

CURRICULUM VITAE - FRANCIS DAVIS

1. PERSONAL INFORMATION

Name: Prof. Francis Davis

Profile: Francis, a Professor in Mechanical Engineering specializing in design and manufacturing, boasts over 20 years of experience in research, teaching, maintenance, repairs, and consultancy. He demonstrates exceptional leadership and management skills honed through administrative positions entrusted by the University's Management. As Principal Investigator for Training of Transformative Leaders for Africa Programme funded by the MasterCard Foundation, Transport Engineer, Acting Head of Department, and Postgraduate Programmes Coordinator, his contributions led to notable transformations and expansions within the University Community, Nation, and International Community. Currently, he serves as Director General of the Technology Consultancy Centre, a UNESCO Category II Centre of Excellence driving innovation, manufacturing, technology transfer, and entrepreneurship. He chairs the committee tasked with commercializing the Transport Department for revenue generation, and leads the design and implementation of DVLA-KNUST Regional Centre of Excellence in Driver Vehicle Licensing, Standardisation, and Management.

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Date and Place of Birth: 16th September, 1968, Ghana.

Marital Status: Married with three children

Nationality: Ghanaian

Current Rank and Position Professor of Mechanical Engineering;
Director-General, TCC International Centre for Innovation, Manufacturing, Technology Transfer and Entrepreneurship, UNESCO Category 2 centre of Excellence, KNUST, Kumasi.

Academic Interest: Innovative and Sustainable Training & Research in Mechanical Engineering with special emphasis on the following areas:

- i. Modelling, Product Design, and Manufacturing of Mechanical and Thermal Systems
- ii. Maintenance Engineering, Production Engineering, Machine

- Building Capabilities, Servicing and Repair Works
- iii. Engineering Education, including curriculum development and program assessment for continuous improvement

2. OBJECTIVE

To diligently serve my University, Country and World, by positively influencing my generation with exemplary leadership and life-long learning attitudes.

3. EDUCATION

a) Academic Qualifications earned with Dates

2010	Doctor of Philosophy – Mechanical Engineering
2004	Master of Philosophy – Mechanical Engineering
1998	Bachelor of Science – Mechanical Engineering
1994	Diploma in Mechanical Engineering
1990	City & Guilds Ordinary Technician Diploma in Mechanical & Electrical Engineering
1986	City & Guilds Mechanical Engineering Technician Part 1
1986	General Course in Engineering
1985	General Certificate of Education, Ordinary Level
1983	Curriculum Research & Development Certificate

b) Institutions Attended with Dates

2005-2006	North Carolina Agricultural & Technical State University, Greensboro
2008-2010	North Carolina Agricultural & Technical State University, Greensboro
2000-2003	Kwame Nkrumah University of Science & Technology, Kumasi,
1994-1998	Kwame Nkrumah University of Science & Technology, Kumasi
1992-1994	Kwame Nkrumah University of Science & Technology, Kumasi
1987-1989	Takoradi Polytechnic
1985-1986	Takoradi Polytechnic
1982-1985	Mfantsipim School
1980-1982	Experimental Junior Secondary School

4. CAREER HISTORY AND EXPERIENCES

4.1 Major Academic Ranks/Positions

August 2023 – date	Professor, Department of Mechanical Engineering, KNUST-Kumasi
August 2018 – July 2023	Associate Professor, Department of Mechanical Engineering, KNUST-Kumasi
August 2012 – July 2018	Senior Lecturer, Department of Mechanical Engineering, KNUST-Kumasi
April 2004 – July 2012	Lecturer, Department of Mechanical Engineering, KNUST-Kumasi

4.2 Teaching and Research Experience with Dates

4.2.1 April 2004 to date Lecturing, Department of Mechanical Engineering, KNUST, Kumasi,

Subjects Taught:

2011 to date	Advanced Manufacturing Processes to First Year Design and Manufacturing Graduate Students
2011 to date	Manufacturing Mechanics to First Year Design and Manufacturing Graduate Students
2011 to date	Solid Modelling to First Year Design and Manufacturing Graduate Students
2011 to date	Integrated Product and Process Design to First Year Design and Manufacturing Graduate Students
2006 to date	Quality Assurance to First Year Design and Manufacturing Graduate Students
2011 to date	Finite Element Analysis to First Year Design and Manufacturing Graduate Students
2011 to date	Experimental Design and Analysis to First Year Design and Manufacturing Graduate Students
2011 to date	Production Engineering to Final Year Final Year Mechanical Engineering Students
2006 to date	Optimal Design of Machine Elements to First Year Design and Manufacturing Graduate Students
2006 to date	Manufacturing Technology to Second Year Mechanical & Agricultural Engineering Students
2006 to date	Strength of Materials to Third Year Mechanical & Agricultural Engineering Students
2011 to date	Machine Shop and Factory Design to Final Year Mechanical Engineering Students

