L | T | P | C |
|---|---|---|---|---|---|---|
| 1 | 15A54401 | Probability and Statistics | 3 | 1 | - | 3 |
| 2 | 15A99301 | Basic Electrical and Electronics Engineering | 3 | 1 | - | 3 |
| 3 | 15A03401 | Machine Drawing | 3 | 1 | - | 3 |
| 4 | 15A03402 | Kinematics of Machines | 3 | 1 | - | 3 |
| 5 | 15A03403 | Thermal Engineering – 1 | 3 | 1 | - | 3 |
| 6 | 15A03404 | Manufacturing Technology | 3 | 1 | - | 3 |
| 7 | 15A03405 | Thermal Engineering Laboratory | - | - | 4 | 2 |
| 8 | 15A03406 | Manufacturing Technology Laboratory | - | - | 4 | 2 |
| 9 | 15A03407 | Comprehensive Online Examination-I | - | - | - | 1 |
| | | Total | 18 | 06 | 08 | 23 |

_____R15

## B.Tech III-I Semester (ME)

| S. No. | Course Code | Subject | L | T | P | C |
|--------|-------------|---------|---|---|---|---|
| 1. | 15A01510 | Fluid Mechanics and Hydraulic Machines | 3 | 1 | - | 3 |
| 2. | 15A03501 | Thermal Engineering - II | 3 | 1 | - | 3 |
| 3. | 15A03502 | Dynamics of Machinery | 3 | 1 | - | 3 |
| 4. | 15A03503 | Machine Tools | 3 | 1 | - | 3 |
| 5. | 15A03504 | Design of Machine Members - I | 3 | 1 | - | 3 |
| 6. | 15A03505 15A03506 15A03507 | MOOCS -I a. Entrepreneurship b. Nano Technology c. Micro Electro Mechanical Systems | 3 | 1 | - | 3 |
| 7. | 15A01511 | Fluid Mechanics and Hydraulic Machines Laboratory | - | - | 4 | 2 |
| 8. | 15A03508 | Machine Tools Laboratory | - | - | 4 | 2 |
| 9. | 15A99501 | Audit course – Social Values & Ethics | 2 | 0 | 2 | 0 |
| | | Total | 20 | 6 | 10 | 22 |

## B.Tech III-II Semester (ME)

| S. No. | Course Code | Subject | L | T | P | C |
|--------|-------------|---------|---|---|---|---|
| 1. | 15A03601 | Operations Research | 3 | 1 | - | 3 |
| 2. | 15A03602 | Design of Machine Members – II | 3 | 1 | - | 3 |
| 3. | 15A03603 | Heat Transfer | 3 | 1 | - | 3 |
| 4. | 15A03604 | Finite Element Method | 3 | 1 | - | 3 |
| 5. | 15A03605 | Metal forming Process | 3 | 1 | - | 3 |
| 6. | 15A03606 15A03607 15A03608 15A01608 | CBCC-I a. Non Conventional Source of Energy b. Total Quality Management c. Mechatronics d. Intellectual Property Rights | 3 | 1 | - | 3 |
| 7. | 15A03609 | Heat Transfer Laboratory | - | - | 4 | 2 |
| 8. | 15A03610 | Computer Aided Engineering Laboratory | - | - | 4 | 2 |
| 9. | 15A52602 | Advanced English Language Communication Skills (AELCS) Laboratory (Audit Course) | | | 2 | - |
| 10. | 15A03611 | Comprehensive Online Examination - II | - | - | - | 1 |
| | | Total | 18 | 6 | 11 | 23 |

_____R15

**B.Tech IV-I Semester (ME)**

| S. No. | Course Code | Subject | L | T | P | C |
|---|---|---|---|---|---|---|
| 1. | 15A52601 | Management Science | 3 | 1 | - | 3 |
| 2. | 15A03701 | Automobile Engineering | 3 | 1 | - | 3 |
| 3. | 15A03702 | CAD/CAM | 3 | 1 | - | 3 |
| 4. | 15A03703 | Metrology and Measurements | 3 | 1 | - | 3 |
| 5. | 15A03704 15A03705 15A03706 | **CBCC-II** a. Refrigeration and Air – Conditioning b. Tool Design c. Modern Manufacturing Methods | 3 | 1 | - | 3 |
| 6. | 15A03707 15A03708 15A03709 | **CBCC-III** a. Computational Fluid Dynamics b. Automation and Robotics c. Production & Operations Management | 3 | 1 | - | 3 |
| 7. | 15A03710 | CAD/ CAM Laboratory | - | - | 4 | 2 |
| 8. | 15A03711 | Metrology and Measurements Laboratory | - | - | 4 | 2 |
| | | Total | 18 | 6 | 8 | 22 |

**B.Tech IV-II Semester (ME)**

| S. No. | Course Code | Subject | L | T | P | C |
|---|---|---|---|---|---|---|
| 1. | 15A03801 15A03802 15A03803 | **MOOCS-II** a. Industrial Engineering b. Product Design c. Composite Materials | 3 | 1 | 0 | 3 |
| 2. | 15A03804 15A03805 15A03806 | **MOOCS -III** a. Power Plant Engineering b. Gas Turbines and Jet Propulsion c. Energy Management | 3 | 1 | 0 | 3 |
| 3. | 15A03807 | Comprehensive Viva Voce | 0 | 0 | 4 | 2 |
| 4. | 15A03808 | Technical Seminar | 0 | 0 | 4 | 2 |
| 5. | 15A03809 | Project work | 0 | 0 | 24 | 12 |
| | | Total | 6 | 2 | 32 | 22 |

