

QR-100 Quantitative Reasoning-I

Credit Hours: 3-0

Prerequisites: None

Course Objectives: Quantitative reasoning is the ability to interpret and reason with information that involves numbers or mathematical ideas. It is a crucial aspect of literacy, and it is essential in making important decisions and understanding contemporary issues. Information technology and the rigorous dissection of logical arguments in any discipline depends on algorithms and formal logical constructs. The ability to think quantitatively plays important role in university education. The topics covered in this course will help you work with quantitative information and make critical decisions.

Core Contents: Problem solving approaches, Applications of numbers in real world, Managing money, Statistical reasoning, and Probability.

Detailed Course Contents: Common Fractions, Decimal Fractions, Extending Unit Analysis, Percentages, Ratio, with Scientific Notation, Scientific Notation, Rounding, The Inflation Calculator, Tax Calculations, Powers and Roots, The Compound Interest Formula, Four Basic Rules of Algebra, Derivation of the Savings Plan Formula, Fractional Powers, Fractional Powers, The Loan Payment Formula, Principal and Interest Portions of Loan, Fundamentals of Statistics, Statistical Tables and Graphs, Frequency Tables in Excel, Bar Graphs and Pie Charts in Excel, Line Charts in Excel Graphs with Multiple Data Sets, Scatterplots in Excel Mean, Median, and Mode in Excel, Standard Deviation in Excel, Standard Scores and Percentiles in Excel, Statistical Inference, Fundamentals of Probability, The Multiplication Principle, Combining Probabilities, Assessing Risk, The Law of Large Numbers.

Course Outcomes: After completing this course, students are expected to developed a clear understanding of the fundamental concepts mathematics with real-world applications. The topics covered in this course will help you work with quantitative information and make critical decisions. Students are expected:

- To develop strong skills in critical and logical thinking to make wise personal decisions.
- Put numbers from the real life into a context that makes them understandable.
- Possess the mathematical tools needed to make basic financial decisions.
- Be familiar with basic ideas of probability and risk and be aware of how they affect life.

Textbook: C, William Briggs, Using & Understanding Mathematics: A Quantitative Reasoning Approach (7th Edition) Pearson Education, Inc. (2019).

Reference Books:

1. Eric Zaslow , Quantitative Reasoning: Thinking in Numbers, Cambridge University Press (2020)
2. Paul A. Calter, Michael A. Calter, Technical Mathematics, John Wiley & Sons, (2011)

Weekly Breakdown		
Week	Section	Topics
1	2A, 2B	APPROACHES TO PROBLEM SOLVING: Common Fractions, Decimal Fractions, Extending Unit Analysis,
2	3A, 3B	NUMBERS IN THE REAL WORLD: Percentages, Ratio, with Scientific Notation, Scientific Notation, Rounding,
3	3C, 3D	The Inflation Calculator, Tax Calculations
4	4A, 4B	MANAGING MONEY: Powers and Roots, The Compound Interest Formula, Four Basic Rules of Algebra,
5	4C	Derivation of the Savings Plan Formula, Fractional Powers, Fractional Powers
6	4D	The Loan Payment Formula, Principal and Interest Portions of Loan
7	5A, 5B	STATISTICAL REASONING: Fundamentals of Statistics, Statistical Tables and Graphs,
8	5C	Frequency Tables in Excel, Bar Graphs and Pie Charts in Excel, Line Charts in Excel
9	Mid Semester Exam	
10	5D, 5E	Graphs with Multiple Data Sets, Scatterplots in Excel
11	6A	Mean, Median, and Mode in Excel
12	6B, 6C	Standard Deviation in Excel, Standard Scores and Percentiles in Excel,
13	6D	Statistical Inference
14	7A	PROBABILITY: Fundamentals of Probability
15	7B	The Multiplication Principle, Combining Probabilities
16	7C	Assessing Risk
17	7D	The Law of Large Numbers
18	End Semester Exam	