




# Hamza Mohammad Alkuime

## Contact

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## EDUCATION

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- PhD** University of Idaho (Uof I) , Moscow, ID, USA December 2019  
 Civil Engineering / Pavement Engineering  
 Dissertation: “ Innovative Assessment Tests and Indicators  
 for Performance-Based Asphalt Mix Design”  
 Chair: Dr. Emad Kassem, Ph.D., P.E.
- MS** Jordan University of Science and Technology (JUST), Irbid, Jordan August 2015  
 Civil Engineering/Transportation Engineering  
 Thesis: “Trip Attraction Model for Universities in Jordan”  
 Advisor: Prof. Taisir Khedaywi, Ph.D.,
- BS** The Hashemite University (HU), Zarqa, Jordan June 2013  
 Civil Engineering

## HONORS AND AWARDS

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- Scholarship to graduate school at University of Idaho** 2017 - 2019  
 Scholarship from the Hashemite University to pursue Ph.D. in Civil  
 Engineering/Pavement Materials at the University of Idaho, USA.

## TEACHING EXPERIENCE

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- The Hashemite University (HU), Zarqa, Jordan** February 2020 to Present  
**Assistant Professor**, Department of Civil Engineering

Taught *Pavement Materials & Design*,

An undergraduate course covering the following topics: pavement types, pavement materials properties, testing, and evaluation; Hot Mix Asphalt (HMA) mix design (Marshall and Superpave methods); traffic and traffic assessment, flexible pavement structural design (AASHTO 1993 method); production, transportation, laying and compaction of hot mix asphalt; quality control of production and acceptance of HMA mixes; introduction to new advances in asphalt mix design (Performance-Engineered Mix Design [PEMD] method) and pavement structural design ( AASHTO ME method). My responsibilities were to developing course materials, quizzes, exams, and homework, lecturing, grading, and revising the syllabus to meet accreditation standards.

Taught *Transportation Engineering and planning*,

An undergraduate course covering the following topics: transportation systems, roles of transportation within different sectors, transportation planning, transportation modeling, economics of transportation, planning of transportation facilities and systems, and their characteristics. My responsibilities were to developing course materials, quizzes, exams, and homework, lecturing, grading, and revising the syllabus to meet accreditation standards.

Taught *Pavement Management Systems*,

An undergraduate elective course covering the following topics Pavement maintenance management systems (PMS) concepts and components; Pavement condition survey and rating procedures; Flexible and rigid pavement distresses (types & causes); Pavement maintenance and repair (M&R) procedures; Assessment of maintenance needs; Evaluation and selection of proper maintenance alternatives, field visits. My responsibilities were to developing course materials, quizzes, exams, and homework, lecturing, grading, and revising the syllabus to meet accreditation standards.

**Al al-bayt University (AABU)**, Mafrqa, Jordan  
**Lecturer**, Department of Surveying Engineering

February 2016 to December 2016

Taught *Construction Surveying*,

An undergraduate course covering the following topics: coordinate systems and point location techniques; control surveys networks; measurement errors and adjustments; establishing horizontal control networks, horizontal control techniques, determination of plan and height coordinates within an appropriate coordinate system, positioning slopes, setting out building, pipeline, bridge abutments, and sewers and drains. My responsibilities were to developing course materials, quizzes, exams, and homework, lecturing, and grading.

Taught *Construction survey laboratory*,

An undergraduate course covering the following topics: chain surveying, the use of the level and leveling staff; setting out levels; profile and cross-section leveling, the theodolite and its use, traverse surveying, tachometry and electronic distance measurements, measurement of areas with the planimeter, the use of laser theodolite and level. My responsibilities were to developing course materials, quizzes, exams, and homework, lecturing, and grading.

## **TECHNICAL AND ACADEMIC PROFICIENCY**

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***Servo-hydraulic Testing Machines: MTS and IPC.***

***Asphalt Mixture Performance Assessment Tests and Indicators***

**Assessment Tests :**

- Monotonic fatigue cracking assessment test: IDT, IDEAL-CT, SCB-FI, SCB-J<sub>c</sub>
- Low temperature cracking assessment test: IDT creep, IDT strength, and SCB-low temperature

- Rutting assessment test: APA rut test and HWTT

**Assessment Indicators and Analysis Methods:**

- $G_{fracture}$ ,  $IDT_{strength}$ ,  $IDT_{Modulus}$ , IDEAL-CT<sub>Index</sub>, CRI, FI, Nflex factor,  $J_C$ , and Weibull<sub>CRI</sub>

**Developed Asphalt mix performance assessment tests and indicators:**

- Through my Ph.D. study, I developed and evaluated a new and innovative monotonic cracking performance indicator called Weibull Cracking Resistance Index (Weibull<sub>CRI</sub>). The proposed indicator describes the entire load-displacement curve, which overcomes the limitations of the existing performance indicators. Also, I developed a new cyclic cracking assessment test called Multi-Stage Semi-circle bending Cyclic (MSSC). The test offers advantages over the available monotonic and dynamic cracking assessment tests and addresses major concerns to implement the Performance-Engineered Mix Design (PEMD) or Balanced Mix Design (BMD) approach.

