

COLLEGE OF ELECTRICAL & MECHANICAL ENGINEERING

27TH CONVOCATION

OCTOBER 14, 2021



CEME- AN INTRODUCTION

College of E&ME (CEME) is the largest constituent college of NUST, spread over 128 acres with 3000 students and 200 faculty members. CEME is a premier engineering institution of the country with 4 engineering programs catering the needs and demands of modern era through meticulously designed curriculum and modern training programs/facilities. CEME prepares its graduates to meet the challenges of the real world by transforming them so that they can shoulder leadership responsibilities. CEME students have a long list of laurels at international and national level, which include Asia Pacific Awards,



Hult Prize and many more. All 4 engineering programs of CEME have been accredited by Washington Accord due to highly qualified faculty, state of the art laboratories, high end curriculum and training programs. CEME alumni are serving in many prestigious positions both at international and national level. Active and vibrant alumni body, spirited student societies, sports and training facilities distinguish CEME from other institutions and enable us to contribute towards social and technical needs of the country.

ACADEMIC DEPARTMENTS

DEPARTMENT OF ELECTRICAL ENGINEERING

Department of Electrical Engineering (DEE) offer programs both at undergraduate and post graduate levels. The under graduate program is based on fundamental and advanced applications related to electrical engineering with an emphasis on circuit design, electronics, electromagnetics, antennas, microwave engineering, communication, microprocessors and control systems. The department started its BE Electrical Engineering program in 1981, while the MS program was initiated in 1986, the PhD program for Electrical Engineering started in 2000. Total 1628 students have graduated till now and currently 354 are enrolled in BE (EE) program. In post-graduate



programmes total 335 students have graduated and currently 116 are enrolled in post-graduate programme, whereas 16 students have graduated and currently 14 are enrolled in various streams of PhD in Electrical Engineering.

DEPARTMENT OF MECHANICAL ENGINEERING

The Department of Mechanical Engineering at College of E&ME was established in 1984. The Department offers BE, MS and PhD degrees in Mechanical Engineering. In MS program, the students have an option to select subjects of their interest from major areas of Design & Manufacturing, Thermo-fluids, Controls and Computational Mechanics. The Department has 21 faculty members, more than 70% of whom are PhDs from reputed international universities. The areas of specialization of faculty members range from Design & Manufacturing to Thermo-fluids and Computational Mechanics. To-date, 1849 BE, 329 MS and 11 PhD students have graduated from the Department. Furthermore, 528 BE, 92 MS and 6 PhD students are currently enrolled in the Department. The department has successfully collaborated with international



universities such as The University of Manchester, UK and Southampton University, UK by securing funding after fierce worldwide competition. Similarly, the Department has a rich history of collaboration with local industry, defense as well as commercial. Students of the Department have not only participated but won accolades in international and local competitions like Shell Eco Marathon in Malaysia and Singapore; Future Flight Design Competition in Turkey; Design Build and Fly Contest at GIKI Pakistan.

DEPARTMENT OF COMPUTER & SOFTWARE ENGINEERING

Computer Engineering (CE) is a blend of computer hardware and software design of devices and systems for a broad spectrum of applications in communication system, multimedia systems, medical equipment, e-healthcare, defense system, agriculture and industrial automation etc. DC&SE started its UG program in April 1996 and PG wef 2001 including BECE, MSCE, MSSE, PhD CE and PhD SE. DC&SE has been among pioneers of outcome based learning in Pakistan via getting its program accredited by Washington Accord. DC&SE consists of 21 full time academic staff from various discipline of computer engineering including computer architecture, programming, hardware based designs, wireless network and mobile communication, computer networks, digital signal/image processing, data science and embedded system design. DC&SE has so far produced 1460 BE, 761 MS and 30 PhDs. DC&SE has highest number of research publications in any engineering department of NUST. DC&SE has collaborated with various academic research and industrial partners and MOUs have been signed with DICE Analytics Pvt. Ltd, IBM, M/S Trillium Pakistan Pvt. Ltd etc. DC&SE faculty is also involved in various funded projects in order to



transform research and student projects into valuable products to help its society. DC&SE faculty has licensed out 13 IPs related to 03 products to industry with help of NUST technology transfer office. The faculty of DC&SE have published different text books which are being taught at multiple international universities. The faculty and student from the department have won numerous national and international awards including Microsoft imagine cup, Falling walls, APITCA, P@SHA, COMPEEC, BITA, NYS, Softech, NECON, Moblink science fair etc. DC&SE has also been organizing a national level project completion with the title of COMPEEC since last 18 years where students of different universities from all across Pakistan compete with each other.

