

Design & Fabrication of Smart Louvered Roof (Project Based Learning in Mechanical Design)

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Abstract

Technical education emphasis more on practical aspects of education and laboratory environment is essential in this approach. Many new pedagogical techniques have been developed and implemented in engineering education; Problem Based Learning/Project Based Learning is one such technique. To accomplish this, a research project is undertaken to design and fabricate a smart louvered roof, the fully automated louvered roofing system, is the latest innovation in roof design, equipped with solar tracking and powered system integrated with intelligent system to automatically respond to changes in environment and user comfort. This environment-friendly system allows you to access natural sunlight and much needed ventilation, while providing protection from rain with a simple flick of the switch/ remote control/ mobile application.

The project was successfully developed aiming to own a simplified system by students as well as academia of schools and colleges of the developing countries enabling to produce the desired components and parts in shortest possible time while cutting down the exuberant costs.

Some of the key features of this project include:

- i) The accuracy range between 96 to 99.5%,
- ii) Very quick response time as per change in weather, and
- iii) Accessible to low budget schools, colleges and even individuals.

Keywords

PBL- Problem/Project Based Learning

Biographies

Ali Alrutui is a final year student of Mechanical Engineering Program at Yanbu Industrial College, Yanbu Al-Sinaiyah, Saudi Arabia.

Dr. Khalid Ababtain (Project Consultant) is a Associate Professor, and Head of Mechanical Engineering Technology Department at the Yanbu Industrial College, Yanbu Al-Sinaiyah, Saudi Arabia. He earned B.S. in Mechanical Engineering from King Fahd University of Petroleum and Minerals, Saudi Arabia, Masters and PhD in Mechanical Engineering from Wayne State University, USA. Dr. Khalid has been working on renewable energy for high temperature applications. He has number of publication and patents in the battery field. A battery first of its kind was designed and optimized for high temperature up to 120 0C.

Engr. Ashraf Alghanmi (Project Advisor) is a lecturer and Coordinator for BSc. of Mechanical Engineering Technology Program at the Yanbu Industrial College, Yanbu Al-Sinaiyah, Saudi Arabia. He earned BSc. in Mechanical Engineering from Yanbu Industrial College, Saudi Arabia, Master in Mechanical Engineering from the University of Dayton, USA. Engr. Ashraf has been working on renewable energy and energy efficiency in the building and manufacturing sectors. He has a number of projects in the HVAC system, thermal solar energy, and energy-saving audits.

Engr. Fayyaz Nadeem (Project Mentor) is currently a fulltime lecturer and Coordinator of Senior Project Design in Department of Mechanical Engineering Technology at Yanbu Industrial College, Saudi Arabia. Mr. Fayyaz holds a Bachelor of Technology degree in Mechanical from University of Engineering & Technology, Lahore, Pakistan and a Master of Business Administration from Allam Iqbal Open University, Islamabad, Pakistan. He has 7 years of industrial experience and over 12 years teaching experience. He has taught different courses in mechanical engineering department to technician & engineers.