- 2011 to date Machine Tool Design to Final Year Mechanical Engineering Students
- 2006 to date Instrumentation and Control to Final Year Mechanical Engineering Students
- 2006 to date Computer Graphics to Second Year Mechanical & Agricultural Engineering Students
- 2006 to 2008 Principles of Production System to Final Year Mechanical Engineering Students
- 2006 to date Engineering Drawing to First Year Mechanical, Electrical, Chemical, Petrochemical, Materials, Geological, Geomatic, and Petroleum Engineering Students
- 2006 to date First Year Design Project to First Year Mechanical & Aerospace Engineering Students
- 2006 to date Second Year Design Project to Second Year Mechanical & Aerospace Engineering Students
- 2006 to date Mechanical Engineering Lab to Second and Third Year Mechanical & Agricultural Engineering Students

4.2.2 September 2000 to April 2016 Part-Time Lecturer, Cape Coast Polytechnic

Subjects Taught:

- Jig and Tool design to Final Year Higher National Diploma, Production Engineering Students
- Production Planning and Control to Final Year Higher National Diploma, Production Engineering Students
- Manufacturing Technology to Second Year Higher National Diploma, Production Engineering Students
- Manufacturing Technology to Final Year Higher National Diploma, Production Engineering Students
- Metrology to Second Year Higher National Diploma, Production Engineering Students
- Measurement & Instrumentation to Second Year Higher National Diploma, Production Engineering Students
- Manufacturing Processes to Second Year Higher National Diploma, Plant Engineering Students
- Mechanics of Machines to First Year Higher National Diploma, Mechanical Engineering Students
- Maintenance & Installation to Second Year Higher National Diploma, Production Engineering Students

4.4.3 January 2009 to May 2010 Instructor, NCA&TSU, Greensboro

Subject Taught:

- Mechanical Engineering Lab II
- Mechanical Engineering Lab III
- Manufacturing Processes

4.2.4 August 2005 – May 2006 Demonstrator, North Carolina Agricultural and Technical State University, Greensboro

Duties performed include:

Execution teaching plans, preparation of handouts for students, grading of quizzes, and conduct of review sessions

4.2.5 October 2000 – August 2002 Demonstrator, KNUST, Kumasi

Duties include:

Supervision of laboratory sessions, grading quizzes and conduct of review sessions.

4.2.6 September 1998 – July 1999 National Service Person (Teaching Assistant), Department of Mechanical Engineering, KNUST, Kumasi

Duties performed include:

Supervision of laboratory sessions, grading of quizzes and conduct of review sessions

4.2.7 September 1990 to August 2002 Tutor, Cape Coast Technical Institute

Subjects Taught:

- Engineering Science
- Mathematics
- Technical Drawing
- Workshop Processes

4.3 Summary of Key Administrative Positions and other Responsibilities

April 2023 - date	Director General, Technology Consultancy Centre, UNESCO C2C Centre of Excellence for Engineering Education in Innovation, Manufacturing, Technology Transfer, and Entrepreneurship for Africa. Accra
Jan 2022 - date	Moderator, BSc. Mechanical Engineering, KAAF University College, Accra
Jan 2022 - date	Chairman, Transport Department Restructuring Committee, KNUST, Kumasi

Jan 2021 - date	Chairman, Transport Organisation Management Committee
June 2015 - date	Coordinator for the University, Memorandum of Understanding between Kwame Nkrumah University of Science and Technology (KNUST) and Driver Vehicle and Licensing Authority (DVLA)
April 2005 – date	Academic Tutor, Department of Mechanical Engineering, KNUST, Kumasi,
Jan 2022 – Mar 2023	Acting Head, Department of Mechanical Engineering, KNUST, Kumasi - Anytime substantive head is not at post
Jan 2022	Member, Committee of six (6) to create awareness and give exposure to all the programmes in the College of Engineering dubbed “College in Focus Programme 2022”
Oct 2020 – Oct 2023	Chairman, Faculty of Mechanical and Chemical Engineering Innovation and Entrepreneurship Committee
July 2020 – Oct 2024	Chairman, Committee for Ensuring equipping of Lecture Rooms and Auditorium with Requisite Technology for Enhanced Teaching, College of Engineering
Jan 2019 – Aug 2021	Postgraduate Programmes Coordinator, Department of Mechanical Engineering, KNUST
January 2019	External Examiner to Capstone Design Project Oral Examination of Senior Year Students, Department of Mechanical Engineering, Arizona State University, Tempe, USA.
July 2016 – Dec 2023	Principal Investigator, Strengthening Institutional Linkages (SIL) Project, International Accelerated Degree Programme in a 3+1+1 Format, Sponsored by Mastercard Foundations, KNUST, Kumasi.
Jan 2014 – Aug 2019	Transport Engineer, Transport Department, KNUST.
July 2013 – July 2020	Online Programmes Coordinator, Institute of Distance Learning, KNUST, Kumasi.

