FALL 2022-2023 - MECT410 & MENG410 CAPSTONE TEAM PROJECT GROUPS				
Gr. No	Supervisor	Project Title	Pre-Requisites	Students
1	Prof. Dr. Hasan Hacisevki	**Speech controlled Autonomous wheel chair Project:** Speech controlled Autonomous wheel chair Project. Mobility of disabled or injured people is carrying an important role in their life. These peple must survive and adopt themself to the enviroment and their community but because of disability they can not join with the enviroment. The main aim in this project to be able to use latest technological instruments and produce a simple and cheap easy guided speech controlled AGV.	**MENG201, MENG203, MENG375**	
2	Prof. Dr. Hasan Hacisevki	**A solar air heater (SAH) wil be designed and manufactured -** For drying fruits and vegetables a novel system will be designed and manufactured. This new SAH also will be tested and compared with the existing solar air heaters for performance and efficiency parameters.	**MENG244, MENG303, MENG345, MENG353**	
3	Prof. Dr. Uğur Atikol	**Solar Air Conditioner** – It is required to convert an old airconditioner into a solar PV-operated air conditioner that will run from a battery directly.The battery will store the energy from the solar panels and will be able to run the air conditioner for 3 to 4 hours until it is charged again. It is required to have a multi-disciplinary team with a partner from the EE department.	**MENG345, MECT361, MENG364, EENG350, MENG443**	
4	Prof. Dr. Uğur Atikol	**Wind Energy Storage System** – It is required to design an energy storage system for a wind turbine having the capacity for storing energy that can provide electricity to the internet, tv, a few bulbs and charging for the cell phone for at least 2 hours. The team should be a multi-disciplinary team formed by mechatronics and electrical engineers.	**MECT361, EENG350, MENG364, EENG342**	
5	Assoc. Prof. Dr. Murat Özdenefe	**Heat Pipe Integrated Evacuated Tube Solar Air Heater:** This project is for designing and manufacturing a novel type of solar air heater which will employ heat pipe integrated evacuated tubes as absorber. The system will involve heat pipes to convey the absorbed radiation to a heat exchanger where the air will be heated. The evacuated tubes will help to minimize the thermal losses.	**MENG353, MENG345, MENG442 (corequisite)**	
6	Assoc. Prof. Dr. Murat Özdenefe	**Smart Window Shade**: The objective of this project is: To design and manufacture an external shading element for windows that is movable and preferably modular. The objective of the system is to block the direct radiation incident on the window for mimimising the heat gains during cooling season and to allow it to fall on the window for maximizing the heat gains during heating season. The external shading element will continiously adjust itself accordingly relative to the sun during a day by means of motors. The system will also be designed to adjust itself seasonally.	**MECT361, MECT444, EENG410, MENG442 (corequisite). Two students must be from Mechatronics Program.**	
7	Assoc. Prof. Dr. Devrim Aydin	**Solar Driven Air Dehumidifiation Unit:** This project aims developing an air dehumidification unit suitable for air conditioning applications. System will be driven with solar energy. Within the project design, development and testing of the dehumidification unit will be performed.	MENG246, MENG345, MENG303	
8	Assoc. Prof. Dr. Devrim Aydin	**Sustainable Cooling System :**Students are expected to design, develop and test a sustainable cooling system based on evaporative cooling. System will use air-to -air heat exchangers and water citculation system. Within the project design, development and testing of thecooling system will be performed.	MENG246, MENG345, MENG303	
9	Assoc. Prof. Dr. Devrim Aydin	**Renovation of an Existing Air Conditioning Unit :**Students are expected to renovate an existing air conditioning unit in ME025 laboratory. Within the project integration an air humidification unit also integration of temperature and humidity sensors to the system will be perofmed. Necessary control tools will also be developed.	MENG246, MENG345, MENG303	
