THE BREW-HAMMOND ENERGY CENTRE, KNUST

Renewable Energy

SHORT COURSES

THE BREW-HAMMOND ENERGY CENTRE (TBHEC)

COLLEGE OF ENGINEERING

Kwame Nkrumah University of Science and Technology

KUMASI, GHANA

REGULAR

SHORT COURSES

INTRODUCTION

As part of its contribution to building national and sub-regional capacity in developing sustainable energy systems, The Brew-Hammond Energy Centre (TBHEC) of the Kwame Nkrumah University of Science and Technology (KNUST) Kumasi, Ghana, has been running short training programmes in renewable energy technology and energy policy over 8 years, with initial support of its partners.

The Center under the Renewable Energy Education Project (REEP) of the EDULINK Programme of the EU-ACP Secretariat has since 2009 been running programmes in:

- Solar Photovoltaic Systems Design and Installation (off-grid and grid-connected)
- Biogas Systems Design and Construction
- Biofuels Technology and Economics

The partners in REEP (which ended in Dec 2011) were the International Institute for Water and Environmental Engineering – 2iE, Ouagadougou, Burkina Faso and Universite du Havre in France.

In 2011, advanced courses were introduced which targets engineers and other practioners in the energy sector (with a minimum of a University Degree in Science or Engineering) who require more sophisticated analytical tools for design and decision-making. These advanced courses have been packaged from the

About The Brew-Hammond Energy Centre

The Brew-Hammond Energy Centre (TEC) of the Kwame Nkrumah University of Science and Technology (KNUST) Ghana, is hosted by the College of Engineering and promotes energy research, development, and demonstration activities in the university by providing strategic direction and using a multidisciplinary approach by drawing expertise and research findings from the various departments of the College of Engineering and the University at large.

TEC offers contract research services for the design, construction, testing and demonstration of new sustainable energy technologies and systems and provides training and expert advisory services in energy management and policy, including energy auditing, strategic planning and policy analysis.

vision to become "a globally-recognized centre of excellence for energy in Africa" is fast becoming reality.

e-learning Masters programme in Renewable Energy Technologies (MSc RETs) which is run by The Brew-Hammond Energy Centre and the Department of Mechanical Engineering of KNUST. These advanced short courses include: Energy Policy and Planning, Solar PV and Solar Thermal Technologies, Renewable Energy (RE) Project Analysis and Grid- Connected Solar PV.

The Brew-Hammond Energy Centre together with its partners in REEP, has trained over 300 technicians, engineers and other energy experts across almost 15 different African countries and the United States of America.

In 2010 the World Bank agreed to support the West African partners in REEP under a Solar Capacity Upgrading Project (SolarCUP), through the AFREA- Afica Renewable Energy (RE) programme.

This brochure is produced to provide basic information and guideline on training programmes and workshops at The Brew-Hammond Energy Centre, KNUST for 2015.

In running these training programmes and workshops, TBHEC hopes to actively contribute to achieving the goals of the ECOWAS Regional Center for Renewable Energy and Energy Efficiency (ECREEE), with whom KNUST has signed a Memorandum of Understanding.

All the events herein will take place at The Brew-Hammond Energy Centre, KNUST, in the historic city of
Kumasi in Ghana.

Regular Short Courses

WIND ENERGY TECHNOLOGY

BIOFUELS TECHNOLOGY AND ECONOMICS

DESIGN AND INSTALLATION OF STAND-ALONESOLAR PV SYSTEMS

BIOGAS SYSTEMS DESIGN AND CONSTRUCTION

RENEWABLE ENERGY PROJECT ANALYSIS

Wind Energy Technology

COURSE OBJECTIVES

To train participants and to equip them with the appropriate knowledge in wind energy study to empower them to serve as conduits for the dissemination of knowledge in wind power technology in Ghana and other parts of Africa.

COURSE DESCRIPTION

Theory, Analysis, Design and Applications of Wind Power Technology; Wind Resource Assessment; Introduction to the RETScreen Software in Wind Power Technology; Construction of small/micro wind turbine.

TARGET PARTICIPANTS

B.Sc. Degree holders in Engineering, Science, Wind Technicians, Wind Developers and Professionals with HND (Engineering) and the allied sciences with the dexterity to construct artefacts.

