



Fall 2020-2021 Graduation Projects

1st Supervisor	2nd Supervisor	Area of Proposed Topic	Title of Proposed Project Topic	Abstract of Proposed Project Topic
Dr. Noha Glal	Dr. Aly Owida	Industrial Engineering	Sustainable Supply Chain Management During and After COVID-19	<p>Sustainability calls for the mutual consideration of economic, environmental and social aspects when designing and managing products and operations. Companies have been striving to achieve sustainability through the management of their supply chains. Main drivers were mainly global and governmental regulations, increased customer awareness, escalating energy prices, increasing environmental problems, and diminishing natural resources.</p> <p>The outbreak of the pandemic has initiated even a stronger driver to pursue sustainability in supply chains while mitigating the risks of the resulting disruptions. This project addresses the optimization of sustainable operations in supply chains to ensure efficient use of resources in supply chains facing the risks of disruptions. The type of supply chain to be considered is the food supply chain due to its vital role in the society and its criticality during the pandemic. Tools applied in this project include mathematical modelling and/or simulation, and the use of optimization software.</p>
Prof. Mahmoud El Sayed		Materials & Manufacturing	Selective laser melting of lattice structures for aerospace applications	<p>Additive manufacturing (AM), particularly Selective Laser Melting (SLM) has enabled development of lattice structures with unique properties. Through the proper selection of their unit cell design, lattice structures can produce unique mechanical, electrical, thermal and acoustic properties. On the other hand, the need for load-bearing components (with a light weight and high mechanical performance) is consistently growing year after year. In the proposed project the effect of design and relative density of the lattice on the mechanical performance of the structures produced will be evaluated. Lattice structures with different designs and with different levels of specific density will be fabricated via SLM, and then tested in a static tension to determine their mechanical properties such as yield strength, ultimate compressive strength, ductility and elastic modulus. The results of this study can provide a design basis for selecting the appropriate lattice design for different engineering applications.</p>



Industrial and Management Engineering

Dr. Mohamed Mourad		Industrial Engineering	Supporting patient adherence through smart packaging	<p>The smart packaging technology is designed to generate data in real time. When a patient pushes a tablet from the blister pack, information regarding the medication type, the tablet extraction time, and the specific packaging cavity pushed, is transmitted via a smartphone application or reader to a database, according to the company. The digital tool is designed to reduce the need for manual documentation and monitoring during clinical trials, improve patient compliance, and shorten trial periods. This digital therapy monitoring allows physicians, for example, to verify that patients have taken their medicine at the right time. Additionally, the technology makes interactive communication between physicians and patients possible.</p> <p>The goal of the project is to conceptualize and prototype a smart blister pack that schedules the log time and date when pills are removed from packaging, to support patient adherence and medication efficacy.</p>
Dr. Hala Farouk	Dr. Mohamed Mourad	Industrial Engineering	Improved Customer Service Platform Solution for Bavarian Automotive Group - BMW	<p>From telematics to mobility as a service, IoT is helping automotive service centers offer more advanced connected cars and long-lasting bonds with customers. It helps car maintenance services to plan, test and roll out automotive IoT solutions around the globe to enhance customer service for BMW business partners.</p> <p>The solution embraces an IoT Real-time smart monitoring system for BMW Automotive Service center located in Alexandria, Egypt. This solution will be applied throughout the whole maintenance phases; starting from the walk-in customer (to initiate service execution) till the washing bay service. This state-of-the-art paradigm aims for optimizing service time for enhancing customer experience.</p>
Prof. Yehia Youssef	Dr. Motaz Ghazy	Materials & Manufacturing	Optimization of Part Characteristics using Finite Element Analysis	
Prof. Khaled El Kilany		Industrial Engineering	Refrigerated vehicle routing problem	
Prof. Khaled El Kilany	Dr. Ingy El Khouly	Industrial Engineering	A simulation approach to integrated lean six sigma	