

New York City College of Technology
Mathematics Department

COURSE CODE: MAT 1190 CO

TITLE: Quantitative Reasoning

PREPARED BY: Professors Ariane Masuda and Estela Rojas based on the existing MAT 1190 course outline prepared by Professors Nadia Benakli, Holly Carley, Ezra Halleck, Grazyna Niezgoda, Katherine Poirier, Jonas Reitz, and Lin Zhou

Number of class hours, lab hours if applicable, credits: 5 class hours, 3 credits

COURSE DESCRIPTION:

Students develop and apply mathematical, logical, critical thinking, and statistical skills to solve problems in real-world contexts. They acquire skills in the fields of algebra, geometry, probability, statistics, and mathematical modeling. The course incorporates opportunities within the classroom to develop students' reading, writing, oral, and listening skills in a mathematical context. The extended hours will be used for students to apply problem solving strategies, reinforcing the concepts of MAT 1190, as well as basic mathematics skills.

COURSE PREREQUISITES:

Certified in reading, CUNY Math Placement for Elementary Algebra, and non-STEM majors only.

REQUIRED TEXTBOOK and/or MATERIALS:

1. Textbook: Math in Our World by Dave Sobecki and Allan G. Bluman, 3rd edition, McGraw-Hill Education
2. Handout activities to be distributed in class (Co-op Work)
3. A scientific calculator

COURSE INTENDED LEARNING OUTCOMES/ASSESSMENT METHODS

LEARNING OUTCOMES	ASSESSMENT METHODS
1. Apply mathematical, logical, critical thinking, and statistical skills to solve problems in real-world contexts.	1. Group activities, written report.
2. Represent mathematical information symbolically, visually, numerically, and verbally.	2. Individual oral presentations, in-class group activities.
3. Estimate mathematical quantities as well as evaluate the accuracy of estimates, and adjust estimates when necessary.	3. Classroom discussion, in-class estimation group assignments.
4. Represent and know how to read, collect and organize data in an assortment of appropriate written and graphical forms.	4. Classroom discussion, in-class group assignments (e.g., students read a newspaper article on a current issue, collect and analyze data related to the issue in the article, and write a report), learning logs.
5. Recognize and understand functions as a way of modeling correspondence between two variables (linear and exponential).	5. Individual short essay related to functions (e.g., population growth, economics, climate change).
6. Describe the behavior of common functions in words, graphically, algebraically and in tables.	6. Written report and group presentation (e.g., an analysis of the garbage patch in the Pacific Ocean), learning logs.

GENERAL EDUCATION LEARNING OUTCOMES/ASSESSMENT METHODS

LEARNING OUTCOMES	ASSESSMENT METHODS
1. Demonstrate the ability to work collaboratively and independently on assignments in and outside a classroom setting.	1. Classroom discussions, group assignments and individual oral presentations.
2. Understand and employ both quantitative and qualitative analysis to solve problems.	2. Classroom discussion, group activities, group presentations, quizzes, tests, final exam.
3. Develop reading, writing competencies, and listening skills.	3. Biweekly reading and writing assignments, individual and group presentation, classroom discussion. Each homework assignment requires written responses.
4. Work with teams. Build consensus. Use creativity.	4. Group projects and presentations.

Assessment of the course should include the following:

- At least three tests 35%
- Work from the extended hour 35%
- Final exam 30%

Scope of work from the extended hour*:

- Learning log
- Participation in group work and discussion
- Homework reading assignments
- Group projects and presentation
- Quizzes

ACADEMIC INTEGRITY POLICY STATEMENT

Students and all others who work with information, ideas, texts, images, music, inventions, and other intellectual property owe their audience and sources accuracy and honesty in using, crediting, and citing sources. As a community of intellectual and professional workers, the College recognizes its responsibility for providing instruction in information literacy and academic integrity, offering models of good practice, and responding vigilantly and appropriately to infractions of academic integrity. Accordingly, academic dishonesty is prohibited in The City University of New York and at New York City College of Technology and is punishable by penalties, including failing grades, suspension, and expulsion. The complete text of the College policy on Academic Integrity may be found in the catalog.

* Depending on department policy, these may be uniform and required for all instructors of the course or there may be guidelines or samples from which instructors may select or adapt.

