

## COURSE OUTLINE 2014/15

ENDS-2503 / ENDS-3503  
SPECIAL TOPICS IIC / SPECIAL TOPICS IIIC  
(ENERGY IN BUILDINGS)

<b>Programme:</b>	BACHELOR OF ENVIRONMENTAL DESIGN		
<b>Year Level:</b>	II / III	<b>Credit Points:</b>	3.0
<b>Semester:</b>	ONE		
<b>Weekly Contact Hours:</b>	4 (1-2 Hrs. Lectures / 2-3 Hrs. Project Work)		
<b>Course Co-ordinator:</b>	MARK OLWENY		
<b>Course Instructors:</b>	M. OLWENY G. KAZOORA		
<b>Contact Details:</b>	M. OLWENY – molweny@umu.ac.ug G. KAZOORA – Goodman.Kazoora@unhabitat.org		
<b>Contact Times:</b>	Tuesday 14:00 – 16:00 Wednesday 11:00 – 13:00 Other times by appointment.		

## COURSE INFORMATION

### Handbook Entry

This is an introductory course in energy use and energy efficiency in buildings. After taking this subject, students will understand how energy is used in buildings, the thermal performance of buildings, as well as how to undertake a walk-through energy audit, as well as being able to creatively employ their understanding of energy fundamentals and knowledge energy use in buildings, innovatively in their design projects.

### Restrictions

None

### Prerequisites

None

### Corequisites

None

## Course Objectives

To understand the important issues associated with energy performance of buildings.  
To develop the essential skills for theoretical analysis and practical study of building energy use.

## Learning Outcomes

The primary learning outcomes of this course will be the ability to:

- i. Describe the important issues and considerations of building energy performance.
- ii. Develop the skills for theoretical analysis and practical study of building energy performance.

## Syllabus Content

Key dates are given in this Course Outline. Students should study this program closely and note the dates on which activities/submissions are to occur. Activities are structured in such a way as to spread the work evenly over the time available and to give constant feedback/direction. The course will cover the following broad areas:

Energy Context - Energy Sources / Energy Uses  
Energy Audits – Types / What to Look For  
The Building Envelope – Materials and Material Performance  
Simulation Tools – Energy Modeling Software  
Energy Performance Certification  
Building Design Best Practice

## Method of Teaching and Learning

### Course Format

Class sessions will vary and will include lectures, discussions and lab. sessions. While I appreciate that class discussion is not everyone's strong point, a course like this one will be much more exciting and engaging for all of us if it stimulates a vigorous and ongoing exchange of ideas. Most important in the course is learning by doing through the lab. sessions.

## ASSESSMENT

### Assessment Tasks

There will be five key submissions for this course

#### **SUBMISSION I (10%) - Individual**

**PERSONAL ENERGY USE EVALUATION:** This initial exercise is for students to review their own energy use habits. Based on the equipment they currently have and use on a daily, or weekly basis, they are to derive an outline of their personal weekly energy use at a personal level. This is to provide a benchmark for the class to appreciate the nature of energy use for a particular group of individuals, and act as a basis for understanding broader energy consumption patterns.

**SUBMISSION II (20%) – Group**

**WALK THROUGH ENERGY AUDIT (STUDENT RESIDENCE):** This second level energy audit is useful in identifying a deeper appreciation of energy use than preliminary benchmarking. It also provides a basis for evaluating simple and low-cost improvements and possible energy conservation opportunities that may be implemented. A Walkthrough Energy Audit is based largely on visual verifications, and a review of installed equipment and operating data, along with detailed analysis of energy consumption data collected over a defined time period.

**SUBMISSION III (20%) - Group**

**ENERGY MODELLING/SIMULATION – EXISTING BUILDING:** Making use of the information gathered from the Walkthrough energy audits, students will use this data to simulate the energy performance of the building. This is to build an appreciation of the opportunities of simulations in the quest to improve the design of buildings, by optimising the inputs to reflect the actual use of an existing building. Further details will be provided at a later date.