4. 3.2 Service to the University

2023 – date	Director-General TCC-CIMET, KNUST
2022 – date	University’s Representative , DVLA/KNUST Regional Centre of Excellence in Vehicle Driver Licensing Standardisation and Management
Jan 2022	Member , Committee of six (6) to create awareness to all the programmes in the College of Engineering dubbed “College in Focus Programme 2022”

- 2020 – date **University’s Representative**, COTVET Skill Sector Body
- 2023 - date **Member**, College of Engineering Board.
- 2020 - date **Member**, Faculty of Mechanical and Chemical Engineering Board.
- 2004 - date **Member**, Department of Mechanical Engineering Board.
- 2005 - date **Member**, Department of Mechanical Engineering Examiners Board.
- May 2018 **Chairman**, A 5-Member Committee to develop a proposal to solicit funds for equipment to furnish Automobile Laboratory
- Feb. 2020 **Member**, Ad-Hoc Committee for Recommended Programmes for Accra, Takoradi, and Tamale Centres of IDL, KNUST
- Feb. 2020 **Member**, Ad-Hoc Committee on Gap Assessment Technical Working Committee
- Sept. 2020 **Member**, Ad-Hoc Committee on Vice-Chancellor’s Vision on ICT
- April 2014 **Chairman**, A 4-Member Committee to explore the possibilities of appointing security officers as security drivers
- 2017-2019 **Member**, KNUST Bus Services Management Committee.
- 2017-2019 **Member**, KNUST Bus Services Technical Committee
- 2018-2020 **Member**, Hospital Car Park Management Committee.
- 2016-2018 **Member**, College of Engineering Innovations and Exhibition Committee.
- 2014 - 2019 **Member**, Welfare Services Board
- 2017 - 2019 **Member**, Transport Organization Management Committee
- 2017 - 2019 **Member**, Security Services Management Committee.
- April 2015 **Member**, A 8 - Member Committee to investigate accident involving students of the university
- Nov. 2017 **Member/Secretary**, A 3 - Member of Committee to develop course materials and course content for ME 477 and ME 577.
- Jan. 2015 **Member**, A 5 - Member Committee to review fifteen-month master’s programme in Marine Engineering and Mechanical Handling
- March 2018 **Member**, A 6 - Member Committee to develop accelerated Master’s programmes in the Department of Mechanical Engineering.
- Sep. 2013 **Member**, A 7 - Member Committee to review the proposal for affiliation submitted by Akim State University College (ASUC), Akim Oda

- March 2013 **Member**, Committee of four (4) to review Mechanical Engineering Department Top Up Programme for HND graduates.
- Nov. 2016 **Member**, A 6 - Member Committee to work out modalities for running parallel programmes at Accra City Campus
- Feb. 2016 **Member**, A 11 - Member Committee to see to the transition of the Professional Master of Engineering Programme to IDL.
- Feb. 2013 **Member**, A 6 - Member Committee to develop guidelines for mounting of KNUST Graduate Programmes in affiliate institutions of the university
- Oct. 2014 **Member**, Committee of three (3) to lead effort in using Mechanical Engineering Top Up programme for HND graduates to Pilot Online Programmes in IDL.
- May 2011 **Member**, A 5 – Member Committee to develop a policy for final year project execution in the Department of Mechanical Engineering.
- March 2012 **Member**, A 5 – Member Standing Committee on Top Up Programme in Mechanical Engineering hosted at Dubai, United Arab Emirates.
- Jan. 2008 **Member**, Committee of three (3) to investigate alleged examination malpractice during end of first semester 2007/2008 academic year examination.
- Oct. 2017 **Juror**, Maiden Edition of Afro-Mobitecture Students Exhibition and Awards, Department of Architecture

4.3.3 Service to the Community

(a) National

I have also served the national community in several capacities notably:

- i) **Technical Expert**, Member of Secondary Education Review Committee set-up by the National Council for Curriculum and Assessment (NaCCA) to develop a new Secondary Education Curriculum, as part of its mandate to develop national curriculum and assessment standards for pre-tertiary education institutions other than the technical and vocational training institutes. This was committee was set-up in August 2022 and I played a crucial role in the developing of this new curriculum which is to be rolled out.
- ii) **Technical Expert**, Member of the Automotive Design and Manufacturing Technology Sub-committee, set-up by the Commission for Technical and Vocational Education and Training

(CTVET) to develop competency-based training (CBT) curricula across National Proficiency I to Higher National Diploma. The sub-committee met in July 2023 and I played a leading role in this CBT curriculum put together by the sub-committee.

