

CURRICULUM VITAE

Mohamed IFTIRICH (Fterich)

PHD in Mechanical Engineering



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PROFIL

PERSONAL INFORMATION

▪ First Name	Mohamed
▪ Last Name	Fterich
▪ Date of Birth	April 17 th , 1988.
▪ Marital Status	Married (2 children in charge)
▪ Nationality	Tunisian
▪ Phone number	0021653236051 / 00966557352116
▪ E-mail	Mohamed.fterich@enis.tn / Mohamedfterichh@gmail.com

EDUCATION AND DIPLOMAS

2015 – 2020 Doctoral Diploma	National engineering school of SFAX (ENIS)-TUNISIA. Date: January 2021. Specialty: Mechanical Engineering. Thesis topics: Parametric study and performance improvement of the solar dryer equipped with PV/T air collector Laboratory: Laboratory of Electromechanical Systems (LASEM) Mention: Very Honorable
2013 – 2015 Research Master Diploma	Higher Institute of Industrial Systems (ISSIG) GABES-TUNISIA. Date: November 2015. Specialty: Mechanical Engineering
2013 – 2015 Professional Master Diploma	Higher Institute of Industrial Systems (ISSIG) GABES-TUNISIA. Date: June 2013. Specialty: Engineering in Electromechanical
2008-2011 Bachelor diploma	Higher Institute of Industrial Systems (ISSIG) GABES-TUNISIA. Date: June 2011. Specialty: Engineering in Electromechanical
2008 Baccalaureate Diploma	Specialty: Mathematical Principal Session Date: June 2008

AFFILIATION

1. University of Sfax, National School of Engineers of Sfax (ENIS), Laboratory of Electromechanical Systems (LASEM), URL, 3038 Sfax, Tunisia
2. Department of Industrial Engineering, College of Engineering, Northern Border University, Arar, 73213, Kingdom of Saudi Arabia

COMPUTER SKILLS

Computer-Integrated Manufacturing System	CAM-Concept and Master CAM
CAD Tools	AUTOCAD, SOLID WORKS, RDM 6 and CATIA
PM Tools	MICROSOFT PROJECT 2003/2013, PRIMAVERA P6.8
Scientific Tools	COMSOL MULTIPHYSICS, ARDUINO and FLUENT
Other Tools	WINDOWS (all distributions), MS OFFICE, LATEX

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EDUCATIONAL ACTIVITIES

EDUCATIONAL EXPERIENCE / TEACHING POSITION

Northern Border University Arar -KSA / College of Engineering

<http://www.nbu.edu.sa>

- 📄 **2017-Till now: Lecture** at Industrial Engineering department of College of engineering at Northern Border University, Arar Kingdom of Saudi Arabia, (<http://www.nbu.edu.sa>).

University of GAFSA- Tunisia / Faculty of Sciences during 2016 – 2017

<http://www.fsgf.rnu.tn>

- 📄 **2016-2017: Assistant contractual** at Department of Mechanical Engineering in Faculty of Sciences (FSGF), University of GAFSA-TUNISIA (<http://www.fsgf.rnu.tn/>).

Academic activities

- ✚ Teaching courses in mechanical engineering and industrial engineering for undergraduate levels
- ✚ Participant for ABET Accreditation of Department of Industrial Engineering, College of Engineering, Northern Border University, Arar, Saudi Arabia at 2017 and 2023 (Self-study, course files, Assessment reports)
- ✚ Head of the Laboratories Committee of the Industrial Engineering Department, College of Engineering, Northern Border University, Arar, Saudi Arabia
- ✚ Head of the Scientific Research Committee of the Industrial Engineering Department, College of Engineering, Northern Border University, Arar, Saudi Arabia
- ✚ Member of the laboratories committee at the College of Engineering, Northern Border University, Arar, Saudi Arabia