INSTRUCTORS

Mr Emmanuel Osei, The Brew-Hammond Energy Centre, KNUST

Mr Eric Osei Essandoh, The Brew-Hammond Energy Centre, KNUST

Places Available: 20

Biofuels Technology and Economics

COURSE OBJECTIVES

Course participants will acquire skills in the extraction, processing and utilization of biofuels from various feedstocks.

COURSE DESCRIPTION

Classification and assessment of feedstocks for biofuel (biodiesel and bioethanol) production; mechanical, thermal and chemical techniques for biofuels extraction and processing; comparison of performance and emission characteristics of biofuels and conventional petroleum fuels; economic evaluation of biofuels extraction and processing

TARGET PARTICIPANTS

Fuel processing and production companies; oil companies who want to position themselves for the future; community development organizations; NGOs and other organizations interested in alternate and sustainable fuel production; etc

NSTRUCTORS

Dr Moses Mensah, Department of Chemical Engineering, KNUST

Dr Johannes Awudza, Department of Chemistry, KNUST

Places Available: 20

Design and Installation of Stand- Alone Solar PV Systems

COURSE OBJECTIVES

This course trains participants design, install and manage off-grid solar Photovoltaic systems

COURSE DESCRIPTION

Solar radiation resource assessment; characteristics of commercially available PV Cell technologies; PV System Design (Load Assessment, PV array sizing, charge regulators, battery bank, cabling, etc); Installation, System maintenance and Management; Economic Assessment of PV projects.

TARGET PARTICIPANTS

Practicing engineers and technicians etc.

INSTRUCTORS

Mr Edwin Adjei, Solar Energy Applications Laboratory (SEAL), KNUST

Places available: 20

Biogas System Design and Construction

COURSE OBJECTIVES

The course aims at training participants in the design, construction and management of biogas systems.

COURSE DESCRIPTION

Theory of Biogas Technology;Practical Applications of Biogas Technology; Design of Biogas Plants; Biogas Piping and End-use Appliances; Operation &Maintenance and Safety Management of Biogas Systems

TARGET PARTICIPANTS

Practising engineers and technicians, students, NGOs, etc

INSTRUCTORS

Dr Elias Aklaku, Agric. Engineering Department, KNUST

Mr. Andreas Ahrenbog, TEC, KNUST

Places Available: 20

Renewable Energy Project Analysis

COURSE OBJECTIVES

The objective of this course is to equip participants with tools for analysing financial and technical viability of renewable energy projects.

COURSE DESCRIPTION

Acquisition and analysis of solar and wind energy resource data, review of key technical characteristics of solar and wind energy technologies, technology cost at system and component levels, performance and system output projection using RETSCREEN and HOMER Financial indicators, risk and sensitivity analysis , options for project financing

TARGET PARTICIPANTS

Renewable Energy and Energy Policy professionals, Engineers,
Project Appraisal Officers, NGOs, Students,

INSTRUCTORS

Dr. Emmanuel A Donkor, Civil, Engineering Department, KNUST

Dr. Francis Kemausuor, Agric. Engineering Department, KNUST

Mr. Ebenezer Nyarko Kumi, Lecturer, UENR, Sunyani

Places Available: 20

GENERAL NOTICE TO APPLICANTS

All fees paid include snacks, lunch, course manuals, tuition, practical, laboratory sessions and certificate. Participants are however requested to take note of the following:

Accommodation – the fee does not include accommodation in Kumasi. Persons who require assistance in arranging accommodation may contact us (see back page) for such logistical support. ECOWAS citizens do not need entry visa to Ghana, non-ECOWAS citizens may also contact us for the necessary support in obtaining entry visas.

All the events (unless otherwise announced during the training) will take place at The Brew-Hammond Energy Centre of the Kwame Nkrumah University of Science and Technology, Kumasi Ghana.

A **10 % discount** is available for first 10 and qualified female participants.

Courses would be run depending on the number of applications received and only courses with the requisite number of applications would run. (Please contact TBHEC office for details

CONTACT INFORMATION
Coordinator of Short Courses
The Brew-Hammond
Energy Centre
Kwame Nkrumah University of Science and Technology
Email: tec@knust.edu.gh, daquansah.coe@knust.edu.gh, tecknust@gmail.com
Tel: +233 20 9105213 +, +233 243506924, +233 50 1125035