



Dr Tareq Manzoor Ahmed
Tenured Associate Professor
Professional Engineer

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Teaching Experience

- **Tenured Associate Professor (Tenure Track Position) (Energy Research Centre, COMSATS Lahore) since July 2020.**
- **Assistant Professor (Tenure Track Position) (Energy Research Centre, COMSATS Lahore) since July 2017.**
- **Assistant Professor (Tenure Track Position) (Department of Mechanical Engineering, COMSATS Sahiwal) from June 2013 to June 2017.**
- **Assistant Professor HITEC University from Feb 2011 to March 2013.**
- **Convener and Team In charge OBE in CUI Sahiwal.**
- **Member PEC EPE Curriculum and Experts Committee for Petroleum and Gas Engineering.**
- **Member Board of studies for Engineering programs in Khawaja Fareed University of Engineering & Information Technology, Rahim Yar Khan.**
- **Member Board of studies for Energy Engineering in UET Taxila.**

Education: Doctor of Philosophy (Thermal Engineering)

1) **PhD (Thermal Engineering) 2013**

Ghulam Ishaq Khan Institute of Engineering Sciences and Technology, Topi

PhD Title: Experimental Studies and Modeling the damping behaviour of shape memory alloys

2) **Master of Petroleum Engineering (Computational Fluid Mechanics). March 2006 First Position (Gold Medal)**

Mehran University of Engineering and Technology, Jamshoro

a. Specialization: Computational Fluid Mechanics

3) **MSc Computer Science, NKFACT Lahore 2004(81% marks)**

Specialization: Optimisation and Computational Mechanics

4) **Bachelor of Science in Petroleum Engineering 2002**

University of Engineering and Technology, Lahore.

Courses (taught /interested)

1. Power Generation and Power Plant Operation
2. Lighting Design
3. Energy modeling and efficiency
4. Computer Simulation Methods
5. Thermal system Design
6. Heat Transfer and Modeling
7. Optimization Modeling
8. Modeling Processes, Numerical Analysis
9. Magneto-hydrodynamics and Thermo-Fluids
10. Characterization of Materials
11. Finite Element Analysis

Approved HEC/ PSF projects

1. 'Analysis of energy storage materials and systems for energy applications', NRPU Research project ID: 10640, Total Funds: 9.5 millions. Higher Education Commission, Pakistan
2. 'CFD analysis of engine exhaust system ,2.0 millions, Funding Agency, Pakistan Science Foundation, Pakistan.
3. 'Design optimisation based on CFD analysis of combustion of multiphase system in diesel engine, (PSF). 2.2 millions Pakistan Science Foundation, Pakistan.
4. 'Design and Analysis of high-performance energy efficient optoelectronic devices for Pakistan', NRPU Reference research project No 14812.
5. 'Development of Micro-texturing machine for enhancing the efficiency of Automotive components', NRPU Reference research project No 14516 .

Publications (International journals and conferences)

1. Design and Analysis of Peak Times Estimation Framework for Vehicle Occurrences at Solar Photovoltaic and Grid based Swappable Battery Charging Stations ", Sustainability, Vol: 23, Issue: 21, (IF 3.9) .
2. Atawi, A.A.; Alyahyan, S.; Alatawi, M.N.; Sadad, T.; Manzoor, T.; Farooq-i-Azam, M.; Khan, Z H (2023), " Stress Monitoring Using Machine Learning, IoT and Wearable Sensors. Sensors 2023, 23, 8875. <https://doi.org/10.3390/s23218875>", Sensors, Vol: 23, Issue: 21, (IF 3.9) .
3. Fawad Azeem, Tareq Manzoor, A novel automated demand response control using fuzzy logic for islanded battery-operated rural microgrids, IET Renewable Power Generation, 2023 <https://doi.org/10.1049/rpg2.12713>. (IF 4.5) .
4. **Tareq Manzoor** , S Iqbal. A Note on Slip Effects of an Oldroyd 6-constant Fluid: Optimal Homotopy Asymptotic Method, Front. Phys.Sec. Interdisciplinary Physics. doi: 10.3389/fphy.2022.1003000, (IF 3.7) .
5. **Tareq Manzoor**, Effects of High Temperature and Thermal Gradients in Varying Porosity Petroleum Reservoir Structures, **Frontiers** Accepted.
6. **Sami, Tareq Manzoor , Fabrication and Analysis of Surface Patterned Regular Porous Silicone Films**, Designed Monomers and Polymers, Accepted.
7. **Tareq Manzoor** , Analysis of vertical axis wind turbine blade for off-shore applications, Wind Engineering, Jun2023, Vol. 47 Issue 3, p499-514. 16p, (IF 2.9) ..