- ✦ Member of the Self-Study Preparation Committee for the Industrial Engineering Department (NCAAA) at 2022-2023, College of Engineering, Northern Border University, Arar, Saudi Arabia
- ✦ Member of the Quality and Academic Accreditation Committee of the Industrial Engineering Department
- ✦ Member of the Statistics and Performance Measurement Committee for the Industrial Engineering Department
- ✦ Member of the Professional Guidance Committee for the Industrial Engineering Department
- ✦ Member in the committee to develop a program of Industrial Engineering (2022-2023)
- ✦ Member in the Program Accreditation Committee of the Department Industrial Engineering (2022-2024)
- ✦ Member of the Alumni Committee of the Department of Industrial Engineering
- ✦ Member of the Exit Exam Committee of the Industrial Engineering Department
- ✦ Academic advisor for students of the Industrial Engineering Department (pre-registration process on BANNER system)
- ✦ Participant for ABET Accreditation of Industrial Engineering Department 2017 (Self-study, course files, Assessment reports)
- ✦ Member of the committee for developing a professional diploma program in the mining
- ✦ Member of the committee for developing a bachelor degree program in engineering safety
- ✦ Supervision of three project of the graduates' students
- ✦ Good background knowledge in the Banner
- ✦ Good background knowledge in the Blackboard
- ✦ Teaching courses in Mechanical engineering undergraduate and graduate levels

Taught Courses

✦ **Heat Transfer:**

Key words: Principles of Heat Transfer, steady state and transient conduction in different co-ordinates, extended surfaces. Convection heat transfer. Analysis and empirical relations for forced and natural convection. Radiation heat transfer, radiation exchange between black and grey surfaces. Heat transfer applications (Heat Exchangers). Numerical methods in heat transfer with computer applications.

✦ **Engineering Mechanics**

Key words: This course familiarizes students with the concept of equilibrium as applied to rigid bodies- the case in which the forces and moments acting on a body do not result in an acceleration of the body. The course will define a methodology, the method of statics, used to determine certain forces

and moments acting on and within rigid bodies, and structures and machines composed of rigid components, that are in equilibrium. The most important concept that will be introduced is the free-body diagram. The objective of this course is to instill the ability to create and interpret free-body diagrams and solve complicated mechanics problems in a clear and concise manner.

+ **Computer Integrated Manufacturing system**

Key words: CIM overview and modeling, CIM components: CAD/CAPP/CAM/CAQC/AS&RS. Group Technology. Flexible manufacturing systems. Computer Numerical Control Manufacturing: Machine tool programming. Industrial robotics. Further, training the student to use the Software CAM-CONCEPT (or MASTER CAM) for design and virtual manufacturing mechanical system

+ **Basic workshop**

Key words: Introduction to manufacturing processes. Workshop safety. Engineering materials. Workshop measurements. Bench work. Sand casting process. Metal forming processes and sheet metal working. Metal cutting processes. Joining of materials.

theorem, similarity. Viscous flow, pipe flow, losses in conduit flow. Laminar and turbulent flows.

+ **Engineering drawing**

Key words: Introduction: Skills of freehand sketching. Methods of projection: orthographic, isometric. Dimensioning of views. Third view prediction. Primary and successive auxiliary views. Intersections of surfaces and bodies. Sectioning

+ **Manufacturing Technology**

Key words: Definition and classification of manufacturing systems; Manufacturing automation fundamentals; Manufacturing strategies (lean manufacturing, agile manufacturing and Application of KBS in manufacturing); performance of manufacturing system; Modeling of manufacturing systems; High volume manufacturing systems design and analysis; Flexible manufacturing performance analysis; automated inspection analyses.

+ **Materials engineering**

Key words: This course is designed to introduce the students to basic materials science. The students will be able to relate the microstructure of a material to its properties, and understand the effects of the environment on materials. The students will be provided with demonstrations of various processes in the laboratory. Main course topics include: Crystalline Structure and Nanocrystalline structure; Structural imperfections; Diffusion and Solidification; Mechanical working and heat treatment; Metals and alloys; Applications and processing of metals; Corrosion; Electrical and Magnetic Properties; Semiconductors and Superconductors; Nanomaterials; Ceramics and Glasses; Polymers and Composites; Failure Analysis and Prevention.