_____R15

## Minor Discipline in ME

| S. No. | Course Code | Subject | L | T | P | C |
|---|---|---|---|---|---|---|
| 1 | 15A03303 | Thermodynamics | 3 | 1 | - | 3 |
| 2 | 15A03403 | Thermal Engineering-I | 3 | 1 | - | 3 |
| 3 | 15A03501 | Thermal Engineering-II | 3 | 1 | - | 3 |
| 4 | 15A03603 | Heat Transfer | 3 | 1 | - | 3 |
| 5 | 15A03101 | Minor Discipline Project | - | - | - | 8 |
| | | Total | 12 | 4 | - | 20 |

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI**
**(Autonomous)**
**Course structure for Four Year Regular B.Tech. Degree Program**
**(Effective for the batches admitted from 2019-20)**
**MECHANICAL ENGINEERING (ME)**

| INDUCTION PROGRAM (3 weeks duration) |
|---|
| ❖  Physical activity<br>❖  Creative Arts<br>❖  Universal Human Values<br>❖  Literary<br>❖  Proficiency Modules<br>❖  Lectures by Eminent People<br>❖  Visits to local Areas<br>❖  Familiarization to Dept./Branch & Innovations |

**I B. Tech – I Semester**

| S.No | Category | Course Code | Course Title | Contact Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | CIE | SEE | Total |
| **THEORY** | | | | | | | | | | |
| 1 | BS | 19ABS9901 | Algebra and Calculus | 3 | 1 | 0 | 4 | 30 | 70 | 100 |
| 2 | BS | 19ABS9905 | Engineering Chemistry | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 3 | ES | 19AES0501 | Problem Solving and Programming | 3 | 1 | 0 | 4 | 30 | 70 | 100 |
| **PRACTICAL** | | | | | | | | | | |
| 4 | LC | 19ALC0301 | Engineering Workshop Practice | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 5 | ES | 19AES0301 | Engineering Graphics Lab | 1 | 0 | 3 | 2.5 | 30 | 70 | 100 |
| 6 | BS | 19ABS9910 | Engineering Chemistry Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 7 | ES | 19AES0503 | Problem Solving and Programming Lab | 0 | 0 | 3 | 2 | 30 | 70 | 100 |
| | | | **TOTAL** | 10 | 2 | 12 | 18.5 | 210 | 490 | 700 |

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**MECHANICAL ENGINEERING (ME)**
**I B. Tech – II Semester**

| S.No | Category | Course Code | Course Title | Contact Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|------|----------|-------------|--------------|---|---|---|---------|-----|-----|-------|
| | | | | L | T | P | | CIE | SEE | Total |
| **THEORY** | | | | | | | | | | |
| 1 | ES | 19AES0202 | Basics of Electrical & Electronics Engineering | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 2 | BS | 19ABS9906 | Differential Equations and Vector Calculus | 3 | 1 | 0 | 4 | 30 | 70 | 100 |
| 3 | BS | 19ABS9903 | Engineering Physics | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 4 | ES | 19AES0502 | Data Structures | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 5 | HS | 19AHS9901 | Communicative English- I | 2 | 0 | 0 | 2 | 30 | 70 | 100 |
| **PRACTICAL** | | | | | | | | | | |
| 6 | HS | 19AHS9902 | Communicative English – I Lab | 0 | 0 | 2 | 1 | 30 | 70 | 100 |
| 7 | LC | 19ALC0302 | Mechanical Engineering Workshop | 0 | 0 | 2 | 1 | 30 | 70 | 100 |
| 8 | ES | 19AES0204 | Basics of Electrical & Electronics Engineering Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 9 | BS | 19ABS9908 | Engineering Physics Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 10 | ES | 19AES0504 | Data Structures Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| | | | **TOTAL** | 14 | 1 | 13 | 21.5 | 300 | 700 | 1000 |

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**MECHANICAL ENGINEERING (ME)**
II B. Tech – I Semester

| S.No | Category | Course Code | Course Title | Contact Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|------|----------|-------------|--------------|---|---|---|---------|-----|-----|-------|
| | | | | L | T | P | | CIE | SEE | Total |
| **THEORY** | | | | | | | | | | |
| 1 | BS | 19ABS9913 | Probability & Statistics, PDE and Complex Variables | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 2 | HS | 19AHS9903 | Communicative English II | 2 | 0 | 0 | 2 | 30 | 70 | 100 |
| 3 | ES | 19AES0302 | Design Thinking & Product Innovation | 2 | 0 | 0 | 2 | 30 | 70 | 100 |
| 4 | PC | 19APC0301 | Engineering Mechanics | 3 | 1 | 0 | 4 | 30 | 70 | 100 |
| 5 | PC | 19APC0306 | Material Science and Engineering | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 6 | PC | 19APC0308 | Thermodynamics | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 7 | MC | 19AMC9903 | Environmental Studies | 2 | 0 | 0 | 0 | 30 | - | 30 |
| **PRACTICAL** | | | | | | | | | | |
| 8 | HS | 19AHS9904 | Communicative English II Lab | 0 | 0 | 2 | 1 | 30 | 70 | 100 |
| 9 | ES | 19AES0303 | Design Thinking & Product Innovation Lab | 0 | 0 | 2 | 1 | 30 | 70 | 100 |
| 10 | PC | 19APC0307 | Material Science and Engineering Lab | 0 | 0 | 2 | 1 | 30 | 70 | 100 |
| 11 | LC | 19ALC0303 | Computer Aided Machine Drawing Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| | | | **TOTAL** | 19 | 1 | 9 | 21.5 | 330 | 700 | 1030 |