8. **Tareq Manzoor**, Novel computational Design for Designing a Modified Condenser, Innovative Computing review, Accepted.,
9. **Bilal Yousaf , Tareq Manzoor (2022)**, " Investigation of Influence of Elbow on Pump Inlet Flow Behaviour in Cavitating Flow ", Engineering Failure Analysis, Vol: 138, ISSN: 13506307, DOI: <https://doi.org/10.1016/j.2022.106420>, (IF: 4.1)
10. **Rashid Ali, Tareq Manzoor**, Analysis for elimination of solidification shrinkage defects in casting process of aluminum alloy, *Journal of Mechanical Science and Technology, Springer , 2021(IF 1.76)..*
11. Tareq Manzoor, Ayaz Akbar, CFD-Thermal Analysis of Flat plate Solar Collector for different temperature variations", **International Journal of Energy and Water Resources, Springer, 2021.**
12. Usman Inayat, Tareq Manzoor, Iqbal "Numerical Investigation of Heat Transfer on Unsteady Hiemenz Cu-Water and Ag-Water Nanofluid Flow over a Porous Wedge Due to Solar Radiation", **Applied Sciences**, pp: 2021.10855, Vol: 11(22), (IF 3.3) .
13. G A Gohar, Tareq Manzoor, Recovery and Effective utilization of waste heat from the exhaust of IC Engines for cooling applications using ANSYS, Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science (IF 1.76).
14. Usman Inayat, Tareq Manzoor, "Theoretical Investigation of Two-dimensional Nonlinear Radiative Thermionics in Nano-MHD for Solar Insolation: A Semi-Empirical Approach"2021, **Computer Modeling in Engineering and Sciences** (IF 2.01) .
15. Tareq Manzoor, Theoretical Investigation of Unsteady MHD Flow within non-Stationary Porous Plates, **Heliyon, Volume 7, Issue 3, March 2021, e06567. (IF 3.776).**
16. M. Naveed, Arslan Ahmed, Tareq Manzoor, State-of-the-Art and Future Perspectives of Environmentally Friendly Machining Using Biodegradable Cutting Fluids, 2021, **Energies** 14(16):4816 (IF 3.204).
17. Zafar. Tareq Manzoor, "Performance Analysis of Magnetic Nanoparticles during Targeted Drug Delivery: Application of OHAM, 2021, **Computer Modeling in Engineering and Sciences (IF 2.01)** .
18. **Tareq Manzoor**, Theoretical Analysis of Roll-over-web Surface Thin Layer Coating, **Coatings MDPI**, vol 10, issue 7, (IF 3.2)
19. **Tareq Manzoor**, Groundwater investigations in the Hattar Industrial Estate and its vicinity, Haripur district, Pakistan: An integrated approach, 2020, **Kuwait Journal of Science** (IF 1.1) .
20. **Tareq Manzoor**, "Integrated Thermo – Economic Analysis of Industrial Boilers: A Cost Effective Approach" (DOI: 10.1007/s42108-020-00083-4), International Journal of Energy and Water Resources (83).
21. **Tareq Manzoor**, ‘Effect of Microstructural Phases on Thermo-mechanical Analysis of Ductile Cu-Al–Mn-Ni Memory Alloys for Structural Applications’, **Materials express, (2020)(IF 1.9).**
22. **TareqManzoor**, An improved micro-thermo-mechanics model for shape memory alloys: analysis and applications, **Materials Research Express**, Volume 7, Number 5, (2020) (IF 1.9).
23. Habib Ullah Manzoor, **Tareq Manzoor**, Moustafa H. Aly, FWM Mitigation in DWDM Optical Networks, Journal of Physics, IOP Conference series, 1447 (2020) 012033, doi:10.1088/1742-6596/1447/1/012033.
24. Habib Ullah Manzoor, Songzuo Liu **Tareq Manzoor**, Saqib Saleem, Improving FWM efficiency in Bi-directional ultra DWDM-PON networking centered light source by using PMD emulator, **Results in Physics, 2019 (IF 4.42).**
25. G A Gohar, **Tareq Manzoor**, Synthesis and Investigate the Properties of Cu-Al-Ni Alloys with Ag Addition Using Powder Metallurgy Technique, **Journal of Alloys and Compounds**, Volume 817, 15 March 2020, 153281 (IF 6.39).