LAB of Materials sciences: Hardness Materials, Cold work, annealed and traction

+ **Mechanical Drawing**

Key words: Introduction to 3D modeling, 2D drawings, reference geometry, 3D drawing (features), drawing and editing mechanical parts, assembly drawing, Standard mechanical parts: Screw threads, fasteners and spring. Fits and tolerance: Fundamentals, types, symbols. Detailed drawing: Orthogonal views, auxiliary views, sectional views and dimensions. Manufacturing symbols: Geometrical

tolerance, surface texture and weld symbols. Training the student to use the software's (Solid works / CATIA) for computer aided design

✦ **Engineering Economy**

Key words: Fundamentals of engineering economy. Time value of money. Evaluation of alternatives. Replacement and retention analysis. Break even analysis. Depreciation methods

✦ **Work System Analysis and design (Work Study)**

Key words: Introduction to Work Study (WS). Productivity and WS. WS approaches. Basic procedure of method engineering and operation analysis. Principles of motion economy and work design. Work Measurement (WM) techniques. Learning curves

Project supervision

2021-2022 Supervision of the B.Sc. Senior Design Project of the graduates' students in the Industrial engineering from Industrial engineering department, College of engineering at Northern Border University- Arar-KSA. The title of the project is: **Design of Energy Storage System**

2019-2020 Supervision of the B.Sc. Senior Design Project of the graduates' students in the Industrial engineering from Industrial engineering department, College of engineering at Northern Border University- Arar-KSA. The title of the project is: **Design of an approach for improving performance of northern region cement**

2016-2017 Supervision of End of Studie Project (PFE) of the 3rd year of students of Applied license degree in electromechanics from Faculty of science of GAFSA. The title of the project is: **Development of a model database to carry out practical work in the F.S.G laboratories**

Participation in jury members

Evaluation of several projects of engineering student's levels at college of engineering, Northern borders university:

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SCIENTIFIC ACTIVITIES

Title Parametric study and performance improvement of the solar dryer equipped with PV/T air collector

Abstract The present doctoral thesis deals with the parametric study and energy-efficiency improvements of a solar dryer equipped with a PV/T air collector. Furthermore, we studied the solar dryer by developing the numerical simulation of **Heat and Mass transfer** and by ensuring experimental validation. This drying unit consists essentially of a hybrid solar air collector (PV / T) and a drying chamber where the product the product to be dried is spread out. The numerical simulation based on **Heat and Mass transfer** in each component of the dryer system was developed. The system of equations with distributed parameters is

solved by **COMSOL Multiphysics** software. Numerical simulation allows to better understand the behavior of each stage as well as of the entire unit, according to variations in input parameters and variations in meteorological conditions. The numerical simulation developed has been experimentally validated.

RESEARCH WORK

- ✦ Good background knowledge in renewable energy such as **Heat transfer**, solar collector and solar dryer system.
- ✦ Proficiency in FEA tools COMSOL Multiphysics.
- ✦ **Research internship (2016-2017)**: As part of a cooperation between the LASEM research laboratory at the ENIS and National Polytechnic Institute CIDIR-OAXACA MEXICO. This cooperation is part of the development of a numerical simulation of a **Heat and Mass transfer** in solar dryer equipped by a PVT air collector using to dry the agroo food products during my research work of the thesis.

Scientific Papers Published

- [1] **Mohamed Fterich**, Ahmed saadeddine souissi, Ezzeddine Touti and Hatem. Bentaher «Experimental and Numerical Study of the Performance Improvement of the Solar Dryer Equipped with PVT» Engineering, Technology & Applied Science Research, (2024), **(Q2, IF=1.5)**.
<https://doi.org/10.48084/etasr.7140>
- [2] Ahmed saadeddine souissi, Majed Masmali, **Mohamed Fterich**, Ezzeddine Touti and Houssam Chouikhi « 3D Numerical Study and Parametric Analysis of PV/T Design Effect on Thermal and Electrical Performance » Engineering, Technology & Applied Science Research, (2024), **(Q2, IF=1.5)**. <https://doi.org/10.48084/etasr.7227>
- [3] Majed Masmali, Mamdouh Elamy, **Mohamed Fterich** and Ezzeddine Touti « Comparative Studies on Load Frequency Control with Different Governors Connected with Mini Hydro Power Plant Via PSCAD Software » Engineering, Technology & Applied Science Research, (2024), **(Q2, IF=1.5)**.
<https://doi.org/10.48084/etasr.6722>
- [4] **M. Fterich**, M. Elamy, E. Touti, H. Bentaher <<Experimental and Numerical Study of Tomatoes Drying Kinetics Using Solar Dryer Equipped with PVT Air Collector >> Engineering Science and Technology, an International Journal, JESTCH_101524, (2023), **(Q1, IF=5.7)**.
<https://doi.org/10.1016/j.jestch.2023.101524>
- [5] E. Touti, M. Masmali, **M. Fterich** and H. Chouikhi « Experimental and numerical study of the PVT design impact on the electrical and thermal performances» Case Studies in Thermal Engineering 43, (2023), 102732, **(Q1, IF=6.26)**. <https://doi.org/10.1016/j.csite.2023.102732>
- [6] **M. Fterich**, H. Chouikhi, S. Ghorbel, H. Bentaher, S. Sandoval Torea A. Maalej, «NUMERICAL AND EXPERIMENTAL STUDY OF SOLAR DRYER EQUIPPED WITH PV/T » Technical gazette, Vol. 29/No.3 (2022) **(Q4, IF=0.783)**.

