

**BOARD OF TRUSTEES
UNIVERSITY OF THE DISTRICT OF COLUMBIA
UDC RESOLUTION NO. 2023 - 15**

SUBJECT: TENURE APPROVAL FOR HOSSAIN AZAM, PH.D., SCHOOL OF ENGINEERING AND APPLIED SCIENCES (SEAS)

WHEREAS, pursuant to D.C. Code §38-1202.06(3), the Board of Trustees is authorized to establish or approve policies and procedures governing admissions, curricula, programs, graduation, the awarding of degrees, and general policy making for the components of the University; and

WHEREAS, Dr. Hossain Azam is a continuing and recently promoted Associate Professor in the Department of Civil Engineering, of the School of Engineering & Applied Sciences (SEAS), who has petitioned the University of the District of Columbia to be granted tenure in the department in which she is qualified; and

WHEREAS, Dr. Devas Shetty, Dean of SEAS, in conjunction with the SEAS faculty, have conducted a thorough review of Dr. Azam's background and record of achievements in teaching, scholarship and university and community service; and

WHEREAS, Dr. Azam is judged to be an outstanding professor with distinguished skills and expertise who meets the criteria by which University of the District of Columbia faculty are evaluated, based on the 8th Master Agreement; and

WHEREAS, the Chief Academic Officer and the President have affirmed the recommendation of tenure for Dr. Azam, which is also supported by the Dean and Faculty of SEAS, and the President has forwarded the recommendation for tenure to the Board of Trustees.

NOW THEREFORE BE IT RESOLVED, that the Board of Trustees of the University of the District of Columbia approves the award of tenure to Dr. Hossain Azam at the rank of Associate Professor in the School of Engineering and Applied Sciences (SEAS).

Submitted by the Academic & Student Affairs Committee:

May 31, 2023

Approved by the Board of Trustees:

June 8, 2023



Christopher D. Bell
Chairperson of the Board

LAWRENCE T. POTTER, JR., Ph.D.
CHIEF ACADEMIC OFFICER

CONFIDENTIAL MEMORANDUM

TO: Ronald Mason, Jr., J.D.
President

FROM: 
Chief Academic Officer

DATE: April 30, 2023

RE: Recommendation: Professor Hossain Azam for tenure and promotion to the rank of
Associate Professor

President Mason:

Guided by the *Eight Master Agreement* and criteria established by the School of Engineering & Applied Sciences (SEAS) for promotion and tenure, I have reviewed the portfolio and supporting documentation submitted by **Dr. Hossain Azam for tenure and promotion to the rank of Associate Professor.**

As Chief Academic Officer, my review aims to evaluate evidence of significant and relevant achievements in scholarship/creative work, teaching, and service. In addition, I review the self-narrative to ensure alignment between established standards and evidence provided within the portfolio. I conduct my review of each applicant after the files have been reviewed by the Chair, DEPC, CPC, Dean, and URC (in cases where an appeal is filed). Based on a holistic review of recommendations and the file, I make an independent recommendation to you for consideration.

Professor Azam arrived as a tenure-track Assistant Professor in 2019. He was promoted to Assistant Professor in 2014 while holding a tenure-track appointment at Manhattan College from 2014-2019. When he arrived at UDC, he was given 2-year credit toward the five-year tenure track appointment in Civil Engineering. **He has met the eligibility criteria, with 4, 3, and 4 being his composite annual evaluation ratings for the past three years.**

Chair: **Strongly Recommended (1 of 1)**
DEPC: **Strongly Recommended (1 of 1)**
CPC: **Strongly Recommended (1 of 1)**
Dean: **Recommended (1 of 1)**

TEACHING: Professor Azam has taught a total of 12 undergraduate and graduate courses at UDC (note that cross-listing occurs in a few of these courses). He provides a comprehensive table of his end-of-course evaluations with all data collected in an easily accessible/readable format. This is the first time I have seen teaching effectiveness data presented in a faculty evaluation—please see the image included in my summary below. Consistently, and with reasonably high response rates, Professor Azam’s students “Agree” or “Strongly Agree” at a rate of 95%:

Item Number	Rating Category	Fall, 2019		Spring, 2020		Fall, 2020		Spring, 2021		Fall, 2021		Overall Summary	
		Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
1 - The syllabus provided information on office hours, required textbooks, grading, and material to be covered in the course.	Strongly Agree or Agree	9	100	7	100	16	100.0	10.0	100.0	25.0	96.2	67	98.5
	Disagree or Strongly Disagree	0	0	0	0	0	0.0	0.0	0.0	1.0	3.8	1	1.5
2 - The instructor typically was punctual in meeting this course.	Strongly Agree or Agree	9	100	7	100	15	93.8	10.0	100.0	24.0	92.3	65	95.6
	Disagree or Strongly Disagree	0	0	0	0	1	6.3	0.0	0.0	2.0	7.7	3	4.4
3 - The instructor was concerned that I learned and understood the material.	Strongly Agree or Agree	9	100	6	85.714	16	100.0	10.0	100.0	25.0	96.2	66	97.1
	Disagree or Strongly Disagree	0	0	1	14.286	0	0.0	0.0	0.0	1.0	3.8	2	2.9
4 - It was clear to me how my work in the course would be evaluated.	Strongly Agree or Agree	9	100	5	71.429	15	93.75	10	100	24	92.3077	63	92.6
	Disagree or Strongly Disagree	0	0	2	28.571	1	6.3	0.0	0.0	2.0	7.7	5	7.4
5 - The instructor raised challenging questions or problems in the class.	Strongly Agree or Agree	9	100	7	100	16	94.1176	10	100	25	96.1538	67	97.1
	Disagree or Strongly Disagree	0	0	0	0	1	5.9	0.0	0.0	1.0	3.8	2	2.9
6 - The instructor encouraged me to think for myself.	Strongly Agree or Agree	8	88.9	7	100	16	100	10	100	25	96.1538	66	97.1
	Disagree or Strongly Disagree	1	11.1	0	0	0	0.0	0.0	0.0	1.0	3.8	2	2.9
7 - Class presentations made the subject interesting and understandable.	Strongly Agree or Agree	8	88.9	4	57.143	15	93.75	10	100	22	84.6154	59	86.8
	Disagree or Strongly Disagree	1	11.1	3	42.857	1	6.3	0.0	0.0	4.0	15.4	9	13.2
8 - I was made to feel welcome in seeking help.	Strongly Agree or Agree	9	100	7	100	16	100	10	100	25	96.1538	67	98.5
	Disagree or Strongly Disagree	0	0	0	0	0	0.0	0.0	0.0	1.0	3.8	1	1.5
9 - I was encouraged by the instructor to ask questions.	Strongly Agree or Agree	8	88.9	7	100	16	100	10	100	25	96.1538	66	97.1
	Disagree or Strongly Disagree	1	11.1	0	0	0	0.0	0.0	0.0	1.0	3.8	2	2.9
10 - I felt free to disagree with the instructor and/or to express my own ideas.	Strongly Agree or Agree	9	100	6	85.714	16	100	10	100	24	96	65	97.0
	Disagree or Strongly Disagree	0	0	1	14.286	0	0.0	0.0	0.0	1.0	4.0	2	3.0
11 - My interest in the subject has been stimulated.	Strongly Agree or Agree	9	100	6	85.714	14	87.5	10	100	21	87.5	60	90.9
	Disagree or Strongly Disagree	0	0	1	14.286	2	12.5	0.0	0.0	3.0	12.5	6	9.1
12 - Classroom discussions or presentations were relevant to the objectives and content of the course.	Strongly Agree or Agree	9	100	6	85.714	16	100	9	90	25	96.1538	65	95.6
	Disagree or Strongly Disagree	0	0	1	14.286	0	0.0	1.0	10.0	1.0	3.8	3	4.4
13 - Assignments made a meaningful contribution to my understanding of the course.	Strongly Agree or Agree	9	100	5	71.429	16	100	10	100	25	96.1538	65	95.6
	Disagree or Strongly Disagree	0	0	2	28.571	0	0.0	0.0	0.0	1.0	3.8	3	4.4
14 - My examinations were graded and returned or graded and reviewed with me by the instructor.	Strongly Agree or Agree	9	100	4	66.667	14	87.5	10	100	22	88	59	89.4
	Disagree or Strongly Disagree	0	0	2	33.333	2	12.5	0.0	0.0	3.0	12.0	7	10.6
Semester Wise Performance		123	97.6	84	86.6	217	96.4	139	99.3	337	93.6	900	94.94
		3	2.38	13	13.4	8	3.6	1	0.7	23	6.4	48	5.06

Even though the number of students taught is very low, overall, Professor Azam's scores can be seen as laudable. What the chart does not reveal, however, are disaggregated responses (by course). Given the small numbers, it might be more revealing to understand where exactly the few "Disagree or Strongly Disagree" responses occurred (the numbers for certain semesters are so low that one is left to wonder whether all course evaluations were included). Thus, the presentation of data is both helpful and unhelpful. A weakness in this section is that the narrative mainly contains descriptions of teaching methods, not evidence of success in advancing student learning. His statement about evidence of effectiveness is not uncommon: *"Students really got [sic] benefitted from my approach, which was reflected in the annual evaluation of my courses."* Student evaluations, of course, are not evidence of teaching effectiveness. However, they are indirect evidence of student perceptions of performance and their experiences in the classroom and are, therefore, better than nothing. Inadvertently, Professor Azam does hint at the evidence of teaching effectiveness later in his narrative when he states: *"I have started bringing industry leaders to my classroom at the end of a pandemic to conduct a class on a relevant topic of the course. Additionally, I have started arranging [water] treatment plant tours as part of the environmental engineering courses offered by me. Those approaches really got the students excited in the area of environmental engineering."* It would have been far better if Professor Azam had done more with this (i.e., provided student reflections/comments on the experience as evidence). If he had connected these experiences to specific learning outcomes in the class that were improved because of the guest speaker or tour, that would represent closing the loop. This small piece of the narrative, coupled with the data compiled in the course evaluation chart, suggests that Dr. Azam meets the standard in this domain, albeit minimally.

RESEARCH: The Dean calls Dr. Azam's publication record "very impressive," noting that he has published "15 peer-reviewed journals and more than ten conference publications. In addition, he has contributed to four book chapters." Dean Shetty states that Dr. Azam has published in "high-quality journals and [that] the conferences he attended are known for their quality and contribution to the domain of environmental engineering." The journals mentioned by Dean Shetty include the *ASCE Journal of Environmental Engineering*, *Chemosphere*, and *Analytical Chemistry*. However, Dr. Azam published in these journals in 2013 - 2014, so their relevance to this review should not have been considered, as this was prior to his tenure clock at UDC. Professor Azam's actual output since arriving at UDC has been modest (understanding that it's only been three years, much impacted by COVID): **four** (4) journal publications and **two** book chapters, all of which he calls "peer reviewed." One book chapter can be considered peer-reviewed because it was published by DOE's Office of Scientific and Technical Information. The second book chapter is in a technical manual published by the Water Environment Federation. While mostly technical,

the two chapters *are* informed by research and provide important technical information to practitioners. The four journal outlets are *Energy* (Elsevier – Science Direct), *Sustainability* (MDPI), *International Journal of Environmental Science and Technology* (Springer), and *Journal of Environmental Management* (Elsevier – Science Direct). Dr. Azam has also published **two** (2) conference papers since his arrival.

