



**International Conference on
Advances in Mechanical Engineering - 2024**

ICAME-24 Program

August 08, 2024

Inaugural Session

Chair: Dr. M. Mahabat Khan

Co-Chair: Dr. Salman S. Warsi

**Registration08:00 – 09:00
(C-D Block Front)**

**Opening Ceremony.....09:00 – 09:45
(Auditorium A1)**

**Refreshments09:45 – 10:00
(River Side Cafe)**

**Department of Mechanical Engineering
Capital University of Science and Technology
Islamabad, Pakistan**



Technical Session A

Fluid Dynamics and Heat Transfer

Technical Session A-I 10:00 – 13:00

(Venue: B2)

Chair: Dr. M. Irfan

Keynote Lecture 10:00 - 10:30

Title: Hydrogen storage in nanomaterials for energy applications and fuel cells

Speaker: Prof. Dr. Darvaish Khan is a lecturer at the Center of Excellence for NaNo Energy, School of Energy and Chemical Engineering, Xiamen University Malaysia. He obtained his Masters from the University of Liverpool UK and PhD in Hydrogen Sciences from the School of Materials Science & Engineering, Shanghai Jiao Tong University China. He is an expert in hydrogen, and graphene production from natural gas through atmospheric microwave plasma, hydrogen storage in nanomaterials for energy applications, and hydrogen fuel cells. He has won several international awards for his innovative work in hydrogen science and fuel cells. His work has been published in the International Journal of Hydrogen Energy, Chemical Engineering Journal, Journal of Materials Chemistry A, ACS Applied Materials & Interfaces, etc. He is a member of the American Chemical Society, the International Society of Hydrogen Energy, and the International Association of Advance Materials. He is also a reviewer at the American Journal of Nano Research and Applications.

Paper ID	Time	Authors	Title
ICAME-24-153	10:45 – 11:10	Asad Asghar Janjua, Waqas Khalid, Samiur Rahman Shah, and Xavier Tauzia	Exploring the Efficacy of Port Water Injection on Air-Fuel Ratios and NOx Emissions in Diesel Engine: An Experimental Study
ICAME-24-154	11:10 – 11:35	Nawaf Mehmood Malik, Waqas Khalid, Muhammad Tauseef Nasir and Muhammad Talha	Predicting the Performance of a Basin Type Solar Still at different locations of Pakistan using a Mathematical Model
ICAME-24-171	11:35 – 12:00	Jamshaid Iqbal, Hussnain Javed, Muhammad Tahir Sajjad	An Assessment of the Drinking Water Supply System in Islamabad, Pakistan
ICAME-24-172	12:00 – 12:25	Liaqat Hussain, and Muhammad Mahabat Khan	The Influence of Location of Coanda Surface Ribs on Fluidic Oscillator Performance
ICAME-24-178	12:25 – 12:50	Muhammad Noman Shahid, Muhammad Mahabat Khan, Muhammad Usman Shahid and Shummaila Rasheed	Fluidic Properties of Diamond and SplitP Structures with Varying Porosity Levels in Tissue Engineering Applications: A Computational Fluid Dynamics Analysis

Note: 20 mins presentation followed by 5 mins Q & A session

Prayer & Lunch Break (River Side Cafe) 13:00 - 14:30

Fluid Dynamics and Heat Transfer

Technical Session A-II 14:30 – 17:00

(Venue: B2)

Chair: Dr. Naseem Ahmad

Paper ID	Time	Authors	Title
ICAME-24-181	14:30 – 14:55	Muhammad Usman Shahid , Muhammad Mahabat Khan and Muhammad Noman Shahid	Numerical Investigation of the Heat Transfer Rate and Fluid Flow Characteristics of Conventional and Triply Periodic Minimal Surface (TPMS) Based Heat Sinks
ICAME-24-184	14:55 – 15:20	Shahid Iqbal, Muhammad Faisal Naveed , Manzar Masud, Adnan Tariq, Taimoor Kausar, Zohaib Nasir and Moazzam Ali Babar	Experimental Evaluation of Thermal Performance in Shell and Tube Heat Exchangers Using $Al_2O_3-\gamma$ Nanofluids
ICAME-24-196	15:20 – 15:45	Muhammad Huzaifa, Muhammad Haider Ali, Muhammad Taha Hashmi, Sarmad Ali , M. Mahabat Khan, M. Shahid Shafiq	Melting Performance Enhancement of Latent Heat Thermal Energy Storage Unit by Changing the Angular Orientation
ICAME-24-213	15:45 – 16:10	Muhammad Mahad Shah , Usman Latif, Emad Uddin, Syed Maaz Hasan	VIV-Based Energy Harvesting from Tandem Cylinders for Self-Sustained IoT Systems
ICAME-24-214	16:10 – 16:35	Muhammad Mahad Shah, Moeen Mahboob, Usman Latif, Emad Uddin, Muhammad Rizwan Siddiqui , Muhammad Zulfiqar	Investigation of bluff body size effects on piezoelectric performance using flow-induced vibration

