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Evaluation of the programme specification for the proposed Master of Science Degree in Renewable Energy

I have recently been asked to review the programme specification for an MSc in Renewable Energy that will be taught at the African Centre of Excellence in Energy for Sustainable Development (ACE-ESD) starting in the academic year of 2017-2018.

I have been a staff member of Bahir Dar Energy Centre, Bahir Dar Institute of Technology, Bahir Dar University since January 2017 in the position of Assistant Professor. I was the chairperson/convener of the recently launched PhD Program in Sustainable Energy Engineering. I have also served as Lecturer in the Department of Materials and Energy Science and Engineering at the Nelson Mandela African Institution of Science and Technology in Tanzania for 4 years. I specialize in renewable energy primarily wind and solar energy including energy storage, and thermodynamic modeling aspects with respect to thermal energy storage. I have 7 years experience teaching and performing research in field of renewable energy. I successfully completed my 2 year Post-Doctoral Fellowship at the Centre for Renewable and Sustainable Energy Studies, Stellenbosch University, where I designed and performed tests for an outdoor solar thermal test facility. I am a Professional Engineer and Co-opt member of the Engineers Registration Board, Tanzania in the field of Aeronautical Engineering. I am also an Affiliate member of the African Academy of Science for the period 2017-2021. I got all my degrees from a reputable University in the USA, Georgia Institute of Technology. I have a PhD in Aerospace Engineering, MSc in Aerospace Engineering, and a BSc. (Hons.) in Electrical Engineering.

I would like to provide accolades to the University of Rwanda for undertaking this important academic endeavor of introducing the Master of Science Program in Renewable Energy, as that is the most appropriate route for realizing the sustainability development goals in the context of appropriate technology.

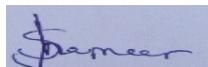
However, I have some suggestions regarding the development of this curriculum in the context of being haphazardly organized in conjunction with the specialization areas not clearly defined. I believe the rationale and the program objectives need to be mentioned including facilities and expertise. The Master

of Science degree course structure is missing in this document in terms of the required credits for the student to graduate including assessment criteria. This document focuses only on the module descriptions in an unorganized manner. The courses per semester including core courses are not mentioned in this document. The most important aspect of Master's research is missing in this document including the required publications by the student. There should be a mentioning of Master of Science by Research and Master of Science with Coursework streamlines. This is not a complete document. I suggest the tripartite structure of Government, Academia, and Industry needs to be implemented in the curriculum development through stakeholder workshops before it is sent to the governing body for approval.

Finally a thorough course content formulation is required in terms of pre-requisites, objectives, course content, learning outcomes, and appropriate textbook/journal references. The learning outcomes need to be condensed and be reflective of the program objectives. The course content needs to be refined in the context of providing more detailed information. Currently, the course content is organized more so like a textbook table of contents, which I believe needs to be refined in a pragmatic manner. I also suggest renaming the Mathematical Analysis course to Numerical analysis in the context of the mathematical techniques required by Engineers. I also suggest including a course in Energy Modeling, Computational Methods in Energy Engineering, Energy Storage, Wind Turbine Design, PV Metrology and System Design, and some other relevant courses in terms of carefully allocating the specializations of the envisaged program. The Smart Grid Systems course requires energy storage in its content. The references for the courses need to be condensed in a pragmatic manner. Finally, the laboratory facilities and expertise available needs to be clearly mentioned in a table in the context of the proportion of Lecturers, Senior Lecturers, Associate Professors, and Full Professors. The collaborators of the program need to be mentioned as well. I suggest having specializations in wind, solar, bio-energy, oceanic energy, and small hydro power.

Please take these constructive unbiased suggestions to improve the envisaged program and I am also willing to provide further contributions to support this program.

Yours Sincerely,

A handwritten signature in blue ink, appearing to read "Sameer".

Dr. Eng. Sameer Hameer

Assistant Professor - BEC