PERSONAL DETAILS

Name:	Emad Gamal Barakat Hussein
Title:	Assistant Prof. Dr.-Ing.
Place and Date of Birth:	Sohag city, Egypt, January 1, 1987
Marital Status:	Married with three children
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Google Site:	https://sites.google.com/site/elemad1987/

RESEARCH INTERESTS

- Fluid Mechanics
- Computational Fluid Dynamics (CFD)
- Numerical Methods
- Thermal Fluid System
- Microfluidics
- Microfabrication
- Fuel Cells
- Semiconductor Industries

EDUCATION

Ph. D. in Mechanical Engineering — Feb. 2025

Department of Mechanical Engineering, Korea University of Technology and Education (KOREATECH), Republic of Korea.

Thesis: Numerical methods for efficient multi-nozzle fluid flow simulation and design optimization in Plasma-Enhanced Chemical Vapor Deposition (PECVD) reactors

M. Sc. in Mechanical Engineering — Jan., 2016

Department of Mechanical Engineering, Assiut University, Egypt.

Thesis: Effect of flow passage configurations on the performance of Proton Exchange Membrane Fuel Cells (PEMFCs)

B. Sc. in Mechanical Engineering — June, 2009

Department of Mechanical Engineering, Assiut University, Egypt.

Commutative Average Grade: 81.43/100 (Honors degree & ranked 5th in the whole department of Mechanical Engineering)

ACADEMIC POSITIONS HELD

Assistant Professor, Assiut University, Egypt	Mar.	2025	–	Present	
PhD Student, Korea University of Technology and Education (KOREATECH), Republic of Korea	Sept.	2018	–	Feb.	2025
Assistant Lecturer, Assiut University, Egypt	Feb.	2016	–	Mar.	2025
Teaching Assistant, Assiut University, Egypt	May	2010	–	Feb.	2016

PRACTICAL & INDUSTRIAL EXPERIENCE- June 2009- present

- Site Engineer on several firefighting system projects, Egypt.
- Designed an industrial ventilation system tailored for welding workshops, Assiut, Egypt.
- Design and development of HVAC systems for residential and administrative complex project in Jeddah, Kingdom of Saudi Arabia.
- Development and analysis for PECVD reactor showerhead, SAMSUNG electronics, Korea.
- Trained Engineer in Daewoo Motors Egypt Aboul-Fotouh Group, Cairo, Egypt.

TEACHING EXPERIENCE- June 2009- Aug. 2017

- Tutor and marker of Fluid Mechanics I, Fluid Mechanics II, Hydraulic machines (Pumps and Hydraulic Turbines), Gas Dynamics, Steam Turbines, and Engineering Drawing, every academic year.
- Tutored for 4 semesters the following courses: Thermodynamics, Engineering Analysis, Engineering programming using FORTRAN, Computer-aided Drawing with AutoCAD, and Machine construction. In addition, I tutored Industrial ventilation for one semester.
    - Average teaching load (30 hrs./week). This is tutoring and office hours. It does not include the marking time.
    - Tasks include solving examples, supervising course projects, helping students during office hours, and marking midterms.
    - Class size ranges from 30 to 145 students.

PATENTS

- Park SeungKyung*, **Emad Hussein**, Hong Joo-pyo, Kim Yeon-chan (2024) {APPARATUS AND METHOD FOR MODELING POROUS MEDIA FOR FLOW ANALYSIS OF GAS DISTRIBUTOR}. Application no. 2-2005-024336-1 (South Korea).
- Park SeungKyung*, Zeeshan A. Khan, **Emad Barakat** (2020) {BIOMARKER FOR DETECTING BETA AMYLOID INCLUDING METAL-HRP AND METHOD FOR CONFIRMING BETA AMYLOID CONCENTRATION USING THE SAME}. Application no. KR102481526B1 (South Korea).
  https://patents.google.com/patent/KR102481526B1/en
- Park SeungKyung*, Zeeshan A. Khan, **Emad Barakat** (2020) {BIOASSAY FOR DETECTING TESTOSTERONE AND IDENTIFYING METHOD FOR CONCENTRATION OF TESTOSTERONE USING THE SAME}. Application no. KR102423082B1 (South Korea).
  https://patents.google.com/patent/KR102423082B1/en

- Park SeungKyung*, Zeeshan A. Khan, **Emad Barakat** (2020) {BIOMARKER FOR DETECTING AMYLOID BETA AND IDENTIFYING METHOD FOR CONCENTRATION OF AMYLOID BETA USING THE SAME}. Application no. KR102481373B1 (South Korea).
  https://patents.google.com/patent/KR102481373B1/en

