



SCHOOL OF MECHANICAL AND MANUFACTURING ENGINEERING

9TH CONVOCATION



19th May, 2022

SMME INTRODUCTION

In January, 2007 the School started as Institute of Manufacturing Engineering (IME) in a hired accommodation in Sector F-11, Islamabad. It was renamed as School of Mechanical and Manufacturing Engineering (SMME) in 2009 in order to add more diversity in the academic activities.

Undergraduate programme in Mechanical Engineering and Post Graduate programme in Industrial & Manufacturing Engineering started in 2009. In September 2009, first batch of 40 undergraduate students of Mechanical Engineering and 13 postgraduate students of Industrial & Manufacturing Engineering, joined the School and a dream of an institute for full support to the community and industry became a reality.

Since 2009, School has added Department of Design and Manufacturing Engineering, Department of Robotics and Artificial Intelligence, Department of Biomedical Engineering and Sciences along with Department of Mechanical Engineering. The School offers undergraduate programme in Mechanical Engineering as well as postgraduate programmes in Mechanical Engineering, Design and Manufacturing Engineering, Robotics and Intelligent Machine Engineering, Biomedical Engineering and Biomedical Sciences. The school faculty is actively engaged in academic and industrial research. As of today, the School has a population of 600 undergraduates and 533 postgraduates including 35 PhD students. The School has world class laboratories and faculty strength of 50 with more than 35 PhDs qualified from world's leading universities.



DEPARTMENT OF MECHANICAL ENGINEERING

Mechanical Engineering is the oldest and broadest field of engineering which combines skills with a wide range of engineering technologies in designing of components and systems. Mechanical Engineering department is an integral part of SMME with twenty PhDs educated from reputed international and national universities and total 800 BE, MS and PhD students are currently studying in the department. The mission of the mechanical engineering program is to provide students with the fundamental knowledge, skills and professional experience necessary for successful careers in industrial or academic roles. The department of Mechanical Engineering provides excellent platform for young students to study and perform in challenging environment. The department is equipped with almost all laboratory equipment necessary for undergraduate and postgraduate studies. There faculty has



strived hard to get the funded projects from national and international funding agencies, also a good number of industrial projects are delivered to the industry. The curriculum is designed to meet challenges forced by the industry and expectations of the modern corporate world. Due to excellent academic record in the last couple of years, the department is receiving huge number of applications for admission at undergraduate and postgraduate levels every year.

DEPARTMENT OF ROBOTICS AND ARTIFICIAL INTELLIGENCE

The Department of Robotics & Artificial Intelligence was established in September 2011 as Pakistan's first academic initiative in the field of Robotics and Artificial Intelligence. Mainly focused towards postgraduate studies and research in the cutting edge areas of Robotics, Mechatronics, Machine Intelligence, Control Systems, Machine Vision and Industrial Automation. The department offers Masters and PhD degrees in the field of Robotics and Intelligent Machine Engineering (RIME). The department houses dedicated laboratories of Robotics and Intelligent Systems Engineering (RISE), Machine Vision, UAVs / Aerial Robotics, Control Systems, Industrial Automation, Electronics, Embedded Systems and Computer Aided Engineering. It is also supported by the Manufacturing Resource Center (MRC), Rapid Prototyping (RP) lab and Computer Numerical Control (CNC) lab, which facilitate mechanical fabrication of indigenously designed robot prototypes at SMME. These laboratories provide equipment both for research and teaching purposes including mobile and humanoid



robots, robotic arms of various types, stereo vision camera systems, robot designing kits, advanced microcontroller instrumentation, human brain computer interface equipment, remote piloted helicopters, pneumatic / hydraulic workstations, PCB precision prototyping facilities as well as various models for experimentation into non-linear and adaptive control systems. These enable the students to get maximum practical exposure to modern day robotic technology at par with similar graduate programs in other leading international universities. The department is home to highly qualified faculty from leading universities of Japan, USA, UK and France. The faculty has brought in a total funding of more than 1200 M PKR over the years.

NATIONAL CENTRE OF ARTIFICIAL INTELLIGENCE

National Centre of Artificial Intelligence (NCAI) is a centre in the field of Artificial Intelligence in Pakistan; operating under the umbrella of Higher Education Commission. NCAI is a consortium of 9 labs selected through competitive evaluation and established at 6 leading universities of Pakistan; NUST Islamabad, UET Peshawar, NED UET Karachi, CUI Islamabad, PU Lahore and UET Lahore. The headquarters of NCAI is at National University of Science and Technology (NUST), Islamabad Campus H-12. In addition, the centre has 12 x Research Fund Project Labs distributed in various universities across Pakistan i.e. Karachi Institute of Economics and Technology (PAF-KIET), National University of Computer & Emerging Sciences (NUCES-FAST), School of Electrical Engineering and Computer Science (SECS) NUST, Lahore University of Management Sciences (LUMS), Shaheed Zulfiqar Ali Bhutto Medical University and Air

University. The centre aims to become the leader of innovation of technology and Research & Development in the domain of Artificial Intelligence, in Pakistan. NCAI further endeavours to help the local industrial sector in enabling an AI-powered culture by commercialization of AI technology and by transfer of knowledge to local economy in the area of Artificial Intelligence. The centre aspires to facilitate the researchers in the field of Artificial Intelligence, help them establish and grow AI advancement and seek solutions to the indigenous problems through AI. The centre has acquired external funding of 427 M PKR till date from various national and international organizations. It is in collaboration with over 22 international AI academia and industry. The research based publications of the centre are 122 till date. NCAI has also kick-started 11 startups with indigenous technologies as products.

