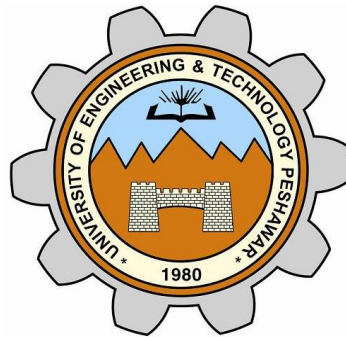


Self-Assessment Report for the Period of
2010-2021
for Promotion to Associate Professor on TTS



Submitted by

Dr. Khan Muhammad

Department of Mining Engineering, Main Campus, University
of Engineering and Technology (UET), Peshawar
(March 2022)

OVERVIEW

I was awarded PhD degree on 29th June 2009 by the University of Exeter, UK. I rejoined the University on 2nd July, 2009 as an Assistant professor on contract and later on 21-2-2010 as an Assistant Professor at UET Peshawar as a full-time faculty member on the newly introduced Tenure Track system. During the last Eleven plus years of TTS service, I took many initiatives to acquire funding to fill the gap of existing facilities to carry out state of the art research. I took a lead role in submitting PC-I for the establishment of the stone development centre and Centre of Advance Studies for Energy to the successful establishment through USAID grant. I have contributed to teaching, scholarship and research, and service to the Department/University, enhancing personal and professional characteristics. At the UET Peshawar, I have effectively contributed to the department's accreditation, curriculum revision, and implementation of Outcome-Based Education (OBE). I have served as the semester coordinator of the undergraduate semester program for three years in 2010 and 2011, and 2020. Furthermore, I have served as Postgraduate advisor for nine years from 2010 to 2018 and 2020. Currently I am working as director of Gems and Jewellery Centre of Excellence since Oct, 2019. I have been teaching undergraduate and postgraduate courses, supervising/co-supervising MSc/PhD researchers, publishing in reputed international journals and conferences, industrial consultancies, member policy-making bodies at the provincial and national level and securing/utilizing research grants. Current I am contributing to the Mining industry at national and international level through novel AI applications/solutions for mining and minerals industry in the five years PKR 1098 Million project 2019-2014 where I am leading the 70 Million PKR Intelligent Information Processing Lab of National Centre of AI established at UET Peshawar.

This report presents an overview of the progress I have made during my service as a Assistant Professor on Tenure Track at the Department of Mining Engineering, Main Campus, UET Peshawar. The work undertaken during this period is presented for review and recommendation for promotion from Assistant Professor to Associate Professor on TTS with effect from 1st March 2022

Teaching

One of my primary responsibilities at UET Peshawar was to teach undergrad and postgrad courses. During this period, I have upgraded course curriculum of concerned subjects and used the best available teaching aids to communicate to the students. Moreover, I have been available to students for assisting and counselling after the class. I have initiated linkages with mining software companies like MineSight, Vulcan and Netpromine and have taught these for ore reserve estimation and mine design. Also, I have supervised or continue to supervise/co-supervise four undergrad final year projects, seven MSc theses and two PhD researchers.

Courses Taught at Undergraduate Level

S. No.	Course Title	Credits Hours
1.	MinE-106L: Computer Applications (Lab)	01
2.	BSI-351: Probability and Statistics (Theory)	03
3.	MinE-311: Geostatistical Ore Reserve Estimation	03
4.	MinE-311L: Geostatistical Ore Reserve Estimation (Lab)	01
5.	MinE-306 Mine Economics and Management	02

6.	MinE-302 Underground Mine Design (Theory)	03
7.	MinE- 101 & 101L Introduction to Mining Engineering (Theory and Lab)	01

Courses Taught at Postgraduate level

S. No.	Course Title	Credits
1	MinE -5563 Mine System Simulation	03
2	MinE -5240 Operations Research	03
3	MinE-5535 Computer Applications in Mining and Advance Programming	03
4	MinE-5576 Spatial Data Analysis and Reserve Estimation	03
5	MinE-5577 Advance Geostatistics	03

Undergraduate Projects Supervised

- Geological Modelling using Gempy
- Mixed-integer linear programming approach for truck allocation problem in a cement quarry
- Production Scheduling for an Open Pit Mine
- Development of lab-based China Clay Processing unit.
- The automation of electronic discharge system of batac jig
- Bayesian learning approaches for mineral resource estimation
- AI based algorithms for mineral resource estimation: ANFIS
- Cleaning of coarse coal product (+3mm to 15mm size) through Batac Jig.
- Economic Analysis of Coal cleaning through water only cyclone
- Coal Cleaning through froth Flotation
- Optimization of Design parameters for water only cyclone
- Study of Coal Washability characteristics for Cherat coal
- Feasibility study for upgradation of coal resources of KP coal