**SUBMISSION IV (20%) – Individual**

**REDUCING ENERGY USE/DEMAND:** Taking the results from Submission III and IV, students are to propose some alternatives that could reduce the energy demand of an existing building, keeping in mind the differences between changes to users, versus changes to the building itself, which may require physical alterations. Further details will be provided at a later date.

**SUBMISSION V (30%) – Individual**

**ENERGY MODELING/SIMULATION – NEW BUILDING:** This final assignment is for students to reflect on their collective learning in this course, and to propose a new building that showcases energy efficiency in a proposed new building. Students may use as a basis, one of the buildings being designed for the course ENDS-3113. Further details will be provided at a later date.

Assessment Number	Weight	Description	Date or Due Date
Submission I	10%	PERSONAL ENERGY USE EVALUATION (Individual)	REPORT/ PRESENTATION SEPT. 16, 2014
Submission II	20%	WALK THROUGH ENERGY AUDIT (STUDENT RESIDENCE) (Group)	REPORT/ PRESENTATION OCT. 03, 2014
Submission III	20%	ENERGY MODELLING/SIMULATION – EXISTING (Individual)	POSTER SUBMISSION OCT. 20, 2014
Submission IV	20%	REDUCING ENERGY USE/DEMAND (Group)	REPORT/ PRESENTATION NOV. 10, 2014
Submission V	30%	ENERGY MODELING/SIMULATION - NEW (Individual)	POSTER SUBMISSION DEC. 08, 2014

## Course Policies and Minimum Requirements for Students in this Course

This is a seminar based course, and attendance at Tutorial and Laboratory Sessions is compulsory. A record of attendance may be kept.

Spelling and Grammar. Use of **UK English** is expected. Marks will be deducted for incorrect referencing, poor spelling & grammar, and poor presentation of work. The university policy on plagiarism should also be read and understood. Candidates are also advised to closely follow

the academic writing style and reference requirements. Deviations from the norms, may lead to exclusion from the examination process.

Assignments will generally be returned within two weeks of the submission date, unless otherwise indicated. Occasionally it is necessary for Instructors to retain student work for the purposes of Accreditation. Should this be the case, the relevant student(s) will be informed.

All work must be submitted to the Faculty Office before the stipulated time: Late submissions will not be accepted. All submissions will be dully stamped, and marked off the class list provided by the course coordinator. The Faculty will not take responsibility for work submitted in any way, other than that stipulated by the Course-Coordinator. Should students become aware of any circumstances that might prevent them from submitting their work on time, they need to inform the Course Coordinator at least 24 hours before submission. Only under these circumstances, and when the Course Coordinator finds the causes valid, will late submissions be accepted.

Students who do not pass a component of the course have the opportunity to redo their work and resubmit it for assessment before the end of the semester. See Section on Submissions in the 2014/15 Faculty Handbook and Outline of Courses.

Should any changes be made to this program, for whatever reason, all students will be notified by e-mail. You are advised to ensure the Course-Coordinator has your current e-mail address. Student complaints will be addressed promptly by the Course Coordinator.

## LEARNING RESOURCES

Key texts that will be used should be indicated. These should be made available to students in the library. Key references can be placed on reserve for the duration of the Course if need be to ensure that all students undertaking the course can access them. Students are also expected to be resourceful and independent in the pursuit of research material. It is therefore imperative that they be expected to go beyond these texts in any research work.

### Key Reference Texts/Bibliography

There is no generally applicable required or recommended reading for the course

### Internet/Intraweb Resources

Communication and submissions will largely be via the intranet using the following tools:  
Course Wiki <[http://fobeserver.umunet/groups/ends2503\\_2014/](http://fobeserver.umunet/groups/ends2503_2014/)>

### Learning Guide

N/A

**Date: September 12, 2014**