In terms of grant funding at UDC, Dr. Azam has secured over \$1.02 million as a PI and over \$4.64 million as Co-PI. Through his grant-supported research, he works in collaboration with colleagues in SEAS, CAS, and CAUSES. One impact of the grants is new instrumentation to improve institutional capacity for further research. Another impact has been the Environmental Engineering laboratory at UDC, which supports the areas of water and wastewater treatment and the “water-energy-food-climate nexus.” Additionally, some of the external funding allows Professor Azam to work with DCPS high schools and middle schools to develop curricula for engineering and agrotechnology in the hopes of, in Professor Azam’s words, “*generating a new pipeline of students to UDC.*” The effort here is not entirely within Professor Azam’s control, and it should be noted that too many activities outside of his lab potentially detract from his overall productivity as a scholar. Recruitment of a pipeline of students is a laudable aim but not solely a faculty priority. Professor Azam has demonstrated excellent research and publication strengths and output. He has met the challenges and answered the call to turn his research focus somewhat into the service of UDC’s community-engagement and student-recruitment mission. He meets the standard in this domain.

SERVICE: The **DEPC** observes that, in terms of community service, “*Dr. Azam is an active member of President’s DAWN initiative and is working closely with DCPS to develop an agrotechnology and civil course curriculum for high schools and middle schools of DC. He has hosted high school students at his lab for research experiences. He gave lectures on Environmental Engineering and Water-Energy-Food-Climate nexus to high school students . . . [including] students in Anacostia High School.*” In terms of service to **SEAS**, the department, and the broader university, the **Chair** notes that “*Dr. Azam is currently serving as Graduate Program Director and Faculty Senate Representation for the Civil Engineering Department.*” **Dr. Behera** also commends Professor Azam for standing up and serving as the advisor for the UDC Student chapter of the Water Environment Federation (WEF) and for mentoring student members: “*Dr. Azam guided students of the chapter to participate in the competitions, and [they were] also awarded prizes.*” Indeed, as was celebrated in the emails that circulated at the time, the UDC Student Chapter of WEF won the 2nd prize twice in the regional Chesapeake Water Environment Association (CWEA) student design competition (2020 and 2021). Although Dr. Azam’s service does not appear extensive in terms of committee presence, a depth of engagement is involved in his service work that compensates for the apparent scarcity of activities. To engage with students in both the Student Chapter of WEF (for competitions, presentations, etc.), and to support the DAWN initiative, is to expend much valuable time. Professor Azam meets the standard in this domain.

Summary Evaluation

Professor Azam provides letters from six (6) external evaluators. I have reviewed all letters and will quote only from four (4). The external reviewers are **Andrew Shaw, PhD**, PE, BCEE, ENV SP, Associate Vice President, Black & Veatch, a Global Practice & Technology Leader in Sustainability & Wastewater; **Dr. Eberhard Morgenroth**, Institute of Environmental Engineering, Chairs of Urban Water Management, Zurich Institute of Environmental Engineering; **Joseph G. Cleary, P.E.** BCEE, Senior Consultant, Geosyntec Consultants (Lyndhurst, NJ); **Ramesh Goel, Ph.D.**, Professor and Graduate Director, Associate Editor: “Water Research” and “Water Environment Research,” Civil and Environmental Engineering, **University of Utah**; **Rumana Riffat, Ph.D., P.E.**, Professor of Civil and Environmental Engineering, Associate Dean for Graduate Studies, George Washington University; **Somnath Basu, PhD**, PE, MBA, F AAAS, F AIChE., Science & Technology Policy Fellow, US Department of Energy (DOE).

The most concerning comment among these letters comes from **Dr. Morgenroth**, who writes: “*Overall, I see Dr. Azam as a valuable contributor to UDC. He brings significant experience from his time at Manhattan College, and George Washington University/DC Water. I do not see him as a top researcher, and I would not recommend him for a top research university. But I can see how his experience and solid approach to mentoring students and running research projects can be a good match for UDC. With my letter, I have tried to provide a balanced review of his strengths and weaknesses. Overall, I would support his promotion to Associate Professor with tenure.*” Dr. Morgenroth acknowledges that Dr. Azam teaches more courses than a researcher at an R1 university and has obligations to community outreach efforts that other researchers do not have. Other reviewers similarly point to community engagement as a factor that impacts Professor Azam’s traditional scholarly portfolio—

but in potentially positive ways. For example, **Dr. Basu** states, “I feel his research focus is **more practice-oriented** rather than purely academic, which I feel is very beneficial to an urban university like UDC. This will also help him attract grants from local and federal agencies to conduct research for solving real-world problems that may need immediate attention.” **Dr. Riffat** likewise points positively to the external engagement: “It is very encouraging to see that Dr. Azam has obtained an educational grant that establishes a formal relationship between UDC and DC Public Schools. This type of grant requires significant time commitment and enthusiasm. But in the long term, it has more rewarding outcomes in terms of motivating and developing the next generation of scientists and engineers. His mentorship will always encourage and motivate young students to pursue their passion.” We recognize that UDC needs to represent both “traditional” research aligned with R2 aspirations while also performing “engaged scholarship” that impacts/influences the community in various ways. The tension inherent in trying to do both is noted by Dr. Morgenroth: “.... I can see the benefit for the UDC students to choose from this diverse range of topics working with Dr. Azam. But such a diverse portfolio also makes it difficult to develop a clear identity and clear research program that is recognized beyond UDC. In his research statement, Dr. Azam focused on his productivity. I would advise him to also spend a bit of time identifying the specific focus he wants to be known for and to use this to shape his research program.” (emphasis added). The only other academic among the reviewers is **Dr. Goel**, who offered strong endorsement, “without hesitation.” Despite the somewhat tepid endorsement from Dr. Morgenroth, the overall portfolio exhibits sufficient success in each domain to merit approval. **Therefore, I concur with all recommendations and external reviewers in supporting Professor Azam to be tenured and promoted to Associate Professor.** The portfolio is well organized and thorough—one of the best I have seen at UDC.

The electronic dossier is available for review. Send an email request to the Office of the Chief Academic Officer at CAO@udc.edu.

I, Ronald Mason, Jr., President of the University of the District of Columbia, APPROVE X DENY

the recommendation to promote Professor Hossain Azam to the rank of Associate Professor with tenure, and
recommend him for approval to the Board of Trustees.


Signature

5/11/23

Date

cc: Professor Hossain Azam
Albert Pearsall, President, UDCFA
Lorinnsa Bridges-Kee, Vice President of Human Resources

Hossain M Azam

E-mail: hossain.azam@udc.edu

EDUCATION

- PhD, Environmental Engineering** **May 2012**
University of Illinois at Urbana-Champaign (UIUC), Urbana, IL
- Master of Science, Civil Engineering** **August 2007**
Specialized in Water Resources and Environmental Eng.
North Carolina State University (NCSU), Raleigh, NC
- Bachelor of Science, Civil Engineering** **February 2003**
Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

PROFESSIONAL LICENSE

- Fundamentals of Engineering Exam (EIT) (Passed) **April 2007**
Professional Engineering (PE) License Exam (Passed-Michigan) **October, 2018**
(DC License application is under review)

TEACHING EXPERIENCE

- **Assistant (Tenure Track) Professor of Environmental Engineering** **Aug 2019– Present**
Dept. of Civil Engineering
University of the District of Columbia (UDC), Washington, DC
- Undergraduate Courses:**
- a. Civil Engineering Materials Lecture & Lab: Spring 2022
 - b. Hydrology and Hydraulics (Junior Course): Fall 2019, 2020, 2021, 2022
 - c. Hydrology and Hydraulics Lab (Junior Course): Fall 2019, 2020, 2021, 2022
 - d. Environmental Engineering and Science (Senior): Fall 2019, 2020, 2021, 2022
 - e. GIS Fundamentals and Eng. Applications (Sophomore): Spring 2020, 2021, 2022
 - f. CE Senior Project (Capstone Project)-Environmental Engineering: AY 2021-2022
 - g. Fundamental of Eng. Preparation-Environmental Engineering: Spring, 2022
 - h. Research-Professional Practice Course-Environmental Engineering: Fall, 2021
- Graduate Courses:**
- a. Environmental Engineering and Science: Fall 2019, 2020, 2021
 - b. Water and Wastewater Engineering: Spring 2020, 2022
 - c. Environmental Microbiology and Biotechnology: Spring 2021
 - d. Environmental Chemistry: Fall 2021
 - e. Energy and the Environment: Fall 2022

ABET accreditation (UDC): Conducted and continuously conducting assessment and evaluation of courses for **ABET accreditation** of the civil engineering program. This is based on program objectives and related student outcomes, with the goal of pursuing continuous improvement.

Guest Lecture: Dr. Robert Bornhofen (DC Water, Fall, 2021); Mr. Joseph Cleary, P.E. (Geosyntec, Fall, 2022), Dr. Valentina Aquila (American University, Fall, 2022)

Wastewater Treatment Plant Visit: Noman M Cole Pollution Control Plant, Fairfax, VA, Fall, 2021

TA Advising: Stephanie Fuentes and Andrae Harris

▪ **Assistant (Tenure Track) Professor**

Dept. of Civil and Environmental Engineering
Manhattan College (MC), Riverdale, Bronx, New York City, NY

Aug 2014 – June 2019

Undergraduate Courses:

- a. Introduction to Engineering (Freshman Course): Fall 2015
- b. Introduction to Engineering Computation (Freshman Course): Spring 2015, 2016, 2017
- c. Environmental Engineering Principles I (Sophomore Course): Fall 2016, 2017, 2018, Spring 2019
- d. Fluid Mechanics (Sophomore/Junior Level Course): Spring 2018
- e. Energy and the Environment (Junior Level Course): Fall 2014, 2015, 2018, Spring 2015, 2016

Graduate Courses:

- a. Water Chemistry [Aquatic and Sediment Chemistry]: Fall 2014
- b. Environmental Chemistry: Fall 2015, 2016, 2017, 2018
- c. Environmental Biotechnology: Spring 2017, 2018

ABET accreditation: Conducted assessment and evaluation of courses for **ABET accreditation** of the civil and environmental engineering program. This was based on program objectives and related student outcomes, with the goal of pursuing continuous improvement.

▪ **Visiting Assistant Professor and Adjunct Professor/Post-Doctoral Scientist**

Dept. of Civil and Environmental Engineering
George Washington University (GWU), Washington, DC [Affiliation: DC Water]

Jan 2013 – Aug 2014

Undergraduate Courses:

- a. Environmental Engineering I (Water Resources and Water Quality): Spring 2013
- b. Environmental Engineering Laboratory: Spring 2013, 2014
- c. Introduction to Geo-environmental Engineering: Spring 2014

Graduate Courses:

- a. Microbiology for Environmental Engineers: Spring 2013, 2014
- b. Environmental Chemistry: Fall 2013
- c. Industrial Waste Treatment: Fall 2013

ABET accreditation: Conducted assessment and evaluation of courses for **ABET accreditation** of the civil engineering program. This was based on program objectives and related student outcomes, with the goal of pursuing continuous improvement.

▪ **Graduate Teaching Assistant**

Dept. of Civil and Environmental Engineering
University of Illinois at Urbana-Champaign (UIUC)

Spring 2011

Course: "Engineering Risk and Uncertainty"; Approx. 130 students.

▪ **Graduate Teaching Assistant**

Dept. of Civil and Environmental Engineering
University of Illinois at Urbana-Champaign (UIUC)

Fall 2007 & 2010

Course: "Introduction to Environmental Engineering and Science"; Approx. 80 students.

▪ **Graduate Teaching Assistant**

Dept. of Civil, Construction and Environmental Engineering
North Carolina State University (NCSU)

Fall 2006

Course: "Hydrology and Urban Water Systems"; Approx. 50 students.

▪ **In-Class Teaching and Lecture Preparation (UIUC): Selected Lectures**

Aug 2007-Aug 2011

Water Quality Control Proc II: Wastewater
Water Quality Engineering

Biological Principles of Environmental Engr.
Introduction to Environmental Engineering

▪ **Lecturer**

Dept. of Civil Engineering

Feb 2003-July 2005

Univ. of Asia Pacific (UAP) & Military Institute of Sc. & Technology (MIST), Bangladesh

Selected Environmental Engineering Courses: Environmental Pollution and its Control, Fluid Mechanics, Environmental Lab & Hydraulics Lab.

