



# EMET NEWSLETTER

Issue 5, Feb 2022

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## Message from EMET Faculty



Dear Readers,

Electro-Mechanical Engineering Department provides a perfect blend of youthful enthusiasm and core professional experience for the budding engineering aspirant that the UAE industry needs. Electro-Mechanical Engineering encompasses many technologies such as power systems, electrical machines, electronics, control systems, robotics, renewable energy, and Artificial Intelligence. The department strives to provide a blend of fundamental core knowledge and cutting-edge technologies to create an Engineer who can cope with the requirements of the UAE Industry and handle the current demands of higher studies.

The department encompasses a fine blend of young and dynamic faculties with a balanced mix of industry and academics. Most faculties have excellent track records and are drawn from leading institutes and other reputed universities worldwide.

The department conducts various activities under the departmental association such as Knowledge Enrichment Club, graduation projects expo, industry site visits for constant knowledge up-gradation of staff and students.

We continue to play a significant role in our discipline, which leads us towards creating an innovative and effective professional graduate community that would be attractive and provide continuous learning.

We hope you enjoy reading this newsletter issue as in the past. Please let us know your story and suggestion.

From  
Electromechanical Engineering Technology Faculty  
AD Poly, Abu Dhabi Campus.

## New Programs Launched in 2021

(Focus on UAE's Future Growth Areas)

EMET is ABET and CAA- Fully accredited Applied Bachelor, Higher Diploma & Diploma degrees in Electro-Mechanical Engineering Technology with the following specializations:

- + Mechanical Engineering Technology
- + Electrical Engineering Technology
- + Mechatronics Engineering Technology
- + Instrumentation and Control Engineering Technology

New Programs Launched in 2021 (Focus on UAE's Future Growth Areas)

- + Intelligent Systems Engineering Technology
- + Smart Manufacturing Engineering Technology
- + Electrical Engineering Technology – Minor Artificial Intelligence
- + Mechanical Engineering Technology– Minor Artificial Intelligence

### Intelligent Systems Engineering Technology

Intelligent System (IS) can be defined as the system that incorporates intelligence into applications being handled by machines. Intelligent systems perform search and optimization along with learning capabilities. Intelligent systems also perform complex automated tasks, which the traditional computing paradigm is not possible. Intelligent systems, as the name implies, is an area of study that deals with systems and machines with intelligence. These systems come in many different forms; examples range from autonomous cars and drones to speech and facial recognition applications.

Our department focuses on two main areas within intelligent systems: how machines perceive their environment and how those machines interact with that environment. A system based on approaches, methods or techniques of the Artificial Intelligence field to perform more accurate and effective operations for solving the related problems.

### Smart Manufacturing Engineering Technology

Smart Manufacturing "intelligent manufacturing" refers to a new global industrial method that relies heavily on the evolutions of the latest technologies in terms of connected means of production during the manufacturing process.

In EMET, Smart Manufacturing can be understood as combining existing and modern technologies with standards that work to create hyper flexible, self-adapting manufacturing capabilities. Key smart manufacturing technologies include internet-connected machines through the Industrial Internet of Things (IoT), process virtualization with digital twins, improved worker safety and automation with advanced robotics, artificial intelligence (AI) assisted process analytics, additive manufacturing, machine learning, and more.

The program provides students with knowledge and skills for Industry 4.0 standards, Additive Manufacturing, and emerging Manufacturing processes.



In addition, the following qualifications received the final endorsement and approval from UAE National Qualifications Centre (NQC).

- Diploma in Mechatronics Engineering Technology (2 Years)
- Diploma in Instrumentation & Control Systems Engineering Technology (2 Years)
- Advanced Diploma in Mechatronics Engineering Technology (3 Years)
- Advanced Diploma in Mechanical Engineering Technology (3 Years)
- Advanced Diploma in Electrical Engineering Technology (3 Years)
- Advanced Diploma in Instrumentation & Control Systems Engineering Technology (3 Years)

## EXPO's 2020 Role in The Higher Education Sector

Dr. Sawsan Dagher/EMET

Education is amongst the most important fields supported by Expo 2020 programs, as it is an entire sector for building the state by its people. Hence, Expo 2020 Dubai actively contributes to the future of the education sector by organizing many events held over six months to explore the most prominent methods of modern education. By this event, the Emirates have made it clear and proved its superiority and precedence to the world and took its position among the leading countries in various fields, to achieve the slogan on which this historical event is based, "Connecting Minds and Creating the Future."

