#### ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET (AUTONOMOUS)

**Department of Mechanical Engineering I B. Tech - Zero Semester**

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| **Phase** | **Course Code** | **Name of the course** | **Lecture** | **Practical** |
| Regular Phase | 19A501 | Proficiency classes: Familiarity with a computer | 2 | 2 |
| Regular Phase | 19AC01 | Proficiency classes: English Communication Skills | 2 | 2 |
| Regular Phase | 19A502 | Basics of Programming and Lab | 3 | 2 |
| Regular Phase | 19AC02 | Foundation classes in Mathematics | 3 | 0 |
| Regular Phase | 19AC03 | Foundation classes in Physics | 3 | 2 |
| Regular Phase | 19AC04 | Foundation classes in Chemistry | 3 | 2 |
| Regular Phase | 19AC05 | Universal Human Values | 2 | 0 |
| Regular Phase | 19A301 | Fundamentals of Engineering Drawing | 1 | 0 |
| Regular Phase | - | Physical education activities – Sports and Games | 0 | 1 |
| Non daily | - | Creative Arts |  |  |
| Non daily | - | Lectures by eminent personalities |  |  |
| Non daily | - | Visits to local area |  |  |
| Non daily | - | Extra-curricular activities |  |  |

**ANNAMACHARYA INSTITUTE OF TECHNOLOGY AND SCIENCES RAJAMPET (AUTONOMOUS)**

**Department of Mechanical Engineering Course Structure for R19 Regulations**

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| **I Year I Semester** |
| S. No. | Category | Course Code | Course Title | Hours per week | Credits |
| L | T | P |
| 1 | HS | 19AC15T | Functional English and Life Skills | 3 | - | - | 3 |
| 2 | BS | 19AC11T | Algebra and Calculus | 3 | 1 | - | 4 |
| 3 | BS | 19AC13T | Chemistry of Materials | 3 | - | - | 3 |
| 4 | ES | 19A311T | Engineering Graphics –I | 1 | - | 2 | 2 |
| 5 | ES | 19A511T | Problem Solving and C Programming | 3 | - | - | 3 |
| 6 | MC | 19AC16T | Environmental Science | 3 | - | - | 0 |
| Lab Courses |
| 7 | HS | 19AC15L | [Communicative English Lab](file://localhost/C%3A/Users/DrNMR/Desktop/syllabus/ME/19AC15L_25L_CommunicativeEnglishLab.docx) | - | - | 3 | 1.5 |
| 8 | BS | 19AC13L | Chemistry of Materials lab | - | - | 3 | 1.5 |
| 9 | ES | 19A511L | C Programming Lab | - | - | 3 | 1.5 |
|  | 16 | 1 | 11 | 19.5 |
| **I Year II Semester** |
| S. No. | Category | Course Code | Course Title | Hours per week | Credits |
| L | T | P |
| 1 | BS | 19AC21T | Differential Equations and Vector Calculus | 3 | 1 | - | 4 |
| 2 | BS | 19AC23T | Engineering Physics | 3 | - | - | 3 |
| 3 | ES | 19A521T | Python Programming | 3 | - | - | 3 |
| 4 | ES | 19A321T | Engineering Graphics –II | 2 | - | 2 | 3 |
| 5 | ES | 19A322T | Engineering Mechanics | 2 | 1 | - | 3 |
| Lab Courses |
| 6 | ES | 19A521L | Python Programming Lab | - | - | 3 | 1.5 |
| 7 | BS | 19AC23L | Engineering Physics Lab | - | - | 3 | 1.5 |
| 8 | ES | 19A323L | Engineering & IT Workshop | - | - | 3 | 1.5 |
|  | 13 | 2 | 11 | 20.5 |