- iii) **Technical Expert**, Panel Member for Stem Curriculum Writing Workshop set-up by the National Council for Curriculum and Assessment (NaCCA) for residential writing workshop aimed at strengthening Senior High School Education while introducing flexible learning pathways and promoting Gifted and Talented Education (GATE). This residential workshop started in June 12, 2022. I was a key member making immense contributions to the workshop.
- iv) **Visiting Lecturer** to Ho Technical University. I was invited to teach a course in Continuous Improvement and Production Methods (MPE 528) in Semester 2 2017/2018 Academic Year to MTECH Production Engineering Year 2 Students. The class enjoyed my teaching.
- v) **External Examiner** to Bachelor of Technology Project Oral Examination Team, Department of Mechanical Engineering, Cape Coast Polytechnic. Invitation was honoured and report submitted before deadline.
- vi) **External Assessor** to Review Bachelor of Technology in Mechanical Engineering Curriculum for HND Graduates of Engineering, Cape Coast Polytechnic. The Bachelor of Technology in Mechanical Engineering Programme has taken off and my recommendations taken on board.
- vii) **Technical Expert**, Developed Mechanical Engineering Programme Course Outline and Descriptions for Madina Institute of Science and Technology (MIST). My work was accepted by a review committee and subsequently submitted to KNUST for programme affiliation consideration.

(b) International

The international community has also enjoyed my services in the following capacity:

- i) **Visiting Lecturer** to University of Science, Engineering and Technology, the Gambia. This is under KNUST/Gambia mentoring programme being sponsored by the World Bank.
- ii) **Visiting Lecturer** to Arizona State University, Tempe, USA. This is under International Accelerated Degree Programme sponsored by the Mastercard Foundation.

- iii) **Visiting Lecturer** to North Carolina Agricultural and Technical State University, Greensboro, USA. This is under Staff and Student Exchange Programme sponsored by NCATSU and KNUST.
- iv) **Visiting Lecturer** to Madonna University, Akpugu Campus, Nigeria. With the permission of the Vice Chancellor, KNUST, I participated in their National University Commission's Accreditation and Evaluation Exercise from 25th - 29th March, 2012 and 4th -9th March, 2016. My rich scientific, technological, and industrial experience in Mechanical Engineering contributed greatly to securing accreditation for their Mechanical Engineering Programme in both instances.
- v) **External Examiner** to Capstone Design Project Oral Examination of Senior Year Students, Department of Mechanical Engineering, Arizona State University. During the design reviews I examined the students after their presentations and provided them with intelligent and valuable feedback and suggestions for improving their projects. This reflected my strong technical background and experience.
- vi) **Resource Person** at Strengthening Institutional Linkages Initiative Workshop on Faculty Development Seminar towards MasterCard Foundation Support of 3+1+1 Programme, Arizona State University, Phoenix, USA, from 6th - 26th January, 2018. Panel discussion session for hundred and twenty (120) Mastercard Scholars studying at Arizona State University.
- vii) **Resource Person** at World Innovation Summit for Education (WISE) Conference, Doha, Qatar, from 3rd - 5th November, 2015. Panel discussion session on engineering training in Africa, the way forward. My contributions were commendable.

4.4 Financial Resource Mobilization

July 2016 Principal Investigator to a Project titled Strengthening Institutional Linkages which seeks to narrow the gap, third world country's ability to compete internationally and provide opportunities for its members through international university partnership. The partnering institutions are KNUST, Ashesi, and Arizona State University. This grant is being sponsored by Mastercard Foundation to the tune of twenty-one million six hundred thousand dollars (\$21.600,000.00).

- October, 2016 Won a Grant to carry out Renovation and Retooling of KNUST Transport Department, Creation of KNUST Auto Washing, and Setting up of KNUST Branch Office of SIC Insurance Company Limited. This grant was sponsored by SIC Insurance Company Limited to the tune of Two Hundred and Sixty-Four Thousand, Six Hundred and Seven Ghana Cedis, Forty-Three Ghana Pesewas, (GHS 264,607.43).
- May 2018 Chaired a committee to develop and present a proposal to solicit funds for equipment to furnish the Automobile Laboratory for which Ghana Gas awarded US\$ 50,000.00.
- May 2022 Facilitated sponsorship of GHs 10,000.00 from the Brew Hammond Energy Centre to fabricate a prototype of Automated Paper Shredding and Compacting Machine.
- May 2022 Facilitated sponsorship of GHs 10,000.00 from the KNUST Engineering Education Programme (KEEP) to fabricate a prototype of Automated Paper Shredding and Compacting Machine.

5. AWARDS/HONOURS

- December 2010** Kennedy Excellence Award for GPA of 4.0, North Carolina Agricultural & Technical State University, Greensboro
- Aug. 2008 - Dec 2010** Fulbright Scholar
- Aug. 2002 - May 2003** Alcoa Scholar, North Carolina Agricultural & Technical State University, Greensboro
- Aug. 2005 – Dec. 2005** Alcoa Scholar, North Carolina Agricultural & Technical State University, Greensboro

6. MEMBERSHIP OF PROFESSIONAL BODIES

- 2004 – date** Member, University Teachers Association of Ghana (UTAG)
- 2022 – date** Member, Institution of Engineering and Technology (IET)

7. PUBLICATIONS

- 1) Mensah, G., Opoku, R., Teye, M., **Davis, F.**, & Obeng, G. Y. (2024). Investigating green hydrogen production operated by redundant energy on a solar PV mini-grid through matlab simulation and artificial neural network. International Journal of Hydrogen Energy.