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**II B. Tech – II Semester**

| S.No | Category | Course Code | Course Title | Contact Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|------|----------|-------------|--------------|---|---|---|---------|------|------|-------|
| | | | | L | T | P | | CIE | SEE | Total |
| **THEORY** | | | | | | | | | | |
| 1 | BS | 19ABS9915 | Transform Techniques and Numerical Methods | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 2 | PC | 19APC0309 | Kinematics of Machines | 2 | 0 | 0 | 2 | 30 | 70 | 100 |
| 3 | ES | 19AES0505 | Internet of Things (IoT) | 2 | 0 | 0 | 2 | 30 | 70 | 100 |
| 4 | PC | 19APC0302 | Mechanics of Materials | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 5 | PC | 19APC0312 | Manufacturing Technology | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 6 | PC | 19APC0314 | Fluid Mechanics & Hydraulic Machinery | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 7 | MC | 19AMC9901 | Biology for Engineers | 2 | 0 | 0 | 0 | 30 | - | 30 |
| **PRACTICAL** | | | | | | | | | | |
| 8 | PR | 19APR0301 | Socially Relevant Project (15 Hrs/Sem) | 0 | 0 | 0 | 0.5 | 50 | - | 50 |
| 9 | PC | 19APC0315 | Fluid Mechanics & Hydraulic Machinery Lab | 0 | 0 | 2 | 1 | 30 | 70 | 100 |
| 10 | ES | 19AES0506 | Internet of Things (IoT) Lab | 0 | 0 | 2 | 1 | 30 | 70 | 100 |
| 11 | PC | 19APC0303 | Mechanics of Materials Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 12 | PC | 19APC0313 | Manufacturing Technology Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| | | | **TOTAL** | 16 | 0 | 10 | 21.5 | 380 | 700 | 1080 |

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**MECHANICAL ENGINEERING (ME)**

**III B. Tech – I Semester**

| S.No | Category | Course Code | Course Title | Contact Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|------|----------|-------------|--------------|---|---|---|---------|-----|-----|-------|
| | | | | L | T | P | | CIE | SEE | Total |
| **THEORY** | | | | | | | | | | |
| 1 | PC | 19APC0325 | Dynamics of Machines | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 2 | PC | 19APC0310 | Thermal Engineering – I | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 3 | PC | 19APC0316 | Design of Machine Members - 1 | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 4 | PC | 19APC0324 | Machine Tools | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 5 | PE | | **Professional Elective I** | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | 19APE0304 | Nano Technology | | | | | | | |
| | | 19APE0305 | Composite materials | | | | | | | |
| | | 19APE0306 | Renewable Energy Technologies | | | | | | | |
| 6 | OE | | **Open Elective I (Inter disciplinary)** | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | 19AHSMB01 | Managerial Economics and Financial Analysis | | | | | | | |
| | | 19APE0501 | Artificial Intelligence | | | | | | | |
| | | 19APE0416 | Sensor Networks | | | | | | | |
| 7 | MC | 19AMC9902 | Constitution of India | 2 | 0 | 0 | 0 | 30 | - | 30 |
| **PRACTICAL** | | | | | | | | | | |
| 8 | PR | 19APR0302 | Socially Relevant Projects (15 Hrs /Sem) | 0 | 0 | 0 | 0.5 | 50 | - | 50 |
| 9 | PC | 19APC0311 | Thermal Engineering Lab | 0 | 0 | 2 | 1 | 30 | 70 | 100 |
| 10 | PC | 19APC0305 | Machine Tools Lab | 0 | 0 | 2 | 1 | 30 | 70 | 100 |
| 11 | PC | 19APC0315 | Computer Aided Drafting Lab | 0 | 0 | 2 | 1 | 30 | 70 | 100 |
| | | | **Total** | **18** | **0** | **6** | **21.5** | **350** | **630** | **980** |

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**MECHANICAL ENGINEERING (ME)**
III B. Tech – II Semester

| S. No | Category | Course Code | Course Title | Contact Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | CIE | SEE | Total |
| | | | **THEORY** | | | | | | | |
| 1 | PC | 19APC0316 | Design of Machine Members – 2 | 3 | 1 | 0 | 4 | 30 | 70 | 100 |
| 2 | PC | 19APC0317 | Heat Transfer | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 3 | PC | 19APC0319 | Thermal Engineering – II | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 4 | PE | | **Professional Elective II** | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | 19APE0316 | Management Science | | | | | | | |
| | | 19APE0317 | Optimization Techniques | | | | | | | |
| | | 19APE0318 | Introduction to CAD/CAM | | | | | | | |
| 5 | OE | | **Open Elective II (Inter disciplinary)** | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | 19APC0513 | Machine Learning | | | | | | | |
| | | 19APC0216 | Neural Networks & Fuzzy Logics | | | | | | | |
| | | 19AOE0101 | Structural Health Monitoring | | | | | | | |
| 6 | HE | | **Humanities Elective I** | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | 19AHE9902 | Principles of Effective Public Speaking | | | | | | | |
| | | 19AHE9904 | Advanced Numerical Methods | | | | | | | |
| | | 19AHE9908 | Electromagnetic Theory | | | | | | | |
| 7 | MC | 19AMC9904 | Professional Ethics and Human Values | 2 | 0 | 0 | 0 | 30 | - | 30 |
| | | | **PRACTICAL** | | | | | | | |
| 8 | PR | 19APR0303 | Socially Relevant Projects (15 Hrs / Sem) | 0 | 0 | 0 | 0.5 | 50 | - | 50 |
| 9 | PC | 19APC0318 | Heat Transfer Lab | 0 | 0 | 2 | 1 | 30 | 70 | 100 |
| 10 | PC | 19APC0320 | Design & Simulation Lab | 0 | 0 | 2 | 1 | 30 | 70 | 100 |
| 11 | PR | 19APR0 | Industrial Training/ Internship/ Research Projects in National Laboratories/Academic Institutions | 0 | 0 | 0 | 0 | - | - | - |
| | | | **Total** | 18 | 0 | 6 | 21.5 | 320 | 560 | 880 |

