Kuwait University
Health Sciences Centre

Course Title	:	**Biostatistics and Basic Epidemiology (BBE)**
Course no.	:	**14 10 144**
Credits	:	3
Total Clock hours	:	52 h
Lectures	:	28 h

- Biostatistics: 16 hours (2 hours per week for 8 weeks)
- Epidemiology: 12 hours (2 hours per week for 6 weeks)

Evaluations and exams: In-course assessments (50% of the total score)

In-course assessment-I	Biostatistics	30 MCQs (1½ hours duration)
In-course assessment-II	Epidemiology	20 MCQs (1 hour duration)

Final exam (50% of the total score)

Biostatistics   30 MCQs
Epidemiology   20 MCQs   } (2½ hours duration)

1. Aims and objectives of the course:
Biostatistics Component (60%)

General objectives:

This component aims to provide health sciences students with the biostatistical quantitative measurement techniques required to analyze and interpret health data. The course provides examples which are relevant to health and reflect real-life situations. Emphasis in the course is placed upon bringing students to appreciate the relevance and role of biostatistics in health sciences. It also focuses on concepts, limitations, and assumptions underlying biostatistical methods.

Specific objectives:
A student who completes the course should be able to:

- Understand the relevance of biostatistics to health
- Differentiate between various types of variables and their distribution patterns in human populations; between sample and population; parameter and estimate; variable and measurement; descriptive and inferential statistics
- Summarize and present data by frequency tables, descriptive, and graphical methods
- Understand the principles of probability of occurrence events

- Describe the probability behavior of events through learning common probability distributions with emphasis on the normal distribution
- Appreciate the possibility of drawing inferences about the whole population from a sample through estimation of population confidence interval
- Recognize the importance of randomization to control patients' selection bias.
- Appreciate various sampling techniques to draw random, unbiased, representative, and adequate sample.
- Perform tests of hypotheses in order to ascertain that the difference between treatments is genuine and not due to chance, while appreciating the limitations and underlying assumptions of these tests
- Know the methods of evaluating the association between qualitative or quantitative variables, and the ways of assessing the significance of such associations
- Understand the situations where parametric methods are inappropriate in hypothesis testing, and decide the pertinent nonparametric tests applicable in such situations

Epidemiology Component (40%)
General objectives:

This component aims to introduce health sciences students to the basic concepts of Epidemiology and Public Health. It emphasizes the epidemiologic and ecologic approach to public health in an historical context, and presents basic principles of the measures of the occurrence of disease, association, study design, sources of error, prevention, infectious disease and environmental epidemiology, outbreak investigation, and surveillance. This component provides students with basic background material on which are based further courses in the curriculum on Epidemiology, Evidence-Based Medicine, and Community Medicine.

Specific objectives:
A student who completes the course should be able to:

- Introduce the role of Epidemiology in health and medicine
- Define and express the impact of health disorders upon human populations in quantitative terms
- Differentiate basic study designs and recognize main sources of error in Epidemiology
- Calculate and interpret basic measures of disease occurrence and association, and causal inferences in Epidemiology
- Describe the patterns of health and disease in the population in terms of persons, time and place
- Describe the basic concepts of Epidemiology of infectious diseases and the purpose of surveillance systems
- Explain basic concepts of prevention
- Recognize the environmental and global public health perspectives of epidemiology
- Describe the properties of diagnostic tests such as sensitivity, specificity, positive predictive value and negative predictive value

2. Course contents:

This 3 credit hour course is taught to the first year Health Sciences Centre (HSC) students (Medical, Dental, and Pharmacy) on their second semester as part of the preprofessional curriculum. The course is comprised of two components: Biostatistics (60%) and Epidemiology (40%). Emphasis in this course is placed upon bringing the HSC students to appreciate the relevance and role of Biostatistics and Epidemiology in medicine. It focuses on concepts, limitations, proper use, validity and assumptions underlying various biostatistical and epidemiological methods rather than on mathematical derivations or formulae. The course involves training students to process relevant medical data sets using computer software packages in practicals (computer sessions).

Theme   Topic

3. Teaching plan:

A. Lectures (n=42)
- Biostatistics: 16 hours (2 hours per week for 8 weeks)
- Epidemiology: 12 hours (2 hours per week for 6 weeks)
- Total lecture hours: 28 hours

D. Tutorials (n=6)
  Small group tutorials/ Computer sessions
- Biostatistics:
  - 8 computer sessions (2 hours each)
- Epidemiology
  - 4 tutorials (2 hours each)
- Total small-group contact hours: 24
- Total : 32 hours Biostatistics, 20 hours Epidemiology

4. Textbooks and Reading Materials:
a. Moussa MAA and Gomez JE (2007). *Medical Statistics: Concepts and Critical Appraisal*. Kuwait University Press, Kuwait.

b. Petrie A and Sabin C (2005). *Medical Statistics at a glance.* Blackwell Publishing Ltd., USA.

Computer Practical's

a. Moussa MAA, Thalib L, Suresh A and Gomez JE (2007). *Medical statistics: Data analysis using SPSS*, Kuwait University Press, Kuwait.

Epidemiology:

a. Rockett I. *Population and Health: An Introduction to Epidemiology*. Population Bulletin, Second Edition, Vol. 54, No. 4 (1999). [Available Online – Free]