DEPARTMENT OF DESIGN AND MANUFACTURING ENGINEERING

This department started functioning concurrently with the establishment of Institute of Manufacturing Engineering (IME) in 2007. MS programme in Industrial and Manufacturing Engineering was also launched in 2009. In 2010, the Industrial and Manufacturing Engineering (IME) programme was renamed as MS and PhD in Design and Manufacturing Engineering (DME) and accordingly the departments were also renamed as the Department of Design and Manufacturing Engineering (DME). The Department offers specialization in following areas:

- Manufacturing Engineering
- Design Engineering
- Industrial Engineering and Management



CNC milling and lathe machines, laser engraving machines and metallography lab for material mounting, polishing and surface characterization. This facilitates other departments in SMME and other schools for mechanical fabrication of indigenously designed prototypes and equipment for mechanical testing. These enable the students to get maximum practical exposure to modern day design and manufacturing technology at par with similar graduate programs in other leading international universities. One such example is the placement of Dr Muhammad Younas Khan, a DME department MS and PhD graduate, appointed as Lecturer in School of Engineering, Robert Gordon University, Aberdeen, United Kingdom.

In addition, the department has acquired high end laboratories that provide equipment both for research and teaching purposes including Digital Microscope DSX1000, Creaform 3D scanner, Forearm Coordinate Measuring Machine (CMM), Stereolithography (SLA) 3D printer, Fused Deposition Modelling (FDM) machine,

DEPARTMENT OF BIOMEDICAL ENGINEERING AND SCIENCES

The Department of Biomedical Engineering and Sciences was established in 2012 and it offers MS and PhD Programs in Biomedical Engineering and Biomedical Sciences. Our emphasis is on the medical research, innovation and commercialization. The key areas of our research are Biomaterials, Biochemistry, Medicine, Bio-nanotechnology, Neurosciences, Rehabilitation Engineering, Signals and Imaging and Medical Device Designing. Our department facilitates the development of complex biomedical systems like clinical and computer-based decision support, knowledge acquisition and management, medical imaging, computational intelligence in bio-clinical medicine, molecular medicine, and healthcare organizational aspects. All emerging fields in above contemporary areas assists in transformation of disease diagnostics, treatment and prognosis of existing treatments which could help in combating the health challenges in the developing countries. Our curriculum integrates fundamental engineering disciplines with physical and life sciences while drawing on mathematics and computational sciences.



This convergence allows the understanding of the operation of living systems and aids the design of novel solutions to critical problems in medicine and biology. Advance curriculum and student internships support the objective of quality education. By leveraging our intellectual communities and world-class resources we are at the forefront of discovery and innovation. Our students and researchers collaborate with schools, centers and initiatives across the greater bioengineering community locally as well as internationally. High external funding secured from different local and foreign agencies aids to execute cutting edge research activities and student support.

MANUFACTURING RESOURCE CENTRE

MRC is seen to assume its unique and innovative status in terms of its existence and operation under a University environment. It is supported by a high profile faculty and expertise that is already available in the School of Mechanical and Manufacturing Engineering (SMME). The center now has capability to train and educate more than 500 UG students for their workshop technology courses annually. MRC is providing support to all engineering schools of NUST H-12 campus that have Manufacturing or Workshop Practice courses in their curriculum. Besides imparting education training, MRC also plays a vital role in manufacturing of parts and products for schools of NUST. It provides support and facilitates students in their project work both at under and Post Graduate levels. MRC has been extending support to local industry for experimenting, prototyping and limited manufacturing in their projects. Moreover, free of cost vocational training skill development courses have been extended to underprivileged interested candidates during summer vacations so that they could further pursue their future endeavours. It is staffed by a well-trained composite team having basic expertise and skills in different fields of manufacturing. LABS/FACILITIES: The present facilities of MRC include nine major areas which in due course will be



further augmented by equipment. The facilities include:

Surface Treatment Lab:
Electrical Lab:
Bench Fitting Lab:
Wood Working Lab:
Foundry & Forging Lab:
Machine Lab:
• EDM Wire Cut
• EDM Die Sinking

Welding & Fabrication Shop:
• Arc Welding
• Gas Welding
• TIG and MIG Welding
• Spot Welding
• Plasma Cutter
• Hydraulic Press
• Stamping Press
• Sheet bending Machine
• Pipe Benders
• Shear Cutters etc.