26. **Tareq Manzoor**, Kashif Nazar, Muhammad Zafar , Shaukat Iqbal ,Muddassir Ali ,Woo Young Kim ,Mahmood Saleem and Sanaullah Manzoor, Analysis of a Thin Layer Formation of Third-grade Fluid, **Coatings MDPI**, Volume 9 Issue 11 (2019)(**IF 3.2**).
27. **Tareq Manzoor**, Mediating Role of the Organizational Cynicism in the Relationship between Workplace Incivility and Turnover Intentions: **Decision, Springer**.
28. Saqib Saleem, **Tareq Manzoor**, Granger causal analysis of electrohysterographic and tocographic recordings for classification of term vs. preterm births, **Biocybernetics and Biomedical Engineering**, (**IF 5.5**).
29. **Tareq Manzoor**, Improved transmission length in the presences of Ambient Noise using Duobinary Modulation in 40 Gbps FSO channel, **Microwave and Optical Technology Letter**, (IF 1.95)
30. **Tareq Manzoor**, ‘Fabrication and Characterization of AA6061/CNTs Surface Nano Composite by Friction Stir Processing’, **International Journal of Advanced Manufacturing Technology, Springer**, 2019, Volume 105, Issue 1–4, pp 749–769 (2019)(**IF 4.4**).
31. **Tareq Manzoor**, ‘Facile Synthesis of $Cu_xZn_{1-x}Fe_2O_4$ Nanoparticles and their Thermo-Physical Properties Evaluation’, **Applied Physics A**, 125: 626 , (2019) **2019 (IF 2.81)**.
32. Habib Ullah Manzoor, **Tareq Manzoor**, Analysis of Multiple Surface Electromagnetic waves on the planner interface of Hyperbolic medium and Rugate filter having Sinusoidal refractive index profile, **Plasmonics**(2019)(**IF 2.92**).
33. Muhammad Zafar, Shenawar Ali Khan , Fatima Sher , Muddassir Ali, **Tareq Manzoor**, Sheik Abdur Rahman , Woo Young Kim, Mahmood Saleem , Do-Heyoung Kim, Effect of randomly grown morphology of ZnO nanorods in inverted organic solar cells, **Journal of Nanoscience and Nanotechnology**, Accepted (**IF 1.54**).
34. Masroor Hussain, **Tareq Manzoor**, Khurram Imran Khan, Performance analysis of parallel stabilized mixed Galerkin method for three-dimensional transient Darcy flow using mesh reordering techniques, **Journal of Petroleum Science and Engineering** , Volume 176, 2019, Pages 621-631, (**IF 5.3**).
35. H M Younas, **Tareq Manzoor**, Dynamical Study of Fokker-Plank Equations By Using Optimal Homotopy Asymptotic Method, **Mathematics MDPI**, 2019, 7(3), 264; <https://doi.org/10.3390/math7030264>(**IF 2.2**).
36. Saqib Saleem, **Tareq Manzoor**, A strategy for classification of `vaginal vs. cesarean section' delivery: bivariate empirical mode decomposition of cardiotocographic recordings, **Frontiers in Physiology**, section Computational Physiology and Medicine, 2019, <https://doi.org/10.3389/fphys.2019.00246>, (**IF 5.39**).
37. G A Gohar, **Tareq Manzoor**, Design and Comparative Analysis of an INVELOX Wind Power Generation System for Multiple Wind Turbine through CFD, **Advances in Mechanical Engineering**, Vol. 11(4) 1–10, 2019, (**IF 1.6**).
38. Shahab U. Ansari, Masroor Hussain, Suleman Mazhar, **Tareq Manzoor**, Khalid J. Siddiqui, · Muhammad Abid and · Habibullah Jamal, Mesh Partitioning and Efficient Equation Solving Techniques by Distributed Finite Element Methods: A Survey, **Archives of Computational Methods in Engineering**, DOI 10.1007/s11831-017-9227-2, Volume 26, Issue 1, 1–16 (2019) (**IF 8.124**).
39. Tahir Sattar, **Tareq Manzoor**, F A Khalid, Electrochemical behavior of hydroxyapatite-coated NiTi shape memory alloy, **Journal of Materials Science**, (2019) Volume 54, Issue 9, pp 7300–7306 (**IF 4.22**).
40. Habib Ullah Manzoor, **Tareq Manzoor**, FWM Reduction Using Different Modulation Techniques and Optical Filters in DWDM Optical Communication Systems: A Comparative Study, **Iranian Journal of Science and Technology**, <https://doi.org/10.1007/s40998-019-00189-4>, 43, pages479–488 (2019) (**IF 1.5**).
41. **Tareq Manzoor**, Analysis of Bloch surface waves at the Interface Between Two Semi-infinite Rugate Filters with Symmetric Refractive Index Profiles, **Plasmonics**, 2018, Vol 13, Issue 6, pp 2319–2328 (**IF 2.926**) .
42. Habib Ullah Manzoor, **Tareq Manzoor**, Masroor Hussain, Sanaullah Manzoor and Kashif Nazar, Multiple Bloch surface waves in visible region of light at the interfaces between rugate filter/rugate