Other Courses: Engineering Materials, Engineering Geology and Geomorphology, Mechanics of Solids, Structural Analysis I, Geotechnical Engineering, Project Planning and Management

Key Responsibilities of Teaching Experience:

- Currently teaching 5 undergraduate courses and 5 graduate courses related to water resources and environmental engineering at UDC as tenure track Assistant Professor.
- Currently working as “Course Advisor” for at least 5 undergraduate students at UDC.
- Developed and taught 5 undergraduate/3 graduate civil and environmental engineering courses at Manhattan College as tenure track Assistant Professor.
- Developed and taught several graduate/undergraduate civil and environmental engineering courses at GWU in USA, as well as at UAP and MIST in Bangladesh.
- Developed and taught specific course contents for graduate and undergraduate (lecture notes, PPT, exam questions) for environmental engineering courses (e.g. ‘BIOWIN’ tutorial, Nitrification, AQUASIM modeling, Virus, Regulation of water and wastewater etc) at University of Illinois at Urbana Champaign (UIUC) as a graduate student.
- Presented lectures and explained challenging quantitative, chemical, physical and biological concepts to different level of students (undergraduate/graduate) at MC, GWU, UIUC, NCSU, UAP and MIST.
- Developed ‘term projects’, ‘assignments’; led ‘field trips’; conducted ‘office hour’, ‘grading’ etc.
- Worked in various university committees both in USA (UDC, MC, GWU, UIUC) and Bangladesh (UAP and MIST).
- Advised students personally for four semesters about course progress, future career plans and effective techniques for studying in Bangladesh.

RESEARCH EXPERIENCE

Assistant (Tenure Track) Professor of Environmental Engineering

University of the District of Columbia (UDC), Washington, DC

Dept. of Civil Engineering

Aug 2019 – Present

Summary: Started several research projects related to **Water & Wastewater Treatment** and **Water-Energy-Food-Climate nexus**. Developed an active research group at UDC. Furthermore, 4 different types of environmental engineering research laboratory are under development. Additionally, there are few active collaborative projects ongoing within and outside of USA. Several current active research projects are anaerobic digestion/co-digestion with CH₄ & H₂ recovery, struvite inhibition/dissolution with recovery, life cycle sustainability assessment (LCSA) of aquaponics and hydroponics, rainwater harvesting and solar energy for next generation urban farming practices, educational grant connecting with UDC and DC public schools. Working on several proposals, got several funded (1.03 million as PI and 4.64 million as Co-PI) and submitted several unsuccessful proposals. Recently funded projects are from National Science Foundation (NSF), Department of Defense (DoD), United States Department of Agriculture (USDA), National Aeronautics and Space Administration (NASA), Water Research Resources Institute (WRRI), Propel Center (Apple).

Currently advising 1 full time PhD student and 2 PhD level part time students (co-advising), 4 MSc level students (1 co-advising) and 9 undergraduate students (STEM Center, NSF Nanotechnology Center and NASA-MIRO funded) during Fall, 2022 for their research effort at UDC.

- Current Full Time PhD Student in Computer Science and Engineering: Stephanie Fuentes
- Current Part-Time PhD Students in Urban Leadership & Entrepreneurship (Co-Advisor): Michael Somersall and Emi Kameyama
- Current MSc Students: Assefa Tadesse (Civil), Jonas Lee (Civil), Andrae Harris (Civil) and Annabelle Arnold (CAUSES, Co-Advising)
- Former MSc Students: Meron Uregessa (Civil), Dylan Mehri (CAUSES, Co-Advising)

- Undergraduate Students Advised under Lockheed Martin Fellowship: Richmond Lin Calapano and Kalkidan Ayele
- Undergraduate Students Advised under “Research-Professional Practice Course”: Lirane Kertes Mandjouna, Richmond Lin Calapano and Natinael Zaga
- Successful Mentoring and Transition of Students to Higher Studies:
 - MSc Student to PhD Student-Stephanie Fuentes
 - Undergraduate Students to MSc Students-Assefa Tadesse, Andrae Harris and Lirane Kertes Mandjouna (to be started from Spring, 2023)
 - Volunteer to MSc Student-Nazia Nowshin (to be started from Spring, 2023)

Projects/Proposals (funded and ongoing at UDC):

Project/Proposal 01 (TOTAL: \$148,612):

a) Use of life cycle sustainability assessment (LCSA) to measure environmental, economic, and societal impacts of aquaponics and hydroponics, **Hossain Azam (PI)**, Sponsor: The United States Department of Agriculture (USDA)-National Institute of Food and Agriculture (NIFA), Funding duration: 02/01/21-09/30/23, Status: Funded (\$90,000) &

b) Quantification of environmental, economic, and societal impacts of specialty crops grown in aquaponics and hydroponics, **Hossain Azam (PI)**, Sponsor: The United States Department of Agriculture (USDA)-Specialty Crop Block Grant Program–Farm Bill (SCBGP-FB), Funding duration: 02/01/22-01/31/24, Status: Funded (\$58,612)

Project/Proposal 02 (TOTAL: \$135,112):

a) Food-Energy-Water (FEW) Nexus: Using Rainwater Harvesting and Solar Energy for Next Generation Urban Farming Practices, **Hossain Azam (Co-PI)**, Sponsor: The United States Department of Agriculture (USDA)-National Institute of Food and Agriculture (NIFA), Funding duration: 02/01/21-09/30/23, Status: Funded (\$90,000) &

b) Food-Energy-Water (FEW) Nexus: Next Generation Urban Farming Practices to Integrate Specialty Crop Production with Rainwater Harvesting and Solar Energy, **Hossain Azam (PI)**, Sponsor: The United States Department of Agriculture (USDA)-Specialty Crop Block Grant Program–Farm Bill (SCBGP-FB), Funding duration: 02/01/22-01/31/24, Status: Funded (\$45,112)

Project/Proposal 03: NSF Major Research Instrumentation: Acquisition of Dual Beam FIB/SEM to Enable New Capability for Research, Education and Training at UDC [Biodegradable chelating agent assisted inhibition and dissolution of struvite and vivianite for subsequent recovery as fertilizers at water resources recovery facilities (WRRFs)/ FIB/SEM Characterization of Precipitation Quality of Bio-Mediated Soil] **Hossain Azam (Co-PI)**, Sponsor: National Science Foundation (NSF), Funding duration: 07/01/20-06/30/21, Status: Funded (\$511,707)

Project/Proposal 04: GPU Accelerated Micro-CT Imaging System for Research and Education [GPU Accelerated Micro-CT Imaging of Mineral Precipitation Growth in Bio-Mediated Soil], **Hossain Azam (Co-PI)**, Sponsor: Department of Defense (DoD), Funding duration: 07/01/21-06/30/22, Status: Funded (\$389,000)

Project/Proposal 05: Impact of high strength wastes (HSW) co-digestion with sludges on the performance of lab-scale anaerobic digesters and biogas methane potential (BMP) assays with potential to generate H₂, **Hossain Azam (PI)**, Sponsor: Water Research Resources Institute (WRI), Funding duration: 03/01/20-12/31/21, Status: Funded (\$9,933)

Project/Proposal 06: Performance evaluation of membrane bioreactor (MBR) in sustainable buildings for potable water in DC area, **Hossain Azam (Co-PI)**, Sponsor: Water Research Resources Institute (WRI), Funding duration: 03/01/20-12/31/21, Status: Funded (\$9,980)

Project/Proposal 07: Next Generation Modeling Techniques for Determining N & P from Point & Non-Point Sources and for Predicting & Controlling Harmful Algal Blooms (HAB) in the Chesapeake Bay Watershed, **Hossain Azam (Co-PI)**, Sponsor: Water Research Resources Institute (WRI), Funding duration: 03/01/21-02/28/22, Status: Funded (\$14,968)

Project/Proposal 08: Removal of Estrogens and Antibiotics by Innovative Treatment Technologies and Determination of Their Effects on Planarians, **Hossain Azam (PI)**, Sponsor: Water Research Resources Institute (WRRI), Funding duration: 03/01/21-02/28/22, Status: Funded (\$14,949)

Project/Proposal 09: NSF Major Research Instrumentation: Acquisition of a new X-Ray Diffractometer to advance research and education in Primarily undergraduate/minority serving institutions within the District of Columbia [Alternative Mineral Precipitation Techniques for Bio-mediated Ground Improvement Utilizing Anaerobic Digestion (AD) Effluent of Water Resources Recovery Facility (WRRF)] **Hossain Azam (Senior Personnel)**, Sponsor: National Science Foundation (NSF), Funding duration: 09/01/21-08/31/22, Status: Funded (\$324,627)

Project/Proposal 10: PROPEL UDC: A Diverse Pipeline of Agrotechnology Talents for Urban Innovation and Entrepreneurship in Anacostia Schools and Ward 08 of Washington, DC. **Hossain Azam (Co-PI)**, Sponsor: Apple Inc, Funding duration: 01/01/22-12/31/22, Status: Funded (\$300,000)

Project/Proposal 11: Acquisition of LC-MS/MS to Accelerate Multidisciplinary Research, Education and Training Capabilities at UDC, **Hossain Azam (PI)**, Sponsor: Department of Defense (DoD), Funding duration: 07/16/22-07/15/23, Status: Funded (\$403,978)

Project/Proposal 12: Aquaponics with ethylene scavengers to support human life off Earth, **Hossain Azam (PI)**, Graduate Student: Jonas Lee, Sponsor: National Aeronautics and Space Administration (NASA) Fellowship Proposal, Funding duration: 09/01/21-08/31/24, Status: Funded (\$100,000)

Project/Proposal 13: MIRO center- Center for advanced manufacturing in space technology and applied research extension proposal [Aquaponics with ethylene scavengers to support human life off Earth & Synergistic roles of recoverable in-situ materials to support human life off Earth], **Hossain Azam (Co-PI)**, Sponsor: National Aeronautics and Space Administration (NASA), Funding duration: 10/01/22-12/31/24, Status: Funded (\$2,000,000)

Project/Proposal 14: Targeted Infusion Project: Integrating Water-Energy-Food-Climate Nexus into Undergraduate Engineering and Science Education, **Hossain Azam (PI)**, Sponsor: National Science Foundation (NSF), Funding duration: 08/06/22-08/15/24, Status: Funded (\$200,000)

Project/Proposal 15: Economical production of methane (CH₄) and hydrogen (H₂) and struvite recovery from agricultural waste, energy crops, and food waste, **Hossain Azam (PI)**, Sponsor: Water Research Resources Institute (WRRI), Funding duration: 03/01/22-02/28/23, Status: Funded (\$15,000)

Project/Proposal 16: HBCU-RISE: Game Theory Based Climate Change Impact Analysis for the Protection of Critical Infrastructure Systems, **Hossain Azam (Co-PI)**, Sponsor: National Science Foundation (NSF), Funding duration: 08/16/22-08/15/25, Status: Funded (\$999,711)

Project/Proposal 17: UDC-HEERF: Gas Chromatography – Mass Spectroscopic (GC-MS) Instrumentation for Enhancing Undergraduate and Graduate Education, Research and Outreach/Training at the College of Arts and Sciences (CAS) and School of Engineering and Applied Sciences (SEAS), **Hossain Azam (PI)**, Sponsor: Higher Education Emergency Relief Fund (HEERF), U.S. Department of Education, Funding duration: 2022, Status: Funded (\$85,965.14)

Proposals/Projects (submitted at UDC with decisions pending):