PUBLICATIONS

- **E. Barakat**, Y. Kim, J. Hong, and S. Park, "Computational Modeling and Optimization of Large-area Showerhead Configurations in PECVD Reactors", IEEE Transactions on Semiconductor Manufacturing, *under review* *(submitted 15th of May, 2025)*
- **E. Barakat**, Y. Kim, J. Hong, and S. Park, "Numerical Studies for the Effects of Reactor Geometries on the Flow Field in PECVD Reactor", *Journal of the Semiconductor & Display Technology*, 24(1), 59-65 (**2025**)
  https://www.kci.go.kr/kciportal/ci/sereArticleSearch/ciSereArtiView.kci?sereArticleSearchBean.artiId=ART003191867
- **E. Barakat**, Hong Joo-pyo, and Seungkyung Park, "Numerical simulation of flow field and thin film deposition in PECVD reactor," in *Proceedings of the 9th International Conference on Manufacturing, Machine Design and Tribology (ICMDT 2023)*, 2023, p. 74. *https://icmdt.org/*
- H. Jeon, Z. A. Khan, **E. Barakat**, S. Park, "Label-Free Electrochemical Microfluidic Chip for the Antimicrobial Susceptibility Testing", Antibiotics, 9(6), 348-362 (2020). *https://www.mdpi.com/2079-6382/9/6/348*
- **E. Barakat**, K. Ahmed, M. Ahmed, Ali K. Abdel-Rahman, and Ahmed Hamza H. Ali, "Influence of Parallel Flow Field Design on the Performance of PEM Fuel Cells", ICCE 2013: Proceedings of the International Conference and Exhibition on Clean Energy, Ottawa, Canada, Sept. 2013, pp. 268- 282, http://iaemm.com/ , 2013.
- **Emad G. Barakat**, Ali K. Abdel-Rahman, Mahmoud A. Ahmed, and Ahmed Hamza H. Ali, "An Experimental Study of Operational Parameters on the Performance of PEMFC", ASME, IMECE2010, Vancouver, British Columbia, Canada, November 12–18, 2010, Volume 5: Energy Systems Analysis, Thermodynamics and Sustainability; NanoEngineering for Energy; Engineering to Address Climate Change, Parts A and B, Paper No. IMECE2010-39080, pp. 927-933; 7 pages, https://doi.org/10.1115/IMECE2010-39080

SCHOLARSHIPS

- KGSP scholarship (The Korean Government Scholarship Program) for studying PhD, Korea, Sept. 2017 – Aug. 2021

RESEARCH GROUPS

- Mechanical Engineering Laboratory, Assiut University, Egypt, 2009 – Present
- Complex Fluid Laboratory CFL, Korea University of Technology and Education (KOREATECH), South Korea, 2018 – Present

HONORS AND AWARDS

- Awarded the Young Innovators Awards (YIA) prize funded by Nahdet El Mahrousa Association with support from the Egyptian Ministry of Industry for the graduation project. [June 2009]

- Awarded "Prof. Yehia Elheney" Award for the best mark in heat transfer course from the mechanical engineering department at Assiut University. [2008]
- Academic excellence awards include a financial award of 100 EGP for the academic years 2005, 2006, 2007, and 2008. These awards are given to students with an overall grade of A^+.

LANGUAGES

English	C2
Korean	B2
Arabic	Mother tongue

PROFESSIONAL MEMBERSHIP

- IEEE Membership
- Syndicate of Egyptian Engineers
- Syndicate of Egyptian Professors

PROGRAMMING and SOFTWARES

- MATLAB, FORTRAN, C++ and still learning Python
- LABVIEW
- SOLIDWORKS
- GAMBIT 2.4
- ANSYS FLUENT
- AutoCAD 2D
- Catia

PERSONAL HOBBIES

- Running, Football, Table Tennis, Hiking, and Writing poetry.

TRAINING COURSES

- Critical Thinking Skills
- Essential Research Skills
- Effective Communication Skills
- Conference Organization
- University Administration
- Legal Aspects of the Universities
- Effective Teaching
- Quality Standards in Teaching
- Research Team Management
- International Publishing of Research

REFERENCES

Prof. Seungkyung Park (PhD supervisor)

Address:	Complex Fluids Lab CFL, Eng. Bldg. 1, D202, Mechanical Engineering, KOREATECH, 1600 Chungjeol-ro, Dongnam-gu, Cheonan, Chungnam 31253, Korea.
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E-mail:	spark@koreatech.ac.kr

Prof. Ahmed Hamza H. Ali (Master supervisor)

Address: Professor of Heat transfer - Mechanical Engineering department, Assiut University.
Former Director for Center of Research Excellence for Energy Resources and Management - Egypt-Japan University of Science and Technology (E-JUST).
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