- filter and rugate filter/dielectric slab/rugate filter, **Journal of Optics**, 2018, Volume 20, Number 4. (IF 2.953).
43. Ghulam Abbas Gohar, **Tareq Manzoor**, Assad Naeem Shah, Investigation of Thermal and Mechanical Properties of Cu-Al alloys with silver addition prepared by Powder Metallurgy, **Journal of Alloys and Compounds**, Volume 735, 25 February 2018, Pages 802-812 (IF 6.3).
 44. **Tareq Manzoor**, Zaffar Mehmood, Manzoor A. Zahid, S. Tauseef Mohyud-Din, Habibullah Manzoor and Sadiq Hashmi, A note on fractional order in thermo-elasticity of shape memory alloys' dampers', **International Journal of Heat and Mass Transfer**, Volume 114, (2017), pages 597-606 (IF 5.58) .
 45. Habib Ullah Manzoor, Ashiq Hussain, Chong Xiu Yu and **Tareq Manzoor**, Complete suppression of FWM in ultra dense WDM-PON optical networks using centralized light source, **Journal of Nonlinear Optical Physics & Materials**, Volume 24, Issue 04, (2015) (IF 1.549).
 46. **Tareq Manzoor**, G Shabbir and F A Khalid, Two-Dimensional Analytical Technique for Stress Wave Model for Memory Alloy Dampers, **Journal of Mechanical Science and Technology**, Springer, 26 (10) (2012) pages 3059~3066 (IF 1.821).
 47. **Tareq Manzoor**, Modeling the Damping Behaviour of Shape Memory Alloys for Different Thermal Regime, Accepted, Journal of Solid Mechanics, Accepted (IF 0) (Q3).
 48. Zhang Jun, Muhammad Ayaz Akbar, **Tareq Manzoor**, Ahsan Ali, M. Amjad, CFD Analysis of performance of circular pipe flat plate solar collector, International Journal of Emerging Trends in Science and Technology, DOI: <https://dx.doi.org/10.18535/ijetst/v4i10.14>.
 49. **Manzoor Tareq**, Khalil S, Khan I, Gohar GA and Abid M, Design and Development of Flexible Vacuum Clamping System for Thin Walled Cylindrical Object for CNC Machines, Journal of Applied Mechanical Engineering, DOI: 10.4172/2168-9873.1000271, Volume 6 • Issue 4 • 1000271 (2017) (IF 0) .
 50. Uzair Riaz, Tareq Manzoor, Hassan Ali, CFD Techniques to Optimize Car Design for Coefficient of Drag, Accepted American Journal of Mechanical Engineering, accepted (IF 0).
 51. **Tareq Manzoor** and Fazal A Khalid, Compositional Effect on Microstructure and Damping Properties of Cu–Al–Mn Shape Memory Alloys, *accepted Applied Mechanics and Materials*.
 52. H. U. Mazoor, M. Rehman, S. Manzoor, A. Aslam and T. Manzoor, "Improved FWM Efficiency for Already Deployed Bidirectional Fiber Optic Cable using Polarization Manipulation for Underwater Applications," 2020 17th International Bhurban Conference on Applied Sciences and Technology (IBCAST), Islamabad, Pakistan, 2020, pp. 567-572.
 53. Rida Younis , Amina Iqbal, Umer Farooq, Awais Iqbal, Habib Ullah Manzoor, Amir Mehmood, **Tareq Manzoor**, "Techno-economio-environmental viability assessment of Grid-Connected photovoltaic system- A case for different cities of Pakistan". "PGSRET 2018".
 54. **Tareq Manzoor**, Muhammad Ayaz Akbar, Ghulam Abbas Gohar, Zohaib Hassan, Hassan Javed, CFD Analysis of performance of circular pipe flat plate solar collector, International Conference on Energy for Environmental and Economic Sustainability (ICEEES2016).
 55. **Tareq Manzoor**, Bilal Yousaf, Ali Bakht Yousaf, Nauman Jalal & Faizan Ahmad, Design & Fabrication of Compressed Air Vehicle Engine System, International Conference on "Energy Systems for Sustainable Development (ESSD-2015).
 56. **Tareq Manzoor Ahmed**, F A Khalid and G Shabbir, Numerical Simulation of Damping Behaviour of Shape Memory Alloys, *LUMS summer conference in mathematics*, 27-28 July, 2009.

