**CHHATRAPATI SHIVAJI MAHARAJ INSTITUTE OF TECHNOLOGY,PANVEL**

**DEPARTMENT OF MECHANICAL ENGINEERING**

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| **Name of the Faculty** | Dr. Manish Sharma |

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| **Designation**  | Vice Principal |
| **Aadhar ID** | 9305-0825-1629 |
| **No.of B.Tech Project Guided** | 25 |
| **No.of M.Tech Project Guided** | 2 |
| **Area of Specialization**  | Thermal Engineering |
| **UG Degree** | BE (Mechanical Engineering) from RTM Nagpur University  |
| **PG Degree**  | M. Tech (Mechanical Engineering) from Abdul Kalam Technological University  |
| **Ph.D**  | Solar Thermal Power Generation from Motilal Nehru National Institute of Technology (MNNIT-A) |
| **Total Experience** | **Teaching:15** | **Industry:** NIL |
| **No. of Journals (National & International)** | 24 |
| **No .of Patents Published** | 3 |
| **Roles and Responsibilities**  | Coordinator (IQAC) and Innovation Ambassador(AICTE)  |
| **Guest Lecture Delivered**  | 1. Guest Lecture Delivered on **Design Thinking** under IIC on 10th July 2021 in MMANTC, Malegoan. 2. Guest Lecture Delivered on **Design Thinking & Critical Thinking** on 5th February 2022. in MREC.  |
| **FDP’s Conducted**  |  |
| **NPTEL**  | 1. NPTEL Elite with Silver certification in Innovation Business Model and Entrepreneurship
2. NPTEL Elite Certification in Understanding Design
3. NPTEL Elite with Silver Certification in Product Design and Manufacturing
4. NPTEL Elite Certificate in Innovation by Design
5. NPTEL Elite with Silver Certificate in Design Thinking: A Primer
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| **Area of Interest:** |
| Solar Thermal Power Generation, Solar Concentrating Collectors, Solar Desalination and Ecological Footprint of Renewable Energy and Building |
| **About My Research work** |
| Organic Rankine Cycle (ORC) is a feasible solution to low temperature heat recovery. It is analogous to Rankine cycle with a change of working fluid, i.e. organic fluids are used instead of water. The reason for using an organic fluid is the positive slope of saturated vapour curve which tends to superheated vapor at the turbine outlet, eliminating erosion problems. An analytical model for various cycle configuration and parabolic trough collector was prepared for evaluation of various parameters. Experimental setup based on the simple ORC cycle was fabricated and tested for climatic condition of Prayagraj, UP, India. Economic analysis of the experimental model is also evaluated to check the practical applicability. The simulation model was prepared by using the mass balance equation for each component. The model evaluated the first law and second law efficiency along with various parameters including net work, mass flow rate of cooling fluid, and heat addition in boiler. The properties of working fluid for simulation was taken from the chemistry webbook of National Institute of Standard and Technology (NIST), USA. The maximum pressure of the cycle was assumed to be 2.5 MPa. Condenser pressure is maintained at 0.5 MPa. The mass flow rate of the working fluid is kept at 0.6 kg/sec. The condenser saturation temperature was 40°C. The heat transfer fluid is Isobutane. The turbine inlet temperature is varied in the range of 100 to 150°C. The maximum work output of 34.68 kJ/kg was achieved at 150°C for R-134a working fluid. The efficiency of the ReORC is reduced with the increase in the TIT. The reason for the reduction is due to the lower work extraction as compared to heat addition for the temperature rise at same pressure. Thus, ReORC is not suggested for ORCs. It is found that energy and exergy efficiency were in good correlation with the literature available. The working fluid variation is also studied. The exergy destruction was found to be maximum in the boiler and condenser i.e. heat exchangers. Thus, the use of heat exchanger with higher effectiveness is suggested. The exergy destruction in wet and isentropic fluids follows the same trend, in case of dry fluids the destruction is approximately distributed equally in all components. The overall conclusion limits the use to small and low temperature heat source application for ORC. |