I see Expo 2020 as a real, valuable, and excellent opportunity for students to identify areas of passion in their personalities. The program also allows the students to speak to experts to answer their questions and provide them with valuable experiences. The Expo program is focused on developing hands-on practical experiences that will prepare students for the future. Through these experiences, they will gain a deeper understanding of reality.

Expo 2020 is a golden opportunity for those who wish to travel across the vast world in record time. It puts in the hands of students the developments of the world in all fields in an interesting, impressive, curious and passionate manner. It includes about 192 countries presenting their developments and the best of their science and technology in one platform and thus represents the most prominent student gathering.

It also provides a platform where individuals can discuss their new ideas on dealing with the future of education. One of these excellent program outcomes is the student's openness to many cultures and different interests. The program hosts nearly 3000 or more participants in the field of education to look into the future of the education sector, including how to create new advanced paths that meet the needs of generations in the next stage, within the framework of achieving the goals of sustainable development, given that education is an essential pillar that helps in achieving the international goals.



*EMET Students Tour-EXPO 2020*

## EMET Department Newly Developed Labs

Eng. Anand Gopalakrishnan-Lab Coordinator/EMET

2021 a year of development for EMET Department, positive discussions happened with the supporting industries in UAE & around the world to take the technology used in EMET Laboratories one step high. Lucas Nulle (Germany) conducted a two-day workshop on the various training stations used in the Power Systems Lab located on the 4th Floor. The training benefited our EMET Staff members. Dr. Fawwaz, Dr. Farhan Malik, Eng. Anand & Eng. Soumya attended the training on 11<sup>th</sup> & 12<sup>th</sup> October 2021. Now, this lab is equipped to cover the courses like Renewable Electrical Energy, Power System Operation & Control, Power System Protection, Power Transmission and Introduction to Power Systems. The electrical focus group is currently working with external organizations like NETA, Lucas Nulle, and ABB to develop an MOU in terms of Electrical Professional License for the benefit of our EMET students.



*Students Gaining Hands-On Experience in Power System Laboratory*

*-Renewable Energy Lab Session*

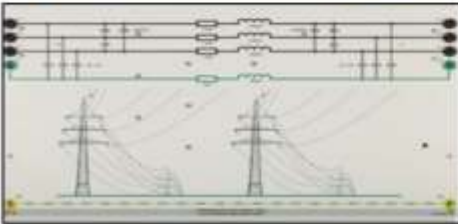




## Newly Developed EMET Labs & Facilities



### Power System Laboratory



### FAB Laboratory-CNC Router, Laser Cutter & 3D Printing



### Refrigeration & Air Conditioning Laboratory



### Automobile Technology Laboratory







## EMET Students Activities GITEX Global Event 2021



A breathtaking array of innovations from 140 countries. EMET Students attended and explored the most inspiring ideas on business transformations and the best moments of GITEX GLOBAL 2021. Ministers and Heads of Government shared their achievements, challenges and opportunities in their countries' quests for innovation and knowledge transformation excellence. GITEX YouthX brought young tech talents closer to the practitioner ecosystem. Transportation was arranged from AD Poly for the convenience of students and followed all safety rules and regulations to attend this event. Eng. Yusuf Airani and Eng. Mohammed Amin from EMET Department accompanied our students.

## Graduation Project's Virtual Exhibition between UAE & KSA

Virtual exhibition for graduation projects between UAE and KSA happened on 9th June 2021, and the following EMET Graduation Projects bagged the top three prizes. Thanks to our EMET students, project supervisors and student services for their support and encouragement.



## EMET Graduation Projects Final Presentation & Exhibition Fall-2021-22, Location:-Abu Dhabi Campus

EMET Students participated in the GP Final Presentation from Nov 21<sup>st</sup> to Nov 23<sup>rd</sup> and showcased their final projects on a special exhibition organized by Abu Dhabi Polytechnic on Nov 24<sup>th</sup> 2021. Abu Dhabi Polytechnic Director Dr. Ali AlNaqbi inaugurated the event and explained the importance of graduation projects.



*Snapshots of EMET Graduation Projects Final Presentation & Exhibition-Fall-2021-22*





## Emirates Skills Competition



➤The Emirates Skills National Competition is the UAE's premier event dealing with technical and vocational skills and inspires the young generation to get passionate about new trades, as well as embrace technology-based career pathways.

