

Dr. Omar G. Alsawafy

Assistant Professor
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EDUCATION

Ph.D. in Industrial & Systems Engineering | 2015–2018
King Fahd University of Petroleum & Minerals (KFUPM)

Thesis: Discrete Production and Inventory Control with Imperfect Items
Supervisor: Prof. Shokri Selim

M.Sc. in Industrial & Systems Engineering | 2010–2012
King Fahd University of Petroleum & Minerals (KFUPM)

Thesis: Production and Inventory Planning with Imperfect Quality Items and Shortages
Supervisor: Prof. Shokri Selim

B.Sc. in Industrial Engineering | 2004–2009
An-Najah National University

Graduated first in class in Industrial Engineering.

TEACHING EXPERIENCE

Academic appointments

Assistant Professor | 2026–Present
Department of Operations and Supply Chain Management, College of Business, Effat University

Assistant Professor | 2018–2026
Industrial & Systems Engineering Department, KFUPM

Lecturer B | 2015–2018
Systems Engineering Department, KFUPM

Technical Research Assistant | 2012–2015
KFUPM Endowment Fund

Research Assistant | 2010–2012
Systems Engineering Department, KFUPM

Teaching Assistant | 2009–2010
Industrial Engineering Department, An-Najah National University

Courses Taught

- ISE 201 – Introduction to Industrial & Systems Engineering
- ISE 205 – Engineering Probability & Statistics
- ISE 291 – Introduction to Data Science
- ISE 303 – Operations Research I
- ISE 307 – Engineering Economic Analysis
- ISE 315 – Engineering Statistics
- ISE 405 – Stochastic Systems Simulation
- ISE 490 – Senior Design Project
- ISE 499, 599, 699 – Seminars
- ISE 522 – Advanced Stochastic Simulation
- ISE 606 – Independent Research

RESEARCH EXPERIENCE

Research Areas

Production planning and inventory control; supply chain management and logistics; maintenance planning and optimization; renewable energy optimization; discrete-event simulation and simulation-based optimization.

Research Contributions

- Developed models for imperfect production systems, inventory policies, and customer order promise times with earliness and lateness penalties.
- Studied inspection and maintenance policies for dependent multi-component systems, including spare parts provisioning, service logistics, stochastic degradation, and resource constraints.
- Applied simulation and optimization to petrochemical supply chains, integrating production, inventory, recycling, backup supply, and emissions decisions.

Research Appointments and Affiliations

Research Scholar, KFUPM research centers: Interdisciplinary Research Center for Smart Mobility and Logistics (IRC-SML) (2024-2026); previously the Interdisciplinary Research Center for Intelligent Manufacturing and Robotics. (2021-2024)