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**MECHANICAL ENGINEERING (ME)**
IV B. Tech – I Semester

| S. No | Category | Course Code | Course Title | L | T | P | Credits | CIE | SEE | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | **THEORY** | | | | | | | |
| 1 | PC | 19APC0321 | Metrology and Measurements | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 2 | PC | 19APC0323 | Operations Research | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 3 | PC | 19APC0326 | Automobile Engineering | 2 | 0 | 0 | 2 | 30 | 70 | 100 |
| 4 | PE | | **Professional Elective III** | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | 19APE0307 | Refrigeration & Air Conditioning | | | | | | | |
| | | 19APE0308 | Finite Element Analysis | | | | | | | |
| | | 19APE0309 | Computational Fluid Dynamics | | | | | | | |
| 5 | PE | | **Professional Elective IV** | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | 19APE0310 | Power Plant Engineering | | | | | | | |
| | | 19APE0311 | Simulation Modelling for Manufacturing Systems | | | | | | | |
| | | 19APE0312 | Advanced Mechanics | | | | | | | |
| 6 | HE | | **Humanities Elective II** | 2 | 0 | 0 | 2 | 30 | 70 | 100 |
| | | 19AHE9906 | Effective Technical Communication | | | | | | | |
| | | 19AHE9901 | Technical Writing | | | | | | | |
| | | 19AHSMB03 | Organizational Behaviour | | | | | | | |
| | | | **PRACTICAL** | | | | | | | |
| 7 | PC | 19APC0322 | Metrology and Measurements Lab | 0 | 0 | 2 | 1 | 30 | 70 | 100 |
| 8 | PR | 19APR0304 | Socially Relevant Project (15 hr/sem) | 0 | 0 | 0 | 0.5 | 50 | - | 50 |
| 9 | PR | 19APR0305 | Industrial Training/Internship/Research Projects in National Laboratories / Academic Institutions | 0 | 0 | 4 | 1.5 | 50 | - | 50 |
| | | | **Total** | 18 | 0 | 7 | 19 | 370 | 490 | 800 |

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**MECHANICAL ENGINEERING (ME)**
IV B. Tech – II Semester

| S.No | Category | Course Code | Course Title | Contact Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|------|----------|-------------|--------------|---|---|---|---------|-----|-----|-------|
| | | | | L | T | P | | CIE | SEE | Total |
| | | | **THEORY** | | | | | | | |
| 1 | OE | | **Open Elective V (MOOC)** | 3 | 0 | 0 | 3 | - | - | 100 |
| | | 19APE0121 | Air pollution and control | | | | | | | |
| | | 19AOE0516 | R Programming | | | | | | | |
| | | 19APE0208 | Electricity and Safety Measures | | | | | | | |
| 2 | PE | | **Professional Elective V (MOOC)** | 3 | 0 | 0 | 3 | - | - | 100 |
| | | 19APE0313 | Rapid Manufacturing | | | | | | | |
| | | 19APE0314 | Laser Based Manufacturing | | | | | | | |
| | | 19APE0315 | Energy Conservation and Waste Heat Recovery | | | | | | | |
| | | | **PRACTICAL** | | | | | | | |
| 3 | PR | 19APR0307 | Project | 0 | 0 | 14 | 9 | 60 | 140 | 200 |
| 4 | PR | 19APR0308 | Technical Seminar | 0 | 0 | 0 | 0 | 50 | - | 50 |
| | | | **Total** | **6** | **0** | **14** | **15** | **170** | **280** | **450** |

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**MECHANICAL ENGINEERING (ME)**

| INDUCTION PROGRAM (3 Weeks duration) |
|---|
| ❖ Physical activity<br>❖ Creative Arts<br>❖ Universal Human Values<br>❖ Literary<br>❖ Proficiency Modules<br>❖ Lectures by Eminent People<br>❖ Visits to local Areas<br>❖ Familiarization to Dept./Branch & Innovations |

### Semester I (First year)

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | CIE | SEE | Total |
| 1 | Basic Science course | 20ABS9901 | Algebra and Calculus | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 2 | Basic Science courses | 20ABS9903 | Engineering Physics | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 3 | Engineering Science Courses | 20AES0202 | Basics of Electrical & Electronics Engineering | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 4 | Engineering Science Courses | 20AES0301 | Engineering Graphics | 1 | 0 | 4 | 3 | 30 | 70 | 100 |
| 5 | Engineering Science Courses | 20AES0501 | Problem Solving and Programming | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 6 | Engineering Science Courses (LAB) | 20ABS9910 | Engineering Physics Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 7 | Basic Science course (LAB) | 20AES0204 | Basics of Electrical & Electronics Engineering Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 8 | Engineering Science Courses (LAB) | 20AES0503 | Problem Solving and Programming Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| | | | **Total credits** | | | | **19.5** | **240** | **560** | **800** |