➤In 2020-21, our EMET Students participated and awarded Gold Medal for the following Emirates Skills Competitions:

❖Car Painting

❖Mobile Robotics

❖Automobile Technology

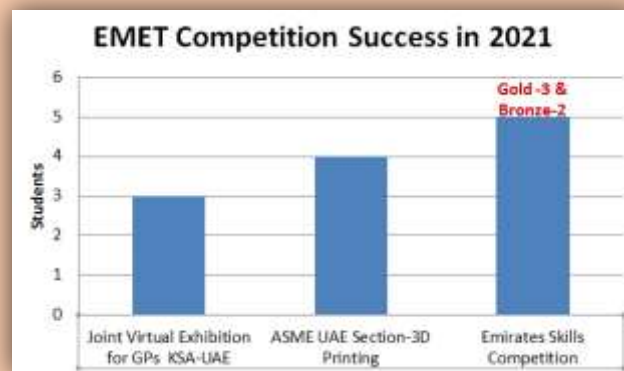


## EMET Students Training & Competition Statistics in 2021

In 2022, EMET Students have shown interest in Emirates Skills Competitions like Car Painting, Electronics, Electrical Installations, Mobile Robotics, Welding & Automobile Technology. EMET Department takes this opportunity to thank the Trainers from Innovation Park for their continuous support and guidance.

Our sincere thanks to the following EMET Department Trainers for training our Students related to Festo, Siemens & Inventor certifications.

Training Name	Trainer Name(s)	Students Achieved Certification
Inventor Certification	Dr. Dani Abdo, Eng. Khalid Al Jarrah & Eng. Khalifa Al Mansoori	11
Festo Certification	Eng. Ihab Abdelrahman	12
Siemens Certification	Eng. Hussein Alsmairat	37





## New Developments in EMET Robotics Lab

Eng. Aboobacker Sidheeq /EMET



*EMET Robotics Lab-Panoramic View*

EMET recently modified the arrangement of the former Mechatronics lab. The name of the lab is now changed to Robotics Lab with equipment required to gain hands-on experience on Mobile robotics and Industrial robots, Embedded System Design, Introduction to mechatronics and Mechatronics System design. The new lab layout and arrangement gives ample space for students to work on the equipment's individually or in groups.

Robots are becoming increasingly crucial in automation technology alongside industrial robots. In the mobile robotics training on FESTO Mobile robots, the student integrates and uses an extensive range of technology, for example, electrical drive technology, sensors, control technology, image processing and programming techniques. The new robotics lab is also equipped with LEGO NXT and VEX V5 competition super kit to train ADPOLY students in the Emirates Skills competition.

The Fundamentals of Mechatronics are now taught on Arduino Mega kits in the robotics lab. The students gain knowledge and skills on various components in mechatronics systems, such as sensors, actuators, and other electrical components. Students do their mini projects on these kits at the later stages in the fourth year of the course Mechatronics System. The lab is also equipped with SCORA Industrial robotics to train our student's on robot kinematics and robotic arm manipulation concepts. Students are assigned to do different challenges on SCORA robotic arm during the training to move items from one location to another. They engage in the engineering process to design, program and operate the arm.

EMET is currently in the process of purchasing EASY PIC V7 development kits that are required in Embedded Systems OCT to give hands-on experience on microcontroller applications and interfacing with basic solid-state input/ output devices, A/D and D/A converters, LCDs and Multiplexing seven-segment LED displays.

## FAB LAB TRAINING SESSION

Eng. Yusuf Airani /EMET

The Fab Lab at Abu Dhabi Polytechnic is a fully equipped workspace that allows students to learn & develop their skills in smart manufacturing using the finest industry-driven software & computer-controlled machines & recent technologies. Apart from catering to specializations in Mechanical engineering & Smart manufacturing courses, the Fab Lab is also used for graduation projects, Emirates skills & World skills competition training.

In the second week of Nov 2021 training was conducted by the visiting engineer from Hungry for the Tortec Laser cutting machine & was attended by the selected faculty & lab engineers from EMET department. The training was highly informative & successful in terms of use & application of the laser cutter & engraving machine.

The first round of training for the CNC machining software Mastercam was conducted in the first week of the spring semester, benefitting the staff in attendance associated with CAD/CAM & manufacturing courses.



*Snapshots of Fab Lab Training Session*

## EMET Students Club- Intelligent Robots Club

Managed by Dr. Sobers Francis/EMET

The purpose of this club is to assist students in comprehending, designing, and learning robotics; provide interested students the chance to demonstrate their skills, knowledge, and creativity by creating, programming, and conceiving robots. It provides a medium through which students can develop their science, technology, engineering, and mathematics skills. It also provides opportunities for students to participate in various competitions in UAE or events related to robotics internationally.