10	Assist. Prof. Dr. Mohammad Asmael	**Refurbishment of the Mini CNC Milling Machine**	**MENG364, MENG303, MECT361, MECT444 - COREQUISUTE Preferably, 2 Mechatronic 3 Mechanical**	
11	Assist. Prof. Dr. Mohammad Asmael	**Refurbishment of the Mini CNC Turning Machine**	**MENG364, MENG303, MECT361, MECT444 - COREQUISUTE Preferably, 2 Mechatronic 3 Mechanical**	
12	Assist. Prof. Dr. Mohammad Asmael	**Ultrasonic Nondestructive testing**	**MENG364, MENG303, MECT361 All the team members must be in Cyprus Preferably, 2 Mechatronic 3 Mechanical**	
13	Assist. Prof. Dr. Mohammad Asmael	**Surface Roughness Measurements**	**MENG364, MENG303, MECT361 All the team members must be in Cyprus Preferably, 2 Mechatronic 3 Mechanical**	
14	Assist. Prof. Dr. Babak Safaei	**Furnace and characterization systems:** An industrial furnace, also known as a direct heater or a direct-fired heater, is a device used to provide heat for an industrial process, typically higher than 400 degrees Celsius. They are used to provide heat for a process or can serve as reactor which provides heats of reaction.	MENG303, MENG331, MENG364, MENG375,MECT375, MECT361, MECT444 SPECIAL REQUIREMENT: At least 2 team members should be from the Mechatronics Program. Software: Solidworks, ANSYS, Abaqus	
15	Assist. Prof. Dr. Babak Safaei	**Vacuum Chamber and characterization systems:** Vacuum systems are used to remove the air from high viscosity materials like silicone rubber before pouring. They are also ideal for vacuum degassing liquid plastics (such as Crystal Clear™ plastic) for making bubble free castings	MENG303, MENG331, MENG364, MENG375,MECT375, MECT361, MECT444 SPECIAL REQUIREMENT: At least 2 team members should be from the Mechatronics Program. Software: Solidworks, ANSYS, Abaqus	
16	Assist. Prof. Dr. Babak Safaei	**OEM Microscope:** This technology is the result of our development of the IncuScope inverted fluorescent microscope. We would like to offer it as a module for other instrument makers to use in a variety of imaging functions.	MENG303, MENG331, MENG364, MENG375,MECT375, MECT361, MECT444 SPECIAL REQUIREMENT: At least 2 team members should be from the Mechatronics Program. Software: Solidworks, ANSYS, Abaqus	
17	Prof. Dr. Qasim Zeeshan	**Snake Robot - 2.0:** This project focuses on the redesign, development and testing of the snake robot 1.0 which was inspired from real snakes. It consists of compact links (brackets) which allows to maintain smooth movements. The most effective movement pattern such as; crawling and slithering must be implemented. Servo motors, wireless cam, Arduino Nano and remote control are some of the components that must be used to develop this prototype. To make the snake robot function like a real snake, it is constructed using many brackets. To cut down the cost, these brackets must be designed and 3D printed. Each bracket can have a servo motor that enables the robot to have various degrees of freedom for different gaits. Modular design must give the robot flexibility to reach different territories and ability to move around in complex environments. The work will cover several key areas of mechanical and mechatronics engineering.	MENG303, MENG331, MENG364, MENG375, MECT361, MECT444, EENG320, EENG410, EENG428 SPECIAL REQUIREMENT: At least 2 team members should be from the Mechatronics Program. Software: Solidworks, MATLAB, Simulink, ANSYS, ARDUINO, PLC	
18	Prof. Dr. Qasim Zeeshan	**Refurbishment of a Mini Cricular Automated Storage and Retrieval System (ASRS)**- Automated Storage and Retrieval Systems (AS/RS) are used as warehouses, specifically designed for material handling in advanced manufacturing systems and are broadly utilized in distribution centers as subsystem for production area. The aim of the project is to refurbish the mini Circular AS/RS Configuration. The configuration is based on a single aisle; single S/R (Storage/Retrieval) machine. Randomly storage assignment policy is applied for the system.	MENG303, MENG331, MENG364, MENG375, MECT361, MECT444, EENG320, EENG410, EENG428 SPECIAL REQUIREMENT: At least 2 team members should be from the Mechatronics Program. Software: Solidworks, MATLAB, Simulink, ANSYS, ARDUINO, PLC	