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI**
**(Autonomous)**
**Course structure for Four Year Regular B.Tech. Degree Program**
**(Effective for the batches admitted from 2020-21)**
**MECHANICAL ENGINEERING (ME)**

### Semester II (First year)

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | CIE | SEE | Total |
| 1 | Basic Science courses | 20ABS9906 | Differential Equations and Vector Calculus | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 2 | Basic Science course | 20ABS9905 | Engineering Chemistry | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 3 | Humanities and Social science | 20AHS9901 | Communicative English | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 4 | Engineering Science Courses | 20AES0509 | Basics of Python Programming | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 5 | Engineering Science Courses | 20AES0304 | Engineering Workshop Practice | 1 | 0 | 4 | 3 | 30 | 70 | 100 |
| 6 | Humanities and Social science LAB | 20AHS9902 | Communicative English Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 7 | Basic Science course (LAB) | 20ABS9910 | Engineering Chemistry Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 8 | Engineering Science Courses/Prof Core (Interdisciplinary) (LAB) | 20AES0510 | Basics of Python Programming Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| | Mandatory course (AICTE suggested) | 20AMC9902 | Constitution of India | 2 | 0 | 0 | 0 | 30 | - | 30 |
| | | | **Total credits** | | | | **19.5** | **270** | **560** | **830** |

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI**
**(Autonomous)**
**Course structure for Four Year Regular B.Tech. Degree Program**
**(Effective for the batches admitted from 2020-21)**
**MECHANICAL ENGINEERING (ME)**

### Semester III (Second year)

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | CIE | SEE | Total |
| 1 | Basic Science courses | 20ABS9913 | Probability & Statistics, PDE | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 2 | Professional Core Course | 20APC0308 | Thermodynamics | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 3 | Professional Core courses | 20APC0301 | Engineering Mechanics | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 4 | Professional Core courses | 20APC0306 | Material Science and Engineering | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 5 | Professional Core courses | 20APC0303 | Machine Drawing | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 6 | Professional Core courses (LAB) | 20APC0307 | Material Science and Engineering Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 7 | Professional Core courses (LAB) | 20APC0313 | Mechanical Engineering Workshop Practice | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 8 | Professional Core courses (LAB) | 20APC0324 | CAD Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| | Skill oriented course* | 20ASC0301 | CATIA Lab | 1 | 0 | 2 | 2 | 100 | - | 100 |
| | Mandatory course (AICTE suggested) | 20AMC9903 | Environmental Studies | 2 | 0 | 0 | 0 | 30 | - | 30 |
| | | | **Total credits** | | | | 21.5 | 370 | 560 | 930 |

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI**
**(Autonomous)**
**Course structure for Four Year Regular B.Tech. Degree Program**
**(Effective for the batches admitted from 2020-21)**
**MECHANICAL ENGINEERING (ME)**

### Semester IV (Second year)

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | CIE | SEE | Total |
| 1 | Engineering Science Courses | 20AES0505 | Internet of Things (IoT) | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 2 | Basic Science Course /Prof core course | 20AES0324 | Thermal Engineering | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 3 | Professional Core courses | 20APC0312 | Manufacturing Technology | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 4 | Professional Core courses | 20APC0302 | Mechanics of Materials | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 5 | Humanities and Social Sciences | 20AHSMB01 | Managerial Economics and Financial Analysis | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 6 | Humanities and Social Sciences | 20AHS9905 | Universal Human Values | 3 | 1 | 0 | 3 | 30 | 70 | 100 |
| 7 | Engineering Science Courses (LAB) | 20AES0506 | Internet of Things (IoT) Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 8 | Professional Core courses (LAB) | 20APC0326 | Thermal Engineering Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 9 | Professional Core courses (LAB) | 20APC0304 | Mechanics of Materials Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 10 | Skill oriented course* | 20ASC0302 | Manufacturing Process Lab | 1 | 0 | 2 | 2 | 100 | - | 100 |
| | | | **Total credits** | | | | 24.5 | 370 | 630 | 1000 |

**Community Service project with credits**

(To visit the selected community to conduct survey (Socio-economic &amp; domain survey) and conduct sensitization/awareness program/activities at the end of IV- semester before commencement of V-semester and complete immersion Programme also during V-Semester and submit report in V - semester. Assessment will be done at the end of V-Semester)

| **Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)** | 4 | | 0 | 4 | 100 | - | 100 |
|---|---|---|---|---|---|---|---|

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI**
**(Autonomous)**
**Course structure for Four Year Regular B.Tech. Degree Program**
**(Effective for the batches admitted from 2020-21)**
**MECHANICAL ENGINEERING (ME)**

### Semester V (Third year)

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | CIE | SEE | Total |
| 1 | Professional Core courses | 20APC0327 | Machine Tools | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 2 | Professional Core courses | 20APC0309 | Kinematics of Machines | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 3 | Professional Core courses | 20APC0314 | Fluid Mechanics & Hydraulic Machinery | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 4 | Open Elective Course/Job oriented elective | 20AOEMB02 | Entrepreneurship Development | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | 20APE0501 | Artificial Intelligence | | | | | | | |
| | | 20APE0416 | Sensor Networks | | | | | | | |
| 5 | Professional Elective courses | 20APE0306 | Renewable Energy Technologies | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | 20APE0302 | Introduction to CAD/CAM | | | | | | | |
| | | 20APE0303 | Nano Technology | | | | | | | |
| 6 | Professional Core courses Lab | 20APC0315 | Fluid Mechanics & Hydraulic Machinery Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 7 | Professional Core courses Lab | 20APC0329 | Machine Tools – 1 Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 8 | Skill advanced course/ soft skill course* | 20ASA0502 | Soft skills | 1 | 0 | 2 | 2 | 100 | - | 100 |
| 9 | Mandatory course (AICTE suggested) | 20AMC9904 | Professional Ethics and Human Values | 2 | 0 | 0 | 0 | 30 | - | 30 |
| 10 | CSP | 20CSP0301 | Community Service Project | 0 | 0 | 0 | 1.5 | 100 | - | 100 |
| **Total credits** | | | | | | | **21.5** | **440** | **490** | **930** |
| **Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)** | | | | **4** | **0** | **0** | **4** | **30** | **70** | **100** |

