

SPRING 2021-2022 - MECT410 & MENG410 CAPSTONE TEAM PROJECT GROUPS			
Gr. N°	Supervisor	Project Title	Pre-Requisites
1	Prof. Dr. Hasan Hacıoğlu	Drag force measuring instrument for Wind tunnel - A drag force measuring system will be designed and manufactured for the wind tunnel experiment. This device will measure the drag force formed on the bodies while they are tested in Department wind tunnel.	MENG201, MENG303, MENG353
2	Prof. Dr. Hasan Hacıoğlu	A solar air heater (SAH) will 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 Heater Demonstration Unit - Previously manufactured solar air heater is to be used as a part of a demonstration unit for training technicians and architects. It is required to mount the whole apparatus on the roof of the solar lab and have controls and digital displays of temperature, flow rate and pressure.	MENG345, MENG353, MECT361, MENG364
4	Prof. Dr. Uğur Atikol	Ice Thermal Storage Tank - Ice thermal storage is now more and more interesting as multi tariff system is in force in N. Cyprus. In this project it is required to design the storage tank of the ice thermal storage system.	MENG246, MENG345, MENG364, MENG443
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
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 minimizing 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 continuously adjust itself accordingly relative to the sun during a day by means of motors. The system will also be designed to adjust itself separately.	MECT361, MECT444, EENG410, MENG442. Two students must be from Mechatronics Program.
7	Asst. Prof. Dr. Devrim Aydin	Solar Driven Moving Bed Heat Storage Process : This project aims performing modelling, simulation and testing of a solar driven thermochemical heat storage process. Students are expected to perform numerical modelling on the proposed process using Fluent or Matlab software. In addition, students will integrate the existing components, solar collector, heat exchanger and thermochemical unit to develop a process for solar thermal heat storage. Finally experiments on the developed process will be performed and results will be validated with the previously obtained simulation results.	MENG246, MENG345, MENG364, MENG440, MENG303 Additional requirements: (i) At least 3 members of the group should be in Cyprus (ii) At least 2 group members should be experienced on Fluent and Matlab. (iii) Maximum 1 member could be from Mechatronics Engineering
8	Asst. Prof. Dr. Devrim Aydin	Solar driven air cooling system : Students are expected to design, develop and test a solar driven cooling system. System will be working based on endothermic reversible dissociation of salt impregnated porous composite. Proposed system should be operating continuously and should be able to provide >1 kW cooling output. Developed cooling system will be integrated with solar collector and solar energy will be used to power the cooling process.	
9	Asst. Prof. Dr. Mohammad Amsal	Measurements of Solidification of Metal Casting	MENG344, MENG303, MECT361 Co-requisite MENG482 All the team members must be in Cyprus Preferably, 2 Mechatronic 3 Mechanical
10	Asst. Prof. Dr. Mohammad Amsal	Non destructive Testing of Welding Joint	MENG344, MENG303, MECT361 Co-requisite MENG482 All the team members must be in Cyprus Preferably, 2 Mechatronic 3 Mechanical
11	Asst. Prof. Dr. Mohammad Amsal	Surface Roughness Measurements	MENG344, MENG303, MECT361 Co-requisite MENG482 All the team members must be in Cyprus Preferably, 2 Mechatronic 3 Mechanical
12	Asst. Prof. Dr. Babak Safaei	Hardness tester : The principal purpose of the hardness test is to determine the suitability of a material for a given application, or the particular treatment to which the material has been subjected.	MENG303, MENG351, MENG364, MENG375, MECT375, MECT361, MECT444 SPECIAL REQUIREMENT: At least 2 team members should be from the Mechatronics Program. Software: Solidworks, ANSYS, Abaqus
13	Asst. 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, MENG351, MENG364, MENG375, MECT375, MECT361, MECT444 SPECIAL REQUIREMENT: At least 2 team members should be from the Mechatronics Program. Software: Solidworks, ANSYS, Abaqus
