

## Mohamed Elwardany Fouad Tolba

Assistant Lecturer, Mechanical Power Engineering Department

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### EDUCATION

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#### M.Sc. In Mechanical Power Engineering

Sep. 2020–Mar. 2024

- Mechanical Power Engineering Department, Faculty of Engineering, Assiut University - Assiut, Egypt
- Cumulative Grade Point Average: **Very Good (3.15/4)**
- Thesis title: “Thermal Performance of Gas Turbine Power Plants Based on Exergy Analysis”

#### B.Sc. In Mechanical Power Engineering

Sep. 2013–Jun. 2018

- Mechanical Engineering Department, Faculty of Engineering, Assiut University - Assiut, Egypt
- Accumulative Grade: **Distinction with Honors (86.8%), Equivalent GPA: (3.79/4), Ranked 2nd out of 132**
- Thesis title: “Design and Performance of Hybrid Solar Thermal Assisted Air Conditioning System in Hot Areas”

### PUBLICATION

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**Google Scholar Profile:** <https://scholar.google.com/citations?user=wBDqjlQAAAAJ&hl=en>

#### JOURNAL PUBLICATIONS

1. **Elwardany, M.**, Abdelrazik, A. S., Heba, A. S. A., Asmaa, F., & Abdelkawy, N. (2024). Practicality and Economic Assessment on Using the Solar Organic Rankine Cycle as a Power Source for a Specific Membrane - based Desalination System Organic Rankine cycle. *Water Conservation Science and Engineering* (Vol. 9). Springer Nature Singapore. <https://doi.org/10.1007/s41101-024-00273-9>. (I.F. 1.7)
2. **Elwardany, M.**, Nassib, A.M. & Mohamed, H.A. (2024). Exergy analysis of a gas turbine cycle power plant: a case study of power plant in Egypt. . *Journal of Thermal Analysis and Calorimetry*. <https://doi.org/10.1007/s10973-024-13324-z>. (I.F. 3.2)
3. Abdelrazik, A. S., Sharafeldin, M. A., **Elwardany, M.**, Abdulkawy, N., Shboul, B., Ezzat, S. M., Antar, M. A. (2024). Effect of design and operation parameters on solar-driven membrane-based desalination systems: An overview. *Wiley Interdisciplinary Reviews: Energy and Environment*, 13(3), e521. <https://doi.org/10.1002/WENE.521>. (I.F. 5.4)
4. **Elwardany, M.** (2024). Enhancing steam boiler efficiency through comprehensive energy and exergy analysis: A review. *Process Safety and Environmental Protection*, 184(January), 1222–1250. <https://doi.org/10.1016/j.psep.2024.01.102>. (I.F. 6.9)
5. **Elwardany, M.**, Nassib, A. M., Mohamed, H. A., & Abdelaal, M. (2023b). Energy and exergy assessment of 750 MW combined cycle power plant: A case study. *Energy Nexus*, 12(July), 100251. <https://doi.org/10.1016/j.nexus.2023.100251>. (I.F. 8)
6. **Elwardany, M.**, Nassib, A. M., & Mohamed, H. A. (2024a). Advancing sustainable thermal power generation: insights from recent energy and exergy studies. *Process Safety and Environmental Protection*, 183(January), 617–644. <https://doi.org/10.1016/j.psep.2024.01.039>. (I.F. 6.9)
7. **Elwardany, M.**, NASSIB, A. E. M., & Mohamed, H. A. (2023). Comparative Evaluation for Selected Gas Turbine Cycles. *International Journal of Thermodynamics*, 26(4),57–67. <https://doi.org/10.5541/ijot.1268823>. (I.F. 0.8)
8. **Elwardany, M.**, Nassib, A. M., & Mohamed, H. A. (2024b). Analyzing global research trends in combined cycle power plants: A bibliometric study. *Energy Nexus*, 13(December 2023), 100265. <https://doi.org/10.1016/j.nexus.2023.100265>. (I.F. 8)
9. Abdelrazik, A. S., Osama, A., Allam, A. N., Shboul, B., Sharafeldin, M. A., **Elwardany, M.**, & Masoud, A. M. (2023). ANSYS-Fluent numerical modeling of the solar thermal and hybrid photovoltaic-based solar harvesting

systems. *Journal of Thermal Analysis and Calorimetry*, 148(21), 11373–11424.