IMAGINE CUP-2021

Team "AI Based Ophthalmology Grading" from NUST College of Electrical and Mechanical Engineering has won the national round of Microsoft Imagine Cup 2021. It is a premier international event about product ideas and software development that is also described as the "Olympics" for Software Engineering students. The team led by Assos Professor Dr Usman Akram comprised, Khizer Hussain and Asad Mansoor Khan.



AEYRON-A STARTUP BY EME GRADUATES

Aeyron is a tech based startup which was founded by NS Khizar Hussain from CE 39 along with 2 of his team mates from ME 38 - NS Taha Qureshi and NS Syed Adil. They were incubated as a startup 2 years ago in ICE, EME. They provide services related to Computer Vision, IOT and AI based solutions. Along with that they have also been working in the fields of Robotics and Product development. During the last 2 years they have collaborated with 10+ companies from US, Europe and Middle East



LICENSING OF EPIC: A SMART WEARABLE EPILEPSY MONITORING UNIT

4x IPRs for "EPIC: A Smart Wearable Epilepsy Monitoring Unit" are transferred to industry in form of licensing agreement that was signed on Dec 08, 2020 between NUST and RISETech Pvt Ltd. The IPs belong to Dr. Sajid Gul Khawaja and Dr Muhammad Usman Akram, faculty of DC&SE at NUST College of EME.



DEPARTMENT OF MECHATRONICS ENGINEERING

Department of Mechatronics Engineering (DMTS), is a pioneer department that introduced Mechatronics Engineering in Pakistan in the year 1998. It started the MS and PhD program in 2005. The department has been host to National Engineering Robotics Contest which is the biggest robotics contest of Pakistan being held annually since 2003. In 2014 the department has the honor of becoming one of Pakistan's first four OBE accredited programs under Washington Accord. In 2014 the department established the Faiz PLC Lab in collaboration with industry EESINT Pvt Ltd. to give out industrial training on PLC, SCADA and HMI. In 2018, the department became host to the secretariat of the National Centre of Robotics and Automation. Under this centre, two labs have also been established at College of EME. The department has



been hosting IEEE International Conference on Robotic and Automation in Industry (ICRAI). The department consists of 19 full time highly qualified academic staff. The faculty is dedicated towards imparting best quality teaching and research to its students. The faculty has brought in a total funding of 269 Mn PKR over the years. DMTS has so far produced 1116 UG and 73 PG students. The students of the department have participated and won many National and International events.

DEPARTMENT OF ENGINEERING MANAGEMENT

Department of Engineering Management at the College of E&ME provides an opportunity to graduate engineers of all disciplines to prepare themselves with latest principles and techniques of management preparing them adequately to shoulder the responsibilities of technical leadership positions in today's technology driven organizations. The department envisions to drive productivity through management in the society and therefore follows a purpose tailored curriculum aided by collaborative arrangements. These engineers are then candidates for the positions of Chief Executive Officer (CEO), Chief Operating Officers (COOs), Chief Technical Officers (CTOs), and other Technical Management positions in high tech service and industrial



organizations. Their services are utilized by national & international public / private enterprises and defense organizations to conduct their functions efficiently and effectively. The department started its Master program in 2006 while PhD program was introduced in the year 2009. So far 16 PhD and 278 MS scholars have completed their degrees. The department holds one MS and 7 PhD qualified faculty.

DEPARTMENT OF BASIC SCIENCES & HUMANITIES

Basic Sciences and Humanities department aims at providing a comprehensive knowledge of basic scientific principles, mathematical tools and developing the personalities of their students in every sphere of life. The courses offered by the department are on Mathematics, Engineering Physics, Chemistry, Pakistan Studies and Religious Studies; and cover about 35% of the Engineering Curriculum. The curriculum focuses preessential for all engineering majors and strives to provide a strong foundation, which allows the students to cope up with the basic mathematical and physical concepts of engineering education. The syllabus has been designed to enrich the students'



understanding towards the subjects with a view to helping them in encountering practical problems in their engineering careers. There are 18 faculty members in the department out of which 10 hold PhD degrees.