**Granular materials assessment tests:**

- CBR
- Mr

**Computer software**

- *Pavement analysis, design, and evaluation:* AASHTOWare Pavement ME Design, KENLAYER, KENPAVE, KENSLABS, LTPP, PAVEXpress, Everstress, FAARFIELD, COMFAA, LEDFAA, PCASE, AirCost, AirPave, StreetPave, MODULUS, WINFLEX, PAVECHECK, ProVAL
- *Finite Element:* ABAQUS
- *Geographical Information Systems:* ArcGIS
- *Statistical Analysis:* SPSS and Excel
- *Drawing:* AutoCAD and SketchUp
- *Mathematics:* MATHCAD
- *MS Office Applications*

**Short Courses and webinars**

- Jordan engineers association (JEA) Webinar: Asphalt Mixture Design – Part 1, March 6, 2021.
- Jordan engineers association (JEA) Webinar: Asphalt Mixture Design – Part 2, March 7, 2021.
- TRB Webinar: Balanced/Performance-Engineered Asphalt Mixture Design – Part 2, November 26, 2018.
- TRB Webinar: Balanced/Performance-Engineered Asphalt Mixture Design – Part 1, November 1, 2018.
- AAPT/AI Webinar Series – Balanced Mix Design Part III: BMD Implementation – A Case Study, November 16, 2017

- AAPT/AI Webinar Series – Balanced Mix Design Part II: Developing a Balanced Mix Design Framework, November 9, 2017
- AAPT/AI Webinar Series – Balanced Mix Design Part I: Introduction – What is Balanced Mix Design?, November 2, 2017

### RESEARCH INTERESTS

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- Pavement engineering
- Infrastructure materials
- Sustainable pavement materials
- Pavement design, preservation, maintenance, and management
- Asphalt mix performance assessment tests and indicators
- Laboratory and field non-destructive testing.

### PUBLICATIONS

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#### *Funded Research Projects:*

Sponsor	PI Name	Co-PI Names	Project Title	Status	Fund Amount (JD)	Dates
The Hashemite University	Hamza Alkuime	Randa Mujalli	A Normalization Approach for Intermediate Temperature Cracking Monotonic Performance Assessment Testing Standards and Indicators for Asphalt Mixes Based on Specimen Configuration	Active	59,100	3/2021-3/2022

### PUBLICATIONS

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#### *Journal Publications*

1. **Alkuime, H.**, Kassem, E., Nielsen, R. & Bayomy, F. Evaluation and Development of Performance-Engineered Specifications for Monotonic Loading Cracking Performance Assessment Tests and Indicators (2021). *Journal of Testing and Evaluation*. <https://doi.org/10.1520/JTE20200590>

2. Chowdhury, R., Kassem, E., **Alkuime, H.**, Mishra, D., & Bayomy, F. Summary Resilient Modulus Prediction Model for Unbound Coarse Materials *Journal of Transportation Engineering, Part B: Pavements*. (2021). <https://doi.org/10.1061/JPEODX.0000289>
3. **Alkuime H**, Kassem E, Bayomy FM, Nielsen R. Development of a multi-stage semi-circle bending cyclic test to evaluate the cracking resistance of asphalt mixtures. (2020). *Road Materials and Pavement Design*. <https://doi.org/10.1080/14680629.2020.1809500> .
4. **Alkuime, H.**, Tousif, F., Kassem, E. & Bayomy, F. Review and evaluation of intermediate temperature cracking testing standards and performance indicators for asphalt mixes. (2020). *International Journal of Construction and Building Materials*, Volume 263,2020,120121, <https://doi.org/10.1016/j.conbuildmat.2020.120121> .
5. **Alkuime, H.**, Kassem, E. Comprehensive evaluation of wheel-tracking rutting performance assessment tests. *International Journal of Pavement Research and Technology*. 13, 334–347 (2020). <https://doi.org/10.1007/s42947-020-0265-z> .
6. **Alkuime, H.**, Kassem, E., Bayomy, F. & Nielsen, R. Development of a new performance indicator to evaluate the resistance of asphalt mixes to intermediate temperature cracking. *Journal of Transportation Engineering, Part B: Pavements*. (2020). <https://doi.org/10.1061/JPEODX.0000224>

#### ***Journal Papers (in Review)***

1. **Alkuime, H.**, Kassem, E., Bayomy, F. M. & Nielsen, R. Investigate the Applicability of Weibull Cracking Resistance Index Using Data Generated by Other Researchers and Reported in The Literature. *Innovative Infrastructure Solutions* (Submitted).