<https://doi.org/10.1007/s10973-023-12509-2>. (I.F. 3.2)

10. Abdelrazik, A. S., Shboul, B., **Elwardany, M.**, Zohny, R. N., & Osama, A. (2022). The recent advancements in the building integrated photovoltaic/thermal (BIPV/T) systems: An updated review. *Renewable and Sustainable Energy Reviews*, 170(April), 112988. <https://doi.org/10.1016/j.rser.2022.112988>. (I.F. 16.3)

### CONFERENCE PUBLICATIONS

1. **Elwardany, M.**, Nassib, A. M., & Mohamed, H. A. (2023). Case Study: Exergy Analysis of a Gas Turbine Cycle Power Plant in Hot Weather Conditions. In 2023 5th Novel Intelligent and Leading Emerging Sciences Conference (NILES) (pp. 291–294). IEEE. <https://doi.org/10.1109/NILES59815.2023.10296731>
2. **Elwardany, M.**, Nassib, A. M., Mohamed, H. A., & Abdelaal. (2023a). Performance Assessment of Combined Cycle Power Plant. In 2023 5th Novel Intelligent and Leading Emerging Sciences Conference (NILES) (pp. 80–84). IEEE. <https://doi.org/10.1109/NILES59815.2023.10296617>
3. AZ. Hafez, **M.W. Fouad**. The collector's design parameters impact on solar energy applications – A review. 2nd International Conference on Sustainability, Energy and Environmental Sciences, University of Cambridge, Cambridge, United Kingdom, 17-19 September 2018

### RESEARCH EXPERIENCE

#### **Mechanical Power Engineering Department, Assiut University, Assiut, Egypt**

*Graduate Researcher*; Advisor: Dr. Hany A. Mohamed

Sep. 2020–Mar. 2024

- Conducted theoretical comparative analysis for selected gas turbine power plants using exergy analysis
- Performed two case studies to assess the thermal performance of gas turbine and combined cycle power plants through detailed energy and exergy analysis
- Recommended measures to enhance performance and increase the efficiency of power plants
- Published 6 peer-reviewed journal articles and presented 2 oral presentations at international conferences

#### **Mechanical Engineering Department, Assiut University - Assiut, Egypt**

*Bachelor Graduation Project*; Advisor: Dr. Ahmed Hamza H. Ali

Dec. 2017–Jul. 2018

- Initiated with a group of 4 students to investigate experimentally the performance of Hybrid Mechanical Compression Refrigeration-Solar thermal assisted system
- Involved in writing a grant proposal to fund the project, which awarded 60,000 EGP (~US\$4,000)

### TEACHING EXPERIENCE

#### **Mechanical Power Engineering Department, Faculty of Engineering, Assiut University – Assiut, Egypt**

*Assistant Lecturer*

Mar. 2024–present

- Courses Taught: Thermodynamics, New and Renewable Energy, Energy Systems
- Supervising undergraduate graduation projects
- Marking assessments and providing feedback
- Preparing laboratory materials and maintaining course web pages

#### **Mechanical Power Engineering Department, Faculty of Engineering, Assiut University – Assiut, Egypt**

*Teaching Assistant*

May. 2020– Mar. 2024

- Courses Taught: Production Engineering, Heat Transfer, Heat Exchanger, New and Renewable Energy, Hydraulic Machines, Mechanical Power Laboratories, Energy Systems, Power Plants & Their Economics
- Demonstrating problems in tutorials & Explaining concepts in one-on-one meetings with students
- Writing weekly quizzes, posting solutions online, and grading quizzes and exams
- Prepared materials for lectures and laboratory sessions
- Assisted in faculty operations, including Equipment Inspection Committees

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**WORK EXPERIENCE**


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**Dawi Medical Co. – Assiut, Egypt***Part-time Maintenance Engineer*

May. 2020–Ap. 2021

- Diagnosed errors and breakdowns in air compressors and pneumatic systems
- Evaluated and understood the requirements of products and services
- Coordinated with production and maintenance departments to enhance line capabilities

**Samsung Electronics Egypt, Product Design Department – Bani Swief, Egypt***Product Design intern*

Aug.–Sep. 2017

- Involved in mechanical design, CAD modeling, prototyping, and reliability testing
- Rotated through various departments in the factory to gain exposure to different functions

**CEMEX Egypt – Assiut, Egypt***Operational Excellence intern*

Jul.–Aug. 2017

- Implemented lean manufacturing and six sigma capability studies
- Analyzed production processes to improve productivity and minimize losses

**Hydro Plants Generation Co. – Aswan, Egypt***Engineering intern*

Jul.–Aug. 2016

- Gained practical knowledge of electricity production through the Aswan High Dam
- Identified hydraulic turbines, accessories, and common faults

**Upper Egypt Electricity Production Co. – Assiut, Egypt***Engineering intern*

Aug.–Sep. 2015

- Gained practical experience and knowledge about electricity production through the steam power plant
- Learned about different mechanical machines such as turbines, burners, pumps, and valves

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**EXTRACURRICULAR ACTIVITIES**


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**Assiut Robotics, Assiut University, Assiut, Egypt***Part-time volunteer*

Dec. 2014– Dec. 2016

- Served as as mechanical designer and organization community member
- Collaborated on designing and manufacturing a manual badminton-playing robot with a multi-disciplinary team for the local ROBOCON competition in 2015 (4th place)
- Collaborated on designing and manufacturing a macro robot for the Assiut Robotics Lab competition in 2014 (1st place), capable of moving and carrying objects of different shapes