Drive Smart



Drive Smart – a final-year project (FYP) team of DEE comprising Ms. Fiazah Khalid, Romessa Fatima and Taha Bin Saeed led by Dr. Shahzor Ahmad, are among

60 finalists for Finding Innovative and Creative Solutions (FICS) 2021, a national contest held annually at NUST, aimed at nurturing entrepreneurial activities.

NUSTAG



NUST Autonomous Group – led by Dr. Raja Amer Azim of DME and co-led by Dr. Fahad Mumtaz Malik of DEE ranked 8th after

clearing 4 selection rounds, and qualified for the Teknofest Autonomous Competition to be held in Turkey in Sep 2021.

TELE-OPERATED DECONTAMINATION ROBOT

A Tele-Operated Decontamination Robot is developed by NCRA which is wirelessly operated and can spray the disinfectant while the operator is at a standoff safe distance. The spraying of disinfectant result in neutralizing public places like airports, railway stations, hospitals, malls and possible contaminated places. It can be used for disinfecting indoor space of quarantine camps and also surroundings of quarantine camps without endangering the operator.



DIGITAL PAKISTAN LAB (DPL)

DPL is a specialty lab at CEME working under Planning Commission's Vision 2025, working with its partner labs under National Center in Big Data and Cloud Computing (NCBC) at LUMS. Its Core Projects & Application Areas include Industry 4.0, Cloud Computing, Efficient Energy Systems (ACES) and E-Healthcare.



IP LICENSE ON INDUSTRIAL IOT TRANSFERRED TO LOCAL INDUSTRY

2x Intellectual property rights (IPRs) for the technology developed for Industrial IoT 4.0 virtualization by Dr Ali Hassan and Dr Farhan Riaz, faculty of DC&SE, has transferred to the local industry Wisdom Wheel Wireless Pvt Ltd, a tenant at National Science and Technology Park (NSTP). The licensing agreement was signed at NUST-H-12 campus on September 9, 2021.



HIGHLIGHTS 2021

STUDENTS GRADUATING

Department	UG	MS	PhD
Electrical Engineering	94	43	1
Mechanical Engineering	96	33	-
Computer Engineering	89	76	3
Mechatronics Engineering	82	18	-
Engineering Management	-	11	2

NATIONAL CENTRE OF ROBOTICS AND AUTOMATION (NCRA)

The National Centre of Robotics and Automation (NCRA) is a PSDP project worth 1.295 Bn under the umbrella of HEC. It is a consortium of 11 labs established in 13 Universities of Pakistan Centred at College of E&ME. Among major objectives are national capacity development R&D, Problem Solving through technology commercialization and licensing, shared services to academia, startups and industrial partners and Human Resource Development in Robotics and Automation. The secretariat of NCRA manages the 11 labs established in 13 Universities across Pakistan, the centre has labs established at College of E&ME, FAST NUCES, Air University, LUMS, ITU, MUET, MUST, NEDUET, UET Taxila, UET Peshawar, UET Lahore, UCP Lahore and BUTITEMS. The secretariat also hosts the IEEE International Conference on Robotics and Automation and Annual Robotics Startup challenge. In addition to the lab 9 x Research fund projects are also supported by NCRA in various Universities across Pakistan.

Maker Lab. The Robot Design and Development lab is working in the domain of Unmanned systems, Biomedical Robotics and Agri Robotics and serves as a fusion Centre where real world (preferably local) problems are picked, given to a



multidisciplinary team, and lead till commercialization. The lab has also participated in establishing the "National Drone Policy" with the Ministry of Science and Technology which was presented to the Prime Minister of Pakistan on 21st December 2021. The lab provides design services and manufacturing services in terms of dual layer PCB making, 3D printing, injections molding, CNC machining, Composites and laser cutters etc.

SAVDIX PAKISTAN AND RCCI DIGITAL EXPORTS

The SAVDEX Conference was held on 27th – 29th Feb 2020 while RCCI Digital Exports Conference was held on the 3rd & 4th of Feb 2020 in Pearl Continental Hotel - Rawalpindi to promote state of the art technology brands and innovators. Showcase of Robot Design and Development Lab (RDDL) and Robot Maker Lab (RML) (NCRA), Department of Mechatronics Engineering, CEME r/flecting Trec UGV, Thorbot with eye, Prothesis upper limb, Defender Diagnostic and MAHZ 1 Radar were highly appreciated.