MSc Thesis Supervision

- Tahir Usman: Modeling productivity of Deewan Cement Quarry: application of Principal Component Analysis
- Akram Shah: Minimizing Backbreak for Deewan Cement Quarry
- Waqas Ahmad: Prediction of calorific value of coal-based on proximate analysis using Machine Learning Algorithms
- Saad Salman: A Novel Block Aggregation Heuristic for Short Term Planning of Open Pit Mines with Multiple Processing Destinations
- Ibrahim Amin: Evaluation of Truck shovel fleet Performance based on rock Fragmentation
- Naeem Abbass: Study of optimization and efficiency of Water only cyclone

PhD Supervision/Co-supervision

- Engr. Waqas Ahmad
- Engr. Abdur Rehman

Funding/Grants

- Principal Investigator, Artificial Intelligence (AI) in Mineral Resource Estimation and Mine

Planning, Intelligent Information Processing Lab, National Centre of AI, PKR 35 million approx., Feb. 2019 – Jan 2022

- Principal Investigator, "Development of Pilot Scale Coal Washing Unit" Directorate of Science and Technology Govt of KP, May 2013 – April 2016
- 14 Mn USD USAID Centre of Advance Studies in Energy UET Peshawar as founding member and team for making/updating technical proposals.

Industrial Funding

Mineral Resource Estimation of Copper Mines Pakistan Mineral Development corporation (PMDC) Federally Administered Tribal Areas (FATA)

Mineral Resource Estimation and Copper Open Pit Mine Design for Mineral Exploration and Development Organization (MEDO)

Mineral Resource Estimation and Molybdenum Open Pit Mine Design for Mineral Exploration and Development Organization (MEDO) – Under Negotiation, Potential Project In Progress

AI based Geological Mapping for Mineral Exploration and Development Organization (MEDO) - Under Negotiation, Potential Project In Progress

International Funding

Development of a Production scheduling system for NETCAD- Under Negotiation, Potential Project In Progress

Advisory Services

Government of Khyber Pakhtunkhwa Dept of Mines and Minerals for formulation and review of Mineral Policy 2022

Government of Khyber Pakhtunkhwa for formulation of riverbed rules by consortium of provincial department lead by the provincial Irrigation Department

Trainings

- Five Days Hands-on Workshop in Machine Learning and Artificial Intelligence, for industry professionals and in Earth Sciences UET Peshawar, December 2021.
- Five Days Hands-on Workshop for industry professionals from Baluchistan using MineSight software for Geological Modelling and Mineral Resource Estimation, UET Peshawar, December 2018.
- AI in Mining: Past, Present and Future, UK Speech Conference to Postgraduate students, University of Exeter, UK, 2021.
- Two Days Hands-on Workshop on Teaching Skills as part of HEC train the trainers program Mining Dept UET 2012.
- Two Days Hands-on Workshop on Teaching Skills as part of HEC train the trainers program Mining Dept UET Dec, 2012.
- Two Days Hands-on Workshop on Teaching Skills 4MAT approach as part of Outcome based education for Mining and Agricultural engineering faculty March 2021.

Member of Professional Societies

- Member IOM3

- Member IAMG
- Member Pakistan Engineering Council (PEC)

Awards and Achievements

- Selected as a member of the Copernicus Network of Experts in Remote Sensing applications using Artificial Intelligence
- Developed research collaborations with Istanbul Technical University, Hacettepe University, Turkey, and the University of Exeter, UK.

Journal Review

- Advances in Civil Engineering Materials
- IEEE Access
- Journal of Electronic Imaging

Research and publications

During my post-PhD experience between 2010-2021, I have been actively engaged in research. I have conducted and supervised AI applications in Mining operations, AI-based spatial estimation, pattern recognition, machine learning and artificial intelligence. This research between 2010-2021 has resulted in 13 journal publications (a detailed list and CV are attached).

Conclusions

Given the rules stated in Tenure Track Statutes, UET Peshawar, in light of the Higher Education Commission (HEC) and HEC's letter ref. No. CON. QA/HEC/TTS-137/320 dated 04/12/2017, it is requested to please consider my case for promotion from Assistant Professor to Associate Professor on TTS in the Dept of Mining Engineering.

Date: March 11, 2022

Signature:



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Google Scholar: <https://scholar.google.com.pk/citations?user=Xnox71MAAAAJ&hl=en>

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