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI**
**(Autonomous)**
**Course structure for Four Year Regular B.Tech. Degree Program**
**(Effective for the batches admitted from 2020-21)**
**MECHANICAL ENGINEERING (ME)**
**Semester VI (Third year)**

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | CIE | SEE | Total |
| 1 | Professional Core courses | 20APC0317 | Heat Transfer | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 2 | Professional Core courses | 20APC0316 | Design of Machine Elements | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 3 | Professional Core courses | 20APC0318 | Dynamics of Machines | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| 4 | Professional Elective courses | 20APE0311 | Refrigeration & Air Conditioning | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | 20APE0305 | Composite materials | | | | | | | |
| | | 20APE0301 | Automobile Engineering | | | | | | | |
| 5 | Open Elective Course/Job oriented elective | 20AOE0515 | The joy of computing using Python | 3 | 0 | 0 | 3 | | | 100 |
| | | 20AOEMB01 | Principles of Management | | | | | | | |
| | | 20AOE0518 | An Introduction to Artificial Intelligence | | | | | | | |
| 6 | Professional Core courses Lab | 20APC0328 | CAM Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 7 | Professional Core courses Lab | 20APC0319 | Heat Transfer Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 8 | Professional Core courses Lab | 20APC0330 | Machine Tools – 2 Lab | 0 | 0 | 3 | 1.5 | 30 | 70 | 100 |
| 9 | Skill advanced course/ soft skill course* | 20ASC0303 | Crystal structure Analysis Lab | 1 | 0 | 2 | 2 | 100 | - | 100 |
| 10 | Mandatory course (AICTE) | 20AMC9901 | Biology for Engineers | 2 | 0 | 0 | 0 | 30 | - | 30 |
| | | | **Total credits** | | | | 21.5 | 370 | 560 | 930 |
| **Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)** | | | | 4 | | 0 | 4 | 100 | - | 100 |
| **Industrial/Research Internship (Mandatory) 2 Months during summer vacation** | | | | | | | | | | |

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES, TIRUPATI**
**(Autonomous)**
**Course structure for Four Year Regular B.Tech. Degree Program**
**(Effective for the batches admitted from 2020-21)**
**MECHANICAL ENGINEERING (ME)**
**Semester VII (Fourth year)**

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | CIE | SEE | Total |
| 1 | Professional Elective courses | 20APE0307 | Alternative Fuels and Emission Control in Automotives | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | 20APE0308 | Finite Element Analysis | | | | | | | |
| | | 20APE0309 | Computational Fluid Dynamics | | | | | | | |
| 2 | Professional Elective courses | 20APE0310 | Power Transmission in Hybrid and Electric Vehicles | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | 20APC0323 | Operations Research | | | | | | | |
| | | 20APE0312 | Optimization Techniques through MATLAB | | | | | | | |
| 3 | Professional Elective courses | 20APE0313 | Total Quality Management | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | 20APE0314 | Power Plant Engineering | | | | | | | |
| | | 20APE0315 | Autotronics (Automobile Electronics) | | | | | | | |
| 4 | Open Elective Courses/ Job oriented elective | 20APC0515 | Operating Systems | 2 | 0 | 2 | 3 | 30 | 70 | 100 |
| | | 20AOEMB03 | Intellectual Property Rights | | | | | | | |
| | | 20AOE9903 | Environmental Waste Management | | | | | | | |
| 5 | Open Elective Courses/ Job oriented elective | 20AOE9901 | Research Writing Skills | 2 | 0 | 2 | 3 | 30 | 70 | 100 |
| | | 20AOE0501 | E Commerce | | | | | | | |
| | | 20AOE0503 | Mobile App development | | | | | | | |
| 6 | *Humanities and Social Science Elective | | Universal Human Values | 3 | 0 | 0 | 3 | 30 | 70 | 100 |
| | | | Understanding Harmony | | | | | | | |
| 7 | Skill advanced course/ soft skill course* | 20ASC0305 | MATLAB | 1 | 0 | 2 | 2 | 100 | - | 100 |
| **Industrial/Research Internship 2 Months (Mandatory) after third year (to be evaluated during VII semester** | | | | 0 | 0 | 0 | 3 | 100 | - | 100 |
| **Total credits** | | | | | | | 23 | 380 | 420 | 800 |
| **Honors/Minor courses (The hours distribution can be 3-0-2 or 3-1-0 also)** | | | | 4 | - | 0 | 4 | 100 | - | 100 |

**Semester VIII (Fourth year)**

| Sl. No. | Category | Course Code | Course Title | Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | C | CIE | SEE | Total |
| 1 | Major Project | PROJ | Project Project work, seminar and internship in industry | 0 | 0 | 0 | 12 | 60 | 140 | 200 |
| **INTERNSHIP (6 MONTHS)** | | | | | | | | | | |
| **Total credits** | | | | | | | 12 | 60 | 140 | 200 |