- 2) Odoi-Yorke, F., Opoku, R., **Davis, F.**, & Obeng, G. Y. (2024). Employing bibliometric analysis to identify the trends, evolution, and future research directions of sand-based thermal energy storage systems. *Journal of Energy Storage*, 94, 112343.
- 3) Akolgo, J., Mensah, G., Marfo, D., Seesi, E., Agbagah, W. S., & **Davis, F.** (2024). Optimisation of the performance of a prototype instrument for measuring solar irradiation using artificial neural network. *Solar Energy Advances*, 4, 100065.
- 4) Baah, B., Opoku, R., Boahen, S., Sekyere, C. K., Uba, F., **Davis, F.**, & Obeng, G. Y. (2024). Analysis and hypothesis testing of redundant energy of solar home systems without net-metering. *Renewable Energy*, 220, 119736.
- 5) Danquah, R., Mensah, G., Agbagah, W.S., & **Davis, F.**, (2023) Assessment of hazard recognition performance of thermal power plant workers: A case study of a combined cycle power plant, *Cogent Engineering*, 10:1, 2252621.
- 6) Odoi-Yorke, F., Opoku, R., **Davis, F.**, & Obeng, G. Y. (2023). Optimisation of thermal energy storage systems incorporated with phase change materials for sustainable energy supply: A systematic review. *Energy Reports*, 10, 2496-2512.
- 7) **Davis, F.**, Andoh, P.Y., Fiagbe, Y.A.K. and Atsu, A.K., 2023. Optimization of gas tungsten arc welding parameters for welding of super duplex stainless steel using factorial design. *Cogent Engineering*, 10(1), p.2216870.
- 8) Kofi Danso Addo, **Francis Davis**, Yesuenyeagbe A. K Fiagbe, Anthony Andrews, Machine Learning for Predictive Modelling of the Performance of Automobile Engine Operating Without Coolant Thermostat, *Scientific African* (2023), doi: <https://doi.org/10.1016/j.sciaf.2023.e01802>
- 9) Ansong, G., Fiagbe, Y.A., Tetteh, A.Y. and **Davis, F.**, 2023. Tensile strength and elongation of selected Kenaf fibres of Ghana. *Cogent Engineering*, 10(1), p.2202036.
- 10) Opoku, R., Mensah, G., Adjei, E.A., Dramani, J.B., Kornyo, O., Nijjhar, R., Addai, M., Marfo, D., **Davis, F.** and Obeng, G.Y., 2023. Machine learning of redundant energy of a solar PV Mini-grid system for cooking applications. *Solar Energy*, 262, p.111790.
- 11) Okwabi, R., Mensah, G., Fiagbe, Y.A.K. and **Davis, F.**, 2023. Towards the estimation of quantity of fuel consumed in steam generation through predictive modelling of feedwater temperature. *Scientific African*, 20, p.e01650.
- 12) Opoku, R., Baah, B., Sekyere, C.K., Adjei, E.A., Uba, F., Obeng, G.Y. and **Davis, F.**, 2022. Unlocking the potential of solar PV electric cooking in households in sub-Saharan Africa—the case of pressurized solar electric cooker (PSEC). *Scientific African*, 17, p.e01328.
- 13) **Davis, F.**, Okwabi, R. and Oman, E.K., 2022. A review of the significance of feedwater temperature on the health of a steam boiler. *ARPN J. Eng. Appl. Sci.*, 17(8), pp.893-903.