14	Asst. 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, MENG351, MENG364, MENG375, MECT375, MECT361, MECT444 SPECIAL REQUIREMENT: At least 2 team members should be from the Mechatronics Program. Software: Solidworks, ANSYS, Abaqus
15	Asst. Prof. Dr. Babak Safaei	OEM Microscope : This technology is the result of our development of the IncoScope 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, MENG351, MENG364, MENG375, MECT375, MECT361, MECT444 SPECIAL REQUIREMENT: At least 2 team members should be from the Mechatronics Program. Software: Solidworks, ANSYS, Abaqus
16	Assoc. Prof. Dr. Qasim Zeehan	Snake Robot - 2.0 : The project focuses on the design, development and testing of the snake robot 2.0 which was inspired from real snakes. It consists of compact links (braking which allows to maintain smooth movements). The most effective movement pattern such as crawling and slithering must be implemented. Servo motors, sensors, Arduino Nano and remote control are some of the components that must be used to develop this prototype. To make the snake robot function the real snake, it is constructed using many brackets. To cut down the cost, these brackets must be designed and 3D printed. Each one of them have a sensor motor that enables the robot to have various degrees of freedom for different parts. Module 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, MENG351, MENG364, MENG375, MECT375, MECT361, MECT444, EENG300, EENG410, EENG428 SPECIAL REQUIREMENT: At least 2 team members should be from the Mechatronics Program. Software: Solidworks, MATLAB, Simulink, ANSYS, ARDUINO, PLC
17	Assoc. Prof. Dr. Qasim Zeehan	Emergency Ventilator - 3.0 : The project focuses on the design, development and testing of the emergency ventilator 2.0.	MENG303, MENG351, MENG364, MENG375, MECT375, MECT444, EENG300, EENG410, EENG428 SPECIAL REQUIREMENT: At least 2 team members should be from the Mechatronics Program. Software: Solidworks, MATLAB, Simulink, ANSYS, ARDUINO, PLC
18	Assoc. Prof. Dr. Qasim Zeehan	Autonomous Underwater Vehicle - 3.0 : This project focuses on the design, development and testing of the previously designed AUV.	MENG303, MENG351, MENG364, MENG375, MECT375, MECT444, EENG300, EENG410, EENG428 SPECIAL REQUIREMENT: At least 2 team members should be from the Mechatronics Program. Software: Solidworks, MATLAB, Simulink, ANSYS, ARDUINO, PLC
19	Assoc. Prof. Dr. Qasim Zeehan	Digitization of Universal Vibration Apparatus - TM16 - TM16 series is a range of products that reach 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, MENG351, MENG364, MENG375, MECT375, MECT444, EENG300, EENG410, EENG428 SPECIAL REQUIREMENT: At least 2 team members should be from the Mechatronics Program. Software: Solidworks, MATLAB, Simulink, ANSYS, ARDUINO, PLC
20	Asst. 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 continuous sun simulator.	MECT361, MENG 332, EENG 410, at least two members from the mechatronics program and one from mechanical engineering program
21	Asst. 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	Asst. Prof. Dr. Omid Shekoofa	CubeSat Robotic arm for space debris removal : CubeSats are a very popular class of nanosatellites, which are manufactured based on unit 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	Sn. Lec. Cafer Kızıllar	Revitalization and transforming the juice extracting to olive crushing machine	MENG303, MENG364, MENG375/MECT375
24	Sn. Lec. Cafer Kızıllar	Redesign the grass chipper machine	MENG303, MENG364, MENG375/MECT375
25	Sn. Lec. Cafer Kızıllar	Revitalization of the throatless shear press machine	MENG303, MENG364, MENG375/MECT375
26	Sn. Lec. Cafer Kızıllar	Design and manufacture small wood chipping machine	MENG303, MENG364, MENG375/MECT375

THERMAL SCIENCES

- Dr. Hasan
- Dr. Uğur
- Dr. Murat
- Dr. Devrim

MECHANICS

- Dr. Qasim
- Dr. Babak
- Sn. Lec. Cafer

MATERIALS

- Dr. Mohamed
- Dr. Babak
- Sn. Lec. Cafer

MANUFACTURING

- Dr. Mohamed
- Dr. Qasim
- Sn. Lec. Cafer

MECHATRONICS

- Dr. Omid