



BABCOCK UNIVERSITY

SCHOOL: PUBLIC AND ALLIED HEALTH

DEPARTMENT: PUBLIC HEALTH

SEMESTER: First SESSION: 2017/2018

COURSE CODE: PHFC 819

TITLE: Biostatistics for Public Health

DAY OF CLASS: Regular Module holds Sundays 10:00 am to 1:00 noon

NO OF UNITS: THREE, and VENUE FOR CLASS: Seminar Room CPGS Block BBS Building

TEACHER'S NAME: * Professor Nnodimele O. ATULOMAH and Dr. Kola s. ORITOGUN

OFFICE ADDRESS: Dean's Office, Science Block,

OFFICE HOURS: 8:00am – 5:00pm

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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 | -Our Culture |
| • Integrity | -Our Promise |
| • Accountability | -Our Moral |
| • Servant Leadership | -Our Strength |
| • Team Spirit | -Our Dignity |
| • Autonomy and Responsibility | -Our Passion |
| • Adventist Heritage | -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: This course is a component of Public Health Science that provides skills for data collection, organization, and interpretation. Statistical problem-solving in the laboratory setting with particular

reference to the use of computer-assisted statistical software such as SPSS and Epi-Info defines one of many activities of public health informatics. By illustrative case study exercises, activities such as coding, data entry and definition, frequency distribution analysis and use of special command to transform data into new variables shall be carried out. The course will also introduce to the students the techniques of designing research data-collecting instrument, coding and using computer to derive information that convey meaning when fully analyzed and providing solutions. PHFC 819 is a pre-requisite for this course.

COURSE CONTENT: This course is a component of Public Health Science that provides an introduction to the fundamental methods of collecting, organizing, and presenting data. It is also the study of central tendency and variation, sampling, t tests, chi-squared tests, simple and multiple regression, confidence intervals, correlations, and making statistical inferences. This course provides the basis for quantitative analysis of situations in the community.

COURSE OBJECTIVES: This course aims at fulfilling a fourfold objective in the areas of knowledge, belief, values, and attitude towards computational analysis of research data thus:

KNOWLEDGE ----- At the end of this course, each student is expected to:

1. Define and become acquainted with key terms in biostatistics,
2. Identify types of variables used in measurement data,
3. Describe the nature of measurement and configuration of statistical data in terms of central tendency and spread,
4. Define the concept of probability and describe the use of probability in public health research,
5. Describe specific applications of probability distribution related data processing in public health,
6. Apply knowledge gained in elementary probability theory to process sampling theory,
7. Identify and explain the purpose of applying test statistic in health research,
8. Explain how multivariate analysis is conducted to demonstrate statistical modeling of cause-effect relationships and test the significance of the relationships,
9. Use principles in biostatistics to develop research process and design research instrument,

BELIEFS ----- It is expected that at the end of this course, students would have an understanding establishing:

- i. God as the source of all knowledge and events occurring in nature,
- ii. Biostatistics deals with information derived from natural world,
- iii. Biostatistics facilitates understanding natural phenomena and conveys the truth about events occurring in nature.

VALUES ----- Knowledge is truth and that All knowledge comes from God who reveals it.

ATTITUDE ----- At the end of this course each student will:

1. Express confidence in the correct use of data to explain natural phenomenon in communicating truth about the nature of health and disease.
2. Be willing to use skills acquire in biostatistics to design, develop, carry out empirical studies in public health.
3. Confidently apply ethical principles when using data analytical skills to synthesize new knowledge.

REQUIRED TEXTBOOKS/JOURNALS: Required and recommended texts for the course include:

1. Daniel, W. W. and Cross, C. L. (2013) *BIostatistics; A Foundation for Analysis in the Health Sciences*. 10th Edition. Wiley Publication, USA (*Available as eBook in the Dropbox Folder*)
2. Edwards AL., *Statistical Methods for behavioral sciences* (Holt Rinehart) NY (In the lib 310)
3. SPSS Inc. (2006) *SPSS for Windows 14.0* Chicago, USA (*Software is available in the Dropbox Folder*)
4. Review of how Data are applied in Journal Articles is strongly recommended.
5. Magnuson, J. A and Fu, P. C. (2014) *Public Health Informatics and Information Systems*. Second edition. Springer Publisher, London (*Available as eBook in the Dropbox Folder*)

Note: Each student is required to have a calculator (Casio fx-991MS) for computations. Further, each student is expected to bring a laptop for practical exercise of data entry and analysis. Statistical software is already available

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 gargets 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: there are weekly group assignments to be submitted on schedule dates as stipulated on the course outline table below.

LATE ASSIGNMENTS: Assignments could be turned in earlier, but not later than the deadline set by the teacher. Any student found careless in this regard will be penalized in line with the regulations of the Academic Bulletin.

GUIDELINE FOR WRITTEN WORK: **Assignments should be typed or hand-written on A4 paper as stipulated in the course outline table below.**

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 Bulletin 2012-2015 p.18*).

GRIEVANCE PROCEDURE

“Students who believe that their academic rights have been infringed upon or that they have been unjustly treated with respect to their academic program are entitled to fair and impartial consideration of their cases. They should do the following to effect a solution:

1. Present their case to the teacher(s) concerned
2. If necessary, discuss the problem with the Head of Department
3. If agreement is not reached at this level, submit the matter to the School Dean
4. Finally, ask for a view 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 Bulletin 2012-2015 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.

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 grading system adopted by the University Senate translates as follows:

Grades	Marks-Quality	Grade 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*).