Note: 20 mins presentation followed by 5 mins Q & A session

Closing Ceremony 17:00 - 17:30
(Auditorium A1)

Networking and Refreshments..... 17:30 - 18:00
(River Side Cafe)

Technical Session B

Energy Management and Sustainability

Technical Session B-I 10:00 – 13:00

(Venue: B4)

Chair: Dr. Salman S. Warsi

Keynote Lecture 10:00 - 10:30

Title: The Future of Resiliency and AI – A Winning Partnership

Speaker: *Prof. Tim Wentz is an Emeritus Professor of Construction Management. Prof. Wentz graduated from the University of Nebraska with a Bachelor of Science degree in Mechanical Engineering and a Masters degree in Business Administration. He is a registered professional engineer in Nebraska. Additionally, he holds both Master Heating Contractor and Master Plumbing Contractor licenses, is a LEED® - Accredited Professional (AP-BD&C) and holds an ASHRAE certification as a High-performance Building Design Professional (HBDP). Prof. Wentz served on the Construction Management faculty in the College of Engineering for 25 years until being named an Emeritus Professor in 2018. He is also a very active volunteer within ASHRAE, where he has served as the Nebraska Chapter President from 1997-1998. He also served as Director and Regional Chair for Region IX of ASHRAE and was inducted into the Region IX Hall of Honor in 2005. ASHRAE also elected Tim a Fellow of the Society in 2005. Tim served as Society President in 2016-2017 and launched the Society theme for that year ‘Adapt Today to Shape Tomorrow’.*

Paper ID	Time	Authors	Title
ICAME-24-167	10:45 – 11:10	Usman Aftab , Farrokh Jaleel, Mughees Aslam, Muhammad Haroon, and Rafiq Mansoor	Building Information Modeling (BIM) Application in Construction Waste Quantification - A Review
ICAME-24-169	11:10 – 11:35	Ubaid Zia , Saleha Qureshi, Hina Aslam, and Muhammad Zulfiqar	Decarbonizing Pakistan’s Cement Sector: The Role of Carbon Capture and Storage (CCS) Technologies
ICAME-24-170	11:35 – 12:00	Zona Usmani , Sadia Satti, Muhammad Zulfiqar	Accelerating Green Energy Transition Under CPEC 2.0
ICAME-24-175	12:00 – 12:25	Haris Sheh Zad, Abasin Ulasyar, Adil Zohaib , Muhammad Irfan, Samid Ali Haider, and Zeeshan Yaqoob	Adaptive Sliding Mode Control of DC-DC Buck Converter with Load Fluctuations for Renewable Energy Systems
ICAME-24-190	12:25 – 12:50	Muhammad Zulfiqar, Adal Farooq , Zona Usmani, Ubaid ur Rehman Zia, Sibghat Ullah, Zaeem Bin Babar	Pakistan’s Electric Vehicles Market: Challenges, Opportunities, and the Future Pathways

Note: 20 mins presentation followed by 5 mins Q & A session

Prayer & Lunch Break (River Side Cafe) 13:00 - 14:30



Energy Management and Sustainability

Technical Session B-II 14:30 – 17:00

(Venue: B4)

Chair: Mr. Tauseef Ahmed

Paper ID	Time	Authors	Title
ICAME-24-194	14:30 – 14:55	Haris Sheh Zad, Abasin Ulasyar, Adil Zohaib , Muhammad Irfan, Zeeshan Yaqoob, and Samid Ali Haider	Robust & Optimal Predictive Current Control for Bi-directional DC-DC Converter in Distributed Energy Storage Systems
ICAME-24-197	14:55 – 15:20	Qamar Mahboob , Muhammad Aftab Aalam, Sanan Tahir, Wang Zhiwen, Mao Qiyuan and Tan Zidong	Incorporating KPIs in the quantification of Overall Efficiency of Rolling Stock of Railways
ICAME-24-212	15:20 – 15:45	Sadia Satti , Adal Farooq, Ubaid ur Rehman Zia, Muhammad Zulfiqar, Sibghat Ullah, Ummama Naeem	Women Empowerment through Clean Energy Transition in Pakistan: Prospects & Opportunities
ICAME-24-219	15:45 – 16:10	Aisha Akbar Awan , and Umar Shahbaz Khan	Compensation of Backlash for High Precision Tracking Control of Inverted Pendulum by Drive-Anti Drive Mechanisms