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES :: TIRUPATI**
**(Autonomous)**
**Course structure for Regular M.Tech. Degree Program**
**(Effective for the batches admitted from 2019-20)**
**PRODUCTION ENGINEERING AND ENGINEERING DESIGN (PEED)**

## M. Tech – I Semester

| S.No | Category | Course Code | Course Title | Contact Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | CIE | SEE | Total |
| **THEORY** | | | | | | | | | | |
| 1 | BS | 19DBS9901 | Advanced Mathematics for Engineers | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | PC | 19DPC9001 | Mechanical Vibrations | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 3 | PC | 19DPC9003 | Advanced Material Science & Metallurgy | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | PE | | *Program Elective I* | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 19DPE9001 | Non-Destructive Evaluation | | | | | | | |
| | | 19DPE9002 | Rapid Prototyping | | | | | | | |
| | | 19DPE9003 | Advanced Mechanisms | | | | | | | |
| 5 | PC | 19DPC9008 | Research Methodology and IPR | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 6 | MC | | *Audit Course I* | 2 | 0 | 0 | 0 | 40 | - | 40 |
| | | 19DMC0101 | Disaster Management | | | | | | | |
| | | 19DMC9901 | English for Research Paper Writing | | | | | | | |
| | | 19DMC9902 | Sanskrit for Technical Knowledge | | | | | | | |
| | | 19DMC9903 | Value Education | | | | | | | |
| **PRACTICAL** | | | | | | | | | | |
| 7 | PC | 19DPC9002 | Mechanical Vibrations Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 8 | PC | 19DPC9009 | Mechanisms and Robotics (Virtual) Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| | | | **TOTAL** | | | | 18 | 320 | 420 | 740 |

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES :: TIRUPATI**
**(Autonomous)**
**Course structure for Regular M.Tech. Degree Program**
**(Effective for the batches admitted from 2019-20)**
**PRODUCTION ENGINEERING AND ENGINEERING DESIGN (PEED)**

## M. Tech – II Semester

| S. No | Category | Course Code | Course Title | L | T | P | Credits | CIE | SEE | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Contact Hours per week | | | | Scheme of Examination (Max. Marks) | | |
| | | | **THEORY** | | | | | | | |
| 1 | PC | 19DPC9004 | Design for Manufacturing & Assembly | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | PC | 19DPC9006 | Advanced Finite Element Methods | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 3 | PC | 19DPC9007 | Advanced Manufacturing Processes | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | PE | | *Program Elective II* | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 19DPE9004 | Simulation & Modeling of Manufacturing systems | | | | | | | |
| | | 19DPE9005 | Advanced Mechanics of Solids | | | | | | | |
| | | 19DPE9006 | Tribology in Design | | | | | | | |
| 5 | MC | | *Audit Course II* | 2 | 0 | 0 | 0 | 40 | - | 40 |
| | | 19DMC5801 | Pedagogy Studies | | | | | | | |
| | | 19DMC9904 | Constitution of India | | | | | | | |
| | | 19DMC9905 | Stress Management by Yoga | | | | | | | |
| | | 19DMC9906 | Personality Development through Life Enlightenment Skills | | | | | | | |
| | | | **PRACTICAL** | | | | | | | |
| 6 | PC | 19DPC9005 | Design Simulation Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 7 | PC | 19DPC9010 | Manufacturing Simulation (Virtual) Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 8 | PR | 19DPR9001 | Mini Project | 0 | 0 | 4 | 2 | 40 | 60 | 100 |
| | | | **TOTAL** | | | | 18 | 320 | 420 | 740 |

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES :: TIRUPATI**
**(Autonomous)**
**Course structure for Regular M.Tech. Degree Program**
**(Effective for the batches admitted from 2019-20)**
**PRODUCTION ENGINEERING AND ENGINEERING DESIGN (PEED)**

## M. Tech – III Semester

| S.No | Category | Course Code | Course Title | Contact Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | CIE | SEE | Total |
| | | | **THEORY** | | | | | | | |
| 1 | PE | | *Program Elective III* | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 19DPE9008 | Product Design and Development | | | | | | | |
| | | 19DPE9009 | Engineering Fracture Mechanics | | | | | | | |
| 2 | OE | | *Open Elective:* | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 19DOE5801 | Business Analytics | | | | | | | |
| | | 19DOE9001 | Industrial Safety | | | | | | | |
| | | 19DOE9002 | Operations Research | | | | | | | |
| | | 19DOE9003 | Cost Management of Engineering Projects | | | | | | | |
| | | 19DOE9004 | Composite Material | | | | | | | |
| | | 19DOE2001 | Waste to Energy | | | | | | | |
| 3 | PR | 19DPR9002 | Dissertation-I / Industry Oriented Project | 0 | 0 | 20 | 10 | 40 | 60 | 100 |
| | | | **TOTAL** | | | | 16 | 120 | 180 | 300 |

## M. Tech – IV Semester

| S.No | Category | Course Code | Course Title | Contact Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | CIE | SEE | Total |
| 1 | PR | 19DPR9003 | Dissertation II | 0 | 0 | 32 | 16 | 60 | 140 | 200 |
| | | | **TOTAL** | | | | 16 | 60 | 140 | 200 |

# ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: TIRUPATI
## (AUTONOMOUS)
## Department of Mechanical Engineering
**Specialization: Production Engineering & Engineering Design (PE&ED)**
**Effective for the batches admitted from 2022-23**