Submitted Papers

1. Analysis of Effects of High Temperature and Thermal Gradients in Varying Porosity Petroleum Reservoir Structures, **Petroleum Science springer, Under Review.**
2. Numerical Solution of Fractional Order for stress Wave Model for Shape Memory Vibration Mitigation Dampers, **Computers & Mathematics with Applications, Under Review.**
3. Effect of External Dynamic Loadings on Offshore Submerged Oil/Gas Pipelines, **Journal of Pipeline Systems - Engineering and Practice, Under Review.**

4. Technical and Economic Evaluation of Solar Distributed Generation in Islamabad: Possible Scenario for Domestic Consumers, **Energy policy (Elsevier) , Under Review.**
5. Combustion modelling of coal using turbulence chemistry, **Fuel(Elsevier) , Under Review.**
6. Analysis of Slip Effects of an Oldroyd 6-constant Fluid, **Korea-Australia Rheology Journal, submitted.**
7. Analysis of Hartmann Number Influence on Nonlinear Porous Horizontal Stretched Sheet with Nanofluids, **Microfluidics and Nanofluidics submitted.**

REVIEWER OF INTERNATIONAL JOURNALS

1. Mechanical Sciences, Copernicus Associate Editor.
2. Mechanics of materials, Elsevier.
3. Transactions of Mechatronics, IEEE.
4. Energy Efficiency, Springer.
5. Journal of Mechanical Science and Technology, Springer.
6. Journal of the European Optical Society-Rapid Publications, Springer.
7. Journal of manufacturing, ASME.
8. International Journal of Hydrogen Energy - Elsevier