Note: 20 mins presentation followed by 5 mins Q & A session

**Closing Ceremony 17:00 - 17:30
(Auditorium A1)**

**Networking and Refreshments..... 17:30 - 18:00
(River Side Cafe)**

Technical Session C

Materials, Machining and Manufacturing

Technical Session C-I 10:00 – 13:00

(Venue: B6)

Chair: Dr. Shummaila Rasheed

Keynote Lecture 10:00 - 10:30

Title: Multiscale modelling of fibre reinforced composites

Speaker: Dr. Syed Zulfiqar Hussain Shah is a lecturer in the Department of Mechanical Engineering, at Universiti Teknologi Petronas (UTP), Malaysia. He received his PhD degree in Mechanical Engineering from UTP. He is known for his expertise in the field of fibre reinforced composites. With his industrial and academic career spanning over 16 years, he has established himself as a prominent figure in composite manufacturing, testing, and computational mechanics. His current research interests include the multiscale modeling of composites, impact resistance and damage tolerance of composites, fatigue life enhancement of composites, and sandwich composite structures. He has published his work in leading international journals such as *Composite Part B*, *Composite Part A*, *Composite Structures*, *Composite Communications*, etc

Paper ID	Time	Authors	Title
ICAME-24-159	10:45 – 11:10	Mubashir Ali Murtaza, Muhammad Shaban, Muhammad Anwar and Talha Irfan Khan	Surface Roughness Influence on Metal Bonding using RSM Approach
ICAME-24-165	11:10 – 11:35	Ghulam Ameer Mukhtar, Sana Shehzadi, Umair Shahid, Ghufraan Shakeel, Raja Asim Mustafa	Optimizing Bottlenecks Flow and Enhancing Throughput in Prosthodontic Services Using Additive Manufacturing with Discrete Event Simulation and Central Composite Design
ICAME-24-166	11:35 – 12:00	Ghulam Ameer Mukhtar, Sana Shehzadi, Muhammad Moazzam Ali, Abdul Ahad, Abdul Ahad Malik, Muhammad Mohsin Arshad	Rapid Prototyping in Pakistan: A Technical Feasibility Study with AHP Analysis, Bridging Civil and Industrial Engineering Perspectives
ICAME-24-168	12:00 – 12:25	Shahid Iqbal, Adnan Tariq, Manzar Masud, Shahab Khushnood and Waqas Bin Faateh	Comparative Analysis of Adhesive Effectiveness in Kevlar/Aluminum 6061-T6 Hybrid Double Strap Joints: A Study on Static and Fatigue Strength
ICAME-24-200	12:25 – 12:50	Muhammad Usman Ali, Azka Nadeem, Babar Ashfaq, Shafi Ullah, Muhammad Waseem, Muhammad Arbab Aslam, Qazi Amaan Alam	Optimizing Impact Toughness in 3D-Printed PLA Structures Using Hilbert Curve and Honeycomb Infill Patterns

Note: 20 mins presentation followed by 5 mins Q & A session

Prayer & Lunch Break (River Side Cafe) 13:00 - 14:30

Materials, Machining and Manufacturing

Technical Session C-II 14:30 – 17:00

(Venue: B6)

Chair: Mr. Syed Hassan Shah

Paper ID	Time	Authors	Title
ICAME-24-201	14:30 – 14:55	Shafi Ullah , Muhammad Waseem, Babar Ashfaq, Muhmmad Bilal Khan, Muhammad Uzair Shah	Performance Evaluation of 3-Ply Multi Oriented Laminate Composite Fabricated via VARTM Method under Tensile Loading
ICAME-24-203	14:55 – 15:20	Manzar Masud , Aamir Mubashar, Shahid Iqbal, Hassan Ejaz, and Saad Abdul Raheem	Tree-based machine learning approach for predicting impact behavior of carbon/flax bio-hybrid fiber reinforced polymer composite laminates
ICAME-24-204	15:20 – 15:45	Abid Ali , Mirza Jahanzaib, Muhammad Jawad	Performance evaluation of Ti and SS dissimilar GTAW joints via non-destructive testing methods
ICAME-24-206	15:45 – 16:10	Hassan Ejaz, Abdul Wahab , Romail Saeed, Ammad Ahmed and Manzar Masud	Surface Treatment Strategies to Enhance Adhesive Bond Strength for AA7075-T6 in Aerospace Applications
ICAME-24-222	16:10 – 16:35	Muhammad Waqas Hanif , Feroz Haider, Muhammad Jawad, Asad Ali and Asif Imran	Experimental study on Ultimate Tensile Strength and Impact Energy of Al-2024 Friction Stir-Welded joints by Taguchi-based grey relational analysis