<https://doi.org/10.17559/TV-20200926203404>

[7] **M. Fterich**, H. Chouikhi, H. Bentaher, S. Sandoval Torres, A. Elloumi and A. Maalej, « Numerical simulation and experimental characterization of the heat transfer in a PV/T air collector» *Case Studies in Thermal Engineering* 27, (2021) 101209, (Q1, IF=4.92).

<https://doi.org/10.1016/j.csite.2021.101209>

[8] **M. Fterich**, H. Chouikhi, H. Bentaher, A. Maalej, « Experimental parametric study of a mixed-mode forced convection solar dryer equipped with a PV/T air collector» *Solar Energy* 171 (2018) 751–760, (Q1, IF=5.742).

<https://doi.org/10.1016/j.solener.2018.06.051>

Communication in International Congresses

[1] **M. Fterich**, H. Chouikhi, H. Bentaher, A. Maalej, « Experimental and numerical study of drying kinetics of tomatoes in solar dryer with PV/T», CMSM2021, 20-22 December, HAMMAMET-TUNISIA

[2] **M. Fterich**, H. Chouikhi, H. Bentaher, A. Maalej, « Experimental study of direct and indirect solar dryers», CMSM2021, 20-22 December, HAMMAMET-TUNISIA

[3] **M.Fterich**, S. Sandoval-Torres, H. Chouikhi, H. Bentaher and A. Maalej «Numerical and experimental investigation of heat transfer in mixed solar dryer» VSESA 2020, 9-10 December 2020, College of Engineering, Qassim University, SAUDI ARABIA

[4] **M.Fterich**, H. Chouikhi, H. Bentaher, S. Sandoval-Torres and A. Maalej «Efficiency Analysis of Photo-Voltaic Thermal Air Collectors» PGSRT 2019, 26-27 August 2019, TURKEY

[C5] **M.Fterich**, H. Chouikhi, H. Bentaher, S. Sandoval-Torres and A. Maalej «Numerical and experimental evaluation of a photovoltaic thermal air collector's performance (PVT) under Tunisian climatic conditions» GEEE2018, 28-30 April 2018, SOUSSE-TUNISIA

[6] **M. Fterich**, H. Chouikhi, H. Bentaher, A. Maalej, «Experimental Investigation of a new hybrid collector (PV/T) system», ICME2016, 22-24 December, HAMMAMET-TUNISIA.

[7] **M. Fterich**, H. Chouikhi, A. Elloumi, H. Bentaher, A. Maalej, «Performance of an agro-food solar dryer equipped with a PVT/ air collector», ICAMEM2015. 20-21 December, HAMMAMET-TUNISIA.