#### ***Conference Papers***

(Peer-Reviewed)

1. **Alkuime, H.**, Kassem, E. & Bayomy, F. M., “Smart Asphalt Mix Design Approach for Sustainable Asphalt Pavement,” Proceedings of the 8<sup>th</sup> Jordan International Civil Engineering Conference (JICEC8), (Accepted).
2. **Alkuime, H.**, Tousif, F., Kassem, E. & Bayomy, F. M. “Comprehensive Evaluation of Various Performance Indicators used for Cracking Performance Assessment of Asphalt Mixtures,”. Proceedings of Transportation Research Board (2020). Washington D.C., USA, Jan 12-16, 2020.
3. Chowdhury, R., Kassem, E., **Alkuime, H.** & Bayomy, F. M. “Resilient Modulus Prediction Model of Unbound Coarse Materials,”. Proceedings of Transportation Research Board. Washington D.C., USA, Jan 12-16, 2019.

***Presentations:***

1. Kassem, E. Bayomy, F. & **Alkuime, H**, “Development and Evaluation of Performance Measures to Augment Asphalt Mix Design in Idaho,” Idaho Asphalt conference, 2019. Moscow, ID, USA, Oct 28-30, 2019.

***Research Reports***

1. Kassem, E. Bayomy, F. M, Jung. SJ, **Alkuime, H**, & Tousif, F., Development and Evaluation of Performance Measures to Augment Asphalt Mix Design in Idaho,” (2019) (Completed)
2. Bayomy, F. M., Muftah, A., Kassem, E., Tousif, F., & **Alkuime, H.**, Calibration of the AASHTOWare Pavement ME Design Performance Models for Flexible Pavements in Idaho,” (2018) (Completed)  
(<https://apps.itd.idaho.gov/apps/research/Completed/RP235.pdf>)

***Other Publications:***

1. **Alkuime, H**, “Innovative Assessment Tests and Indicators for Performance-Based Asphalt Mix Design” Ph.D. Dissertation, University of Idaho, Moscow, ID, USA, December 2019
2. **Alkuime, H**, “Trip Attraction Model for Universities in Jordan” M.Sc. Dissertation, Jordan University of Science and Technology, Irbid, Jordan, August 2015.

**SUPERVISOR FOR GRADUATION PROJECTS**

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Student Name	Project Title	Academic Year
Ahmad Abdallah Ahmad Bani Mostafa Israr’s Mohammed Osama Alqudah	Multilane Highway design “Jerash-Amman”	Spring 2019-2020
Ola Al-Alawneh Adham Yaseen Rawand Al-Jamal Ahmad Barghash	Multilane Highway design “Al-Salt, Al-Balqa’-Aredah road”	Spring 2019-2020
Batoul Alawaisheh Yasmeen Allan	Utilizing Geographic Information System (GIS) as a Tool for Pavement Distress evaluation	Spring 2021-2022

**PROFESSIONAL AFFILIATIONS**

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Member, Jordan Engineers Association, JEA  
Friend of the following TRB committees :

Asphalt Materials Selection and Mix Design, AKM30  
Asphalt Mixture Evaluation and Performance, AKM40  
Asphalt Pavement Construction and Rehabilitation, AKC60  
Binders for Flexible Pavement, AKM20  
Design and Rehabilitation of Asphalt Pavements, AKP30  
Pavement Condition Evaluation, AKP10  
Pavement Maintenance, AKT30  
Pavement Management Systems, AKT10  
Pavement Preservation, AKT20  
Pavement Structural Testing and Evaluation, AKP40  
Pavement Surface Properties and Vehicle Interaction, AKP50  
Performance Effects of Geometric Design, AKD10  
Production and Use of Asphalt, AKM10

#### **PROFESSIONAL SERVICE**

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**Reviewer/Referee for :**

- International Journal of Pavement Research and Technology (IJPRT)
- 11<sup>th</sup> International Conference on Managing Pavement Assets (ICMPA)

#### **LANGUAGES**

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- **Arabic:** Native Language
- **English:** Excellent

#### **REFERENCES**

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Upon request.