Project/Proposal 01: Beckman Scholars Program application (shortlisted to 25 applicants)-Worked under Dr. Song's leadership with different faculty members and staff of UDC [Biology-CAS: Carolyn Cousin, Freddie Dixon, Rosie Sneed, Samuel Waters, Mathilde Knight; Chemistry-CAS: Ozlem Dilek, Alexandria Taraboletti, Uche Udeochu, Xueqing Song; CAUSES: Matthew Richardson, Community College: Bushra Ahmad Saeed, Civil Engineering-SEAS: Hossain Azam and Mechanical Engineering-SEAS: Pawan Tyagi]

Proposals/Projects (submitted at UDC with unsuccessful attempts):

Project/Proposal 01 (Later Funded): NSF Major Research Instrumentation: Acquisition of GPU Accelerated Micro-CT Imaging System for Research and Education [GPU Accelerated Micro-CT Imaging of Mineral Precipitation Growth in Bio-Mediated Soil], **Hossain Azam (Co-PI)**, Sponsor: National Science Foundation (NSF), Funding duration: 06/22/20-06/22/21, Status: Not Funded (\$412,000)

Project/Proposal 02 (Later Funded with Different Title): HBCU-RISE: Establishment of Educational and Research Infrastructure - Sea Level Rise (SLR) Analytics Center for Coastal Communities, **Hossain Azam (Co-PI)**, Sponsor: National Science Foundation (NSF), Funding duration: 09/01/20-08/31/23, Status: Not Funded (\$999,978)

Project/Proposal 03 (Later Funded with Different Title by DC WRRI as Seed Grant and Dr. Azam as Co-PI): Next Generation Modeling Techniques for Determining N & P from Point & Non-Point Sources and for Predicting & Controlling Harmful Algal Blooms (HAB) in the US, **Hossain Azam (PI)**, Sponsor: United States Geological Survey (USGS), Funding duration: 09/01/2020-08/31/2023, Status: Not Funded (\$249,901)

Project/Proposal 04 (Later Funded with Different Title by DC WRRI as Seed Grant and Dr. Azam as Co-PI): Next Generation Modeling Techniques and Innovative Nutrient Technologies from Point & Non-Point Sources to Predict and Control Harmful Algal Blooms (HAB) in the US, **Hossain Azam (PI)**, Sponsor: Environmental Protection Agency (EPA), Funding duration: 05/18/20-05/17/23, Status: Not Funded (\$999,968)

Project/Proposal 05: Performance enhancement of current MICP, MIDP & EICP techniques with alternative mineral precipitation techniques for bio-mediated ground improvement utilizing anaerobic digestion effluent of water resources recovery facility (WRRF), **Hossain Azam (Co-PI)**, Sponsor: Water Research Resources Institute (WRRI), Funding duration: 03/01/20-02/28/21, Status: Not Funded (\$9,980)

Project/Proposal 06 (NSF-CAREER): Optimization of H₂ production with bioplastics and biodiesel recovery from co-digestion of high strength wastes (HSW) in water resources recovery facilities (WRRFs), **Hossain Azam (PI)**, Sponsor: National Science Foundation (NSF), Funding duration: 06/01/21-05/31/25, Status: Not Funded (\$549,975)

Project/Proposal 07 (NSF-CAREER): Optimization of H₂ production from co-digestion of high strength wastes (HSW) in water resources recovery facilities (WRRFs), **Hossain Azam (PI)**, Sponsor: National Science Foundation (NSF), Funding duration: 06/01/22-05/31/26, Status: Not Funded)

Project/Proposal 08 (NSF-CAREER): Optimization of H₂ production from co-digestion of high strength wastes (HSW) in water resources recovery facilities (WRRFs), **Hossain Azam (PI)**, Sponsor: National Science Foundation (NSF), Funding duration: 08/16/23-05/31/27, Status: Not Funded (\$550,000)

Project/Proposal 09: Implementation Project: Developing an Interdisciplinary Science and Technology Degree Program to Address Climate Change Through Adaptation and Mitigation, **Hossain Azam (Co-PI)**, Sponsor: National Science Foundation (NSF), Funding duration: 08/06/22-08/15/27, Status: Not Funded (\$2,297,430)

Project/Proposal 10: Utilization of geothermal energy and optimization of water and fertilizer use for year-round crop production and pollution prevention, **Hossain Azam (PI)**, Sponsor: The United States Department of Agriculture (USDA)-National Institute of Food and Agriculture (NIFA), Funding duration: 01/01/22-09/30/24, Status: Not Funded (\$90,000)

Project/Proposal 11: Next generation materials to optimize both methane (CH₄) and hydrogen (H₂) production economically from agricultural waste, energy crops, and food waste, **Hossain Azam (PI)**, Sponsor: The United States Department of Agriculture (USDA)-National Institute of Food and Agriculture (NIFA), Funding duration: 01/01/22-09/30/24, Status: Not Funded (\$90,000)

Project/Proposal 12: Multi-Criteria Decision Support Framework and Planning Level Analysis Tool to Evaluate Cost Effective Enhanced Aquifer Recharge (EAR), **Hossain Azam (PI)**, Sponsor: Environmental Protection Agency (EPA), Funding duration: 07/01/22-06/30/25, Status: Not Funded (\$1,999,847)

Project/Proposal 13: Resilient Innovation Laboratory-Green Corridor on UDC Campus, **Hossain Azam (Co-PI)**, Sponsor: DC Department of Energy and Environment (DC DOEE), Funding duration: 08/01/22-09/30/23, Status: Not Funded (\$1,000,200)

Project/Proposal 14: Effects of post-processing on stabilization and mobility of per- and polyfluoroalkyl substances (PFAS) and PFAS precursors in biosolids, Hossain Azam (PI), Sponsor: Water Research Foundation (WRF), Funding duration: 08/15/22-08/14/24, Status: Not Funded (\$256,750)

Assistant (Tenure Track) Professor

Manhattan College, Riverdale, Bronx, NYC, New York

Dept. of Civil and Environmental Engineering

Aug 2014 – June 2019

Summary: Completed several internally and externally funded research projects related to **Water & Wastewater Treatment** and **Water-Energy-Food nexus**. Developed an active research group at Manhattan College. There were few active collaborative projects within and outside of USA. Total Funding (\$277,600). Advised 9 graduate students (4 are part-time) and 7 undergraduates at MC.

Four Completed Projects (Manhattan College):

Project/Proposal 01: *Short cut nitrogen removal process evaluation for MSW landfill leachate treatment*, **Hossain Azam (PI)**, Sponsor: Geosyntec Consultants, USA & Waste Management (WM), Funding duration: January, 2017-August, 2018, Status: Completed (\$60,000)

Project/Proposal 02:

a) *Kinetic studies to optimize chemical dissolution and inhibition of common and exotic oilfield scales*, **Hossain Azam (Co-PI)**, Sponsor: American Chemical Society Petroleum Research Fund (ACS PRF), Funding duration: September, 2015-August, 2018, Status: Completed (\$55,000)

b) *Precipitation, inhibition and dissolution characteristics of important phosphate minerals (struvite and vivianite) and their recovery potential in water and wastewater systems*, **Hossain Azam (PI)**, Sponsor: Start-up funding/Internal summer grant of Manhattan College (Ongoing at UDC).

Project/Proposal 03: *Effects of co-digestion on energy production at a NY wastewater treatment plant*, **Hossain Azam (PI)**, Sponsor: Start-up funding of Manhattan College and Energy Systems Group (ESG) (completed). A supplementary food waste/FOG project of another wastewater treatment plant, **Hossain Azam (Co-PI)**, Sponsor: Hazen and Sawyer (ongoing) (\$16,000 + Materials/logistical support + Start-up Grant)

Project/Proposal 04: *Disinfection (sterilization) of microorganisms together with degradation of emerging contaminants in hydroponic systems using photosensitizers*, **Hossain Azam (PI)**, Sponsor: Korean Institute of Science and Technology (KIST), Funding duration: October, 2015-September, 2018 (completed) (\$66,600)

Collaborative Projects (Completed):

A) Projects with Geosyntec Consultants, USA and Waste Management: Hossain Azam (PI)- \$80,000

- *Short-term industrial project 01 (completed):* Tracer study of an industrial wastewater treatment plant (pulp and paper industry).
- *Short-term industrial project 02 (completed):* Identification of optimum chemical dosages for the

treatment of color and TSS on the raw leachate and SBR decant sample of two landfill leachate treatment plants (two different projects).

- *Short-term industrial project 03 (completed)*: Biological treatability of landfill leachate to reduce CBOD₅, sCOD & ammonia and troubleshooting poor performance of their leachate treatment plants (two different projects).
- *Short-term industrial project 04 (completed)*: Zinc treatability of wastewater from a hauling station.
- *Short-term industrial project 05 (completed)*: Bio-evaluation of NO₂⁻ accumulation in a leachate treatment plant.
- *Short-term industrial project 06 (completed)*: Arsenic removal study of two different leachate treatment plant.

B) Projects with Bradley University, IL, USA: Hossain Azam (Co-PI)

- *Research project (completed)*: Fate and formation mechanism of polycyclic aromatic hydrocarbons (PAHs) in asphalt concrete pavement using molecular dynamic (MD) simulation.

C) Projects with University of Asia Pacific (UAP), Bangladesh: Hossain Azam (Co-PI)

- *Research project 01 (completed)*: Food contamination and adulteration in Bangladesh.
- *Research project 02 (completed with UAP, ongoing at UDC)*: Life cycle assessment of water and wastewater treatment.

D) Projects with the City College of New York, USA: Hossain Azam (Co-PI)

- *Research project 01 (ongoing at UDC)*: Aiding food and water security utilizing climate informed predictive systems.

E) Projects with the State University of New York (SUNY), Canton, USA (energy/building): Hossain Azam (Co-PI)

- *Research project 01 (ongoing at UDC)*: Effects of prime movers in combined cooling, heat and power (CCHP) systems on energy efficiency in different buildings.

F) Projects with Korean Institute of Science and Technology (KIST), Korea (wastewater/food): Hossain Azam (Co-PI)

- *Research project 01 (completed)*: Nutrient monitoring and nutrient removal from hydroponic systems.

Visiting Assistant Professor and Adjunct Professor/Scientist

George Washington University, Washington, DC [Affiliation: DC Water]

Dept. of Civil and Environmental Engineering

Jan 2013 - Aug 2014

Summary: Worked at DC Water on funded projects with the PI, Prof. Riffat. Performed pilot and full scale wastewater treatment plant research at DC Water (Blue Plains Advanced Wastewater Treatment Plant, Washington, DC). Worked as a member of high rate carbon team in DC Water research lab to maximize COD adsorption for energy optimization, minimize oxygen use and mitigate odor problems in activated sludge process. Additionally, worked on pilot aeration reactor to investigate the fouling characteristics and efficiency of fine/coarse bubble diffusers to minimize energy use in aeration process. Led the effort of sequencing batch reactors for testing COD adsorption to biomass, modeling, LABVIEW and other performance based tests such as OUR test, decay test, adsorption test, hydrolysis test, rhodamine-bicarbonate test, odor test etc. Worked actively with four PhD students and mentored several undergraduate students at DC Water.

Graduate Research Assistant/Post-Doctoral Research Associate

University of Illinois at Urbana-Champaign, Urbana, IL

Dept. of Bioengineering and Micro and Nanotechnology Lab. (MNTL) **Sep 2011- Feb 2012 (RA)**
Feb 2012- Dec 2012 (Post-Doc)

Summary: Application of IR and Raman spectroscopy for environmental/agricultural engineering problems. Worked on several environmental/agricultural engineering (food) projects (Compositional analysis of soybean grain by transmission Raman spectroscopy, IR imaging of soybean SDS toxin, Effects of TGF β and BPA on human prostate tissue). Also explored and identified research ideas and solutions for phosphorus removal & recovery from wastewater, membrane processes for drinking water & wastewater treatment, algae for wastewater treatment, photo catalysis, solar energy utilization etc together with IR and Raman spectroscopy as investigative tools.

