



# BABCOCK UNIVERSITY

## COURSE OUTLINE

**SCHOOL: Science and Technology**

**DEPARTMENT: Basic Sciences**

**SEMESTER /SESSION: Second/2015/2016**

**COURSE CODE AND TITLE: MATH 406: Lebesgue Measure & Integration**

**DAY OF CLASS: Wednesday & Thursday**

**NO OF UNITS: 3**

**VENUE FOR CLASS: A107/E001**

**TEACHER'S: NAME: Ayinde, S.A**

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### OUR VISION STATEMENT

A first-class Seventh-day Adventist institution, building servant leaders for a better world

### OUR MISSION STATEMENT

Building leadership through Christian education; transforming lives, impacting society for positive change

To achieve our mission, we are committed to:

- Achieving excellence in our teaching, research program, and service delivery
- Imparting quality Christian education
- Instilling Christ-like character to the members of our Community

### OUR CORE VALUES

- Excellence
- Integrity
- Accountability
- Servant Leadership
- Team Spirit
- Autonomy and Responsibility
- Adventist Heritage
- Our Culture
- Our Promise
- Our Moral
- Our Strength
- Our Dignity
- Our Passion
- Our Commitment

### OUR PHILOSOPHY

Babcock University's philosophy is anchored on the harmonious development of the intellectual, physical, social, and spiritual potentials of our students, inspiring stable and noble character needed for effective leadership and service in the society.

**CORPORATE IMAGE STATEMENT:** A center of excellence for character development and scholarship; a socially responsive, responsible, and accountable institution in matters of commitment and action.

### COURSE DESCRIPTION:

Here, Lebesgue measure, measurable sets and measurable functions are taught. We treat Lebesgue integral and the integration of non-negative functions including the general

integral and convergence theorems. As we study measure in this course reference will be made to other measures including the fact that God measures human being by his laws, that is the Ten Commandments therefore, students will learn to be careful to observe God's law so as not to fall short of the measure

### **COURSE CONTENT:**

Introduction to the basic concept of topology,  $\sigma$ -algebras, topological vector space and measurable space. Measurable functions and some results on it. Concept of measure and some useful results on measure. Lebesgue measure and its constructions on  $\mathbb{R}$  and  $\mathbb{R}^n$ . Lebesgue integral: integration of non-negative functions. Integrable functions in general. The space of integrable functions as normed linear space

### **COURSE OBJECTIVES:**

At the end of the course student should be able to:

- ✓ explain topology,  $\sigma$ - algebra, topological spaces and measurable space and give examples
- ✓ solve problems on measurable functions
- ✓ show that results on general measure hold for Lebesgue measure
- ✓ construct Lebesgue measure on  $\mathbb{R}$  and  $\mathbb{R}^n$ .
- ✓ solve problems on Lebesgue integrals and appreciate the consequences of convergence theorems

### **REQUIRED TEXTBOOKS/JOURNALS:**

Rao, M.M., Measure Theory and Integration. Marsel Dekker Inc. New York. Basel 2004

### **COURSE REQUIREMENTS:**

**CLASS ATTENDANCE:** - "Every student is required to attend classes regularly and punctually, unless ill or prevented by some recognized emergency. Students who absent themselves from class for more than three weeks during the semester shall merit an F grade. Authorized leave of absence from campus does not excuse the student from classes, or relieve the student of the required course work' (*BU Academic Bulletin 2012-2015 p.13*).

**PARTICIPATION:** -Students are to actively engage in topic discussion and sharing of ideas in class.

**TARDINESS/CONDUCT OF STUDENTS IN CLASS:** - Lateness to class is unacceptable; students are not allowed to operate their cell phones, iPods and other electronic mobile gadgets during classes, except with the permission of the teacher. Eating and chewing off bubble gums and drinking (water exempted) is also not allowed except with the permission of the teacher. Very importantly, students are required to dress in compliance with the university dress code and wear their identity cards while in class.

**SHORT DEVOTIONALS/PRAYER:** - Spiritual nurture is a part of whole person development, and team spirit is our strength; thus, every student is required to participate in the devotional exercise and prayer in class.

**SUBMISSION OF ASSIGNMENT:** As the teacher wishes to receive the assignments with the regulations of the Academic Bulletin.

**LATE ASSIGNMENTS:** Assignments could be turned in earlier, but not later than the deadline set by the teacher.

**GUIDELINE FOR WRITTEN WORK:** Teacher should determine the guidelines.

**ACADEMIC INTEGRITY/HONESTY:**“Babcock University has a zero tolerance for any form of academic dishonesty. Morally and spiritually, the institution is committed to scholastic integrity. Consequently, both students and staff are to maintain high, ethical Christian levels of honesty. Transparent honest behavior is expected of every student in all spheres of life. Academic dishonesty include such things as plagiarism, unauthorized use of notes or textbooks on quizzes and examinations, copying or spying the test or paper of another student (formal or take-home), talking to another student during examinations. Academic matter would automatically result in a failing grade for the examination, and suspension, or outright dismissal from the university. Academic dishonesty issues are referred to SPEAM (Senate Panel on Examination and Academic Misconduct) who investigates and makes recommendations to Senate. Penalties for examination and academic misconduct are spelt out in the *student’s handbook* and in other regulations as published from time to time” (*BU Academic Bulletin2012-2015 p.18*).