STUDENTS WITH DISABILITY

“Babcock University seeks to provide 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 official 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*).

Course Outline:

Sessions	Date	Session Titles and Learning Objectives: By the end of each of the Sessions, learners will:	Contents	Assessments
1	Sept 7	<p>Introduction to Biostatistics: Becoming Acquainted with the meaning of terms used in biostatistics for Social and health Science Research</p> <ul style="list-style-type: none"> - Define Information, Statistics and Data processing, - Provide explanation of the meaning of information and how it is structured for processing. - Identify what Data and variables are and how they are structured for research, -Organize response data into Frequency distribution, -Become acquainted with the use of diagrams/graphs to describe data distribution and configurations, 	<ul style="list-style-type: none"> -An introduction to Biostatistics and Informatics in Public Health and explanation of the meaning of biostatistics.-(<i>Public health is concerned with morbidity, mortality characteristics, surveys as a result research is conducted to capture information</i>). -What is information (Data)? -What has made information an important resource today? -Sources of information and data required for processing, -What is biostatistics and how this is related to public health? -Introduction to basic statistical tools, -How may statistics solve research needs? -Why many researchers have challenges with data processing of their research output, -Variables discussed in their categories,(<i>Continuous, interval scale, categorical, nominal and ordinal</i>) -Introduction of Principles of Measurement and Scale calibration, An introduction to data processing in biostatistics with; -<i>process of organizing response data as frequency distribution,</i> -<i>Conducting frequency distribution,</i> -<i>Characteristic features of a distribution-Normal, skewed distribution,-(Graphical representations)</i> -<i>Characteristic features of a distribution-Central location and Dispersion will be discussed,</i> 	First Quiz

2	Sept 14 and 21	Computation of Central Location and Dispersion;; -Compute Mean of a data set, -Compute Median and Mode of a data set, -Explain the meaning of these parameters. - Become well acquainted with the concept of variations, -Compute variance and standard deviation of a data set, -Compute range and quartiles, -Explain the meaning of these parameters.	-Computations of basic statistical procedures involving means, median and mode for given data set, -Procedures to explain the meaning of the various central locations and reasons why the computations are different. -Computations of basic statistical procedures involving variance, standard deviation using sum of squares and mean deviation methods for given data set, -Computations of range and quartiles,	Demonstrations and Class Exercise: Computations of case study data sets. Take-Home work from the two exercises..
3	Sept 27	Elementary Probability Theory I; -define Probability, -Explain Probability rules, -Compute Binomial Probability Distribution, -Compute the Poisson Probability Distribution -Apply Probability computations in explaining natural situations in Health and Diseases.	-Introduction of the concept of probability and its applications in health and disease occurrence, research and nursing practice, -Brief review of principles/rules in Probability, -Binomial probability computations and applications in disease occurrence, -Poisson probability computations with suitable examples.	Demonstrations and Class Exercise: Computations of case study data sets. Take-Home work from the two exercises.
4	Oct 5	Elementary Probability Theory II; -Compute Normal Probability Distribution, -Compute the Normal approximation to the Binomial Probability Distribution -Apply normal Probability computations in explaining natural situations in Health and Diseases.	-Introduction of the concept of Normal probability, - Brief review of principles/rules in normal Probability, -Z-Score computations and applications in standardization process -Computations involving normal probability distribution and explanations of its applications in predicting disease occurrence in populations, -Special applications of the normal approximations of the binomial probability distribution. -Explanations of the Normal curve.	Demonstrations and Class Exercise: Computations of case study data sets. Take-Home work from the two exercises.
5	Oct 12	Sampling Theory and Sampling Distribution: -Explain Principles of Sampling theory, -Compute Sample Error of sample means, -Compute Confidence Interval (Point Estimates)	-Introduction of the concept of Sampling, -Sample Error computations to derive Standard Error of Means/Proportions, -Computations involving sample size determinations relevant in the research process,	Demonstrations and Class Exercise: Computations of case study data sets. Take-Home work from the two exercises.
6	Oct 19 and 26	Test of Hypothesis and Level of Significance I; -Explain what a hypothesis is and Operationalize a test of hypothesis Using various Test Statistic such as; <ul style="list-style-type: none"> • T-Test; • ANOVA; 	-What is a hypothesis? -Describe the process of conduct test of hypothesis, -Conduct test of hypothesis involving the application of Inferential Statistical analysis such as; <ul style="list-style-type: none"> • T-Test for means and proportions; • Analysis of variance ANOVA; 	Mid-Semester Test
7	Nov 2	Test of Hypothesis and Level of Significance II; -Explain what a hypothesis is and Operationalize a test of hypothesis Using various Test Statistic such as;	-Conduct test of hypothesis involving the application of Inferential Statistical analysis such as; <ul style="list-style-type: none"> • Chi-square analysis of Goodness-of-fit, • Chi-square analysis of Independence, • Fisher's exact Test. 	Class Exercise: Computations of case study data sets.

		<ul style="list-style-type: none"> • Chi-square; 		
8	Nov 9 to 30	Data Analysis with Correlation and Regression -Explain what correlation and regression analysis will do, -Conduct correlation analysis, -Conduct regression analysis, -Explain the meaning of results of the analysis.	What is Correlation and regression? -Describe the process of conducting correlation and regression analysis, -Conduct Inferential Statistical analysis using; <ul style="list-style-type: none"> • Correlation analysis, • Regression analysis, 	Demonstrations and Class Exercise: Computations of case study data sets. Take-Home work from the two exercises.
9	Dec 7	Revision and Examination	Final Semester Examination	

God bless! UPDATED September, 2017