Exploring Quantitative Skills

BSU104 Semester 1 Credit Hours 03

COURSE DESCRIPTION

Since ancient times, numbers, quantification, and mathematics has played a central role in scientific and technological development. In the 21st century Quantitative Reasoning (QR) skills are essential for life as they help to better understand socio-economic, political, health, education, and many other issues an individual now faces in daily life. The skills acquired by taking this course will help the students to apply QR methods in their daily life and professional activities. This course will also change student's attitude about mathematics. It will not only polish their QR skills, but also enhance their abilities to apply these skills.

COURSE OBJECTIVES

- Students will be introduced to the above concepts and they will be prepared to apply these concepts to analyze and interpret information in different walks of life.
- Students will get familiarized with the importance of quantitative reasoning skills in the modern age.
- This course will improve their ability to deal with scenarios involving numbers related issues in a logical manner.
- It will provide students an opportunity to appreciate the intellectual beauty of quantitative reasoning skills.
- It will prepare students to apply the quantitative reasoning skills in solving quantitative problems which they will experience in their practical lives.

STUDENT LEARNING OUTCOMES:

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

1. create and develop quantitative reasoning skills and apply to daily life challenges involving social and economic issues.
2. apply the learned principles of quantitative reasoning skills in other disciplines.
3. acquire and use the quantitative reasoning skills in different disciplines.
4. make decisions in a logical manner.
5. apply geometrical models to solve real life problems.

Course Outline

1. Exploring importance of quantitative reasoning skills

- • What is Quantitative Reasoning?
- • Overview of history of mathematics and contributions of Muslim scholars.
- • Different types of standard numbers and their role in practical life scenarios.

2. Problem solving techniques

- • Understanding relationship between parts and whole
- • Practical life scenarios involving parts & whole
- • Practical life scenarios involving units and rate
- • Unit analysis as a problem solving tool.

3. Numbers & the Universe

- • Understanding our World through numbers
- • Dealing with very big and small numbers & their applications
- • Understanding uncertainty and its applications

4. Financial issues

- • Stock exchange and economy
- • Money management (profit, loss, discount, zakat, simple interest, compound interest and taxation)

- • Money management in practical life scenarios like investments and federal budget

5. Exploring expressions

- • Practical scenarios involving expressions
- • Equating two expressions in one variable & using it to solve practical problems
- • Social and economic problems involving expressions

6. Exploring beauty in Architecture & landscape

- • Introduce geometrical objects through architecture and landscape
- • Dealing with social and economic issues involving geometrical objects

7. Venn diagrams

- • Practical scenarios involving sets and Venn diagrams
- • Ven diagrams and their applications in different disciplines

Essential Readings

1. Bennett, J. & Briggs, W. (2015). *Using and understanding mathematics* (6th Edition). Pearson Education, Limited. http://xn--webducation-dbb.com/wp-content/uploads/2019/09/Jeffrey-Bennett-William-Briggs-Using-Understanding-Mathematics_-A-Quantitative-Reasoning-Approach-Pearson-2015.pdf
2. https://aleihsnosni.weebly.com/some-mathematicians-and-there-contributions.html https://famous-mathematicians.org/
3. http://islamicmaths.weebly.com/famous-mathematicians.html
4. Demana, F., Waits, B., Foley, D. & Kennedy, D. (2016). *Precalculus.* (7th Edition). Addison Wesley
5. Section 1.2 https://www.ets.org/s/gre/pdf/gre_math_review.pdf
6. https://www.openalgebra.com/2012/11/fractions.html
7. https://www.onlinemathlearning.com/fraction-word-problems.html
8. https://www.thirteen.org/edonline/adulted/lessons/stuff/lp46_fracword.pdf
9. Blitzer, R. (2014). Precalculus. (5th Edition). Pearson Education, Limited. https://www.ilearnacademy.net/uploads/3/9/2/2/3922443/precalculus__edition_5f.pdf
10. Aufmann, R., Lockwood, J., Nation, R. & Clegg, D. (2007). Mathematical thinking and reasoning. Brooks Cole. https://ciogreentulocu.files.wordpress.com/2020/01/mathematical-thinking-and-quantitative-reasoning.pdf

Additional Resources (Optional)

• Beauty and power of mathematics
https://youtu.be/VIbjHIGMjQM
• Types of numbers:
https://youtu.be/6YytojexiOg
• Mathematics in daily life
https://youtu.be/VIbjHIGMjQM
• Geometry through architecture
https://youtu.be/z2Fb0R2EYo4
• Trigonometric ratios:
https://youtu.be/Jsiy4TxgIME
• Inverse trigonometric functions:
https://youtu.be/JGU74wbZMLg
• Solving word problems involving linear equations:
https://youtu.be/DfbQjiSooOo