PUBLICATIONS

Journal publications

1. **Alsawafy, O. G.** (2026). Flexible Inspection Approach for Maintenance Planning in Multi-Component Systems with Dependencies and Service Logistics. *IEEE Access, 14, 7325–7338.*
2. Attia, A. M., Alanbar, N. S., **Alsawafy, O. G.**, & Akbar, C. (2026). Optimization of a Sustainable Petrochemical Supply Chain: A MILP Framework for Integrated Economic and Environmental Performance. *Process Integration and Optimization for Sustainability, 1–15.*
3. Al Hanbali, A., Darghouth, M. N., Ali Atiah, A. M., Hussein Ghaithan, A. M., Mohammed, A., **Alsawafy, O.**, & Abdel-Aal, M. A. (2026). Optimizing inspection and maintenance decisions in degrading systems with quality-loss. *Proceedings of the Institution of Mechanical Engineers, Part O: Journal of Risk and Reliability, 1748006X261434623.*
4. Mohammed, A., AlRehaili, M., Al-Hanbali, A., Attia, A. M., Darghouth, M. N., Ghaithan, A., ... & **Alsawafy, O.** (2026). Machine Learning Models Integrated with Strategic Theories for Predicting Delivery Time in Supply Chains. *Results in Engineering, 111069.*
5. **Alsawafy, O. G.**, & Selim, S. Z. (2025). Optimal promise time for customer orders in imperfect discrete production systems with earliness and lateness penalties. *International Journal of Production Research, 63(19), 7077–7089.*
6. **Alsawafy, O. G.**, Darghouth, M. N., Al Hanbali, A. A., & Ghaithan, A. M. (2025). Dependency-aware maintenance optimization of multi-component multi-asset systems: A simulation-based approach. *Computers & Industrial Engineering, 206, 111192.*
7. Nasir, A., Mekid, S., Sawlan, Z., & **Alsawafy, O. G.** (2025). Optimized task assignment and predictive maintenance for industrial machines using Markov decision process. *Operational Research, 25, Article 96.*
8. Attia, A. M., Darghouth, M. N., Ghaithan, A. M., Mohammed, A., Abdel-Aal, M. A. M., Al Hanbali, A., & **Alsawafy, O. G.** (2025). Design optimization of standalone photovoltaic systems for enhanced energy density. *Renewable Energy, 252, 123506.*
9. Almaslami, A., **Alsawafy, O.**, & Al-Maraj, I. (2025). Site selection for electric vehicle charging stations in car sharing systems: Integration of photovoltaic systems and upgrade decisions. *Energy, 335, 138138.*
10. Khallaf, Z., Alshibani, A., **Alsawafy, O. G.**, Mohammed, A., & Bubshait, A. A. (2024). Dynamic fleet configuration model for optimizing earthmoving operations using mixed-integer linear programming. *Journal of Construction Engineering and Management, 150(11), 04024110.*
11. Attia, A. M., Alatwi, A. O., Al Hanbali, A., & **Alsawafy, O. G.** (2024). Joint maintenance planning and production scheduling optimization model for green environment. *Journal of Quality in Maintenance Engineering, 30(1), 1–18 (early access).*
12. **Alsawafy, O. G.**, & Selim, S. Z. (2023). Discrete production workstation with two types of imperfect items: determining the optimal promise time. *International Journal of Systems Science: Operations and Logistics, 10(1), Article 2180689.*
13. Akbar, U. A., Mekid, S., **Alsawafy, O. G.**, & Al Hanbali, A. (2022). Design and development of best class discrete production model for distributed manufacturing under Industry 4.0. *Arabian Journal for Science and Engineering, 47(12), 16485–16504.*

14. Al Hanbali, A., Saleh, H. H., **Alsawafy, O. G.**, Attia, A. M., Ghaithan, A. M., & Mohammed, A. (2022). Spare parts supply with incoming quality control and inspection errors in condition-based maintenance. *Computers & Industrial Engineering, 172, 108534.*

15. Mohammed, A., Ghaithan, A., Al-Hanbali, A., Attia, A. M., Saleh, H. H., & **Alsawafy, O. G.** (2022). Performance evaluation and feasibility analysis of 10 kWp PV system for residential buildings in Saudi Arabia. *Sustainable Energy Technologies and Assessments, 51, 101920.*

16. **Alsawafy, O. G.**, & Selim, S. Z. (2022). Analysis of a discrete production workstation. *Computers & Operations Research, 137, 105532.*

17. Ghaithan, A. M., Al-Hanbali, A., Mohammed, A., Attia, A. M., Saleh, H. H., & **Alsawafy, O. G.** (2021). Optimization of a solar-wind–grid powered desalination system in Saudi Arabia. *Renewable Energy, 178, 295–306.*

18. Attia, A. M., Al Hanbali, A., Saleh, H. H., **Alsawafy, O. G.**, Ghaithan, A. M., & Mohammed, A. (2021). A multi-objective optimization model for sizing decisions of a grid-connected photovoltaic system. *Energy, 229, 120730.*

19. Alfares, H. K., & **Alsawafy, O. G.** (2019). A least-loss algorithm for a bi-objective one-dimensional cutting-stock problem. *International Journal of Applied Industrial Engineering, 6(2), 1–19.*

20. Muhammad, A.-S., & **Alsawafy, O.** (2012). Economic order quantity for items with two types of imperfect quality. *An International Journal of Optimization and Control: Theories & Applications (IJOCTA), 2(1), 73–82.*

Conference publications

1. Alanbar, N., Akbar, C., **Alsawafy, O. G.**, & Attia, A. M. (2024, December). Greening the petrochemical supply chain: An integrated model to production planning, inventory management, and emissions reduction. *In Proceedings of the International Conference on Industrial Engineering and Operations Management (IEOM) (pp. 3321–3330). Muscat, Oman.*

2. Akbar, C., **Alsawafy, O. G.**, Alanbar, N., & Attia, A. M. (2024, September). Simulation-based optimization for multi-echelon petrochemical supply chain. *In Proceedings of the 5th Asia Pacific Conference on Industrial Engineering and Operations Management (IEOM) (pp. 866–878). Tokyo, Japan.*