Graduate Research Assistant (PhD Research)

University of Illinois at Urbana-Champaign, Urbana, IL

Dept. of Civil and Environmental Engineering

Aug 2007–Aug 2011

PhD Project: Phosphorus removal in retrofitted on-site anaerobic wastewater systems by stimulating Fe (III) reduction: insoluble mineral precipitation (vivianite)

Research Project (Short Term): RDX remediation from groundwater and sediment

Summary: Researched anaerobic processes of wastewater treatment specially focusing on the effects of iron reduction processes on carbon oxidation, microbial diversity and phosphorus removal using chemical and biological tools. Additionally, developed a model system for phosphorus removal as vivianite (iron mineral) for different types of iron compounds.

Techniques/Instrumentation: Used radiolabelled ^{14}C carbon molecules, Applied molecular tools such as Q-PCR, ARDRA and Identified vivianite minerals using TEM-EDS, FTIR and XRD in addition to basic wastewater assays. Hands on experience of using GC (TCD and FID), GC-GPC, Scintillation Counter, LC-MS, HPLC, IC, TOC Analyzer, Anaerobic Gassing Stations, Anaerobic Glove Bag, etc.

Applications: Design of water and wastewater treatment processes, anaerobic digestion/treatment, nutrient removal, treatment of emerging contaminants, phosphorus and energy recovery (struvite, methane), corrosion and scaling, groundwater remediation design, etc.

Proposal/Graduate Student Grant: *Pharmaceuticals Removal from Onsite Wastewater System, Hossain Azam (PI)*, Development Proposal, Illinois-Indiana Sea Grant, 2010 (\$6000)

Graduate Research Assistant (MSc Research)

North Carolina State University, Raleigh, NC

Dept. of Civil, Construction and Environmental Engineering

Aug 2005–July 2007

MSc Project: Oxidation of methane in landfill covers: a strategy to maximize energy revenue

Research Project (Short Term): Chemical/biological performance analysis of bioreactor landfills

Summary: Performed laboratory assessments of landfill biocovers to evaluate its methane oxidation potential in different pressure gradient, moisture and variable flow of landfill gases produced. Also studied the effects of varying climate and gas collection vacuum through field evaluation of landfill biocover to maximize energy revenue. Additionally, worked on a EPA project about performance evaluation of five North American bioreactor landfills addressing biological and chemical aspects of bioreactor performance (includes gas production and management, leachate quality).

Laboratory Experiences: Designed experimental setup, built laboratory columns with necessary connections, prepared biocover, operated methane flow/monitored methane oxidation potential etc.

PUBLICATION (PEER REVIEWED) PUBLISHED AT UDC

- Bolen, T.J.; Hasan, M.; Conway, T.; Yameogo, D.; Sanchez, P.; Rahman, A. & Azam, H. (2022). Feasibility assessment of biogas production from the anaerobic co-digestion of cheese whey, grease interceptor waste and pulped food waste for WRRF. *Energy*. 254. 124144. 10.1016/j.energy.2022.124144.
- Deksissa, T.; Trobman, H.; Zendejdel, K.; Azam, H. Integrating Urban Agriculture and Stormwater Management in a Circular Economy to Enhance Ecosystem Services: Connecting the Dots. *Sustainability* 2021, 13, 8293. <https://doi.org/10.3390/su13158293>

- Majed, N; Real, M; Redwan, A and **Azam, H** (2021) *How dynamic is the heavy metals pollution in the Buriganga River of Bangladesh? A spatiotemporal assessment based on environmental indices*, International Journal of Environmental Science and Technology (<https://doi.org/10.1007/s13762-021-03434-8>)
- Kwon, M. J.; Hwang, Y.; Lee, J.; Ham B.; Rahman, A.; **Azam, H.** and Yang, Jung-Seok (2021) *Waste nutrient solutions from full-scale open hydroponic cultivation: Dynamics of effluent quality and removal of nitrogen & phosphorus using a pilot-scale sequencing batch reactor*, J. of Env. Management, 281, 111893

PEER REVIEWED BOOK CHAPTERS AS TENURE TRACK PROFESSOR AT UDC

- Gamwo, I. K.; Azam, H. and Baled, H. O. (2022), *Produced Water Treatment Technologies: An Overview*, Chapter 1, Solid–Liquid Separation Technologies-Applications for Produced Water, 1st Edition, CRC Press (eBook ISBN-9781003091011), DOI:10.1201/9781003091011-1
- Azam, H.; Rahman, A.; Hasan, M.; Botero, L. and L. Mandjouda (2021), *Renewable Energy in Water Resource Recovery Facilities (WRRFs)*, Chapter 11, MOP 32 (WEF Manual of Practice, 32), *Energy in Water Resource Recovery Facilities*, 2nd Edition

LIST OF PUBLICATION (JOURNAL ARTICLES) [COMPLETED/PENDING SUBMISSION]

- Real, M; Conway, T; Hasan, M.; Bolen, T; Panayiotou, T; Weeks, A; Horai, E; Tah, T; Stephanie, F; Rahman, A; Rohan, M.; Cleary, J, **Azam, H** (2022) *Optimization of physical (Odor), chemical (As, Zn, Color) & biological (COD, NH₃) treatment of landfill leachate* (Manuscript complete, pending revision & submission)
- **Azam, H**; Ishtiaq, F; Eyob, A.; William, T., Roman, K (2022) *Impact of climate zones on selection of prime mover in combined cooling, heating, & power systems* (Manuscript complete, pending revision, submission)
- Hossain, M. I; Yadavalli, J. P. S.; Pan, J and **Azam, H** (2022) *Leaching Potential of polycyclic aromatic hydrocarbons from asphalt concrete pavements due to environmental and mechanical condition* (Manuscript complete, pending revision and submission)
- Kannan, A; Real, K; Stephanie, F; Calapano, R; Conway, T; Carbonaro, R and **Azam, H** (2022) *Dissolution of struvite from wastewater systems* (Manuscript complete, pending revision and submission)
- Roman, K; Ishtiaq, F.; Talukdar, M.; Islam, M.A.S and **Azam, H** (2022) *A Study of Combined Cooling, Heating, and Power System Integrating Thermal Energy Storage System in the Context of Life Cycle Impact Assessment* (Manuscript complete, pending revision and submission)
- Husnain, T.; Berkheimer, J.; **Azam, H.**; Bhattacharjee, S.; Hanna, C. and Choudhury, M. R. (2022) *Application of membranes in the reclamation of anaerobically treated wastewater* (Manuscript almost complete)

LIST OF PUBLICATION (BOOK CHAPTERS) [COMPLETED/PENDING REVIEW]

- **Azam, H** (2022), Editor, *PFAS in the Water and Wastewater Sectors: Fundamentals, Management and Treatment*, Water Environment Federation (WEF) (Book complete, pending revision & print)
- **Azam, H.**, 2022, Lead Author, Chapter 01- Introduction to PFAS and PFAS Chemistry, WEF PFAS BOOK on “PFAS in the Water and Wastewater Sectors: Fundamentals, Management and Treatment” (Chapter complete, pending revision & print)
- **Azam, H.**, 2022, Co-Author, Chapter 03- PFAS Toxicology for Water and Wastewater, WEF PFAS BOOK on “PFAS in the Water and Wastewater Sectors: Fundamentals, Management and Treatment” (Chapter complete, pending revision & print)
- **Azam, H.**, 2022, Co-Author, Chapter 09- Liquid and Solid Phase Treatment Overview, WEF PFAS BOOK on “PFAS in the Water and Wastewater Sectors: Fundamentals, Management and Treatment” (Chapter complete, pending revision & print)

MSc THESIS AS TENURE TRACK PROFESSOR AT UDC

- Fuentes, S. (2022) Sustainable Wastewater Treatment: Biochemical Methane Production through Anaerobic Digestion of Unconventional Organic Waste, Faculty Advisor: Azam, H, MSc Thesis, UDC

MSc PROJECT AS TENURE TRACK PROFESSOR AT UDC

- Ureggessa, M. (2020), Benefits of Wastewater Process Modeling (Bio Win , ASM1, ASM2 and ASM3) for Planning, Project Development, and Management, Faculty Advisor: Azam, H, MSc Project, UDC

MORE PUBLICATION (PEER REVIEWED) AS A TENURE-TRACK ASST. PROFESSOR

- Hossain, M. I.; Yadavalli, J. P. S.; Pan, J and **Azam, H** (2019) *Molecular dynamics simulation approach to identify release of Polycyclic Aromatic Hydrocarbons (PAHs) from asphalt concrete pavements due to mechanical and environmental factors*, Journal of Transportation Engineering, Journal of Transportation Engineering, Part B: Pavements, Volume 145 Issue 3 - September 2019 (Joint Project)
- Coll, D; Horai, E; Real, M. I.; Castro, S; Dunn, F.; Gunawan, G.; **Azam, H** & Wilson, J (2019) *Chemical dissolution of oilfield strontium sulfate (SrSO₄) scale by chelating agents*, Applied Geochemistry, 106 (2019), 134-141 (Azam, H and Wilson, J are corresponding authors) (Joint Project)
- **Azam, H**; Alam, S T; Hasan, M; Stéphane, D. D.; Kannan, A; Rahman, A and Kwon, M (2019) *Phosphorous in the Env.: Characteristics with Distribution and Effects, Removal Mechanisms, Treatment Technologies, and Factors Affecting Recovery as Minerals in Natural and Engineered Systems*, Env. Sci. Pollut. Res. Int. 2019 Jul;26(20):20183-20207. doi: 10.1007/s11356-019-04732-y. Epub 2019, May 22.
- Lee, J; Rahman, A; Behrens, J; Brennan, C; Ham, B, Kim, H; Nho, J; **Azam, H** and Kwon, M (2018) *Nutrient removal from hydroponic wastewater by a microbial consortium and a culture of Paracercomonas saepeantans*, New Biotechnology, Volume 41, 25 March 2018, Pages 15-24, <https://doi.org/10.1016/j.nbt.2017.11.003> (Joint Project)
- Real, M; **Azam, H** and Majed, N (2017) *Heavy metal contaminated food consumption and associated risks in Bangladesh*, Environmental Monitoring & Assessment, 189: 651, Springer International Publishing (Published: <https://doi.org/10.1007/s10661-017-6362-z>) (Joint Project)
- Lee, JY; Rahman, A; **Azam, H**; Kim, HS and Kwon, MJ (2017) Characterizing nutrient uptake kinetics for efficient crop production during *Solanum lycopersicum* var. *cerasiforme* Alef. growth in a closed indoor hydroponic system. *PLoS ONE* 12(5): e0177041. <https://doi.org/10.1371/journal.pone.0177041> (Joint Project)
- Majed, N.; Real M.; Akter, M. and **Azam, H** (2016) *Food adulteration and bio-magnification of environmental contaminants: a comprehensive risk framework for Bangladesh*, Review paper, Frontiers in Environmental Science, Volume 04, Article 34, doi: 10.3389/fenvs.2016.00034 (Joint Project)

MORE PUBLICATION (PEER REVIEWED) AS A VISITING PROFESSOR/STUDENT

- **Azam, H** and Finneran, K (2014) *Fe(III) Reduction-mediated phosphate removal as vivianite (Fe₃(PO₄)₂.8H₂O) in septic system wastewater*, Chemosphere, Vol. 97, 1-9
- **Azam, H** and Finneran, K (2013) *Ferric iron amendment increases Fe(III)-reducing microbial diversity and carbon oxidation in on-site wastewater systems*, Chemosphere, Vol. 90, Issue 4, 1435-1443.
- Schumerich, M; Gelber, M; **Azam, H**; McKinney, J; Thompson, D; Harrison, S; Kull, L and Bhargava, R (2013) *Amino acid quantification in bulk soybeans by transmission Raman spectroscopy*, Analytical Chemistry, 85, 11376-11381.
- Barlaz, M; Bareither, C; **Azam, H**; Saquing, J; Mezzari, I; Benson, C; Tolaymat, T; and Yazdani, R (2010) *Performance of North American bioreactor landfills.II: chemical and biological characteristics*, J of Environmental Engineering, ASCE, August 10, Vol. 136, No. 8, pp 839 – 853.
- **Azam, H** and Amanat, K (2005) *Effect of infill as a structural component on the column design of Multi-storied building*, UAP Journal of Civil and Environmental Eng., Vol1, No1, March 05, ISSN 1813-1093.

