NATIONAL OPEN UNIVERSITY OF NIGERIA

SCHOOL OF EDUCATION

COURSE CODE: EDU 744

COURSE TITLE: SUBJECT METHODS (PHYSICS)

COURSE GUIDE

EDU 744
SUBJECT METHODS II (PHYSICS)

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Introduction

This Course Guide tells you briefly what the course is about, what course materials you will be using and how you can work your way through these materials. It suggests some general guidelines for the amount of time you are likely to spend on each unit of the course in order to complete it successfully. It also gives you some guidance on your tutor – marked assignments. Details of information on tutor – marked assignments is found in the separate Assignment File, which will be available to you.

What You Will Learn In This Course

This course is to bring to consciousness of those to be involved in physics teaching at senior secondary level. So the overall aim of EDU 744 (Science Methods II) physics is to introduce you to some of the rudiments of physics teaching. You will as well learn about the meaning of science, historical development of science education in Nigeria and the nature of science; science education curriculum reforms at both primary and secondary school levels and psychological theories of learning and its implications for science teaching.

Course Aims

The aim of this course is to prepare you towards teaching physics at senior secondary level. This will be achieved by aiming to:

* introduce you to meaning of science and historical development of science education in Nigeria
* help you appreciate the nature of science
* outline all the science education curriculum reforms at both primary and secondary levels in Nigeria
* examine the contributions of some cognitive psychologists like David Ausubel, Jerome Brunner, Robert Gagne and Jean Piaget to enhance our knowledge of the nature of science teaching
* deal with the basic methods and techniques of teaching physics.

Course Objectives

To achieve the aims set above, the course sets overall objective. In addition, each unit has specific objectives included at the beginning of a unit. You may want to refer to them during and after you might have completed a unit to check on your progress.

Set out below is wider objectives of the course as a whole. By meeting these objectives, you should have achieved the aims of the course as a whole.

On successful completion of the course, you should be able to:

- explain the meaning of science
- define science
- discuss the history of science
- trace the historical development of science education in Nigeria from missionaries to colonial government and to post independence period
- give reasons why science should be taught in schools
- explain the nature of science
- advance reasons for science education curriculum reforms in Nigeria
- discuss the contributions of some cognitive psychologists such as Ausubel, Brunner, Gagne and Piaget to science teaching and their implication for science teaching
- outline the methods of teaching physics
- describe the various resources for teaching physics
- prepare a scheme of work, lesson plan and lesson note for teaching physics at the senior secondary classes.
- describe the design and organisation of physics laboratory
- outline the safety and management procedure in physics laboratory
- develop test items for multiple choice, essay and practical physics.

Working through the Course

To complete this course, you are required to read each study unit of this study material and read other materials, which may be provided by the National Open University of Nigeria. Each unit contains self-assessment exercises for this course and at certain points in the course you would be required to submit tutor-marked assignments for assessment purposes. At the end of the course, there is a final examination. The course should take you about a total of 17 weeks to complete. Below you will find listed all the components of the course, what you have to do and how you should allocate your time to each unit in order to complete the course on time and successfully.

I would advice that you avail yourself the opportunity of attending the tutorial sessions where you will have the opportunity of comparing knowledge with your peers.

The Course Materials

Major components of the course are:

1. The Course Guide
2. Study Units
3. References
4. Assignments
5. Presentation Schedule.

Study Units

There are fourteen study units listed under three modules in this course. They are as follows:

Module 1

The meaning of science, historical development of science education in Nigeria and the nature of science

Unit 1 The meaning and history of science
Unit 2 Historical development of science education in Nigeria I
Unit 3 Historical development of science education in Nigeria II
Unit 4 Justification for teaching science
Unit 5 Nature of science

Module 2

Science education curriculum reforms and how students learn science

Unit 1 Science education curriculum reforms in Nigeria I
Unit 2 Science education curriculum reforms in Nigeria II
Unit 3 Psychological theories of learning and their implications for science teaching I
Unit 4 Psychological theories of learning and their implications for science teaching II

Module 3

Methods and techniques of teaching physics

Unit 1 Methods of teaching physics
Unit 2 Resources for teaching physics
Unit 3 Preparation for teaching physics
Unit 4 Evaluation of science teaching and learning with reference to physics

Each unit consists of table of content, introduction, statement of objectives, contents, conclusion, summary, tutor marked assignment and references; There are activities written at every point these activities will assist you in achieving the stated objectives of the individual units and of the course.

