

Department of Mechanical Engineering

Programmes offered

1. M.Tech. Renewable Energy

Details of Curriculum applicable for different batches of M.Tech. admitted students

| Batch | Applicable Curriculum | Remarks |
|-------------|----------------------------|---------------------|
| 2022 - 2024 | Regulation 2022 | |
| 2023 - 2025 | Regulation 2022 Revision I | New electives added |

M.Tech. Renewable Energy - Regulation 2022 Revision I

SEMESTER I

| S.No. | Course Code | Category | Course Title | Credits | | | | Hours | | | |
|-------|-------------|-------------|--|---------|---|---|-------|-------|---|---|-------|
| | | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE101 | PCC | Solar Energy Systems | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 2. | YRE102 | PCC | Wind, Ocean, Hydro and Geothermal Energy Systems | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | YRE103 | PCC | Process Modelling in Energy Systems | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 4. | | PEC | Professional Elective – I | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 5. | | PEC | Professional Elective – II | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 6. | YRE106 | PCC-L | Solar Energy Laboratory | 0 | 0 | 2 | 2 | 0 | 0 | 4 | 4 |
| 7. | YRM107 | AICTE MC | Research Methodology and IPR | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 2 |
| 8. | YEGOE1 | AICTE Audit | English for Research Paper Writing | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 2 |
| 9. | YRE109 | PCC-L | Process Modelling and Simulation Laboratory | 0 | 0 | 2 | 2 | 0 | 0 | 4 | 4 |
| | | | Total | | | | 21 | | | | 27 |

SEMESTER II

| S.No. | Course Code | Category | Course Title | Credits | | | | Hours | | | |
|-------|---------------|----------|---|---------|---|---|-------|-------|---|---|-------|
| | | | | L | T | P | Total | L | T | P | Total |
| 1. | PCC | YRE201 | Bio Energy Systems | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 2. | PCC | YRE202 | Computational Fluid Dynamics | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | PCC | YRE203 | Electrical Energy Technology | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 4. | PEC | | Professional Elective – III | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 5. | PEC | | Professional Elective – IV | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 6. | PCC-L | YRE206 | Computational Fluid Dynamics Laboratory | 0 | 0 | 2 | 2 | 0 | 0 | 4 | 4 |
| 7. | PCC-L | YRE207 | Bio Energy Laboratory | 0 | 0 | 2 | 2 | 0 | 0 | 4 | 4 |
| 8. | AICTE - Audit | YPSOE1 | Constitution of India | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 2 |
| | | | Total | | | | 19 | | | | 25 |

SEMESTER III

| S.No. | Course Code | Category | Course Title | Credits | | | | Hours | | | |
|-------|-------------|----------|---------------------------|---------|---|----|-------|-------|---|----|-------|
| | | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE301 | PROJ | Dissertation Phase – I | 0 | 0 | 10 | 10 | 0 | 0 | 20 | 20 |
| 2. | | PEC | Professional Elective - V | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | | OEC | Open Elective Course | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| | | | Total | | | | 16 | | | | 26 |

SEMESTER IV

| S.No. | Course Code | Category | Course Title | Credits | | | | Hours | | | |
|-------|-------------|----------|-------------------------|---------|---|----|-------|-------|---|----|-------|
| | | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE401 | PROJ | Dissertation Phase – II | 0 | 0 | 16 | 16 | 0 | 0 | 32 | 32 |
| | | | Total | | | | 16 | | | | 32 |

OPEN ELECTIVE COURSE OFFERED BY MECHANICAL ENGINEERING DEPARTMENT

| S.No. | Course Code | Course Title | Credits | | | | Hours | | | |
|-------|-------------|-------------------|---------|---|---|-------|-------|---|---|-------|
| | | | L | T | P | Total | L | T | P | Total |
| 1. | YREOE1 | Industrial Safety | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |

