Statistics, BS

Learning Outcomes

Students will:

• be able to distinguish between observational studies and
designed experiments and understand the issues related
to the data collection method, including sampling bias,
sampling error, sample size determination, statistical
power, association versus causation, and the design and
analysis of randomized experiments;

• use critical thinking skills to translate substantive
questions into well-defined statistical problems and choose
appropriate statistical methods and graphical summaries
for a given problem;

• use computer software to manage data, carry out
exploratory data analyses and computer simulations,
produce numerical and graphical summaries of data, and
apply basic statistical methodology;

• be able to clearly communicate study results to non-
statisticians, and write accurate and meaningful reports
that describe the statistical analyses and summarize
important findings; and

• understand the mathematical tools underlying statistical
methods, including distribution theory, uncertainty
quantification via probability, estimation theory, and the
probabilistic basis of formal statistical inference.