- 14) Boafo, G., Wireko-Gyebi, R.S., Nkrumah, S.K. and **Davis, F.**, 2022, Competence of Traditional Automobile Practitioners in Maintenance of Automatic Transmission Drives and Implications for Transportation Planning in Ghana. In *Applied Research Conference in Africa* (pp. 913-926).
- 15) Atepor, L., **Davis, F.** and Akangah, P.M., 2022. Experimental Investigations of the Flexible Rotor System by Introducing Parametric Excitations into Both Ends of the Rotating Shaft Axially. In *Sustainable Education and Development–Making Cities and Human Settlements Inclusive, Safe, Resilient, and Sustainable: Proceedings of the Applied Research Conference in Africa (ARCA), 2021 10* (pp. 287-296).
- 16) Atepor, L., **Davis, F.** and Akangah, P.M., 2022. Effect of Parametric Force on the Chaotic Behaviour of Flexible Rotor System Under the Influence of Mass Unbalanced. In *Sustainable Education and Development–Making Cities and Human Settlements Inclusive, Safe, Resilient, and Sustainable: Proceedings of the Applied Research Conference in Africa (ARCA), 2021 10* (pp. 468-478).
- 17) **F Davis**, PY Andoh, G Adablah, (2022). Selection of Optimum Pouring Conditions for Improvement of Aluminium Alloy Castings in Ghana. *Journal of Science and Technology (Ghana)*, 41 (2), 1-17
- 18) G Mensah, A A Andrews, **F. Davis**, K Mensah Darkwa, P Phelan (2022), Stimulating Green Energy Potential in Sub Saharan Africa: Analysis of Copper-Copper Sulphate Thermogalvanic Cell Architecture. *Hermal Science and Engineering Progress*, 34, 101448
- 19) CKK Sekyere, **F Davis**, R Opoku, E too, G Takyi, L Atepor (2022). Performance Evaluation of a 20 MW Grid Coupled Solar Park Located in the Southern Oceanic Environment in Ghana. *Cleaner Engineering and Technology*, 5, 100273.
- 20) L Atepor, **F. Davis**, P M Akangah (2021). Effect of Parametric Force on the Chaotic Behaviour of Flexible Rotor System Under the Influence of Mass Unbalanced. *Applied Research Conference in Africa*, 287-296.
- 21) L Atepor, **F. Davis**, P M Akangah (2021). Experimental Investigations of the Flexible Rotor Systems by Introducing Parametric Excitations into both Ends of the Rotating Shaft Axially. *Applied Research Conference in Africa*, 287-296.
- 22) M Owusu, K Mensah-Darkwa, A Andrews, **F Davis**, P Phelan (2021). Effect of Transient Low Solar Heat on Liquid Thermogalvanic cells. *Materials Today, Proceedings* 38, 767-772 19. Opoku, R., Obeng, G. Y., Adjei, E. A., **Davis, F.**, & Akuffo, F. O. (2020). Integrated system efficiency in reducing redundancy and promoting residential renewable energy in countries without net-metering: A case study of a SHS in Ghana. *Renewable Energy*
- 23) Akangah, P., & **Davis, F.** (2020). Identifying Factors that Promote Student Learning in Thermodynamics Using Machine Learning Techniques. *TECHNOLOGY INTERFACE INTERNATIONAL JOURNAL*, 5.

- 24) Sekyere, C. K. K., **Davis, F.**, Fiagbe, Y. A. K., & Amoo, R. N. G. (2020). Techno-Economic Assessment of Non-Revenue Water: A Case Study at AER, GWCL. *Journal of Water Resource and Protection*, 12(6), 480-494.
- 25) Sekyere, C. K. K., Adams, F. W., **Davis, F.**, & Forson, F. K. (2020). Mathematical modelling and validation of the thermal buoyancy characteristics of a mixed mode natural convection solar crop dryer with back up heater. *Scientific African*, e00441
- 26) Sekyere, C. K. K., **Davis, F.**, Opoku, R., & Oko, T. S. (2018). Determinants of passenger transport choices in Ghana: evidence from household data. *International journal of science and research (Nagpur)*, 9(1), e20203979-e20203979.
- 27) **Davis, F.**, Sackey, M. N., Fanyin-Martin, A., (2018), "Traditional Practices of Automobile Maintenance in Ghana: An Analysis in the Removal of Automobile Engine Thermostat", *African Journal of Applied Research*, Vol. 4, No. 1 pp. 62-70.
- 28) **F. Davis**, A. Andrews, M. N. Sackey, S. P. Owusu-Ofori, (2017), "Effects of Varying Friction Coefficient on Rolling Pressure Distribution", *Journal of Science and Technology*, Vol. 37, No. 2, pp. 85-99.
- 29) **Davis, F.**, Sackey, M. N., Fanyin-Martin, A., Amissah, P. K., (2018), "Road Transportation Safety in Ghana: An Assessment of the Variability in Articulated Trailer Design", *African Journal of Applied Research*, Vol. 4, No. 1 pp. 14-26.
- 30) **Davis F.**, Sekyere, C. K. K., Sogah A. T, Owusu-Ofori S. P., (2018), "Modelling and Prediction of the Temperature Spread Variation for Evaluation of Gas Turbine Performance", *International Journal of Science and Research*, Vol. 7, Issue 1 pp. 1079-1084.
- 31) Paul Akangah, Leotis Parrish, Andrea Ofori-Boadu, **Francis Davis**, (2018). "Predicting Academic Achievement in Fundamentals of Thermodynamics using Supervised Machine Learning Techniques". 2018 ASEE Southeastern Section Conference, Daytona Beach, Florida, USA March 4-6, 2018.
- 32) **F. Davis**, M. N. Sackey, A. Andrews, S. P. Owusu-Ofori, (2017), "Realistic Friction Coefficient Model between a Rolling Cylindrical Element and a Deformable Flat Surface", *Journal of Tribology International*, Vol. 109, pp. 252-257.
- 33) Sekyere, C. K. K., **Davis F.**, Mensah L. D., Forson F. K., (2017), "Technical Analysis of Jatropha and Palm Kernel Biodiesel as the Sole Fuel Source for Powering Diesel Engine", *ARPJN Journal of Science and Technology*, Vol. 7, No. 1, pp. 8-18.
- 34) Sekyere, C. K. K., Adams F. W., **Davis F.**, Forson F. K., (2017), "Experimental Investigation of the Thermal Buoyancy Characteristics of a Mixed Mode Natural Convection Solar Crop Dryer with Back Up Heater", *Journal of Energy Technologies Policy*, Vol. 7, No. 6, pp. 23 -36.