PROFESSIONAL ELECTIVE COURSES

ELECTIVE GROUP – I

| S.No. | Course Code | Course Title | Credits | | | | Hours | | | |
|-------|-------------|------------------------------------|---------|---|---|-------|-------|---|---|-------|
| | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE104A | Fluid Dynamics and Heat Transfer | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 2. | YRE104B | Energy Conservation in HVAC | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | YRE104C | Fuels and Combustion Technology | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 4. | YRE104D | Computational Optimization Methods | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |

ELECTIVE GROUP – II

| S.No. | Course Code | Course Title | Credits | | | | Hours | | | |
|-------|-------------|---------------------------------------|---------|---|---|-------|-------|---|---|-------|
| | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE105A | Environmental Engineering | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 2. | YRE105B | Carbon Sequestration and Trading | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | YRE105C | Waste Management and Circular Economy | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 4. | YRE105D | Energy storage system for e-Vehicle. | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |

ELECTIVE GROUP – III

| S.No. | Course Code | Course Title | Credits | | | | Hours | | | |
|-------|-------------|---------------------------------------|---------|---|---|-------|-------|---|---|-------|
| | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE204A | Optimum Utilization of Heat and Power | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 2. | YRE204B | Statistical Tools for Data Analysis | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | YRE204C | Sustainable Development | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 4. | YRE204D | Hydro Power Technology | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |

ELECTIVE GROUP – IV

| S.No. | Course Code | Course Title | Credits | | | | Hours | | | |
|-------|-------------|--|---------|---|---|-------|-------|---|---|-------|
| | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE205A | Instrumentation Technology for Energy Systems | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 2. | YRE205B | Hydrogen, Fuel cells and Nuclear Energy | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | YRE205C | Energy Modelling, Economics and Project Management | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 4. | YRE205D | Green Building Technologies | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |

ELECTIVE GROUP – V

| S.No. | Course Code | Course Title | Credits | | | | Hours | | | |
|-------|-------------|--|---------|---|---|-------|-------|---|---|-------|
| | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE302A | Energy Audit and Management | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 2. | YRE302B | Unit Operations in Industries | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | YRE302C | CAD/CAM and Simulation of Renewable Energy Systems | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 4. | YRE302D | Industrial Safety | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |

M.Tech. Renewable Energy - Regulation 2022

SEMESTER I

| S.No. | Course Code | Category | Course Title | Credits | | | | Hours | | | |
|-------|-------------|-------------|--|---------|---|---|-----------|-------|---|---|-----------|
| | | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE101 | PCC | Solar Energy Systems | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 2. | YRE102 | PCC | Wind, Ocean and Geothermal Energy Systems | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | YRE103 | PCC | Process Modelling and Simulation in Energy Systems | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 4. | | PEC | Professional Elective – I | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 5. | | PEC | Professional Elective – II | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 6. | YRE106 | PCC-L | Solar Energy Laboratory | 0 | 0 | 2 | 2 | 0 | 0 | 4 | 4 |
| 7. | YRM107 | AICTE MC | Research Methodology and IPR | 2 | 0 | 0 | 2 | 2 | 0 | 0 | 2 |
| 8. | YEGOE1 | AICTE Audit | English for Research Paper Writing | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 2 |
| 9. | YRE109 | PCC-L | Process Modelling and Simulation Laboratory | 0 | 0 | 2 | 2 | 0 | 0 | 4 | 4 |
| | | | Total | | | | 21 | | | | 27 |

SEMESTER II

| S.No. | Course Code | Category | Course Title | Credits | | | | Hours | | | |
|-------|---------------|----------|---|---------|---|---|-----------|-------|---|---|-----------|
| | | | | L | T | P | Total | L | T | P | Total |
| 1. | PCC | YRE201 | Bio Energy Systems | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 2. | PCC | YRE202 | Computational Fluid Dynamics | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | PCC | YRE203 | Electrical Energy Technology | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 4. | PEC | | Professional Elective – III | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 5. | PEC | | Professional Elective – IV | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 6. | PCC-L | YRE206 | Computational Fluid Dynamics Laboratory | 0 | 0 | 2 | 2 | 0 | 0 | 4 | 4 |
| 7. | PCC-L | YRE207 | Bio Energy Laboratory | 0 | 0 | 2 | 2 | 0 | 0 | 4 | 4 |
| 8. | AICTE - Audit | YPSOE1 | Constitution of India | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 2 |
| | | | Total | | | | 19 | | | | 25 |