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| **II Year I Semester** |
| S.No. | Category | Course Code | Course Title | Hours per week | Credits |
| L | T | P |
| 1 | BS | 19AC31T | Partial Differential Equations and Complex Variables | 3 |  | - | 3 |
| 2 | ES | 19A236T | Basic Electrical and Electronics Engineering | 3 | - | - | 3 |
| 3 | BS | 19AC34T | Life Sciences for Engineers | 2 | - | - | 2 |
| 4 | PC | 19A331T | Mechanics of Solids | 2 | 1 | - | 3 |
| 5 | PC | 19A332T | Metallurgy & Material Science | 3 | - | - | 3 |
| 6 | PC | 19A333T | Basic Thermodynamics | 2 | 1 | - | 3 |
| 7 | PC | 19A334T | Kinematics of Machinery | 2 | 1 | - | 3 |
| Lab Courses |
| 8 | PC | 19A335L | Material Science Lab & Mechanics of Solids Lab | - | - | 2 | 1 |
| 9 | PC | 19A336L | CAD Machine Drawing lab | - | - | 2 | 1 |
| 10 | ES | 19A236L | Basic Electrical and Electronics Engineering lab | - | - | 2 | 1 |
|  | 17 | 3 | 6 | 23 |
| **II Year II Semester** |
| S.No. | Category | Course Code | Course Title | Hours per week | Credits |
| L | T | P |
| 1 | BS | 19AC41T | Numerical Methods & Probability and Statistics | 3 | - | - | 3 |
| 2 | HS | 19AE41T | Managerial Economics and Financial Accounting | 2 | 1 | - | 3 |
| 3 | PC | 19A341T | Manufacturing Processes | 3 | - | - | 3 |
| 4 | PC | 19A342T | Fluid Mechanics &and Hydraulic Machinery | 2 | 1 | - | 3 |
| 5 | PC | 19A343T | Dynamics of Machinery | 2 | 1 | - | 3 |
| 6 | PC | 19A344T | Applied Thermodynamics – I | 2 | 1 | - | 3 |
| 7 | MC | 19AC45T | [Essence of Indian Traditional](file://localhost/C%3A/Users/DrNMR/Desktop/syllabus/ME/19AC35T_45T_EssenceofIndianTraditionalKnowledge.docx) [Knowledge](file://localhost/C%3A/Users/DrNMR/Desktop/syllabus/ME/19AC35T_45T_EssenceofIndianTraditionalKnowledge.docx) | 3 | - | - | 0 |
| Lab Courses |
| 8 | PC | 19A341L | Manufacturing Processes Lab | - | - | 2 | 1 |
| 9 | PC | 19A342L | Fluid Mechanics & Hydraulic Machines Lab | - | - | 2 | 1 |
| 10 | PC | 19A345L | Theory of Machines Lab | - | - | 2 | 1 |
|  | 17 | 4 | 6 | 21 |

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| **III Year I Semester** |
| S.No. | Category | Course Code | Course Title | Hours per week | Credits |
| L | T | P |
| 1 | PC | 19A351T | Applied Thermodynamics – II | 2 | 1 | - | 3 |
| 2 | PC | 19A352T | Machine tools | 2 | 1 | - | 3 |
| 3 | PC | 19A353T | Design of Machine Elements-I | 2 | 1 | - | 3 |
| 4 | PE | 19A35AT | IC Engines | 3 | - | - | 3 |
| 19A35BT | Design and Transmission System |
| 19A35CT | Industrial Management |
| 19A35DT | Optimization Techniques through MATLAB |
| 5 | PE | 19A35ET | Automobile Engineering | 3 | - | - | 3 |
| 19A35FT | Design for Manufacturing |
| 19A35GT | Non-Destructive Testing |
| 19A35HT | Automation & Robotics |
| 6 | OE | 19A35IT | Rapid Prototyping | 3 | - | - | 3 |
| 19A35JT | Industrial Robotics |
| 19A35KT | Entrepreneurship development |
| 7 | MC | 19AC57T | Constitution of India | 3 | - | - | 0 |
| 8 | HS | 19AC53T | Universal Human Values - II | 1 | 1 | - | 2 |
| Lab Courses |
| 9 | HS | 19AC51L | General Aptitude | - | - | 2 | 1 |
| 9 | PC | 19A351L | Thermal Engineering Lab | - | - | 2 | 1 |
|  | 18 | 3 | 4 | 22 |
| **III Year II Semester** |
| S.No. | Category | Course Code | Course Title | Hours per week | Credits |
| L | T | P |
| 1 | PC | 19A361T | Heat Transfer | 2 | 1 | 0 | 3 |
| 2 | PC | 19A362T | Engineering Metrology | 2 | 1 | 0 | 3 |
| 3 | PC | 19A363T | Applied Thermodynamics-III | 2 | 1 | 0 | 3 |
| 4 | PC | 19A364T | Design of Machine Elements-II | 3 | - | 0 | 3 |
| 5 | PE | 19A36AT | Turbo machinery | 3 | - | 0 | 3 |
| 19A36BT | Tribology |
| 19A36CT | Instrumentation and control systems |
| 19A36DT | Additive Manufacturing |
| 6 | OE | 19A16GT | Basic Civil Engineering | 3 | - | 0 | 3 |
| 19A16HT | Water Resources and Conservation |
| 19A26GT | Energy Management and Conservation |
| 19A26HT | Fuzzy Logic and Neural Networks |
| 19A46GT | Electronic Circuits and its Applications |
| 19A46HT | Basics of Communication Systems |
| 19A56IT | Artificial Intelligence |
| 19A56JT | Cyber Security |
| Lab Courses |
| 7 | BS | 19AC62L | Professional Communication Skills Lab | - | - | 3 | 1.5 |
| 8 | PC | 19A361L | Heat Transfer Lab | - | - | 2 | 1.5 |
| 9 | PC | 19A362L | Metrology& Machine Tools Lab  | - | - | 2 | 1 |
| 10 | INTERN | 19A366I | Innovative project / Socially relevant project / Entrepreneurship / Internship | - | - | - | 2 |
|  | 15 | 3 | 7 | 24 |