LIST OF PUBLICATION (CONFERENCES)

- Ishtiaq, F.; Islam, M.A.S; Roman, K and **Azam, H** (2022) Current Status and Applications of Renewable Energy in Agriculture: Global and Bangladesh Perspective, Conference on Energy, Climate Change and Sustainable Development in Bangladesh, BAPA-BEN Annual Conference-2022
- Ishtiaq, F.; Roman, K and **Azam, H** (2022) Renewable Energy in Buildings of Bangladesh: A Nano-grid Approach, Conference on Energy, Climate Change and Sustainable Development in Bangladesh, BAPA-BEN Annual Conference-2022
- Kannan, A; Real, K; Conway, T; Carbonaro, R and **Azam, H** (2018) *Chelating agent-assisted inhibition and dissolution of struvite for subsequent recovery: experimental and modeling analysis*, WEFTEC, 2018, New Orleans, LA
- Bolen, T; Conway, T; Rahman, A and **Azam, H** (2017) *Co-digestion of “cheese Whey” as food waste with primary or waste activated sludge maximizes the biogas production*, World Environment & Water Resources Congress, ASCE EWRI (Abstract submission ID#263056, abstract accepted, paper submitted on 01/20/2017 and presented in the EWRI conference on May, 2017)
- Roman, K; Alvey, J; Tvedt, W and **Azam, H** (2017) *Effect of prime movers in CCHP systems for different building types on energy efficiency*, Proceedings of the International Conference on Power Engineering, American Society of Mechanical Engineers (ASME), PowerEnergy2017, June 26-30, 2017, Charlotte, NC, USA (Abstract submission ID#263056, abstract accepted, paper submitted on 11/21/2016 and presented in the ASME conference on June, 2017)
- Hossain, M; Yadavalli, J; **Azam, H** and Pan, J (2017) *Release of polycyclic aromatic hydrocarbon from hot-mix asphalt pavements*, International Conference on Highway Pavements & Airfield Technology, ASCE T&DI, (Abstract submission ID#232479, abstract accepted, paper submitted on 12/9/2016 and presented in the ASCE T&DI conference on June, 2017)
- Yadavalli, J; Hossain, M; **Azam, H** and Pan, J (2017) *Influence of climatic conditions on releasing polycyclic aromatic hydrocarbons from asphalt concrete pavements*, World Environment & Water Resources Congress, ASCE EWRI, (Abstract submission ID#249203, abstract submitted on 10/16/2016 and presented in the EWRI conference on May, 2017)
- **Azam, H** and Finneran, K (2012) *Iron reduction mediated increases in carbon oxidation and phosphorus removal in on-site wastewater systems*, WEFTEC, 2012, New Orleans, LA
- Anam, I and **Azam, H** (2006) *Seismic behaviour of non-linear RC frames with masonry infills*, 10th East Asian Structural Engineering Conference, August 06, Bangkok, Thailand
- Ferdousi, S; **Azam, H**; Abdullah, K and Hossain, M (2005) *Institutional development and people’s participation of the catchment area of Baggar Dona river*, International River symposium 05, Australia

BOOK CHAPTERS (PUBLISHED) AS TENURE TRACK PROFESSOR BEFORE UDC

- Roman, K; Hasan, M and **Azam, H** (2018) *Selection of Prime Mover for CCHP system based on energy, economics and environmental parameters*, Book Chapter (Published), Energy Systems and Environment, ISBN 978-953-51-6008-3
- Real M.I.H., Redwan A., Shourov M.M.R., **Azam H.**, Majed N. (2019) *Heavy Metal Contamination in Environmental Compartments of Buriganga River in Dhaka City*. In: Pradhan B. (eds) GCEC 2017. GCEC 2017. Lecture Notes in Civil Engineering, vol 9. Springer, Singapore

PLATFORM PRESENTATIONS (INVITED)

- **Invited platform presentation (virtual)** on “Sustainable Wastewater Treatment: Resources Recovery as Methane and Struvite from Next Generation Anaerobic Digestion Systems”, Hossain Azam, Michigan Technological University, April 04, 2022

- **Invited platform presentation (virtual)** on “*Sustainable Wastewater Treatment: Resources Recovery as Methane and Struvite from Next Generation Anaerobic Digestion Systems*“, Hossain Azam, Maryland Society of Professional Engineers (MD-SPE), Potomac Chapter, April 28, 2022
- **Invited platform presentation** on “*Optimization of chemical, physical and biological treatment of leachate through laboratory bench scale treatability studies*“, Hossain Azam, Timothy Conway, Md. Isreq Real, Thomas Bolen, Thrasivoulos Panayiotou, April Weeks, Edward Horai, Tapashree Tah and Joe Cleary, Water Environment Federation Technical and Exhibition Conference, Sept 29-October 03, 2018.
- **Invited platform presentation** on “*Sustainable Wastewater Treatment: Applications of Innovative Techniques, Process Control Strategies and Analytical Tools*“ **Hossain Azam**, American Academy of Environmental Engineers and Scientists (AAEES) Breakfast at the NYWEA annual conference, 2018.
- **Invited platform presentation** on “*Environment-Engineering Perspective with Specific Focus on Treatment*” by **Hossain Azam**, International Conference on Business and Applied Sciences Academy of North America, NYC, NY, August, 2016.

PLATFORM PRESENTATIONS

- **Platform presentation** on “*Food-Energy-Water (FEW) Nexus: Using Rainwater Harvesting and Solar Energy for Next Generation Urban Farming Practices*” by Annabelle Arnold, Harris Trobman, Hossain M Azam and Mamatha Hanumappa, American Ecological Engineering Society Conference 2022, Baltimore, MD
- **Platform presentation** on “*Quantification of Environmental, Economic, and Societal Impacts of Specialty Crops Grown in Aquaponics and Hydroponics through Life Cycle Sustainability Assessment (LCSA)*” by Hossain Azam, Matthew L. Richardson, Sabine O'Hara, Jose-Luis Izursa, Patricia D. Millner, Sheikh Mokhlesur Rahman, Dylan Darius Mehri, Jonas Lee, Emi Kameyama, Michael Somersall, Andre de Souza Coelho and Nazia Nowshin, American Ecological Engineering Society Conference 2022, Baltimore, MD
- **Platform presentation** and **Conference paper** on “Current Status and Applications of Renewable Energy in Agriculture: Global and Bangladesh Perspective” by Fardin Ishtiaq, Sadikul Islam, Kibria Roman and Hossain Azam, Conference on Energy, Climate Change and Sustainable Development in Bangladesh, BAPA-BEN Annual Conference-2022
- **Platform presentation** and **Conference paper** on “Renewable Energy in Buildings of Bangladesh: A Nano-grid Approach” by Fardin Ishtiaq, Kibria Roman and Hossain Azam, Conference on Energy, Climate Change and Sustainable Development in Bangladesh, BAPA-BEN Annual Conference-2022
- **Platform presentation** on UDC Research Week, April, 2022
 - Life Cycle Sustainability Assessment (LCSA) of Aquaponics and Hydroponics Systems by Assefa Tadesse (Azam Research Group)
 - Sustainable Food in Space: The Application of Closed-Loop Aquaponics in Spaceflight by Jonas Lee (Azam Research Group)
 - Bio-Methane Production Through Anaerobic Digestion of Unconventional Organic Waste by Stephanie Fuentes (Azam Research Group)
 - Environmental, Economic, and Social Benefits of Soilless Food Production Systems by Dylan Mehri (Azam Research Group)
 - Food-Energy-Water (FEW) Nexus: Using Rainwater Harvesting and Solar Energy for Next Generation Urban Farming Practices by Annabelle Arnold (Azam Research Group, Co-Advised)

- **Project Report** on Incorporating Green Infrastructure into Urban Agriculture Programs, Hossain Azam (Co-PI), National Fish and Wildlife Foundation, 2020
- **A Toolkit** for Stormwater Best Management Practices for Urban Farming, Project Leads-Harris Trobman, Neil Weinstein, Hossain Azam, Jacob Wynn, 2020
- **Platform presentation** and **Conference paper** on “*Chelating agent-assisted Inhibition and Dissolution of Struvite for Subsequent Recovery: Experimental and Modeling analysis*” Arvind Kannan, Timothy Conway, Sebastian Gerlak, Richard Carbonaro and **Hossain Azam**, Water Environment Federation Technical and Exhibition Conference, Sept 29-October 03, 2018.
- **Platform presentation** on “*Turning Waste into Energy-Anaerobic Co-Digestion of Food Wastes to Enhance Energy Recovery through Methane Production*” TJ Bolen, Timothy Conway, Arifur Rahman, and **Hossain Azam**, **3rd Prize**, Environmental and Water Resources Institute (EWRI) of ASCE Congress 2017, Sacramento, CA, USA, May 21-25, 2017.
- **Platform presentation** on “*Upgrading an Existing Wastewater Treatment Plant to Perform Co-Digestion of Different Food Wastes*” Thomas Bolen, Tim Conway and **Hossain Azam**, **3rd Prize**, NY Water Environment Federation (NYWEA) Annual Conference, February, 2017.
- **Platform presentation** on “*Precipitation, Inhibition and Dissolution Characteristics of Struvite in Wastewater Systems: Experimental and Modeling Studies*” Arvind Kannan, Sebastian Gerlak, Rich Carbonaro and **Hossain Azam**, **1st Prize**, NY Water Environment Federation (NYWEA) Annual Conference, February, 2017.
- **Platform presentation** on “*Production of Magnetic Core/Metal Oxide Shell Nanoparticles for Water Purification*” by Jasmine Parks, Adanfa He, Arvind Damodara Kannan, **Hossain Azam**, and Alexander C. Santulli, Undergraduate Research Symposium, NY American Chemical Society, May 2016.
- **Platform presentation** on “*Biochemical Methane Potential of Sludge and Food Waste for an Existing Wastewater Treatment Plant’s Co-Digestion Upgrade*” by Thomad Bolen, Timothy Conway and **Hossain Azam**, International Lasallian Research Symposium, Minnesota, September, 2016.
- **Platform presentation** on “*Iron Reduction Mediated Increases in Carbon Oxidation and Phosphorus Removal in On-Site Wastewater Systems*”, WEFTEC, 2012, New Orleans, LA.
- **Webinar** on “*Chemical Analysis and Imaging of Seeds, Grains, and Plant Tissue*”, Center for Agricultural, Biomedical and Pharmaceutical Nanotechnology (CABPN), University of Illinois at Urbana Champaign, October, 2012.
- **Platform presentation** and **Design report** on “*Retrofit of Wastewater Treatment Plant for Biological Nitrogen Removal*”, *Student Competition*, WEFTEC, 2008, Chicago, IL.
- **Platform presentation** on “*Oxidation of Methane in Landfill Covers: a Strategy to Maximize Energy Revenue*”, Annual Spring Tech. Conference, SWANA NC Chapter, 2007, Wrightsville Beach, NC.