SEMESTER III

| S.No. | Course Code | Category | Course Title | Credits | | | | Hours | | | |
|-------|-------------|----------|---------------------------|---------|---|----|-----------|-------|---|----|-----------|
| | | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE301 | PROJ | Dissertation Phase – I | 0 | 0 | 10 | 10 | 0 | 0 | 20 | 20 |
| 2. | | PEC | Professional Elective - V | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | | OEC | Open Elective Course | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| | | | Total | | | | 16 | | | | 26 |

SEMESTER IV

| S.No. | Course Code | Category | Course Title | Credits | | | | Hours | | | |
|-------|-------------|----------|-------------------------|---------|---|----|-------|-------|---|----|-------|
| | | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE401 | PROJ | Dissertation Phase – II | 0 | 0 | 16 | 16 | 0 | 0 | 32 | 32 |
| | | | Total | | | | 16 | | | | 32 |

OPEN ELECTIVE COURSE OFFERED BY MECHANICAL ENGINEERING DEPARTMENT

| S.No. | Course Code | Course Title | Credits | | | | Hours | | | |
|-------|-------------|-------------------|---------|---|---|-------|-------|---|---|-------|
| | | | L | T | P | Total | L | T | P | Total |
| 1. | YREOE1 | Industrial Safety | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |

PROFESSIONAL ELECTIVE COURSES

ELECTIVE GROUP – I

| S.No. | Course Code | Course Title | Credits | | | | Hours | | | |
|-------|-------------|----------------------------------|---------|---|---|-------|-------|---|---|-------|
| | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE104A | Fluid Dynamics and Heat Transfer | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 2. | YRE104B | Energy Conservation in HVAC | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | YRE104C | Fuels and Combustion Technology | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |

ELECTIVE GROUP – II

| S.No. | Course Code | Course Title | Credits | | | | Hours | | | |
|-------|-------------|--------------------------------------|---------|---|---|-------|-------|---|---|-------|
| | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE105A | Environmental Engineering | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 2. | YRE105B | Carbon Sequestration and Trading | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | YRE105C | Waste Management and Energy Recovery | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |

ELECTIVE GROUP – III

| S.No. | Course Code | Course Title | Credits | | | | Hours | | | |
|-------|-------------|---------------------------------------|---------|---|---|-------|-------|---|---|-------|
| | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE204A | Optimum Utilization of Heat and Power | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 2. | YRE204B | Statistical Tools for Data Analysis | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | YRE204C | Sustainable Development | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 4. | YRE204D | Hydro Power Technology | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |

ELECTIVE GROUP – IV

| S.No. | Course Code | Course Title | Credits | | | | Hours | | | |
|-------|-------------|--|---------|---|---|-------|-------|---|---|-------|
| | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE205A | Instrumentation Technology for Energy Systems | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 2. | YRE205B | Hydrogen, Fuel cells and Nuclear Energy | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | YRE205C | Energy Modelling, Economics and Project Management | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 4. | YRE205D | Energy Efficient Building | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |

ELECTIVE GROUP – V

| S.No. | Course Code | Course Title | Credits | | | | Hours | | | |
|-------|-------------|--|---------|---|---|-------|-------|---|---|-------|
| | | | L | T | P | Total | L | T | P | Total |
| 1. | YRE302A | Energy Audit and Management | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 2. | YRE302B | Unit Operations in Industries | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 3. | YRE302C | CAD/CAM and Simulation of Renewable Energy Systems | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |
| 4. | YRE302D | Industrial Safety | 3 | 0 | 0 | 3 | 3 | 0 | 0 | 3 |