Shivaji University, Kolhapur

Department of Technology

Vision
To be a leader in engineering and technology education, a research centre of global standards to provide valuable resources for industry and society through development of competent technical human resources.
Mission
1. To develop technocrats of national & international stature committed to the task of nation building. 2. To organize teaching learning programs to facilitate the development of competent and committed professionals for practice, research and academics. 3. To undertake collaborative research projects that offer opportunities for consistent interaction with industries.

Name of Programme: M.Tech. (Energy Technology)

Program Outcomes
1. Ability to analyze and solve complex technical problems through the application of the engineering knowledge. 2. Ability to analyze critically engineering problems by use of multi- disciplinary knowledge for creative solutions. 3. Match and develop scientific and technological knowledge in one or more domains of engineering through research and development.

4. Ability to integrate and evaluate wide range of optimal solutions considering public health, safety, cultural societal and environmental factors.
5. Deliver professional and ethical responsibilities.
6. Ability to use the techniques, skills and modern engineering tools necessary for engineering practices.
7. Acquire knowledge of contemporary issues for collaborative multidisciplinary work of national and international repute.
8. Ability to communicate confidently and effectively.
9. Ability to engage in lifelong learning
10. Apply engineering, management and financial techniques in real time.
11. Lead independently, technical knowledge based society.

Program Specific Outcomes

1. 1. Able to apply the knowledge gained during the program in general and all energy technology courses in particular to identify, formulate and solve real life problems faced in industries and/or during research work.

2. Able to provide socially acceptable technical solutions to complex energy sector problems with the application of modern and appropriate techniques for sustainable development.

Course Outcomes

Part-I Semester-I

Course code Audit Course	Course title Research Methodologies	1. Describe the types of researches and research methods for a given problem. 2. Develop the methodologies for the projects. 3. Test the hypothesis and interpretation of reports.
Course code ETC 1-1	Course title Energy Resources and Their Utilization	1. Acquiring the knowledge of energy sector. 2. Analysis of energy scenario. 3. Describe the impact of energy sector on environment.

Course code ETC 1-2	Course title Biomass and its Conversion Technologies	1. Acquiring the knowledge of biomass energy. 2. Understanding Biomass as an renewable energy and its importance with respect to environment protection 3. To design bio-energy systems.
Course code ETC 1-3	Course title Solar Photovoltaic Energy Conversion	1. Acquire the knowledge of Solar PV system. 2. Characterization of Solar PV System. 3. Design the Solar PV System. 4. Market Analysis & Techno-economic feasibility of Solar PV System.
Course code ETE 1-1	Course title Waste to Energy Conversion	1. Acquiring the knowledge of Waste to Energy Conversion. 2. Analysis of Waste to Energy Conversion. 3. Describe the impact of Waste to Energy Conversion.
Course code ETE 1-2	Course title Wind Energy & Small Hydropower System	1. Acquire the knowledge of WESH system. 2. Characterization of WESH System. 3. Design the WESH System. 4. Market Analysis & Techno-economic feasibility of WESH System.
Course code ETE 1-3	Course title Energy Efficient Lighting	1. Acquire the knowledge of Energy Efficient Lighting System (EELS). 2. Characterization of EELS. 3. Design the EELS.
Course code ETE 2-1	Course title Fuel & Combustion Technology	1. Characterization of different types of the fuels. 2. Analysis & applications of thermodynamics and combustion of fuels. 3. Applications, designs and thermal performance evaluation of combustion systems.
Course code ETE 2-2	Course title Solar Passive Architecture	1. Apply the principles of energy systems for SPA. 2. Design & demonstrate SPA technologies. 3. Integration of renewable energy in passive design.
Course code ETE 2-3	Course title Energy Storage System	1. Characterization of energy storage system. 2. Describe various energy storage materials & systems. 3. Demonstrate performance evaluation of various electrical & thermal energy storage systems.
Course code	Course title	1. Describe the research methodology

ETL 1-1	Seminar-I	2. Write technical reports. 3. Design & demonstrate application of new energy systems. 4. Write papers & publications.
Part-I Semester-II		
Course code ETC 2-1	Course title Solar Thermal Energy Conversion	1. Acquire the knowledge of STEC system. 2. Characterization of STEC System. 3. Design the STEC System. 4. Market Analysis & Techno-economic feasibility of STEC System.
Course code ETC 2-2	Course title Energy Management & Audit	1. Apply Energy conservation techniques. 2. Demonstrate Energy efficiency improvements by energy audit. 3. Install Energy management systems. 4. Describe energy conservation & environmental concerns.
Course code ETC 2-3	Course title Energy Efficiency in Thermal & Electrical Utilities	1. Demonstrate performance evaluation of various components of energy system. 2. Demonstrate energy conservation techniques. 3. Apply performance evaluation techniques for Energy conservation 4. Determine potential of energy conservations for various utilities.
Course code ETE 3-1	Course title Hydrogen Technology & Fuel Cell Technology	1. To understand basic of hydrogen energy and its production processes. 2. Describe Hydrogen storage methods and applications. 3. Describe Fuel cells and its developments in India.
Course code ETE 3-2	Course title Alternative Fuels for transportation	1. Describe petroleum based fuels & its influence on environment. 2. Describe alternative fuels & its characterization. 3. Demonstrate of alternative fuels for engineering applications.
Course code ETE 3-3	Course title Power Plant Engineering	1. Describe various types of power plants 2. To analyse & characterize types of load & load curves. 3. Demonstrate performance evaluation of various power plants.
Course code ETE 4-1	Course title Power Cogeneration	1. Describe the basics of cogeneration. 2. Demonstrate performance evaluation of cogeneration power plants.

		3. Determine techno-economic feasibility of cogeneration energy system.
Course code ETE 4-2	Course title Energy Modeling & Project Management	1. Describe econometrics & model useful for energy sector & analyse & simulate types of energy models. 2. Describe energy conservation, project & finance management. 3. Analyse the project evaluation techniques & performance indices.
Course code ETE 4-3	Course title The New Energy Technology	1. Describe superconductors. 2. Synthesize High-Tc superconductors. 3. Apply knowledge of superconductors in electricity. 4. Describe the testing of superconductors.
Course code ETL 2-2	Course title Seminar-II	1. Describe the research methodology 2. Write technical reports. 3. Design & demonstrate application of new energy systems. 4. Write papers & publications.
Part-II Semester-III		
Course code T-31	Course title Industrial training	1. Acquire the field knowledge in engineering & management. 2. Analyse the energy system of industry. 3. Demonstrate the skills of energy conservations & renewable energies. 4. Solve complex energy system problems.
Course code S-32	Course title Dissertation Phase-I	1. Describe the research methodology. 2. Write technical reports & presentations. 3. Design & demonstrate innovative energy systems
Part-II semester-IV		
Course code D-42	Course title Project and Dissertation Phase-II	1. Describe the research methodology. 2. Write technical reports & presentations. 3. Design & demonstrate innovative energy systems