POSTER PRESENTATIONS/REPORTS

- **Poster presentation** on “Experimental and Modeling Analysis of Chelating Agent Assisted Inhibition and Dissolution of Struvite in Wastewater” by Arvind Kannan, Stephanie Fuentes, Lirane Mandjouda, Timothy

Conway, Isreq Hossen, Richard Carbonaro and Hossain Azam, First CSAWWA (Chesapeake Section of American Water Works Association) Virtual Poster Competition, June 27, 2020

- **Poster presentation** on “Upgrade of Existing Water Resources Recovery Facilities (WRRFs) to Perform Co-Digestion Utilizing Plant Modeling, Energy Modeling and Life Cycle Assessment (LCA)” by Assefa Tadesse, Pablo Sanchez, Meron Ureggesa, Kalkidan Ayele, T.J. Bolen, Mahmudul Hasan, Timothy Conway, Arifur Rahman and Hossain Azam, UDC Earth Day Poster Competition, April, 2020
- **Poster presentation** on “Use Of Life Cycle Sustainability Assessment (LCSA) to Measure Environmental, Economic, and Societal Impacts of Aquaponics and Hydroponics Systems” by Assefa Tadesse, Dylan Mehri, Nazia Nowshin, Jonas Lee, Michael Somersall, Emi Kameyama, Andre De Souza Coelho, Matthew Richardson, Sabine O'Hara, Jose Luis Izursa, Pat Millner, Sheikh Mokhlesur Rahman and Hossain Azam, CSAWWA (Chesapeake Section of American Water Works Association) Poster Competition, May, 2022
- **Poster presentation** on “Performance Evaluation of Ethylene Scavengers for Aquaponic Systems” by Jonas Lee, Matthew Richardson, Jose-Luis Izursa and Hossain Azam, CSAWWA (Chesapeake Section of American Water Works Association) Poster Competition, May, 2022
- **Poster presentation** on “*Solar Disinfection (SODIS) of E. coli and Degradation of Pharmaceuticals in Presence of Photosensitizers/Photocatalysts*” by Hannah Mabey, Mohamed Makram, Brendan McDonough, Terence Copping, Adanfa He, Arvind Kannan, Alexander Santulli and **Hossain Azam**, Environmental and Water Resources Institute (EWRI), ASCE Congress 2018, Minneapolis, MN, USA, June 03-07, 2018.
- **Poster presentation** on “*Upgrading an Existing Wastewater Treatment Plant to Perform Co-Digestion of Different Food Wastes*” by Thomas Bolen, Tim Conway and **Hossain Azam**, **2nd Prize**, NY Water Environment Federation (NYWEA) Annual Conference, February, 2018.
- **Poster presentation** on “*Chelant–Assisted Struvite Dissolution and Inhibition Potential in Wastewater Systems: Experimental and Modeling analysis*” Arvind Kannan, Tim Conway, Sebastian Gerlak, Rich Carbonaro and **Hossain Azam**, NY Water Environment Federation (NYWEA) Annual Conference, February, 2018.
- **Poster presentation** on “*Phosphorus Removal, Scale Inhibition/Dissolution and Resource Recovery as Struvite and Vivianite in Anaerobic Digestion Systems: Modeling and Experimental Analysis*” by Conor Brennan, Juliana Behrens, Thomas Bolen, Adanfa He, Richard Carbonaro, and **Hossain Azam**, **1st Prize**, NY Water Environment Federation (NYWEA) Annual Conference, February, 2016.
- **Poster presentation** on “*Solar Disinfection (SODIS) of E. Coli in the Presence of Photosensitizers*” by Adanfa He, Arvind Damodara Kannan, Jasmine Parks, Alexander Santulli and **Hossain M. Azam**, NY American Water Works Association (AWWA) Annual Poster Competition, April, 2016.
- **Poster presentation** on “*Precipitation, Inhibition and Dissolution Characteristics of Important Phosphate Minerals (Struvite and Vivianite) in Water and Wastewater Systems*” by Conor Brennan, Juliana Behrens, Adanfa He, Thomas Bolen and **Hossain Azam**, **3rd place** in NY American Water Works Association (AWWA) annual poster competition, 2015.
- **Poster presentation** on “*Modeling of Precipitation, Inhibition, and Dissolution Characteristics of Struvite and Vivianite in Wastewater Systems*” by Conor Brennan, Juliana Behrens, Adanfa He, Thomas Bolen,

Richard F. Carbonaro, and **Hossain M. Azam**, New England Graduate Student Water Symposium, September, 2015.

- **Final project report** on “*Compositional Analysis of Whole Soybean Grain by Transmission Raman Spectroscopy: A Pilot Study*”, United Soybean Board, USB Project #9282, 2012.
- **Poster presentation** on “*Ferric Iron Amendment Increases Carbon Oxidation and Limits Methane Production in On-Site Wastewater (Septic Systems)*”, WEFTEC, 2010, New Orleans, LA.

RESEARCH VISITS

- NASA Kennedy Space Center Visit for July, 2022, Florida with NASA Fellow Jonas Lee to explore NASA research on plants and environmental engineering
- UDC Visits Greenway Farms Aquaponics Facility Visit for April 19, 2022: 10 students

RELEVANT COURSEWORK AT UIUC/NCSU

- | | |
|--|--|
| ▪ Drinking Water Treatment and Case Histories | ▪ Bioprocess Design and Wastewater Treatment |
| ▪ Solid & Hazardous Waste, Bioreactor Landfill | ▪ GW Hydraulics, Remediation Design |
| ▪ Environmental Organic Chemistry | ▪ Modeling & Analysis of Env. Systems |

COMPUTER EXPERIENCE

- | | |
|-------------------------------------|------------------------------------|
| ▪ LandGEM, BioWin, AQUASIM, MODFlow | ▪ Arc GIS 9.0, Sigma Plot, AUTOCAD |
| ▪ FORTRAN, Visual Basic, MATLAB | ▪ MINEQL, ENVI, LabVIEW, PHREEQC |

LABORATORY EXPERIENCE/TECHNIQUES

- GC (TCD and FID), GC-GPC, Scintillation Counter, LC-MS, HPLC, IC, ICP, TOC Analyzer, Zeta-Sizer, CE etc.
- Anaerobic Gassing Stations and Anaerobic Glove Bag.
- Wet chemistry methods for analysis of COD/TOC, TSS, VSS, Fe (II), Fe (III) SO_4^{2-} , NO_3^- , PO_4^{3-} etc.
- Cell suspension experimentation, growth experimentation, DNA extraction, PCR, Q-PCR, ARDRA.
- X-Ray Diffraction (XRD) Technique, Transmission Electron Microscopy (TEM)-EDS.
- Column and Reactor Studies: Assembled and Conducted Experiment in Flow through System.
- Hands on experience of IR and Raman spectroscopy.

SELECTED CLASS FINAL PROJECTS AT UIUC/NCSU

- Design Solutions-Multiple US Water Facilities & Water Prob. of Developing Countries (Dr. Snoeyink)
- Modeling of Phosphorus Removal from Retrofitted Wastewater Systems using CSTR, Ideal Plug Flow and Axial Dispersion Reactor (Dr. Marinas)
- Investigation of Site & Design of Ground Water Treatment System Using MODFLOW (Dr. Borden)
- Remediation Design for a Remediation Site, Indiana (Dr. Werth)
- Sustainable Remodel of Stone Creek Subdivision, Urbana, IL (Dr. Werth)
- Comprehensive Study of Air Pollution from Motor Vehicles (Dr. Donald van der Vaart)
- Dioxin Emission in the Environment: a known Carcinogen Emitted from Incinerator (Dr. Barlaz)
- Effects of Parameters on Methane Oxidation of Methanotrophs in Landfill Bio-Cover (Dr. de les Reyes)
- Investigation of Ground Water Arsenic Pollution in NC (Dr. Borden)

PROFESSIONAL MEMBERSHIPS, SERVICES AND ACTIVITIES

- **Faculty Affiliate to UDC's Equity Imperative Developing America's Workforce Nucleus (DAWN) initiative** in Ward 8 administered by the Office of the President, UDC [attended several Anacostia High School events with graduate and undergraduate students, attended several meetings with DCPS to develop curriculum on agrotechnology]. Some of the events are:
 - a) Anacostia High School Visit for Hydroponics Installation

- b) Anacostia High Back to School, August 29, 2022
- c) Anacostia Job Fair, March 23, 2022
- d) Event for New Anacostia Urban Waters Federal Partnership Ambassador, April 05, 2022
- e) Poster Presentations with Students at UDC STEAM Fair at Anacostia High School, April 01, 2022
- f) STEAM brochure development for UDC
- g) Active member of C2 academy, part of DAWN initiative
- h) Working actively with PONIX farm and met with DCPS leadership and leaders of several middle schools (Kramer, Sousa and Johnson) for Agrotechnology curriculum development
- **Ron Brown HS Field Investigation Day (May 18, 2022):** Worked whole day and demonstrated different hands-on activities to 23 Students with 3 Ron Brown HS Teachers/Staff, 8 Living Classrooms staff and 2 DOEE special guests
- **Curriculum Development for DCPS EnviSci Course:** Curriculum Development (Science TLI, 12th Grade EnviSci) Support for Jim Hall, Ron Brown College Preparatory High School
- **Host of High School Student Visit** for 1 Week to Azam Research Group for Research Training: August, 2022
- **Faculty Advisor:** WEF Student Chapter at the Univ. of the Dist. of Columbia (UDC), Sp. 2020 to Present.
 - (A) Winner for three consecutive years of WEF InFLOW (Introducing Future Leaders to Opportunities in Water) fellowship awarded to seven undergraduate and graduate students to attend national annual WEF conference (WEFTEC) as Faculty Advisor
 - (B) Student design competition winner for Chesapeake Water Environment Association-CWEA for two consecutive years as Faculty Advisor
 - (C) Supported graduate student Stephanie Fuentes' effort for induction to prestigious Water Leadership Institute (WLI) of WEF,
 - (D) Organized several seminars/webinars at UDC under WEF-UDC Student Chapter]
- **Communication Chair,** Civil Engineering, SEAS, UDC-2020-Present
 - (A) Developing and executing plan with CE Faculty Members about CE departmental outreach
 - (B) Developed Civil Engineering flyer and transferred to Ms. Lankford for further development
- **Active Member:** Curriculum Committee, CE, SEAS, UDC, Fall, 2019-Present
- **Graduate Program Director:** CE, SEAS, UDC, Fall, 2022-Present
- **Active Member:** Department Evaluation and Promotion Committee (DEPC), CE, SEAS, UDC
- **Active Member:** Faculty Senate, Fall, 2022
- **Active Member:** Admission and Retention Committee of Faculty Senate, Fall, 2022
- **Active Member and Secretary:** Graduate Council, Fall, 2022
- **Active Member:** Academic Performance Review Committee, SEAS, Spring, 2022 to Present
- **Active Member:** Outcomes Project (OCAO) under the leadership of Dr. Andrew Carson and Dr. Ludwig Nitsche, Fall, 2022
- **Faculty Affiliate:** **NSF-CNRE** (Center for Nanotechnology Research and Education) of UDC, NASA-MIRO Center for Advanced Manufacturing in Space Technology and Research (**CAM-STAR**) of UDC, STEM Research and Training Center at UDC (**STEM CENTER**), DC Water Resources Research Institute (**DC WRRI**) and Center for Urban Research Engagement and Scholarship (**CURES**)
- **DC Water Partnership Development for Research, Teaching and Internship:**
 - Research:** a) developed partnership to fund PhD student at UDC from DC Water
 - b) submitted proposals together with DC Water
 - Teaching:** a) invited lecture by DC Water leaders to UDC Civil Engineering classes
 - b) planning visit to DC Water

