

## Quantitative Reasoning – II

<b>Course Code</b>	<b>Credit Hours</b>
QR-101	3-0

### Course Description

Quantitative Reasoning (II) is a sequential undergraduate course that focuses on logical reasoning supported with mathematical and statistical concepts and modelling / analysis techniques to equip students with analytical skills and critical thinking abilities necessary to navigate the complexities of the modern world. The course is designed to familiarize students with the quantitative concepts and techniques required to interpret and analyse numerical data and to inculcate an ability in students the logical reasoning to construct and evaluate arguments, identify fallacies, and think systematically. Keeping the pre-requisite course of Quantitative Reasoning (I) as its base, this course will enable students further their quantitative, logical, and critical reasoning abilities to complement their specific major or field of study.

### Text Book:

1. Using and Understanding Mathematics: A Quantitative Reasoning Approach by J. O. Bennett, W. L. Briggs and A. Badalamenti
2. Discrete Mathematics and its Applications by Kenneth H. Rosen
3. Discrete Mathematics with Applications by Susanna S. Epp
4. Applied Mathematics for Business, Economics and Social Sciences by Frank S Budnick
5. Elementary Statistics: A Step-by-Step Approach by Allan Bluman
6. Introductory Statistics by Prem S. Mann
7. Applied Statistical Modelling by Salvatore Baboncs
8. Barron's SAT by Shmvon Weiner Green, M. A and Ira K. Wolf

### Reference Book:

### Prerequisites:

Quantitative Reasoning-I

**Assessment System for Theory**

	<b>Without Project (%)</b>	<b>With Project/Complex Engineering Problems (%)</b>
Quizzes	15	10-15
Assignments	10	5-10
Mid Terms	25	25
Project	-	5-10
End Semester Exam	50	45-50

**Teaching Plan**

**Theory:**

<b>Week</b>	<b>Topic Covered</b>	<b>Reading Assignment/ Home Work</b>		<b>CLO No</b>	<b>Assessment Methodology</b>
1	Introduction and importance of logic, Inductive, deductive, and adductive approaches of reasoning.	Ref 2 & 3		1	Assignments, Quizzes, MSE, & ESE
2-3	Propositions, arguments (valid; invalid), logical connectives, truth tables and propositional equivalences	Ref 2 & 3	Assignment 1 Quiz 1	1	
4	Logical fallacies, Venn Diagrams, Predicates, and quantifiers.	Ref 2 & 3		1	
5	Quantitative reasoning exercises using logical reasoning concepts and techniques	Ref 2 & 3	Quiz 2	2	
6	Introduction to deterministic models	Ref 4		1	
7	Use of linear function for modelling in real-world situations, Modelling with the system of linear equations and their solutions	Ref 4 & 7	Assignment 2 Quiz 3	2	

8	Elementary introduction to derivatives in mathematical modelling.	Ref 1		1	
9	Mid Semester Exam				
10	Linear and exponential growth and decay models, Quantitative reasoning exercises using mathematical modelling.	Ref 4		1	
11-12	Introduction to probabilistic models, Bivariate analysis, scatter plots.	Ref 7	Assignment 3 Quiz 4	1	
13	Simple linear regression model and correlation analysis.	Ref 7		2	
14	Basics of estimation and confidence interval, Testing of hypothesis (z-test; t-test)	Ref 7	Quiz 5	1	
15	Statistical inference in decision making	Ref 7	Assignment 4 Quiz 6	2	
16	Quantitative reasoning exercises using statistical modelling	Ref 2, 4, 6 & 7		2	
17-18	End Semester Exam				

**Practical:** Nil