- 35) **F. Davis**, P.Y. Andoh, M. N. Sackey, S. P. Owusu-Ofori, (2014), "Assessment of Friction between a Rolling Cylindrical Element and a Deformable Flat Surface", *Journal of Science and Technology*, Vol. 34, No. 2, pp. 26-34.
- 36) P.Y. Andoh, Y. A. K. Fiagbe, **F. Davis**, S. Asaana , (2013), "A Mathematical Model to Predict the Quantity of Defective Bottles in an Automated Bottle Washer using Factorial Design Technique", *International Journal of Scientific and Technology Research*, Vol. 2, No. 10, pp. 56-62
- 37) P.Y. Andoh, **F. Davis**, Y. A. K. Fiagbe,, T. Alhassan , (2013), "Tyre Pressure Model for Predicting Fuel Consumption of vehicles on Ghana Roads", *International Journal of Scientific and Technology Research*, Vol. 2, No. 8, pp. 120-124
- 38) P.Y. Andoh, **F. Davis**, Y. A. K. Fiagbe, (2013), " Monitoring of Carbon Dioxide Production in a Carbonated Beverage Company using Factorial Design Technique", *International Journal of Scientific and Technology Research*, Vol. 2, No. 10, pp. 13-19. 36. Andoh, P. Y., Davis, F., Fiagbe, Y. A. K., & Alhassan, (2013). T. Tyre Pressure Model For Predicting fuel Consumptionof Vehicles On Ghana Roads
- 39) 37. P.Y. Andoh, **F. Davis**, S. P. Owusu-Ofori, (2011), "Prediction of a Delamination Area during Drilling of Carbon Composite Laminates Structure", *Journal of Science and Technology*, Vol. 31, No. 2, pp. 120-134. 38. **Davis, F.** (2010). Effects of Variable Friction Coefficient on the Pressure Distribution Between a Rolling Cylindrical Element and a Deformable Flat Surface.
- 40) 39. P.Y. Andoh, **F. Davis**, S. P. Owusu-Ofori, (2010), "Development of a Control Strategy for Monitoring the Delaminating Damage in Drilling of Carbon Composite Laminate", *Journal of Science and Technology*, Vol. 30, No. 3, pp. 143-156.
- 41) 40. **F. Davis** and P.Y. Andoh, (2007), "Effects of Turning Variables on Acoustic Emission's Energy Response using Factorial Design Method". 7th College of Engineering Research Retreat (CERR 7), July 24 – 27, 2007, Chances Hotel, Ho, Volta Region, Ghana.
- 42) 41. **F. Davis**, S. P. Owusu-Ofori, P.Y. Andoh, L. E. Ansong, (2007), "Quasi-Automatic Monitoring System for Turning Operation Using Acoustic Emission Signal Response And Factorial Design Method", *Journal of Science and Technology*, Vol. 27, No. 3, pp. 107-121.
- 43) 42. P. Y. Andoh, **F. Davis**, J. Antonio (2007), "Effect of Cutting Parameters on Acoustic Emission Signal Response during Drilling of Laminated Composites", *Journal of Science and Technology*, Vol. 27, No. 3, pp. 98 -106.
- 44) 43. S. M. Sackey, **F. Davis**, P. Y. Andoh, S. P. Owusu-Ofori, (2009). "An Overview of Practical Statistical Methods for Evaluating Quality Characteristics". 7th College of Engineering Research Retreat (CERR 7), Koforidua, Eastern Region, Ghana July 21-24, 2009, pp. 177-184.
- 45) 44. S. P. Owusu-Ofori, **F. Davis**, P. Y. Andoh, S. M. Sackey, (2009). "Time Series Models for Dynamic Analysis of Product Quality". 7th College of Engineering Research Retreat (CERR 7), Koforidua, Eastern Region, Ghana July 21-24, 2009, pp. 76-83.

- 46) 45. L. Atepor and **F. Davis**, (2009), "Investigation of Nonlinear behaviour of a flexible Rotor System with Parametric Excitation". 7th College of Engineering Research Retreat (CERR 7), Koforidua, Eastern Region, Ghana July 21-24, 2009, pp. 117-123.
- 47) 46. L. Atepor and **F. Davis**, (2009), "Dynamical System Analysis from Nonlinear Transition to Chaos for a flexible Rotor System Model". 7th College of Engineering Research Retreat (CERR 7), Koforidua, Eastern Region, Ghana July 21-24, 2009, pp. 106-116.