- Internship:** a) Initiated the collaboration with DC Water to recruit UDC Students as Summer Interns (Summer, 2022)
- **Referee for UDC Students (Recommendation Letter):** Worked as a referee and submitted recommended letters for UDC Civil Engineering students for Jobs, Internships, Graduate Admission etc.
 - **Engineering Ambassadors Program for UDC:** Currently working with Dr. Max Denis of Mechanical Engineering to run and fund the Engineering Ambassadors program from Fall, 2022 to outreach to different DC public schools
 - **Engineering Open House/High School Visit to UDC:** Actively participated on behalf of Civil Engineering Department for Engineering Open House/Different High School Visit to UDC
 - **Workshop Lecture to High School Students:** Topic- Water-Energy-Food Nexus, GZEP 2020 Virtual Presentation, UDC, July 13, 2020
 - **Lecture to Northern Virginia Community College:** Introduction to Civil Engineering and Civil Engineering Program at UDC, Fall, 2019
 - **Workshop Lecture to High School Students:** Topic-Environmental Engineering, Summer Risk and Resilience Academy, July, 2019
 - **ABET/Construction Management Program Development Support for Civil Engineering:** Worked on several courses to obtain students' assessment and reviewed ABET report. Furthermore, reviewed Construction Management Program documents
 - **Faculty Mentoring Session with PRISSEM Academic Services, LLC:** Summer, 2022 to Present
 - **Faculty Host:** EPA Scientist Visit to UDC Green Roof to develop research on Climate/Air Quality Impacts
 - **Faculty Host and Organizer:** App Development Workshop with Pragmatic Works, Center for Advancement of Learning and Microsoft
 - **CAUSES Protection of Minors Training** Completed
 - **Participant:** Attended UDC/Liaison Total Enrollment Review Meeting
 - **Faculty Participant:** ASME Engineering Education Webinar Series Engineering Workforce – Pursing a Career in Academia
 - **Treasurer and Executive Committee Member,** International Society of Bangladesh-Affiliated Microbiologists (ISBM), 2022-2023
 - **Active Member and Conference Organizer,** Bangladesh Poribesh Andolon (BAPA) and Bangladesh Environment Network (BEN), 2019-Present
 - **Participant:** Attended NASA CAM-STAR and NASA CNRE External Advisory Committees Annual Meeting
 - **Participant and Graduate of New Faculty Academy (NFA):** Attended several talks, training and discussions as a new faculty member of UDC
 - **Participant:** Semester Wise Academic Forum, Fall, 2019 to Present
 - **Participant:** UDC Fall Opening Convocation, Fall, 2022
 - **Participant:** UDC SEAS Faculty and Staff Meeting, Fall, 2019 to Present

- **Participant:** UDC CE, SEAS Faculty and Staff Meeting, Fall, 2019 to Present
- **Participant/Speaker:** Seminar/Workshop on
 - a) US Army Opportunities Feb 19, 2021 (Participant)
 - b) Coronavirus Research, WRF April 16, 2020 (Participant)
 - c) COVID-19 Workshop, May, 2022 (Participant)
 - d) Grants Essentials & COVID-19 Funding Opportunities, April, 2020 (Participant)
 - e) NSF's New Convergent Accelerator Program Funding Opportunities, May 01, 2020 (Participant)
 - f) Utilizing Innovative Materials Science Approaches to Enhance Bioremediation: Session I - Per- and Polyfluoroalkyl substances, US EPA, April 15, 2022 (Participant)
 - g) WRF 4975: Practical considerations for S2EBPR, February, 2021 (Participant)
 - h) Impact of atomic structure and dynamics on solar cell performance of metal halide perovskite thin films, Feb 09, 2021 (Participant)
 - i) The future of resources recovery, July, 2020 (Participant)
 - j) The Role of the National Nanotechnology Initiative and How to Engage, NSF CNRE Seminar, March 03, 2020 (Participant)
 - k) Refinery Wastewater Treatment 201: Advanced Curriculum, WEFTEC, 2019 (Participant)
 - l) Design and Modeling of Advanced Biofilm Reactor Technologies for Nutrient Removal and Recovery, WEFTEC, 2019 (Participant)
 - m) Understanding PFAS: Developing Management Practices and Treatment Options for Industry, WEFTEC, 2021 (Speaker)
 - n) AEG Washington 22Q3 Stakeholder Challenge: Grid Modernization, HQO, DC Water Headquarters, Thursday, July 14, 2022 (Participant)
 - o) CDIMA: Understanding Gender Identity & Sexual Orientation, October 12, 2022 (Participant)
- **Member:** Association of Environmental Engineering and Science Professors (AEESP).
- **Member:** Water Env. Federation (WEF) [**Member:** Industrial Wastewater Committee (IWC), Municipal Resources Recovery Design Committee (MRRDC) and Technical Publication Committee (TPC), WEF].
- **Chair:** Upstream Oil and Gas Subcommittee under the Industrial Wastewater Committee of WEF, 2014-2019
- **Chair:** P/Resources Recovery Subgroup of P Removal Group of Municipal Resources Recovery Design Committee (MRRDC), 2019-2022
- **Chair:** Publication Subcommittee under the Municipal Resources Recovery Design Committee (MRRDC) of WEF, 2017-2022
- **Newsletter of MRRDC,** Publication Subcommittee under the Municipal Resources Recovery Design Committee (MRRDC) of WEF, WEFTEC 2021
- **Vice-Chair:** Publication Subcommittee under Industrial Wastewater Committee of WEF, 2019-Present
- **Moderator/Assistant Moderator for Water Environment Federation Technical Exhibition & Conference (WEFTEC):**
 - Co-Digestion: Impacts of Adding Food Waste and FOG, Tue, 9/24, WEFTEC, 2019 (Assistant Moderator)
 - Metals Removal From Leachate, Uranium Contaminated Water, and Gold, Wed, 9/25, WEFTEC, 2019 (Moderator)
 - Unique Approaches for Removal of Selenium and Other Constituents from Wastewater and Groundwater, WEFTEC, 2021 (Moderator)
- **Vice-Chair** of Proposed "The Written Word: Important Documents in the Water Sector" Workshop for WEFTEC, 2023

- **National Science Foundation (NSF) Proposal Reviewer:** Served as NSF reviewer in the Environmental Engineering program, 2015.
- **Water Research Foundation (WRF) Proposal Reviewer and Technical Review Committee Member:** NTRY12R16, *Unintended Consequences of Resource Recovery & Overall Plant Performance: Solving the Impacts on Dewaterability Properties & NTRY13R16, Understanding the Impacts of Low-Energy & Low-Carbon “N” Removal Technologies on Bio-P & Nutrient Recovery Processes.*
- **Journal Research Paper/Article Reviewer:** Water Research, Water, Air, & Soil Pollution and Journal of Geochemical Exploration.
- **Vice-Chair and Speaker:** Workshop on “PFAS”, Water Environment Federation Technical Conference, September, 2021 (WEFTEC).
- **Vice-Chair:** Workshop on “Fundamentals of Produced Water Treatment in the Oil and Gas Industry (W 14)”, Water Environment Federation Technical Conference, September, 2018 (WEFTEC).
- **Chair:** Water Environment Federation (WEF) Workshop on “Energy Use/Recovery at Municipal Resource Recovery Facilities: Fundamentals, Conservation, and Recovery Technologies”, Water Environment Federation Technical Conference (WEFETC), September, 2016.
- **Vice-Chair:** Workshop on Modeling 101 Modeling Basics and “Hands on Experience” on Modeling Software (Modeling 101), Water Env. Federation Technical Conference, September, 2014 (WEFTEC).
- **Faculty Host for Seminars** at Dept. of Civil and Environmental Eng., Manhattan College.
- **Faculty Participant:** STAR program/training [NSF Project by Sr. MaryAnn Jacobs and Zahra Shahbazi of Manhattan College] to train high school teachers on “Environmental Engineering Projects/Lesson Plan”.
- **Workshop Participant:** ASCE ExCEED Teaching Workshop: Week long training on effective teaching in Civil and Environmental Engineering, Summer, 2015.
- **Faculty Advisor:** NY Water Environment Association (NYWEA) Student Chapter at Manhattan College, May, 2015 to June 15, 2019.
- **Faculty Co-Advisor:** Engineers Without Borders (EWB), Manhattan College Chap., Sp., 15 to Sp., 16.
- **Member:** Smart Eval Committee, A subcommittee of the Educational Affairs Committee (EAC) of Manhattan College -Spring 2015 to June 15, 2019.
- **Member:** Library Committee of Manhattan College May, Spring 2017-June 15, 2019.
- **Member:** Judiciary Committee on Student Affairs of Manhattan College May, 2015-June 15, 2019.
- **Steering Committee Member:** Center for Urban Resilience and Environmental Sustainability (CURES) of Manhattan College, September, 2014-June 15, 2019.
- **Judge:** Westchester Science and Engineering Fair, Sleepy Hollow High School, March, 2016
- **Chair:** Environmental Engineering Advisory Committee, Fall 2008-Fall 2009, UIUC.
- **Member:** Design Team, Metcalf and Eddy Design Competition on Wastewater, UIUC, Spring, 2008.
- **Winner:** Student Competition on Wastewater, CSWEA conference, 2008, Minneapolis, MN and **Design Team Member:** Student Design Competition, WEFTEC 2008.
- **Team Member and Winner (2nd and 3rd):** Design of Water Filtration System for Developing and Water Treatment Systems for Developed Countries at UIUC Engineering Open House: 2008/09.
- **Member:** Engineers Without Borders (EWB)-NCSU and Worked in the “**Bolivia Water Sanitation Project**” and a Team Member of the **First Assessment Trip to Bolivia** in December 2006.
- **Captain:** Bangladesh University of Engineering and Technology (BUET) Cricket Team, **Vice-President:** BUET Debating Club; **Active Member:** BUET Civil Engineering Student Association.



FISCAL IMPACT STATEMENT

TO: The Board of Trustees

FROM: Managing Director of Finance *David A. Franklin*

DATE: June 8, 2023

SUBJECT: Tenure Approval for Hossain Azam, Ph.D., School of Engineering and Applied Sciences (SEAS)

Conclusion

It is concluded that there is no fiscal impact associated with the granting of tenure to Dr. Hossain Azam, Assistant Professor in the Department of Civil Engineering, in the School of Engineering & Applied Sciences (SEAS) of the University of the District of Columbia (UDC). The proposed resolution is for the approval of tenure for Professor Azam at the rank of Associate Professor.

The Chair, DEPC, and CPC of SEAS have conducted thorough, independent reviews and prepared independent reports to the dean regarding tenure for Professor Azam. It was then considered at the Dean's, CAO's and President's levels. It has been recommended in the Board Resolution that Professor Dang be approved for tenure.

Background

Dr. Azam joined the SEAS in August 2019, with two-years of credit towards his five-year tenure track appointment. Vetting of all dossier content was completed at the levels of the program, Department, and School. The CAO reviewed all recommendations and Dr. Azam's portfolio (which includes external reviews of his qualifications). All reviews validate the strengths of Professor Azam's tenure and promotion dossier and conclude that he, as a teacher, emerging researcher and scholar who has begun to receive recognition for his work, is a competitive tenure candidate for an urban university such as UDC. Additionally, he has demonstrated a strong record of service to the University community.

The recommendation of tenure for Professor Azam has been affirmed by the Dean, Chief Academic Officer, and President. The President has forwarded the recommendation and background information along with a resolution for the award of tenure to the Board of Trustees.

Financial Impact

This request has been approved based upon the information provided. There are no anticipated risks at this time.