Presentation Schedule

Your course materials will give you important dates for the early and timely completion and submission of your TMAs and for attending tutorials. You should remember that you are required to submit all your assignments by the stipulated time and date. You should guard against lagging behind in your work.

Assignment File

There are fourteen assignments in this course. That is one assignment per units. These are designed to ensure that you really understood each of the unit. In this file, you will find all the details of the works you must submit to your tutor, for marking. Remember your assignments are as important as the examinations as they carry the weightings 40% for undergraduate.

Assessment

Two major methods will be used to assess the course. The first major method is through assignments while written examination will be the second one. The course material had been prepared to assist you to do these assignments. You are also expected to use information and knowledge from the recommend text at the end of each unit. The assignment will carry 30% of the total marks for the undergraduate students while 70% for the postgraduate diploma students. Final examination of about two hours duration will be written at the end of the course and this will also carry 60% of the total mark for the undergraduate students and 50% for the post graduate diploma students.

Tutor-Marked Assignment (TMAs)

The TMA is a continuous assessment component of your course. It accounts for 30% of the total score. You are required to submit at least four (4) TMAs before you are allowed to sit for the end of course examination. The TMAs would be given to you by your facilitator you are to be return them to the facilitator as and when due

Assignment questions for the units in this course are contained in the assignment file. You will be able to complete your assignment from the information and materials contained in your reading your study units and, references. However, it is desirable to demonstrate that you have read and researched more into other references, which will give you a wider view point and may provide a deeper understanding of the subject.

Make sure that each tutor-marked assignment reaches your facilitator on or before the deadline given in the presentation schedule and assignment file. If for any reason you cannot complete your work on time, contact your facilitator before the assignment is due to discuss the possibility of an extensions. Extension will not be granted after the due date.

Final Examination and Grading

The final examination for EDU 744 will be for two hours duration and will carry 60% of the total marks for undergraduate students. The examination will consist of questions, which reflect the type of self testing, practice activities and tutor-marked assignments/problems you have encountered previously. All areas of the course will be assessed.

You may wish to form a discussion group of considerable numbers of your colleagues and practice or discuss the activities and assignments written in each unit before the examination period.

Course Marking Scheme

Assessment	Category of Student	Scoring	Mark
Assignment 1 – 14	4 for undergraduate	Each counts for 10 marks	40 mark
Final Examination	Undergraduate		60 marks
TOTAL			**100% of course marks**

How to Get the Most from This Course

1) In distance learning, the study units replace the university lecture. This is one of the advantages of distance learning. You can read and work through specially designed study materials at your own pace, and at a time and place that suits you best. Think of it as if you are reading the lecture instead of listening to the lecturer. In the same way a lecturer might give you some reading to do, the study units tell you when and what to read. You are provided activities, to do at appropriate points, just as a lecturer might give his students an in-class activity.

2) Each of the study units follows a common format. The first item is an introduction to the subject matter of the unit, and how a particular unit is integrated with the other units and the course as a whole. Next to this is a set of learning objectives. These objectives allow you to know what you should be able to do, by the time you have completed the unit. These learning objectives are meant to guide your study. The moment a unit is finished, you must go back and check whether you have achieved the objectives. If this is made a habit, then you will significantly improve your chances of passing the course.

3) The main body of the unit guides you through the required reading from other sources. This will usually be either from your references or from a reading section.

4) Self activities are interspersed throughout the units, working through these activities will help you to achieve the objectives of the unit and prepare you for the assignments and the examination. You should do each self activity as you come to it in the study unit.