Others

1. F. Davis. Effects of Variable Friction Coefficient on Pressure Distribution between a Rolling Cylindrical Elements and a Deformable Flat Surface, PhD. Dissertation, North Carolina Agricultural & Technical State University, Greensboro, 2010.
2. F. Davis. Monitoring of Turning Variables using Acoustic Emission – Technique M.Phil. Thesis, Kwame Nkrumah University of Science & Technology, Kumasi, 2003.
3. F. Davis. Design and Construction of an Agro-Processing Drill Jig and Fixture. Bachelor of Science, Mechanical Engineering, Kwame Nkrumah University of Science & Technology, Kumasi, 1998.
4. F. Davis. Characteristic Study of Kwame Nkrumah University of Science & Technology Machine Shop Boiler, Air Compressor, and Refrigeration Plant – Project Report, Kwame Nkrumah University of Science & Technology, Kumasi, 1994.

7. NETWORKING MEETINGS/CONFERENCES /SEMINARS AND WORKSHOPS ATTENDED

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|---|---|
| 11 th - 15 th November, 2023 | Speaker - International Forum: The Role of Engineering Education and Science in Achieving Sustainable Development Goals - New Challenges and Solutions, Saint Petersburg, Russia. |
| 30 th Sep -1 st October, 2024 | Host/Speaker - 10th Calestous Juma Executive Dialogue (CJED), KNUST, Kumasi. |
| 15 th -17 th May, 2024 | Speaker - International Symposium of Category 2 Centres under the auspices of UNESCO at Kuala Lumpur in Malaysia. |
| 10 th October, 2023 | Speaker - International Driver and Vehicle Innovations Conference, Organised by Driver Vehicle and Licensing authority, Kempinski, Accra, Ghana. |
| 26th-27th September, 2023 | Speaker - Forum on Technology Transfer, Innovation, Commercialization, and Entrepreneurship Resource Network for Africa organised by African Academy of Sciences and Michigan State University, Nairobi, Kenya. |

August 2022- August, 2023	Participated in Ideation Workshop on Faculty Collaborative Development Series in 4+1 Programme designed by Faculties from ASU, KNUST, & ASHESI.
17 th - 23 rd October, 2022	Secondary STEM Education Curriculum Writing and Review Workshop on Manufacturing, Volta Serene Hotel, Ho, Ghana.
24 th - 27 th August, 2022	11 th Sustainable Education and Development Research Conference, KNUST, Kumasi, Ghana.
25 th - 28 th August, 2022	10 th Sustainable Education and Development Research Conference, University of Ghana, Legon, Accra, Ghana.
12 th - 17 th August, 2022	Residential Workshop to review Curriculum on STEM Education for Senior High Schools, Volta Serene Hotel, Ho, Ghana.
6 th - 26 th January, 2018	Strengthening Institutional Linkages Initiative Workshop on Second Annual Faculty Development Seminar towards MasterCard Foundation Support of 3+1+1 Programme, Arizona State University, Phoenix, USA.
7 th - 28 th January, 2017	Strengthening Institutional Linkages Initiative Workshop on First Annual Faculty Development Seminar towards MasterCard Foundation Support of 3+1+1 Programme, Arizona State University, Phoenix, USA.
3 rd - 5 th November, 2015	World Innovation Summit for Education (WISE) Conference, Doha, Qatar.
August 6 – 7, 2015	1st International Conference on Engineering, Science, Technology and Entrepreneurship (ESTE) 2015, IDL Conference Centre, KNUST, Kumasi, Ghana.
10 th – 12 th April, 2012	The First KNUST E-Learning Technical Stakeholders’ Collaborative Meeting on Synchronised and Unified Del delivery Strategy for IDL-KNUST, CollinMay Hotel, Ejura, Ashanti Region
July 2009	Washington Fulbright Enrichment Seminar, Global Challenges, Local Solutions: Fostering Change through Social Entrepreneurship, Washington, D.C.
July 21-24, 2009	7 th College of Engineering Research Retreat (CERR 7), Koforidua, Eastern Region, Ghana.
July 24 – 27, 2007	6 th College of Engineering Research Retreat (CERR 6), Chances Hotel, Ho, Volta Region, Ghana.
March 28-31, 2007	The 2007 Annual Conference of the Ghana Institute of Engineers, Engineers Centre, Roman Ridge, Accra, Ghana.
April 2005	TALIF Workshop for Senior Members of the College of Engineering, KNUST

August 2005	Induction Training Workshop for New Lecturers and Lecturers of 3-Year Standing or Less organized by the Quality Assurance and Planning Units/Human Resource Development Section, KNUST, (Topics include: Mandate, Vision, Mission, Core values of the KNUST and expected demands for Quality Assurance; Quality Pedagogy-Trends, Techniques and Technologies; Overview of Use of MCQ for Testing and Grading; Overview of Research Practice: Research Grant Writing, Library Use and Research, Project Execution and Publications Preparation; Competencies in Tutorship and Mentorship)
May 2005	Workshop on Multiple Choice Questions (MCQs) Testing and Grading organized by the College of Engineering, KNUST.
June 2005	International Partnership on Aerospace Education and Research. Organized by the College of Engineering, KNUST, Kumasi.
February 2001	Joint Training Workshop for Science, Technical and Mathematics Teachers (STM) organized by Ghana Education Service, Central Regional Directorate

9. NAMES AND ADDRESSES OF REFEREES

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