INTERNATIONAL COMPETITION OF AUTONOMOUS RUNNING ROBOT



Team Aloha Oe of DE 39 led by Dr. Waqar Shahid from the Department of Mechatronics Engineering participated in the International Competition of Autonomous Running Robot in November 2020 secured 3rd position and won a cash prize of 500 USD in the competition.

OPENCV 2021 FINALIST (MAY 2021)

Dr. Mohsin Tiwana, faculty member at Mechatronics Engineering Department, is a member of the Finalist team currently in the final round at the OpenCV global competition 2021. Open CV, the largest computer vision library in the world.



FICS 21

FICS 21 was completed in June 21. Out of 257 teams in a three competition, team Olive Pitting, from DE-39, Department of Mechatronics Engineering, won the Runner up position with a cash prize of Rs. 50,000.



TECHNOLOGY TRANSFER

Dr. Shahzor Ahmad and Dr. Saif Ullah Awan filed and licensed out technology resulting from a research grant on smart traffic profiling through NUST Technology Transfer Office (TTO) in August 2021.



INTERNSHIP AT TESLA

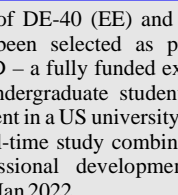
Mr. Muhammad Usama Ejaz of the class of 2021, and member of team NUSTAG, is first Pakistani



to secured a six-month internship at Tesla at their headquarters in Silicon Valley, USA, in Oct 2021.

GLOBAL UGRAD

Ali Raza Mustafa, student of DE-40 (EE) and Hassan Ashraf DE-41 Mts have been selected as principle candidate in Global UGRAD – a fully funded exchange program for outstanding undergraduate students from around the world for placement in a US university for one semester for non-degree full-time study combined with community service, professional development, and cultural enrichment, starting Jan 2022.



INTERNATIONAL MODEL UNITED NATIONS ONLINE CONFERENCE

PC Haseeb Sultan Asad of DE-39 (EE) stood 3rd and received Honorable Mention during the International



Model United Nations Online Conference 34.0, a debate competition held virtually worldwide in December 2020.

CENTER OF INNOVATION AND ENTREPRENEURSHIP (ICE²)

CEME has established a Center of Innovation and Entrepreneurship (ICE²) that focuses on Preparing Healthy Future Disruptive Leaders, doing Society Relevant Research & Innovation, Developing Entrepreneurial Eco-system and Building Happy Families and Societies. The center is well known for its workshops on Next Generation Sequencing (NGS) and Stress Capital Workshops (SCW).



FACULTY AWARDS 2021



Dr. Muhammad Usman Akram
Best University Innovator



Dr. Noeen Sher Akbar
Best College Researcher



Dr. Sajid Gul Khawaja
Best College Innovator



Nattiq Ali
President's Gold Medal
Elec Engg



Raja Parikshat
Chancellor's Silver Medal
Elec Engg



Abdul Basit
Chancellor's Silver Medal
Elec Engg



Eisa Irshad Baloch
President's Gold Medal
Mech Engg



Syed Huzefa Ahmad
Chancellor's Silver Medal
Mech Engg



Ahsan Ali
Rector's Gold Medal
Mech Engg



Maham Mukaram
President's Gold Medal
Comp Engg



Dr. Wasi Haider Butt
Best Teacher



Asst Prof Najamul Saheer
Best Community Service Teacher



Maryum Hamid
Chancellor's Silver Medal
Comp Engg



Khizar Hussain
Rector's Gold Medal
Comp Engg



Khubaib Waqar Khan
Chancellor's Silver Medal
Mts Engg



Ahmed Areeen
Chancellor's Silver Medal
Mts Engg



Usman Amjad
Chancellor's Silver Medal
Mts Engg



Ali Raza
Rector's Gold Medal
Mts Engg



Muhammad Nabras Khan
COAS Gold Medal for Best TC
Mts Engg



Zaid Sheikh
Best Community Service Student
Elec Engg

MEDALISTS 2021-PG



Muhammad Mudassar
President's Gold Medal
Elec Engg



Hassan Farooq
President's Gold Medal
Mech Engg



Faraz Kaiser Malik
President's Gold Medal
Mech Engg



Tabira Iqbal
President's Gold Medal
Comp Engg



Alina Maryum
President's Gold Medal
Comp Engg



Aqsa Rahim
President's Gold Medal
Comp Engg