5) The following is a practical strategy for working through the course. If you run into any trouble, telephone your tutor or visit the study centre nearest to you. Remember that your tutor's job is to help you. When you need assistance, do not hesitate to call and ask your tutor to provide it.

Read this Course Guide thoroughly, it is your first assignment.

6) Organise a Study Schedule- Design a 'Course Overview' to guide you through the Course. Note the time you are expected to spend on each unit and how the assignments relate to the units.

Important information, e.g. details of your tutorials, and the date

of the first day of the Semester is available at the study centre. You need to gather all the information into one place, such as your diary or a wall calendar. Whatever method you choose to use, you should decide on and write in your own dates and schedule of work for each unit.

7) Once you have created your own study schedule, do everything to stay faithful to it. The major reason that students fail is that they get behind with their course work. If you get into difficulties with your schedule, please, let your tutor know before it is too late for help.

8) Turn to Unit 1, and read the introduction and the objectives for the unit.

9) Assemble the study materials. Information about what you need for a unit is given in the 'Overview' at the beginning of each unit. You will always need both the study unit you are working on and one of your set books on your desk at the same time.

10) Keep an eye on the course information that will be continuously posted to you. Visit your study centre whenever you need up to date information.

11) Well before the relevant due dates (about 4 weeks before due dates), visit your study centre for your next required assignment. Keep in mind that you will learn a lot by doing the assignment carefully. They have been designed to help you meet the objectives of the course and, therefore, will help you pass the examination. Submit all assignments not later than the due date.

12) Review the objectives for each study unit to confirm that you have achieved them. If you feel unsure about any of the objectives, review the study materials or consult your tutor. When you are confident that you have achieved a unit's objectives, you can start on the next unit. Proceed unit by unit through the course and try to space your study so that you can keep yourself on schedule.

13) When you have submitted an assignment to your tutor for marking, do not wait for its return before starting on the next unit. Keep to your schedule. When the Assignment is returned, pay particular attention to your tutor's comments, both on the tutor-marked assignment form and also the written comments on the

assignments, consult your tutor as soon as possible if you have any questions or problems.

14) After completing the last unit, review the course and prepare yourself for the final examination. Check that you have achieved the unit objectives (listed at the beginning of each unit) and the course objectives (listed in the Course Guide).

Tutor and Tutorials

Tutorials shall be provided in support of this course. You will be notified of the dates, times and location of these tutorials as well as the names and phone number of your facilitator, as soon as you are allocated a tutorial group.

Your tutor or facilitator will mark and comment on your assignments, keep a close watch on your progress on any difficulties you might encounter and provide assistance to you during the course. Summit your tutor-marked assignment to your tutor before the due date; at least two working days are required. They will be marked by your tutor and returned to you as soon as possible.

Do not hesitate to contact your facilitator on telephone, e – mail and discuss problems if you need assistance. The following might be circumstances in which you would find help necessary. Contact your facilitator if:

- You do not understand any part of the study units or the assigned readings.
- You have difficulty with the self-test or activities.
- You have a question or problem with an assignment, with your tutor's comment or with the grading of an assignment.

You should try your best to attend the tutorials. This is the only chance to have face to face contact with your course facilitator and to ask questions which are answered instantly. You can raise any problem encountered in the course of your study. To gain much benefit from course tutorials prepare a question list before attending them. You will learn a lot from participating in active discussion.

Summary

EDU 744 intends to introduce you to Subject Methods II (Physics). Upon completing the course, you will be equipped with basic

knowledge and skills that will place you in the status of practicing physics teachers.

Among others, you will be able to answer these kinds of questions:

- What is the meaning of science?
- What are the justifications for teaching physics?
- What are the possible reasons for science curriculum reforms in Nigeria at both primary and secondary levels?
- How have the psychological theories of learning contributed to the teaching of science in our schools?
- Which of the teaching methods will you suggest for the teaching of physics in our schools?
- How can you manage the resources in the physics laboratory?
- What are the roles of the unit head of physics, physics teacher, physics laboratory technician and attendants?
- How will you assess physics practical lessons in your school?