#### **GRIEVANCEPROCEDURE**

“Studentswhobelievethattheiracademicrightshavebeeninfringeduponorthattheyhavebeenunjustly treated with respect to theiracademicprogramareentitledtoafairandimpartialconsiderationoftheircases.Theyshoulddothefollowingto effect a solution:

- 1.Presenttheircasetotheteacher(s)concerned
- 2.If necessary, discuss the problem with the Head of Department
- 3.Ifagreementisnot reached at this level, submit the matter to the School Dean
- 4.Finally, ask for a review of the case by the Grievance Committee
5. A fee is charged for remarking of scripts. If a student’s grievance is upheld after an external examiner has remarked the script, the grade would be credited to the student. The lecturer will be given a letter of reprimand and will be asked to refund the fees to the student. If the student’s grievance is not sustained, the student will be given a letter of reprimand and the original grade retained” (*BU Academic Bulletin2012-2015 p.18*).

**TEACHING/LEARNING METHODOLOGIES:** Teachers are to determine their strategies for teaching their students. However, interactive strategies are encouraged, and there should be integration of faith and BU core values in the learning process.

In adherence to Babcock University core value for course delivery, the following methodologies are adopted.

Well-structured instructions  
White board & marker and projector  
Students- teacher interaction  
Direct Instruction.  
Guided Inquiry.  
Discourse.  
Cooperative Learning.

Problem-based Learning.  
 Visual Representations and Concrete Models.  
 Assignments

## COURSE ASSESSMENT/EVALUATION

### *Continuous Assessment:*

Class Attendance:	5% }	} =40%
Quizzes & Tests:	10% }	
Assignments:	10% }	
Mid-Semester Exam:	15% }	
Final Semester Exam:	60%	

## GRADE SCALE

Currently, the 5-point gradingsystem adopted by the University Senate translates as follows:

Grades	Marks- Quality	Range Points	Definition
A	80-100	5.00	Superior
B	60-79	4.00	Above Average
C	50-59	3.00	Average
D	45-49	2.00	Below Average
E	40-44	1.00	Pass
F	0-39	0.00	Fail

**INCOMPLETE GRADE:** An incomplete grade may only be assigned to a student upon request, due to an emergency situation that occurred within that semester, which prevented completion of an/some assignments, quizzes, or examination. Such a student would complete a contract form, obtainable from the Registrar, after agreement with the teacher. The form must be signed by the teacher, the student, the HOD, the dean, the Registrar, and the Senior Vice President (SVP) before contract begins. The original copy of the incomplete form will be sent to the Registrar with copies to the teacher, the student, the HOD, the dean, and the SVP. An incomplete grade(I) reverts to the existing grade if contract is not completed by the end of the following semester (including summer semester, except for examinations), (*BU Academic Bulletin 2012-2015 p. 20*).

## FURTHER READINGS:

### STUDENTS WITH DISABILITY

“Babcock University seeks to provide a conducive environment for optimal living and learning experience. While the university is working towards facilities that accommodate persons with disabilities, provisions will be made for students with disabilities under the following conditions. Students with disabilities are to:

- a. Report to Student Support Services for assessment, and obtain a clearance/recommendation at the commencement of the semester or as soon as

- disabling incidence occurs
- b. Show the clearance/recommendations to relevant university officials at the commencement of the semester or as soon as disabling incidence occurs
  - c. Maintain ongoing contact with Student Support Services” (*BU Academic Bulletin* 2012-2015 p. 20).

**PROPOSED DAILY/WEEKLY OUTLINE OF SCHEDULE:**

WEEK		TITLE	CLASS ACTIVITIES	ASSIGNMENTS DUE
1	Jan.,4	Devotion. Discussion of course outline and introduction.	Questions and answers.	
2	Jan.,11	Introduction to the basic concept of topology, $\sigma$ – algebras, topological vector space and measurable space	Exercise	
3	Jan.,18	Measurable functions and some results on it	Exercise	
4	Jan., 25	Measurable functions and some results on it	Exercise	
5	Feb.,1	Concept of measure and some useful results on	Exercise	Construct Lebesgue measure on a real line.
6	Feb.,8	Concept of measure and some useful results on	Exercise	
7	Feb.,15	Lebesgue measure and its constructions on $\mathbb{R}$ and $\mathbb{R}^n$ .		
8	Feb.,22	Lebesgue measure and its constructions on $\mathbb{R}$ and $\mathbb{R}^n$ .	Exercise	
9	Feb.,29	Lebesgue integral: integration of non-negative functions	Exercise	
10	Mar.,7	Lebesgue integral: integration of non-negative functions	Exercise	
11	Mar.,14	Integrable functions in general	Exercise	

12	Mar.,21	Integrable functions in general	Exercise	
13	Mar.,28	The space of integrable functions as normed linear space	Exercise and Revision.	