### VISION & MISSION:

Encourage students to use and develop their creative and engineering talents through robotics to learn technical skills, teamwork, and leadership. To engage young minds in exciting programs that strengthen technical skills, inspire innovation, and cultivate life qualities such as self-confidence, communication, and leadership, to motivate them to be the driving force in the field of robotics.

### SCOPE:

To bring together students interested in robotics and eager to learn and apply new engineering skills through hands-on tutorials and projects. Students from all majors contribute something to the team. Some of the interesting topics are listed below:

- Autonomous vehicle systems
- Multi-autonomous vehicle systems
- Computer Vision
- Localization and Navigation
- Robots based Visual Object Tracking

### UPCOMING ACTIVITIES AND EVENTS:

- Arduino Certification Training
- Emirates Skills Training (Mobile Robots)
- Intra Robotics Competition (ADPOLY)

## EMET Students Club- Programming Club

Managed by Dr. Ashraf Riad/EMET

This club aims to assist students in analysis, designing, and coding real-life application programs. Engineering students might have brilliant ideas and thoughts but lacks the programming skills to implement them. The programming club will provide the students with the necessary certified practical programming skills to build several applications.

The programming club will introduce different programming languages and app development training divided into essential, intermediate, and advanced learning categories, which will allow students to participate in national and international competitions in the programming field.

### VISION & MISSION:

Increase the coding literacy among students in different academic years and expand the logical thinking among engineering students. Also, to remove the code phobia among students especially new joiners and encourage them to engage in innovative projects and ideas.

### SCOPE:

To bring together students interested in programming and eager to learn and apply new engineering skills through computer programs. Students from all majors contribute something to the team. Some of the interesting topics are listed below:

- Programming using Python
- Programming using C++
- Programming using Java
- Python and AI
- Web Development

### UPCOMING EVENTS:

- PCEP – Certified Entry-Level Python Programmer Certification
- PCAP – Certified Associate in Python Programming certification

## EMET Students Club- MD4 CAD Club

Managed by Dr. Dani Abdo/EMET

Technology is taking a new course daily. With each Eye Blink, new products are developed somewhere in the world.

Everything we use in our day-to-day lives has been designed by someone. CAD Designers use computer-aided techniques to create 3D models and production drawings.

Computer-Aided Design (CAD) is a special branch of Mechanical Engineering that employs a wide range of Computer-based tools and techniques assisting engineers in design and manufacturing endeavours. Geometrical modelling, analysis, optimization, validation and simulation are some of the well-known concepts involved in the study of Computer-Aided Design.

### SCOPE:

The field of 3D Design is one, which serves a wide and varied number of vocations, professions, and industries. The MD4 CAD Club comes under the category of Smart Design and Manufacturing directs its courses and training along practical lines demanded by the industry. Students get qualified and certified to obtain employment in CAD-related occupations and engage in exciting and innovative research and projects. The club is founded to engage motivated students in real-life projects and research to allow them to gain professional experience in the fields of mechanical Design and manufacturing.