*M. Tech – I Semester*

| S.No | Category | Course Code | Course Title | Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | CIE | SEE | Total |
| **THEORY** | | | | | | | | | | |
| 1 | BS | 22DBS9901 | Advanced Mathematics for Engineers | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | PC | 22DPC9001 | Mechanical Vibrations | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 3 | PC | 22DPC9002 | Advanced Material Science & Metallurgy | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | PE | | **Professional Elective I** | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 22DPE9001 | Non-Destructive Evaluation | | | | | | | |
| | | 22DPE9002 | Rapid Prototyping | | | | | | | |
| | | 22DPE9003 | Advanced Mechanisms | | | | | | | |
| 5 | ML | 22MBA0110 | Research Methodology and IPR | 2 | 0 | 0 | 2 | 40 | 60 | 100 |
| 6 | MC | | **Audit course I** | 2 | 0 | 0 | 0 | 40 | - | 40 |
| | | 22DMC2001 | Disaster Management | | | | | | | |
| | | 22DMC9901 | English for Research Paper Writing | | | | | | | |
| | | 22DMC9902 | Sanskrit for Technical Knowledge | | | | | | | |
| | | 22DMC9903 | Value Education | | | | | | | |
| **PRACTICAL** | | | | | | | | | | |
| 7 | PC | 22DPC9003 | Mechanical Vibrations Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 8 | PC | 22DPC9004 | Mechanisms and Robotics (Virtual) Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **Total** | | | | | | | 18 | 320 | 420 | 740 |

# ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: TIRUPATI
## (AUTONOMOUS)
## Department of Mechanical Engineering
### Specialization: Production Engineering & Engineering Design (PE&ED)
### Effective for the batches admitted from 2022-23

### *M. Tech – II Semester*

| S.No | Category | Course Code | Course Title | Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | L | T | P | | CIE | SEE | Total |
| **THEORY** | | | | | | | | | | |
| 1 | PC | 22DPC9005 | Design for Manufacturing & Assembly | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 2 | PC | 22DPC9006 | Advanced Finite Element Methods | 3 | 1 | 0 | 4 | 40 | 60 | 100 |
| 3 | PC | 22DPC9007 | Advanced Manufacturing Processes | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| 4 | PE | | **Professional Elective III** | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 22DPE9004 | Simulation & Modeling of Manufacturing systems | | | | | | | |
| | | 22DPE9005 | Advanced Mechanics of Solids | | | | | | | |
| | | 22DPE9006 | Tribology in Design | | | | | | | |
| 5 | MC | | **Audit course II** | 2 | 0 | 0 | 0 | 40 | - | 40 |
| | | 22DMC5801 | Pedagogy Studies | | | | | | | |
| | | 22DMC9904 | Constitution of India | | | | | | | |
| | | 22DMC9905 | Stress Management by Yoga | | | | | | | |
| | | 22DMC9906 | Personality Development through Life Enlightenment Skills | | | | | | | |
| **PRACTICAL** | | | | | | | | | | |
| 6 | PC | 22DPC9008 | Design Simulation Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| 7 | PC | 22DPC9009 | Manufacturing Simulation (Virtual) Lab | 0 | 0 | 3 | 1.5 | 40 | 60 | 100 |
| **PROJECT** | | | | | | | | | | |
| 8 | PR | 22DPR9001 | Technical Seminar | 0 | 0 | 4 | 2 | 100 | - | 100 |
| **Total** | | | | | | | **18** | **380** | **360** | **740** |

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES: TIRUPATI**
(AUTONOMOUS)
# Department of Mechanical Engineering
**Specialization: Production Engineering & Engineering Design (PE&ED)**
**Effective for the batches admitted from 2022-23**

### *M. Tech –III Semester*

| S.No | Category | Course Code | Course Title | Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|------|----------|-------------|--------------|----|----|----|---------|-----|-----|-------|
| | | | | L | T | P | | CIE | SEE | Total |
| **THEORY** | | | | | | | | | | |
| 1 | PE | | **Professional Elective IV** | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 22DPE9007 | Product Design and Development | | | | | | | |
| | | 22DPE9008 | Engineering Fracture Mechanics | | | | | | | |
| 2 | OE | | **Open Elective I** | 3 | 0 | 0 | 3 | 40 | 60 | 100 |
| | | 22DOE2001 | 1. Waste to Energy | | | | | | | |
| | | 22DOE2002 | 2. Project Management | | | | | | | |
| | | 22DOE5801 | 3. Business Analytics | | | | | | | |
| | | 22DOE9001 | 4. Industrial Safety | | | | | | | |
| | | 22DOE9002 | 5. Operations Research | | | | | | | |
| | | 22DOE9003 | 6. Composite Materials | | | | | | | |
| **PROJECT** | | | | | | | | | | |
| 3 | PR | 22DPR9002 | Dissertation Phase – I | 0 | 0 | 20 | 10 | 100 | 00 | 100 |
| 4 | PR | 22DPR9003 | Co-curricular Activities | 0 | 0 | 0 | 2 | - | - | - |
| **TOTAL** | | | | | | | 18 | 180 | 120 | 300 |

### *M. Tech – IV Semester*

| S.No | Category | Course Code | Course Title | Hours per week | | | Credits | Scheme of Examination (Max. Marks) | | |
|------|----------|-------------|--------------|----|----|----|---------|-----|-----|-------|
| | | | | L | T | P | | CIE | SEE | Total |
| **PROJECT** | | | | | | | | | | |
| 1 | PR | 22DPR9004 | Dissertation Phase – II | 0 | 0 | 32 | 16 | 100 | 100 | 200 |
| **TOTAL** | | | | | | | 16 | 100 | 100 | 200 |