Note: 20 mins presentation followed by 5 mins Q & A session

Closing Ceremony 17:00 - 17:30
(Auditorium A1)

Networking and Refreshments..... 17:30 - 18:00
(River Side Cafe)

Technical Session D

Engineering Management - International

Technical Session D-I 10:00 – 13:00

(Venue: B3)

Chair: Dr. Ghulam Asghar

Keynote Lecture 10:00 - 10:30

Title: Driving Industry 4.0 and Industry 5.0 together: Challenges and opportunities

Speaker: Dr. Azfar Khalid holds a BS in Mechanical Engineering from the GIK Institute of Engineering, Pakistan, and a PhD in Precision Engineering from the University of Manchester (2009). Dr. Khalid is a Senior Lecturer of Mechanical Engineering at the Department of Engineering in the School of Science & Technology at NTU. Dr. Khalid has a teaching role across the disciplines of Mechanical and Electronics Engineering where he has taught Control Systems, Robotics, Cybernetics & Biomechanics. He is actively pursuing research on smart factories, human-robot collaboration, cyber-physical production systems, digital twins, and Industry 4.0. Moreover, he is the research coordinator of the Department of Engineering and leading the Digital Innovation Research Group in smart technologies theme, as part of the Imaging, Materials & Engineering Centre for research.

Paper ID	Time	Authors	Title
ICAME-24-161	10:45 – 11:10	Waqas Awan, Sidra Khan, Muhammad Zulfiqar, Ubaid Zia, Peng Wang and Tayyab Qureshi	Pakistan’s Transport Sector Modeling using AIM/Enduse
ICAME-24-173	11:10 – 11:35	Yinghao Meng, Keyu Shi, Wei Wang, Zhen Yin and Haosen Zhang	The Optimal Condition-Based Maintenance Strategies for a Self-Repairable Component under Fixed-Interval Detection
ICAME-24-174	11:35 – 12:00	Zihao Xu, Jinran Hu, Xingyi Xiao and Yujian Xu	GEB-YOLO: Optimized YOLOv7 Model for Surface Defect Detection on Aluminum Profiles
ICAME-24-183	12:00 – 12:25	Longlong Xu and Yarong Chen	Simulation-Based Hierarchical Heuristic for Printed Circuit Board Assembly Optimization in a Spin-Head Surface Moulder
ICAME-24-185	12:25 – 12:50	Hansen Su, Gaofei Wang and Mudassar Rauf	Optimization of Multi-Operator Human-Robot Collaborative Disassembly Line Balancing Problem using Hybrid Artificial Fish Swarm Algorithm

Note: 20 mins presentation followed by 5 mins Q & A session

Prayer & Lunch Break (River Side Cafe) 13:00 - 14:30



Engineering Management - International

Technical Session D-II 14:30 – 17:00

(Venue: B3)

Chair: Mr. M. Rizwan Siddiqui

Paper ID	Time	Authors	Title
ICAME-24-186	14:30 – 14:55	Jian Huang , Yarong Chen, Jabir Mumtaz and Liuyan Zhong	Neuro-Evolution of Augmenting Topologies for Dynamic Scheduling of Flexible Job Shop Problem
ICAME-24-187	14:55 – 15:20	Ziyang Ji , Jabir Mumtaz and Ke Ke	Using SABC Algorithm for Scheduling Unrelated Parallel Batch Processing Machines Considering Deterioration Effects and Variable Maintenance
ICAME-24-191	15:20 – 15:45	Junjie Zhang , Yarong Chen and Jabir Mumtaz	Improved Evolutionary Strategy Reinforcement Learning for Multi-Objective Dynamic scheduling of Hybrid Flow Shop Problem
ICAME-24-192	15:45 – 16:10	Xue Zhao , Yarong Chen and Mudassar Rauf	Actor-Critic Algorithm for the Dynamic Scheduling Problem of Unrelated Parallel Batch Machines
ICAME-24-193	16:10 – 16:35	Jinhao Du , Jabir Mumtaz, Wenxi Zhao and Jian Huang	FlexSim-Simulated PCB Assembly Line Optimization Using Deep Q-Network
ICAME-24-199	16:35 – 17:00	Ky-Thanh Ho , Thi-Luong Le, Nguyen-Thuan, and Ngoc-Tuan La	Effects of feed rates on deformation forces and thickness distribution in ultrasonic-assisted incremental sheet forming process

Note: 20 mins presentation followed by 5 mins Q & A session

**Closing Ceremony 17:00 - 17:30
(Auditorium A1)**

**Networking and Refreshments..... 17:30 - 18:00
(River Side Cafe)**