### CURRENT AND PLANNED PROJECTS AND RESEARCH TOPICS:

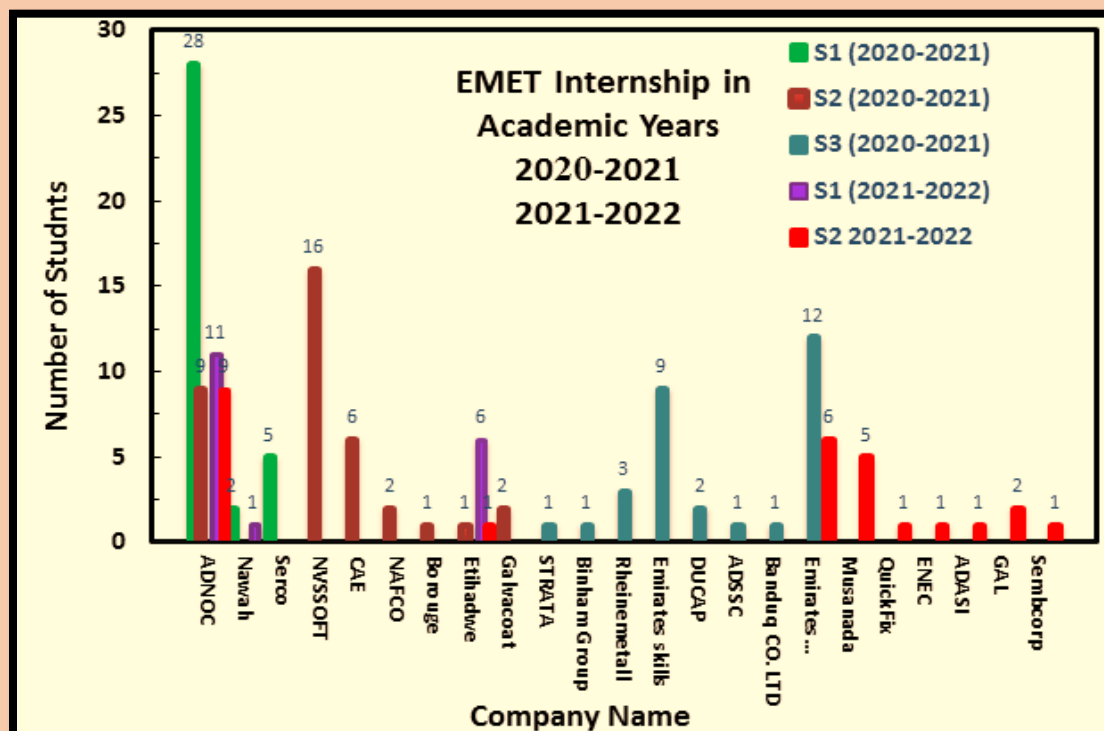
- Robotics Design.
- Wood milling and structural Design.
- Design of materials with negative Poisson's ration / Auxetics.
- Turbine Modelling and Efficiency investigation based on innovative modelling
- Design and Manufacturing of Moulding tools.
- Design methods and Processibility of Composites, GFRP / CFRP



## Electromechanical Engineering Technology Internship

Dr. Sawsan Dagher/EMET

Internships are work-based activities in which students learn through practical and relevant experiences at various internship sites. These structured experiences involve applying previously studied theory through course work. Electromechanical Engineering Technology (EMET) On-Job-Training (OJT) aims to assess trainees' competence in commissioning, maintaining or upgrading Electro-mechanical equipment and processes in line with the manufacturers and organizational practices and procedures. The trainee must complete the maintenance procedures in a timely manner, follow guidelines, and complete the appropriate documentation. Employer specific competence assessment might include diagnosing and finding faults within systems, equipment preparation and evaluation of practices and procedures and ensuring the security of tools and their control procedures. EMET students engaged in different internships distributed in several prestigious companies/entities. The following bar graph shows the companies in which EMET students conducted their training in the last two academic years.



## Welcome on Board EMET Family Proudly Welcomes New Staff Members



**Dr. Dani Abdo**  
Instructor  
Ph.D., Material Science, Mechanics of Materials,  
Polymers and Composites, 2020,  
Loughborough University, United Kingdom.



**Eng. Mahra Al Ali**  
Lab Specialist  
B.Eng, Electrical Engineering  
Abu Dhabi Polytechnic, UAE, 2020



**Dr. Sobers Francis**  
Instructor, Electro-Mechanical Engineering  
Technology  
Ph.D., 2014, Aerospace Engineering (Robotics)  
UNSW Canberra, Australia.



**Eng. Khalid Ibrahim Al Jarrah**  
Vocational Trainer  
BSc in Mechanical Engineering,  
Jordan University of Science and Technology, 1988  
MBA in Health and Safety, 2008



**Dr. Walid Ayadi**  
Assistant Professor  
Ph.D., 2016, Electro-Mechanical Engineering  
National Engineering School of Sfax



**Dr. Mohammad Nadeem Khalid**  
Instructor  
Ph.D., 2022, Mechanical Engineering

## Welcome on Board EMET Family Proudly Welcomes New Staff Members



**Eduardo Kruczkiewicz**  
Vocational Trainer-CNC & CAD/CAM  
B.Sc, 2020, Mechanical Engineering



**Eng. Luis Cesar Akira Kakazu**  
Vocational Trainer-Automobile Systems  
BSc., 2014, Electrical and Electronics Engineering



**Mr. Andrei Rogger Belegante**  
Vocational Trainer  
Technologist in Industrial Mechatronics  
(Gold medalist in World Skills Brazil-Mobile Robotics)



**EMET Department Newsletter**  
**Abu Dhabi Polytechnic**  
**Institute of Applied Technology**

**Mohamed Bin Zayed City**  
**Abu Dhabi**

**Editorial Team**  
**Dr. Osama Hassan (Chair)**  
**Eng. Anand (Editor)**  
**Eng. Amin Tily (Editor)**

**ISSUE 6 COMING SOON😊**

**THANK YOU**