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| **IV Year I Semester** |
| S.No. | Category | Course Code | Course Title | Hours per week | Credits |
| L | T | P |
| 1 | PC | 19A371T | CAD/CAM | 2 | - | - | 2 |
| 2 | PC | 19A372T | Operations Research | 2 | 1 | 0 | 3 |
| 3 | PE | 19A37AT | R&AC | 3 | - | 0 | 3 |
| 19A37BT | Finite Element Methods |
| 19A37CT | Unconventional machining process |
| 19A37DT | Mechatronics |
| 4 | PE | 19A37ET | Non-conventional sources of energy | 3 | - | 0 | 3 |
| 19A37FT | Mechanical Vibrations |
| 19A37GT | Total Quality Management |
| 19A37HT | CNC and Adaptive Control |
| 5 | OE | 19A37IT | Open Elective-3 (MOOCs) | 3 | - | 0 | 3 |
| Lab Courses |
| 6 | PC | 19A371L | CAD/CAM Lab | 0 | - | 2 | 1 |
| 7 | PC | 19A373L | Instrumentation/Optimization lab with MATLAB software lab | 0 | - | 2 | 1 |
| 8 | PW | 19A374P | Project Phase I | - | - | - | 2 |
|  | 13 | 1 | 4 | 18 |
| **IV Year II Semester** |
| S.No. | Category | Course Code | Course Title | Hours per week | Credits |
| L | T | P |
| 1 | PE | 19A38AT | Power plant engineering | 3 | - | 0 | 3 |
| 19A38BT | Composite materials |
| 19A38CT | Production and Operation Management |
| 19A38DT | Supply chain Management |
| 2 | OE | 19A18DT | Disaster Management | 3 | - | 0 | 3 |
| 19A18ET | Building Planning and Construction |
| 19A28DT | Battery Energy Storage Systems |
| 19A28ET | System Modelling and Simulation |
| 19A48DT | Introduction to Digital Design |
| 19A48ET | Industrial Electronics |
| 19A58ET | Internet of Things |
| 19A58FT | Web Programming |
| Lab Courses |
| 3 | PW | 19A381P | Project Phase II | - | - | - | 8 |
|  | 6 | - | - | 14 |

**Open Elective Courses offered by Department of Mechanical Engineering**

**III Year II Semester**

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| --- | --- | --- | --- | --- | --- |
| **S. No.** | **Category** | **Course****Code** | **Course Title** | **Offered****by** | **Offered****to** |
| 1 | OEC | 19A36ET | Introduction to Mechatronics | Dept. of ME | CE, & CSE(for EEE & ECE - MOOCS) |
| 2 | OEC | 19A36FT | Fundamentals of Robotics |
| 3 | OEC | 19A36GT | Non-Conventional Sources of Energy |

**IV Year I Semester**

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| **S. No.** | **Category** | **Course****Code** | **Course Title** | **Offered****by** | **Offered****to** |
| 1 | OEC | 19A37JT | Introduction to Mechatronics | Dept. of ME | EEE & ECE (for CE, CSE & ME MOOCS)  |
| 2 | OEC | 19A37KT | Fundamentals of Robotics |
| 3 | OEC | 19A37LT | Non-Conventional Sources of Energy |

**IV Year II Semester**

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| **S. No.** | **Category** | **Course****Code** | **Course Title** | **Offered****by** | **Offered****to** |
| 1 | OEC | 19A38ET | Entrepreneurship Development | Dept. of ME | CE, EEE, ECE & CSE |
| 2 | OEC | 19A38FT | Optimization in Engineering |
| 3 | OEC | 19A38GT | Total Quality Management |

**List of Value-Added Courses**

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| Sl. No. | Courses |
| 1 | Safety In Industry |
| 2 | Testing Methods for 4 wheeler |
| 3 | Additive Manufacturing |
| 4 | Design of Experiments |
| 5 | Hands on CNC |
| 6 | Fundamentals of CFD |
| 7 | Hands on MATLAB |
| 8 | Manufacturing of Composites |