Research Thesis Supervision:

#	Student Name	Thesis Title	MS/P hD	Supervisor / Co-Supervisor	Status: Registered / Completed
1.	Amish Hassan	Modeling and simulation of energy storage devices	PhD	Co-Supervisor	Registered
2.	Ali Raza	Modeling Reaction Diffusion Equation for Thermal System	MS	Supervisor	Completed
3.	Tariq Javed	Thermo-physical characterization of cu/zn ferrite nanoparticles for industrial applications	MS	Supervisor	Completed
4.	Umar Farooq	Numerical Analysis of Conjugate heat transfer system	MS	Supervisor	Completed

Industrial Training and Experience

- 40 days of training with foreign experts on design and Application.
- One Year in *KEMTECS INC* as Application Engineer.
- More than two years of experience in *Fabricon Pvt Ltd*, where I did many projects in sugar, paper petroleum, milk and foundry industries of Punjab as design and Application Engineer.
- More than two years in sugar, paper, petroleum, cement, and foundry industries of Sindh as design and Application Engineer.
- Up gradation of many plants and units for quality and quantity enhancement.
- Provision of Control and Instrumentation solutions to many industrial requirements.

Short Courses conducted

- Thermal System Design
- Directional Drilling Techniques.
- An Integrated Approach for Prospect Evaluation/Generation.

- Quality control modules for modern Industry.
- Advanced Finite Element Analysis.
- Non Linear Finite Element Analysis.
- Advance Structural Design and Analysis.
- Advance Heat Transfer.

Computational& Mathematical Skills

- ANSYS, ABACUS
- FORTRAN, C/C++, MATLAB, Mathematica, Maple.
- Programming experience on C/C++ and MATLAB.

Professional Membership

- Pakistan Engineering Council (PEC).
- Society of Petroleum Engineers (SPE).
- International Association for Carbon Capture

Conferences

- SPE Conference Held Islamabad in 1999, 2001, 2004 and 2005.
- IBCAST 2007, 2009, 2010, 2012, 2013.
- MATTECH GIKI 2008, 2010, 2012.
- INTERNATIONAL CONFERENCE ON MANAGEMENT MUET JAMSHORO 2008.
- LUMS Summer Mathematics Conference 2009.

Extra Curricular Activities & Attributes

- Reading Books and Newspapers, writing of Articles.
- Knowledge of Economics, International Relations, History.
- Playing Cricket, Playing Table Tennis
- Served SPE.

Products and Technologies developed

Sr. No.	Name/Title	Technical Description
1.	Fabrication and analysis of coatings for bio-medical and industrial applications	Hydroxyapatite (HA)-coated NiTi shape memory alloys (SMAs) have gained significant attention in the field of biomaterials and biomedical engineering due to their unique electrochemical behavior

