AFRICA CENTRE OF EXCELLENCE ON NEW PEDAGOGIES IN ENGINEERING EDUCATION (ACENPEE)
CERTIFICATE IN ENGINEERING EDUCATION (CEE) PROGRAMME

Name of Programme/Certificate

Certificate in Engineering Education (CEE)

Introduction

Engineers who desire to become effective educators must accept the fact that basic knowledge of educational principles and learning theories including working knowledge of instructional technology and media are desirable. New pedagogies in Engineering Education such as the Cooperative, Hands-on, Active, Problem-solving Learning (CHAPL) are required to breakdown complex engineering concepts and skills to the level that students can easily comprehend. The mandate of the Africa Centre of Excellence on New Pedagogies in Engineering Education (ACENPEE) is to provide the platform for the acquisition of these knowledge and skills. The Certificate in Engineering Education (CEE) programme is primarily intended for Postgraduate Engineering students who desire to become engineering educators in the future and also for Faculty who want to improve their knowledge and teaching skills in course design and instruction.

Philosophy of the Programme

The philosophy of the Certificate in Engineering Education (CEE) programme is to produce Engineering Educators with a sound knowledge of educational principles and practices for effective teaching and learning that meet international standards.

Objectives of the Programme

The programme objectives are to:

i. Understand and appreciate the History and Philosophy of Engineering Education
ii. Acquire the basic knowledge of curriculum and course design.
iii. Acquire knowledge and skills in the use of new pedagogies in engineering education.
iv. Be able to use technology (soft and hardware) in teaching and learning.
v. Interpret and apply theories of learning in engineering education.
vi. Design, manage and ensure safety of engineering laboratories.
vii. Develop research proposals in Engineering Education.

Admission Requirements

In addition to the general university requirements for admission to postgraduate programmes in Engineering, a candidate must

a. Indicate an interest in Engineering Education

b. Be in good academic standing at point of admission
c. Be willing to integrate Engineering Education in his/her research work
d. Be committed to the vision of making the Centre a centre of excellence

Course Structure

First Semester	**Status**	**CU**
ACEE 123456 Hist. and Phil. of Engineering Education	Core	3
ACEE 123457 Curr. and Course Design in Engineering	Core	3

Second Semester	**Status**	**CU**
ACEE 123458 Instruct. Tech. and Media in Engr. Educ.	Core	3
ACEE 123459 Learning Theories in Engineering Education	Core	3
ACEE 123460 Micro Teaching Practice	Core	9

Course Description

i. History and Philosophy of Engineering Education

This course provides students background information on the history and philosophy of Engineering Education. The course aims at providing a historical background of engineering and providing insight into what it means to be an engineer, the principles, ideas and methods that underlie engineering. The course provides forum for discussing the philosophy of Engineering Education.

ii. Curriculum and Course Design in Engineering

This course provides students with insight into what curriculum is, its constituent components and its importance. It aims at helping Engineering students understand what Engineering curriculum is and the constituents of engineering curriculum are and how to manage them for effective learning. The course introduces students to the structure of engineering curriculum, the content resources and methodologies needed for effective teaching of engineering at the undergraduate and graduate strategies for obtaining objective harmony outcomes in engineering. Thus the course shall be organized as follows

a. General Concept of Curriculum
b. Curriculum Trends in Engineering Education
c. Structure of Engineering Curriculum
d. Pedagogies in Engineering
e. Teaching strategies in Engineering
f. Learning resources in Engineering
g. Assessing learning outcomes in Engineering

iii. Instructional Technology and Media in Engineering Education.

This course introduces students to existing and projected media/Technology used in facilitating learning in general but with particular reference to engineering. The course aims at helping students understand what instructional media is, the various forms of instructional media and how to apply them in an engineering classroom. Components of the courses, both theoretical and practical, will create opportunities for students to learn the art of improvising, simple instructional media and practical application of the instructional media in engineering environment. The content would include:

a. Concept of instructional media and their forms
b. History of instructional media in an engineering classroom
c. Forms of instructional media for Engineering
d. Improvising and developing Engineering instructional media
e. Application of Instructional media in Engineering classrooms

iv. Learning Theories in Engineering Education.

This course introduces students to the world of psychology, particularly educational psychology with a view of helping them understand the relevance of psychology to engineering. The course introduces students to the theories of human development and learning as they relate to thinking in engineering. It also provides an insight into the different psychological makeup of individuals and how they interact with people and their environment differently. This provides a window for understanding both how individuals interpret their environment and how best to schedule learning for engineering students.

a. Foundation of Engineering Education
b. Engineering and Society
c. Laboratory design, management and safety in Engineering

v. Micro Teaching Practice

Micro teaching is to allow students put in practice what they have learnt by designing a course in Engineering and teaching it to a class. The class will make observations for possible improvement. The Teaching activity will be recorded for subsequent review by the student.

vi. Staff Strength

S/No	Name	Qualification	Specialization	Rank
1.	Raymond B. Bako	PhD	Educational Philosophy	Professor
2.	Abdulkarim S. Ahmed	PhD	Engineering Education	Professor
3.	Fatai O. Anafi	PhD	Engineering Education	Professor
4.	Ayuba Guga	PhD	Curriculum & Instruction	Professor
5.	Binta Abdulkarim	PhD	Research Methods	Professor
6.	Elizabeth F. Adeniyi	PhD	Psychology of Learning	Professor
7.	Bernard Van Wie (WSU - Visiting)	PhD	Engineering Education	Professor
8.	Hazel Sive (MIT - Visiting)	PhD	Curriculum & Course Design	Professor
9.	Adrian O. Eberemu	PhD	Engineering Education	Reader
10.	Baba Abdul	PhD	Engineering Education	Senior Lecturer
11.	Suleiman A. Zubairu	PhD	Instructional Technology	Senior Lecturer