

Proposals for ME 495 - Term 211

#	Faculty name	Faculty email	Research title	Research description	Area
1	Dr. Zuhair Gasem	zuhair@kfupm.edu.sa	The effect of water absorption on interlaminar shear stress on glass-fiber reinforced plastic (GFRP) pipes.	Water absorption in GFRP pipes results in degradation of interlaminar shear strength and consequently leads to drop in flexural properties of buried pipes. A testing program will be carried out to measure the interlaminar shear strength (ISS) of samples of GFRP pipes after exposure in water at different temperature and exposure times.	materials and manufacturing
2	Dr. Atia Khalifa	akhalifa@kfupm.edu.sa	Water Desalination using Membrane Distillation (MD)	Membrane Distillation (MD) is an emerging technology for water desalination. We are conducting experimental and theoretical research to develop energy-efficient MD systems for low-cost freshwater production. The work includes testing innovative ideas, design of new modules, and optimization of operating conditions. In addition, we investigate using the solar energy for heating and cooling applications with MD desalination units. More details to be given in personal meetings for interested students.	thermofluids
3	Dr. Usman Ali	usman.ali@kfupm.edu.sa	Mechanical properties of additively manufactured materials	In this work, we will manufacture and work on additively manufactured parts. We will look at their mechanical properties and identify the relationships between parts of various designs.	materials and manufacturing

4	Dr. Salem Bashmal	bashmal@kfupm.edu.sa	Model and fabrication of a sliding mechanism for reciprocating load	While an initial design will be provided to the student, the student will need to perform a design calculation to define the dimensions and specifications for a mechanism to be used to transfer a rotary motion from a motor to sliding reciprocating motion at variable speeds. Fabrication using 3D printing may be required.	Dynamics and control, Design
5	Dr. Hussain Alqahtani	qahtanih@kfupm.edu.sa	Wind Energy Harvesting	The aim of this research is to improve the available technology of harvesting wind energy over oceans. It involves investigating the dynamics of the phenomena. Also, controlling the process is another aim of this study.	Dynamics and control
6	Dr. Bandar AlMangour	bandar.almangour@kfupm.edu.sa	Additive Manufacturing for oil and gas industry	The student will be responsible to conduct an extensive literature review on the topic and conduct some experiments to evaluate the performance of duplex stainless steel in terms of porosity and properties. The student will be exposed to characterization techniques such as SEM. The outcome of this project may be a Journal paper.	materials and manufacturing
7	Dr. Bandar AlMangour	bandar.almangour@kfupm.edu.sa	Development of Bioglass/ Ti composite	In this project, the student will work first on literature review and then conduct some experiments to evaluate the corrosion performance of the composite. The outcome of this	materials and manufacturing
8	Dr. Bandar AlMangour	bandar.almangour@kfupm.edu.sa	Machine learning for metal additive manufacturing	Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. In this project, data sets will be gathered and analyzed by machine learning for specific metallic alloy.	materials and manufacturing

9	Dr. Mohamed Antar	antar@kfupm.edu.sa	Performance of a multi stage bubble Column HDH Desalination system	An experimental setup of HDH Desalination system is existing in desalination lab. The modifications in the humidifier are completed. we would like to connect a dehumidifier and test the unit performance. A new Dehumidifier based on the same principle is to be designed and built for testing where results can be compared.	thermofluids
10	Dr. Atia Khalifa	akhalifa@kfupm.edu.sa	Cavitation Assisted Membrane Distillation Module for Water Desalination	in this research, the student will design and test a membrane distillation module with water cavitation mechanism to improve the system productivity of the freshwater.	thermofluids
11	Dr. Awad Alquaity	awad.alquaity@kfupm.edu.sa	Cost-Benefit analysis of efficiency improvement of room air conditioners in Saudi Arabia	Residential sector in Saudi Arabia consumes more than 50% of the total electricity generated with the room air conditioners contributing significantly towards the peak load. With a growing population and addition of more than 2 million new homes in the last five years, it is essential to explore the cost-benefit tradeoff of various strategies to improve efficiency of air conditioners in the country. This work will utilize Low Emissions Analysis Platform (LEAP) software to predict the energy savings and emission reductions possible under various scenarios for energy efficiency standards in Saudi Arabia.	thermofluids
12	Dr. Abduljabar Al-Sayoud	sayoudaq@kfupm.edu.sa	Palladium membranes are very efficient in separating hydrogen from gas streams. In this project, the student will develop a machine learning model to evaluate the effect of different alloying elements and processing parameters on the performance of Pd alloys.	Palladium membranes are very efficient in separating hydrogen from gas streams. In this project, the student will develop a machine learning model to evaluate the effect of different alloying elements and processing parameters on the performance of Pd alloys.	materials and manufacturing