2.	Lithium –Ion Battery cells	Composites composed of highly dispersed Sb ₂ S ₃ on freestanding tubular TNAs host via chemical bath deposition method.
3.	Copper-Aluminum-Silver pellets and devices	Powder metallurgy routes for production of Copper-Aluminum-Silver pellets and devices for thermal and electrical applications
4.	Preparation, of Recycled Polyethylene Terephthalate (PET) Fiber Reinforced Green Concrete	Waste plastic need to be utilized well and has attracted more attention nowadays. One of the methods to address this issue is to reuse the waste plastic in concrete. For this purpose, a green concrete is proposed, which is a combination of concrete with waste Polyethylene terephthalate (PET) fibers having strength characteristics comparable or exceeding than render concrete. Concept of green concrete is to use those discarded plastic bottles which if disposed off directly into landfills are not biodegradable
5.	Fabrication and Analysis of Surface Patterned Regular Porous Silicone Films	We present fabrication and characterization of surface patterned regular porous silicones using the breath figure arrays (BFAs) method with a controlled pore size. The purpose of this study is to develop the regular porous surface patterned films with high consistency silicone elastomers MED-4035 and MED-4080 that could be potentially used for various applications like filtration and separation, energy storage and thermal insulation
6.	Preparation of Environmentally Friendly Machining Using Biodegradable Cutting Fluids	The use of cutting fluids has played a vital role in machining operations in lubrication and cooling. Most cutting fluids are mineral oil-based products that are hazardous to the environment and the worker, cause severe diseases and pollute the environment.
7.	Fabrication of Lithium –Ion Battery coins and cells	<p>Composites composed of highly dispersed Sb₂S₃ on freestanding tubular TNAs host via chemical bath deposition method.</p> <ol style="list-style-type: none"> 1. Electrode Preparation: <ol style="list-style-type: none"> a. Cathode Preparation: Prepare the cathode electrode by coating a conductive substrate (such as aluminum foil) with a slurry containing active cathode material b. Anode Preparation: Similarly, prepare the anode electrode by coating a conductive substrate (such as copper foil) with a slurry containing active anode material (e.g., graphite, lithium titanate) along with conductive additives and a binder. 2. Electrode Drying and Calendaring: Dry the coated electrodes to remove solvents, and then use a calendaring process to compress and improve their mechanical integrity. Calendaring involves passing the electrodes between rollers to increase their density and ensure good adhesion between the active material and the current collector. 3. Cell Encapsulation: The stacked electrode assembly with the electrolyte is then enclosed within a cell casing. The casing can be made of metal or a polymer material that provides mechanical support, electrical insulation, and protection against external environmental factors.

8.	Copper-Aluminum-Silver pellets and devices	Powder metallurgy routes for production of Copper-Aluminum-Silver pellets and devices for thermal and electrical applications
9.	Design of high-pressure vessels for industrial and automotive applications	We have expertise in design of high –pressure vessels
10.	Passive energy dissipation Devices to protect buildings and machines from earthquake	<ol style="list-style-type: none"> 1. Base isolation involves installing flexible or sliding bearing devices between the building's foundation and superstructure. These devices decouple the building from the ground, allowing it to move independently during an earthquake and reducing the transmitted seismic forces to the structure. 2. Steel Moment Frames: Steel moment frames provide ductility and energy dissipation capacity during earthquakes. They are designed to undergo controlled plastic deformation, allowing them to absorb seismic energy and protect the building's structural integrity. 3. Fiber-Reinforced Polymer (FRP) Strengthening: FRP materials, such as carbon fiber or glass fiber composites, can be used to strengthen existing structures or retrofit vulnerable elements. FRP strengthening increases the structural capacity and ductility, enhancing the building's ability to withstand seismic forces.
11.	Design of combustion chamber for industrial applications	<ol style="list-style-type: none"> 1. Combustion Chamber Geometry: Design the combustion chamber geometry to promote proper fuel-air mixing, turbulence, and residence time for complete combustion. Consider factors such as chamber shape, volume, and configuration to ensure optimal combustion performance. 2. Emissions Control: Incorporate measures to control emissions, including nitrogen oxides (NOx), carbon monoxide (CO), particulate matter, and other pollutants. This can involve optimizing the combustion process, employing emission control technologies (e.g., selective catalytic reduction), and monitoring systems to ensure compliance with environmental regulations. 3. Combustion Control: Implement a combustion control system to monitor and regulate key parameters, such as fuel flow rate, air-to-fuel ratio, and combustion temperature. This ensures stable combustion, improved efficiency, and minimized emissions. Advanced control techniques, such as feedback control or intelligent algorithms, may be employed for optimal performance.

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References:

1. Prof. Dr Fazal Ahmad Khalid, Rector, GIKI, Topi Swabi.
2. Prof. Dr Shaukat Iqbal, Dean SST, UMT Lahore.

Personal Information

TAREQ MANZOOR is specialized in the area of energy, thermal science and Computational Solid Mechanics /CFD. His main area is study of mathematical modeling based on Partial differential equations. His area of interest is both numerical and analytical techniques. He also has got experience of utilizing FEA softwares. His current research is focused on Experimental and modeling/simulation of energy and thermo-fluid engineering.

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