HIGHLIGHTS 2021

STUDENTS GRADUATING

Department	UG	MS	PhD
Mechanical Engineering	109	65	1
Design and Manufacturing Engineering	-	49	4
Robotics and Artificial Intelligence Engineering	-	52	3
Biomedical Engineering	-	22	-
Biomedical Sciences	-	45	1

1st IEEE International Conference on Artificial Intelligence (ICAI)

The centre introduced Pakistan's first research conference on AI - 1st IEEE International Conference on Artificial Intelligence (ICAI) in April 2021 with Technical Co-sponsorship of IEEE. It also conducted a mega Industry AI extravaganza called the AI TechVerse wherein an AI Expo

Lab2Market event and AI Ideas/startup Challenge was held which was graced by the President of Pakistan; and became the pinnacle of industry-academia collaboration in the sphere of AI in Pakistan.

NUST Community Service Club (NCSC) AI Qalam program awarded 3rd place at MacJannet Prize award by Talloires Network

AI-Qalam Program initiated by two alumni of NUST Community Service Club (NCSC) at National University of Sciences and Technology (NUST), Pakistan, won the third place winner at the prestigious MacJannet Prize 2020. AI-Qalam program is a student organization that provides educational opportunities to children who are out of school due to their family's financial limitations.



The program was launched in 2015 by two highly motivated members of the club. The National Education Management Information System (NEMIS) provided them with statistics on education in Pakistan in the 2015-2016 academic year, which revealed that about 44% of children between the ages of 5 and 16 are not enrolled in schools. Moreover, more than 60% of children in schools drop out before matriculation at a college or university. Most of these children are deprived of education because of their families' financial strife. Given that NCSC members have had the privilege of studying at the best schools and universities, they wanted to help. Thus, AI-Qalam (Arabic: القلم, "The Pen") was born. The program was launched on the basis of voluntary monthly donations

of \$0.53 (equivalent to 100 Pakistani rupees) from NUST student members. AI-Qalam Program is an ongoing project run by council members in coordination with class representatives nominated by elected class ambassadors from all departments of NUST, H-12 campus. This system is the most simplified way to work from the bottom up and ensure a hassle-free process for collecting donations. The main purpose of the NCSC AI-Qalam program is to empower communities by providing basic primary education to out-of-school children in accordance with local needs, contributing to the improvement of Pakistan's educational infrastructure. Currently, 150 students are being funded by this program.

Two NCSC members gets selected as Millennium Fellows in Recognition of NUST Food Bank project

The Millennium Campus Network (MCN) and the United Nations Academic Impact (UNAI) are pleased to announce the Millennium Fellowship Class of 2021, an ambitious programme aimed at assisting in the implementation of the Sustainable Development Goals and UNAI ideals. The class of 2021 has two students of SMME and active members of NUST Community Service Club's project NUST Food Bank, Ms. Eesha Naeem and Mr. Hamza Farooq. Both the students, along with the assistance of NUST Community Services Club (NCSC) are working on their start up, Froods, with the goal to redistribute clean,

leftover food from restaurants, cafes, marquees etc. to the underprivileged members of the society. They are working on developing a user friendly Froods app to help bridge the gap between donors, distributors and recipients. Millennium Fellows are university undergraduates selected based on their leadership on sustainable development-related projects that advance the SDGs in their communities. The Class of 2021 is on track to engage in projects collectively advancing all 17 Sustainable Development Goals and all 10 UNAI Principles.

2 ZERO HUNGER

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

Hamza Farooq
BE Mechanical Engineering
Batch 2019
NUST School of Mechanical & Manufacturing Engineering (SMME)

Eesha Naeem
BE Mechanical Engineering
Batch 2018
NUST School of Mechanical & Manufacturing Engineering (SMME)

FACULTY AWARDS 2021

BEST TEACHER	BEST RESEARCHER	BEST COMMUNITY SERVICE
 Dr. Zaib Ali Assistant Professor	 Dr. Yasar Ayaz Professor	 Dr. Niaz Bahadur Khan Assistant Professor

FINAL YEAR PROJECT CERTIFICATES 2021

- Osama Abdur Rehman
- Waheb Naveed Asad
- Muhammad Owais

MEDALISTS 2021-PG

 Namra Riaz President Gold Medal MSME-18	 Muhammad Idress President Gold Medal MSDME-17	 Ahsan Ali President Gold Medal MSDME-19	 Asakif Mehboob President Gold Medal MSRIME-17	 Muhammad Tahir Rafique President Gold Medal MSRIME-17	 Faizan Saifullah President Gold Medal MSRIME-17
 Farwa Mehmood President Gold Medal MSBMS-17	 Naila Mehmood President Gold Medal MSBMS-18	 Nimra Mehmood Malik President Gold Medal MSBMS-18	 Azmat Ullah President Gold Medal MSBME-16	 Manabil Binte Irfan President Gold Medal MSBME-17	 Zainab Riaz President Gold Medal MSBME-18

MEDALISTS 2021-UG

 Hasan Sammye President's Gold Medal Mech Engg-16	 Sunia Tanveer President's Gold Medal Mech Engg-17	 Saha Yasur Chancellor Silver Medal Mech Engg-16
 Bilal Ghani Chancellor Silver Medal Mech Engg-17	 Saad Shabeer Chancellor Silver Medal Mech Engg-17	 M. Ahmed Khial Rector Gold Medal - Project Mech Engg-17