Books chapters Published

[1] **M. Fterich**, H. Chouikhi, H. Bentaher, A. Maalej «EXPERIMENTAL INVESTIGATION OF A NEW HYBRID SOLAR COLLECTOR (PV/T) SYSTEM» *Mechanical Engineering Technologies and Applications*, 2023, V2, 47-59. DOI: 10.2174/9789815124125123020006

[2] **M. Fterich**, H. Chouikhi, H. Bentaher, A. Maalej «Experimental Study of Indirect Solar Dryer Under Climatic Conditions of Tunisia» *Design and Modeling of Mechanical Systems - V*, V pp 637–645 (2022), DOI: 10.1007/978-3-031-14615-2_71

[3] **M. Fterich**, H. Chouikhi, H. Bentaher, A. Maalej «Efficiency Analysis of Photo-Voltaic Thermal Air Collectors» *Power Generation System and Renewable Energy Technology (PGSRET)-Edition: 2019*, IEEE Xplore, DOI: 10.1109/PGSRET.2019.8882658

National Patents

The principal Inventor of the national patent with title: Solar Dryer of Agro-Food Products (Patents N 25564 INNORPI TN2017000190A1-21/12/2018).

<https://patents.google.com/patent/TN2017000190A1/en>

Participation in Workshop

2016-2017: Participation in the Renewable energy & Mechatronics in agriculture workshop (REMAG 2017) in 4-5 April at Sfax-Tunisia

Participation in Scientific Events

2016-2017: Member in the organization committee of the Renewable energy & Mechatronics in agriculture workshop (REMAG 2017) in the 4-5 April 2017.

Reviewer Activity

Journal	Paper title	Reference of paper
Applied energy	Title of paper: Energy and exergy analysis during drying of green chilli in an indirect type solar dryer: A comparative assessment of forced and natural convection	APEN-D-20-04147
Journal of thermal science	Title of paper: Performance Study of a Hybrid Heat Pump Dryer based on Numerical Analysis and Experimental Set-up	JTS-19-0634
Technical gazette	Title of paper: Impacts of Leading-Edge Pitting and Delamination on Aerodynamic Characteristics of Wind Turbine Blades under Shear inflow	TV-20210226103125

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TRAININGS

Training at the End of study project of the Professional Master's degree between 25 February 2013 to 24 May 2013.

2012-2013

Company: HAIER

Title: Developing a FMECA process

Tasks: Implementing of the FMECA in the production lines of electric washing machines and air conditioners

Technical training: 01 July to 31 July 2010

2009-2010

Company: Halwani Industrial and Naval Metal Construction Company (HALWANI CONSTRUCTION)

Tasks: Maintenance and repair of the equipment's

Worker training: 09 August -09 September 2009

2008-2009

Company: TRANSPORT PAR PIPELINE SAHARA (TRAPSA)

Tasks: Maintenance and repair of the equipment's

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OTHER ACTIVITIES

Additional Formations

09 August 2023	Participation in training session organized by the Naseej Academy about: "The future of e-training and education" .
15 December 2022	Participation in training session organized by the Deanship of University Education Development at Northern Border University about: "Assessment methods according to learning areas"
08 December 2022	Participation in training session organized by the Deanship of University Education Development at Northern Border University about: "Learning outcomes consistent with the National Qualifications Framework" .
06 December 2022	Participation in training session organized by the Deanship of University Education Development at Northern Border University about: "Formulating the mission and objectives of the academic program in light of the mission, objectives and characteristics of university graduates" .
06 December 2022	Participation in training session organized by the Deanship of University Education Development at Northern Border University about the "Teaching strategies according to learning domains" .
21-23 October 2019	Participation in training session organized by the Deanship of University Education Development at Northern Border University about the "Documenting and indexing references in scientific researches using ENDNOTE"
19-21 December 2017	Participation in training session organized by the Deanship of University Education Development at Northern Border University about the "Automated correction and monitoring using mobile devices" .
04 March 2016	Participation in training session organized by the CNUDUST about "how to use Scopus, Science direct and Mendeley"

Community Partnership

Activities Implemented	Brief Description *
Participate in the teaching of the occupational safety and health diploma Program	I participated from 09/15/2021 to 12/30/2021 as a trainer of the course "Emergency response planning" in the occupational safety and health diploma Program that organized by the deanship of community service and continuing education of Northern Borders University (NBU)-Arar-KSA

LANGUAGES

Arabic Native language

French Fluent spoken and written

English Fluent spoken and written

HOBBIES – EXTRA-ACTIVITIES

- Traveling.
- Sports: football - footing.
- Reading scientific and technical magazines.
- Web surfing