19	Prof. Dr. Qasim Zeeshan	**Digitization of Universal Vibration Apparatus – TM16** - TM16 series is a range of products that teach different aspects of vibrations and oscillations in mechanical systems. These include pendulums, mass-springs systems and shafts and beams. The TM16 series is a modular system, based around a Frame and Cupboard. The aim of the project is to digitize the apparatus by integrating it with digital sensors and a digital display unit with data transmission to a PC. The work will cover several key areas of mechanical and mechatronics engineering.	MENG303, MENG331, MENG364, MENG375, MECT361, MECT444, EENG320, EENG410, EENG428 SPECIAL REQUIREMENT: At least 2 team members should be from the Mechatronics Program. Software: Solidworks, MATLAB, Simulink, ANSYS, ARDUINO, PLC	
20	Assist. Prof. Dr. Omid Shekoofa	**Miniature sun simulator:**Sun simulator is an essential part of any photovoltaic laboratory which is used for characterization of solar cells and extracting their I-V curves. Sun simulators are designed and manufactured in different size and provide various irradiance conditions which are classified in A, B and C classes according to their spectral match, uniformity and temporal instability. The aim of this project is to build a development model of low-cost continues sun simulator.	MECT361, MENG 332, EENG 410, at least two members from the mechatronics program and one from mechanical engineering program	
21	Assist. Prof. Dr. Omid Shekoofa	**Renewing a PLC-based industrial automation demonstration and test platform:**The aim of this project is to renew a PLC-based industrial automation lab-scale system by replacing the old PLC module of the system with a new micro-PLC module and equip it with robotic arm to pick up different objects from a recirculating conveyor based on their size, color, etc....	MECT444, MENG 332, EENG 410, at least two members from the mechatronics program and one from mechanical engineering program	
22	Assist. Prof. Dr. Omid Shekoofa	**Robotic arm for space debris removal by CubeSats:**CubeSats are a very popular class of nanosatellites, which are manufactured based on one or several unite cube (1U) structure of 10cm*10cm*10cm dimension. They can provide a low-cost solution in space projects by providing comparable services to micro- or mini-satellites. One new area of CubeSat applications is using them for space debris removal. In this project a miniature robotic arm is designed and built to be installed on a 1U CubeSat for demonstration the capability of this class of satellites for space debris mitigation.	MECT361, MENG 332, EENG 410, at least two members from the mechatronics program and one from mechanical engineering program	
23	Assist. Prof. Dr. Omid Shekoofa	**Robotic solar panel cleaner:** Robotic solar panel cleaner: Solar panels are subjected to various environmental factors that can reduce their performance during their life cycle. One of the main affecting factors is the accumulated dust which covers the surface of the panel and reduces the effective received irradiance to the panel and leads to a decrease in its produced power. Regular cleaning is the best solution for this problem but it is costly and time-consuming, especially for large PV power plants. Different robotic solar panel cleaners are recently designed and manufactured for automatic cleaning of solar panels. This project intends to design and build a low-cost autonomous robotic system for solar panel cleaning.	MECT361, MENG 332, EENG 410, at least two members from the mechatronics program and one from mechanical engineering program	
24	Sn. Lec. Cafer Kızılörs	**Design and manufacture small hydraulic press**	**MENG303, MENG364, MENG375/MECT375**	
25	Sn. Lec. Cafer Kızılörs	**Revitalization and transforming the juice extracting to olive crushing machine**	**MENG303, MENG364, MENG375/MECT375**	