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***Handout activities to be distributed in class: Co-op Work**

****Textbook: Math in Our World by Dave Sobecki and Allan G. Bluman, 3rd edition, McGraw-Hill**

Session	Co-op Work *	Topic	Section/Pages / Examples**	Homework**
1	1	mathematical reasoning	1.1, p.4-12: ex.1-10	p.12: 1, 5, 7, 9, 13, 15, 17, 21, 27, 43-49 odd
2	2	estimation and graphs	1.2, p.16-23: ex.1-7	p.23: 5, 9, 13, 17, 21, 33-41 odd, 49, 51, 53, 55, 61, 63, 65
3	3	statements/quantifiers	3.1, p.98-105: ex.1-5	p.105: 5-11 odd, 17, 21, 27, 29, 41, 43, 53, 55, 65, 67, 69, 85, 87, 91
4	4	truth tables	3.2, p.107-117: ex.1-5	p.118: 1, 5, 9, 13, 17, 21, 25, 29, 33, 35, 37, 41-51 odd
5	5	linear equations	6.2, p.304-312: ex.1-10	p.315: 37-61 odd, 85-91 odd
	5	applications of linear equations	6.3, p.317-320: ex.1-3	p.323: 35, 39, 41, 45, 47
6		exam I		
7	6	ratio, proportion and direct variation	6.4, p.325-332: ex.1-9	p.334: 21-25 odd, 29-39 odd, 53, 55
8	7	linear inequalities	6.5, p.337-344: ex.1-7	p.344: 25-35 odd, 47-53 odd, 73, 77, 85
9	8	systems of linear equations	7.2, p.382-392: ex.1-11	p.393: 21-25 odd, 33-41 odd, 59, 63, 71
10	9	percents	8.1, p.442-449: ex.1-11	p.449: 3, 7-35 odd, 37, 41-47 odd, 53, 59, 63, 65, 67, 73
11	10	simple interest	8.2, p.454-457: ex.1-7	p.459: 1-25 odd, 35, 37, 39, 43, 47, 49, 51, 69
12	11	compound interest	8.3, p.462-466: ex.1-6	p.471: 1-11 odd, 21-39 odd, 65, 69
13		exam II		
14	12	length and unit conversions	9.1, p.520-527: ex.1-8	p.527: 7-17 odd, 19-55 every 4th, 59-65 odd
15	13	area, volume and capacity	9.2, p.529-536: ex.1-11	p.536: 7, 11, 15, 21, 25, 29, 33, 37, 41, 45, 49, 53, 55, 59, 65, 69, 71, 73
16	14	weight and temperature	9.3, p.539-543: ex.1, 3-4, 6-7	p.544: 7, 9, 28, 29, 31, 32, 47, 49, 53, 33, 65, 70, 78, 79, 81, 82, 84
17	15	points, lines, planes and angles	10.1, p.552-559: ex.1-6	p.559: 1-18 all, 19-25 odd, 27-31 odd, 35-40 odd, 51, 53, 55
18	16	triangles	10.2, p.561-568: ex.1-6	p.568: 1, 2, 3, 6, 11-16 all, 17-21 odd, 31, 32, 23, 25, 27, 41, 42, 46, 49, 52, 54

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Session	Co-op Work *	Topic	Section/Pages / Examples**	Homework**
19	17	polygons and perimeter	10.3, p.572-575: ex.3, 4	p.575: 1, 2, 5, 13-20 all, 22, 25, 26, 35, 37, 40, 44
	17	areas of polygons and circles	10.4, p.578-584: ex.1-3, 5, 6	p.584: 1-3 all, 7-14 all, 17, 18, 27-33 odd, 39, 41, 43, 44, 52, 54
20		exam III		
21	18	basic probability	11.3, p.636-643: ex.1-4	p.643: 2-6, 11-45 odd
22	19	tree diagrams, tables	11.4, p.647-652: ex.1-5	p.652: 3-17 odd, 21, 23
23	20	gather/organize data	12.1, p.700-705: ex.1-3	p.707: 1-3, 9, 11-12, 15-16, 18-23, 28, 39-41
	20	picture data	12.2, p.710-715: ex.1-5	p.715: 5, 11, 17, 21, 27, 29
24	21	measures of average	12.3, p.718-726: ex.1-9	p.726: 6-10, 14, 22, 23, 25, 29, 31-34
	21	measures of variation	12.4, p.729-733: ex.1-4	p.734: 1-3, 8, 14, 15, 21, 27, 30
25		exam IV		
26	22	measures of position	12.5, p.736-740: ex.1-5	p.740: 1, 2, 5, 7, 16, 21, 22, 27, 28, 31-33
27	23	normal distribution	12.6, p.742-749: ex.1-5	p.749: 1, 3, 4, 5, 11-41 odd
28	24	correlation and regression	12.8, p.759-768: ex.1-5	p.769: 1, 2, 3, 7, 11, 13, 15, 19, 21, 23
29		review		
30		final exam		