3. Al Hanbali, A., Saleh, H. H., & **Alsawafy, O. G.** (2021, May). Integrated condition-based maintenance and spare parts supply with incoming quality control and inspection errors. *In Proceedings of the IISE Annual Conference & Expo 2021 (pp. 507–512).*

4. Alfares, H. K., & **Alsawafy, O. G.** (2017, April). Efficient least-loss algorithm for a bi-objective trim-loss problem. *In Proceedings of the 7th International Conference on Industrial Engineering and Operations Management (IEOM) (pp. 2118–2122). Rabat, Morocco.*

PRESENTATIONS

Workshops and Short Courses Delivered

- Delivered short courses in Data Science (2025).
- Delivered workshops on simulation and the use of ARENA software (2019–2022).

Conferences attended

- Second International Conference on Smart Mobility and Logistics Ecosystems, Dhahran, Saudi Arabia, 8–11 February 2026.
- SaudiCIS 2024 Conference, Dhahran, Saudi Arabia, 19–21 November 2024.
- First International Conference on Smart Mobility and Logistics Ecosystems, Dhahran, Saudi Arabia, 17–19 September 2024.
- International Conference on Industrial Engineering and Operations Management (IEOM), Riyadh, Saudi Arabia, 26–28 November 2019.
- Saudi Maintenance and Reliability Conference, Khobar, Saudi Arabia, 27–31 October 2019.
- First Saudi Conference for Social Responsibility, Dammam, Saudi Arabia, 5–6 March 2014.
- Campaign Communications Conference, Chicago, USA, 10–11 October 2013.
- Successful Campaigns Conference, Chicago, USA, 8–9 October 2013.
- Asia-Pacific Advancement Conference, Singapore, 19–22 March 2013.

GRANTS AND FELLOWSHIPS

Funded research projects and grants

2026 | Principal Investigator. Logistic Dependency and Imperfect Components Supply in Condition-Based Maintenance of Dependent Multi-Component Systems.

2026 | Co-Investigator. Optimizing Inspection and Maintenance Decisions in Degrading Systems with Quality-loss.

2026 | Co-Investigator. Offline IoT-Enhanced Optimization for Resilient and Equitable Cold-Chain Logistics.

2025 | Principal Investigator. Maintenance Planning for Multi-Component Systems with Dependencies and Service Logistics.

2025 | Co-Investigator. Designing a robust inventory sharing system with backordering allowed under demand uncertainty.

2023–2024 | Co-Investigator. Optimal Supply Chain and Capacity Expansion Strategy for Gulf Pack Company.

2021–2023 | Principal Investigator. Analysis of alternative models with the effect of IMS and DT on international load sharing.

Scholarships

- Ph.D. full scholarship (first honors), KFUPM, 2015–2018.
- M.Sc. full scholarship (first honors), KFUPM, 2010–2012.

AWARDS AND HONORS

- Best Paper Award, Supply Chain and Logistics Track, 3rd GCC International Conference on Industrial Engineering and Operations Management (IEOM), Tabuk, Saudi Arabia, 2–4 February 2026.
- Second place, Poster Competition Presentation, 5th Asia Pacific Conference on Industrial Engineering and Operations Management (IEOM), Tokyo, Japan, September 2024.
- Service Award, Industrial & Systems Engineering Department, KFUPM (2023).
- Service Award, International Conference on Industrial Engineering and Operations Management (IEOM), Riyadh, Saudi Arabia (2019).
- First in class, B.Sc. in Industrial Engineering, An-Najah National University (2009).

THESIS SUPERVISIONS

Graduate theses

- Served as supervisor or committee member for more than 10 graduate student theses.

Senior design projects and training

- Supervised more than 10 senior design projects.
- Supervised 20+ cooperative training and internship students.

PROFESSIONAL MEMBERSHIPS

- Jordan Engineers Association.
- Institute of Industrial and Systems Engineers (IISE).
- Industrial Engineering and Operations Management Society International (IEOM).

RELEVANT SKILLS

Simulation: ARENA, ProModel.
Optimization: LINGO, GAMS.
Programming: Python, MATLAB.
Statistics: Minitab.
Productivity software: Microsoft Office.
Languages: Arabic (native); English (fluent).

REFERENCES

Available upon request.