

# Tools for Quantitative Reasoning

BSU109 2<sup>nd</sup> Semester Credit Hours 03

## COURSE INTRODUCTION

This course is based on quantitative reasoning 1 course. It will enhance the quantitative reasoning skills learned in quantitative reasoning 1 course. Students will be introduced to more tools necessary for quantitative reasoning skills to live in the fast paced 21<sup>st</sup> century. Students will be introduced to importance of mathematical skills in different professional settings, social and natural sciences. These quantitative reasoning skills will help students to better participate in national and international issues like political and health issues. This course will prepare the students to apply quantitative reasoning tools more efficiently in their professional and daily life activities. This course will help them to better understand the information in form of numeric, graphs, tables, and functions.

## COURSE OBJECTIVES

- Students will be introduced to the above listed concepts, and they will be prepared to apply these concepts to practical life scenarios.
- This course will enhance their ability to deal with scenarios involving quantitative reasoning skills in a logical manner which they can face in their practical lives.
- It will prepare students to deal with different forms of data occurring in professional, social and natural sciences.
- Students will be introduced to scenarios involving functions and probability in different disciplines.
- This course will prepare the students to apply the quantitative reasoning skills in other disciplines.
- This course will provide solid foundation for students to use the quantitative reasoning skills in solving practical life problems.

## STUDENTS LEARNING OUT COMES:

After completing this course successfully, students will be able to:

- strengthen their quantitative reasoning skills and apply to daily life problems.
- draw the inferences from the data given in numeric, graphs, tables and functions
- strengthen their quantitative reasoning skills while making decisions.
- apply the concepts of functions in social and economic issues and formulate and solve the problems.
- understand the principal concepts of probability and its applications.
- demonstrate the application of the learned principles of quantitative reasoning skills in different professional activities, social and natural sciences.

## Course Outline

### 1. Exploring graphical information

- Investigating relationships between variables
- Exploring tools to find relationship between variables
- Resources and population growth
- Dealing with Economical, environmental and social issues

### 2. Building blocks of a plane

- Graphical and analytical approaches to solve a problem
- Applications of graphical & analytical approaches in social & economic problems

### 3. Exploring inequalities

- Understanding inequalities around us.
- Dealing with practical problems involving inequalities in different disciplines

### 4. Comparing quantities

- Golden ratio in sculptures
  - Comparison of statements and their use in social and economic problems
  - Number patterns and their applications
- 5. Thinking Logically**
- Survival in the modern World
  - Propositions and truth values
  - Applications of logic
- 6. Understanding data**
- Exploring and summarizing data, misleading graphs
  - Finding a representative value in a data
  - Measure and spread of a data, measuring degree of relationship among variables
  - Counting the odds

## Essential Reading

1. Using and understanding mathematics, 6<sup>th</sup> edition by Jeffrey Bennet and William Briggs, published by Pearson USA.
2. Mathematical thinking and reasoning 2008 by Aufmann, Lockwood, Nation & Clegg published by Houghton Mifflin company USA.
3. Pre-calculus by Robert Blitzer 5<sup>th</sup> edition published by Pearson USA.
4. Pre-calculus Graphical, Numerical, Algebraic 8<sup>th</sup> edition by Franklin D. Demana, Bert K. Waits, Gregory D. Foley & Daniel Kennedy published by Addison Wesley USA.
5. Pre-calculus Mathematics for Calculus, 6<sup>th</sup> edition by James Stewart, Lothar Redlin and Saleem Watson published by Brooks/Cole Cengage Learning USA.
6. [https://www.ets.org/s/gre/pdf/gre\\_math\\_review.pdf](https://www.ets.org/s/gre/pdf/gre_math_review.pdf)
7. OpenAlgebra.com  
A free math study guide with notes and YouTube video tutorials.

### ADDITIONAL RESOURCES (OPTIONAL):

- Direct proportion:  
<https://youtu.be/kuvdMCDqmKg>
- Inverse proportion:  
<https://youtu.be/xEFyfl9YdHA>
- Identifying a linear function:  
<https://youtu.be/AZroE4fjqtQ>
- Functions  
<https://youtu.be/GY6Q2f2kvY0>
- Linear functions:  
<https://youtu.be/MXV65i9g1Xg>
- Applications of linear equations:  
<https://youtu.be/UAYCkFMU-YM>
- Solving system of linear equations:  
[https://youtu.be/2DzmE3\\_QS-E](https://youtu.be/2DzmE3_QS-E)
- Scatter Plot and correlation:  
<https://youtu.be/qscgK78No70>
- Mean Median and Mode:  
<https://youtu.be/B1HEzNTGeZ4>
- Pearson's correlation coefficient  
<https://youtu.be/jBQz2RGxCek>