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**HONORS & AWARDS**


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- First-class Honors in Mechanical Engineering, Syndicate of Egyptian Engineers Aug. 2018
- Bachelor Graduation project Fund 60,000EGP (~US\$4,000), Academy of Scientific Research and Technology (ASRT) 2018
- Distinction grade Fellowship, Faculty of Engineering, Assiut University 2013–2018
- Conference Grant Scholarship, The German Company Sustainable Concepts Nov. 2018  
(The 3rd International Conference on Solar Energy Solutions for Electricity and Water Supply in Rural Areas)
- 1st Place, Engineering Zone Competition, Assiut University Apr. 2018
- 4th Place, Local ROBOCON Competition, Helwan University Jun. 2014
- 1st Place, Robotics Challenge Competition, Assiut Robotics, Assiut University Mar. 2014

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**CONTINUE EDUCATIONAL COURSES AND TRAINING**


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- Optimization Techniques for Energy Systems - Online Training

- The Smart Thermal Energy Systems Group at DTU - Technical University of Denmark 2-12 Apr. 2024
- Tenth KAUST ANSYS Workshop - Online Training by KAUST Supercomputing Laboratory 25-27 Aug. 2023
- Energy Management System in Line with ISO 50001:2018, UNIDO Training Program 24-26 Nov. 2022
- Water-Energy-Food-Ecosystems (WEFE) Nexus: From Research to Practice, Online Training 6-8 Dec. 2021
- 24-hour professional Business Boot-camp - RIndustry Program Online Training Course 1-17 Aug. 2021
- Wind Energy Technology, RIndustry Program Online Training Course 23-27 May. 2021
- Water Desalination Technology, RIndustry Program Online Training Course 16-20 May. 2021
- Solar Technology, RIndustry Program Online Training Course 28-31 Mar. 2021
- Energy and RE Economics, RIndustry Program Online Training Course 21-25 Mar. 2021
- Energy 101: The Big Picture, A 6-Week course from Georgia Institute of Technology (Coursera) Dec. 2018
- Introduction to Solar Energy, An 8-Week course from Delft University of Technology (edX) Nov. 2018
- Intensive Practical Training Course on Solar Energy, A 5-Days Fully Funded by Arab-German Young Academy of Science and Humanities (AGYA), Fayoum University, Fayoum, Egypt Oct. 2017
- ES Lab in Scientific Research – Basics Level, A 12-Week Class provided by Egypt Scholar Program Sep. 2017
- Fundamentals of Fluid Power, A 6-Week course from University of Minnesota (Coursera) Sept. 2016

### PROFESSIONAL DEVELOPMENT

- Professional Scientific Experiments: Smart Selection of Research Topics - CABI Workshop 27 Nov. 2023
- Tackle Literature Reviews with Confidence Using Clarivate Solutions - EKB Workshop 25 Sept. 2023
- Citations and References: Do's and Don'ts! for Researchers - CABI Workshop 13 Sept. 2023
- Attractive and Informative Abstracts! for Researchers - CABI Workshop 30 Aug. 2023
- Preparing a Proposal for a Competitive Research Project - Online Training, Assiut University 16-18 May. 2023
- Online Series Professional Scientific Oral Presentations 6,13,20 Jul. 2022
- How to Review Your Manuscript Before Submission - CABI Workshop 12 Jun. 2022
- How to Write Conclusions, Abstract, Title & References - CABI workshop 22 May. 2022
- Common Mistakes in Manuscript Writing - IET Inspec workshop 18 May. 2022
- How to Write the Results and Discussions - CABI workshop 15 May. 2022
- How to Write the Introduction and Materials & Methods - CABI workshop 8 May. 2022
- Data Analysis and Interpretation - CABI workshop 24 Apr. 2022
- How to Design your Scientific Experiments - CABI workshop 17 Apr. 2022
- How to Select a Novel Research Point - CABI workshop 10 Apr. 2022
- Practical Tips in Mega Scale PV Projects' Management. - Metavirtua workshop 14 Mar. 2022
- Solar O&M - Metavirtua online workshop 8 Mar. 2022
- Solar Project Auditing- Metavirtua workshop 23 Feb. 2022
- Net Zero Energy Buildings – Webinar by the Association of Energy Engineers 2 Jun. 2021
- Self-Marketing workshop - DAAD Cairo Akademie 27 Feb. 2020
- Self-Management workshop - DAAD Cairo Akademie 26 Feb. 2020
- Proposal Writing for Master & PhD. Candidate's workshop, DAAD Cairo Akademie 13 Mar. 2019
- Design Your Effective Training Course workshop, DAAD Cairo Akademie 30 Dec. 2018

### PROFESSIONAL MEMBERSHIPS

- Syndicate of Egyptian Engineers Sep. 2018–Present
- World Society of Sustainable Energy Technologies (WSSET) Oct. 2017–Present

### SKILLS

- MATLAB ▪ python ▪ SolidWorks ▪ AutoCAD ▪ EnergyPlus ▪ EES ▪ TRNSYS ▪ ANSYS  
Fluent