

QUEENSBOROUGH COMMUNITY COLLEGE
DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

COURSE OUTLINE

MA-114 **College Algebra and Trigonometry for Technical Students**

Pre-requisite: MA-010 or satisfactory score on the Mathematics Placement Test.

Hours: 4 Class Hours 4 Credits

Course Description: A basic presentation of the fundamental concepts of college algebra and trigonometry with scientific and engineering applications; linear equations and systems, determinants, functions and coordinate geometry, quadratic equations, trigonometric, exponential, and logarithmic functions and their graphs, vectors, complex numbers, exponents, and radicals.

Curricula for which the course is required and curricular objectives addressed by the course:

MA-114 is one of the General Education core requirements for these curricula.

- *Computer Engineering Technology*
- *Electronic Engineering Technology*
- *Computerized Architectural Technology*
- *Laser and Fiber Optics Technology*
- *Mechanical Engineering Technology*
- *Telecommunications Technology*

Students demonstrate competency in the fundamental concepts of algebra and also learn to apply mathematical techniques from trigonometry, vectors, functions and coordinate geometry to applied problems.

General Education Objectives: Students meet basic calculus requirements for successful two year graduation or transfer into a four year baccalaureate technology program; students will demonstrate mastery of discipline-specific tools required for entry into or advancement in the job market in their field (career programs); students will use analytical reasoning skills and apply logic to solve problems; students write, read, listen, and speak clearly and effectively.

Course Objectives/ Expected Student Learning Outcomes: Students will be able to operate on polynomial, rational, exponential, logarithmic and trigonometric functions and apply them to practical problems; students will be able to determine and apply appropriate mathematical methods and skills to solve problems; students will be able to connect problems in their disciplines (electrical and civil engineering, optics, architecture, etc.) with their mathematical models; students will be able to use technology - graphing calculators/computers for data representations and computations; students will be able to express a mathematical problem in a visual format; students will demonstrate self-reliance by reading and interpreting technical information that is expressed mathematically; students will be able to apply to real world problems techniques learned in solving contextual problems and generating project results.

Text: Basic Technical Mathematics
 Customized for Queensborough Community College
 by Allyn Washington, 9th Edition,
 Pearson, Prentice Hall © 2010

A graphing calculator is required.

Methods by which student learning will be evaluated:

The general guidelines for assessing grades are as follows:

- Examinations, Assignments and Classroom Performance 70%
- Final Examination (minimum score = 55) 30%

The distribution may be changed at the discretion of the individual instructor.

Academic Integrity: Academic honesty is taken extremely seriously and is expected of all students. All assignments must be the original work of the student (and partners or group, if applicable). All questions or concerns regarding ethical conduct should be brought to the course instructor. "It is the official policy of the College that all acts or attempted acts that are violations of academic integrity be reported to the Office of Student Affairs (OSA). At the faculty member's discretion and with the concurrence of the student or students involved, some cases, though reported to the OSA, may be resolved within the confines of the course and department. The instructor has the authority to adjust the offender's grades as deemed appropriate, including assigning an F to the assignment or exercise or, in more serious cases, an F to the student for the entire course." (Taken from the QCC Academic Integrity Policy, 2/14/2005.)

NOTE: Any student who feels that he/she may need an accommodation based upon the impact of a disability should contact the instructor privately to discuss his/her specific needs. Please contact the office of Services for Students with Disabilities in Science Building, room 132 (718 631 6257) to coordinate reasonable accommodations for students with documented disabilities.

<u>TOPIC</u>	<u>SECTIONS</u>	<u>HOURS</u>
Scientific Notation, Significant Digits, Accuracy, Precision	1.3, 1.5	2
Ratio, Proportion, Variation	18.1, 18.2	3
Functions & Their Graphs, Distance Formula, Graphing Lines	3.1-3.6, 21.1-21.2	5
Systems of Linear Equations, Determinants (<i>emphasis on using graphing calculator to evaluate determinants</i>)	5.1, 5.5, 5.7	4
Exam 1		1
Quadratic Equations	7.1-7.3	2
Exponents & Radicals, Equations with Radicals	11.1-11.5, 14.4	5
Angles and Values of Trigonometry Functions	4.1-4.3	4
Exam 2		1
Right Triangle Trigonometry & Trigonometric Functions of Any Angle	4.4-4.5, 8.1-8.4	5
Graphing Sine & Cosine Functions	10.1-10.3	5
Basic Trigonometric Identities; Trigonometric Equations	20.1, 20.5	4
Exam 3		1
Vectors	9.2-9.3	4
Complex Numbers	12.1-12.4, 12.6	4
Exponential & Logarithmic Functions	13.1-13.6	5
Exam 4		1
Reviews and Final Exam		4
	TOTAL	60 hours

The approximate hours per chapter are guidelines and are at the discretion of the instructor. The instructor is responsible for making assignments and scheduling all examinations. **A graphing calculator is required.**

MA-114 Suggested Homework Problems

Homework will be assigned from the problems listed below. Additional exercises may be assigned from the Chapter Review, the Cumulative Review and the Chapter Tests at the end of each chapter.

Section	Pages	Problems
1.3	15	9,11,13,15,17,21,23,27,29,31
1.5	23	3,5,7,9,11,13,15,17,21,23,33,35
18.1	493-494	3,5,7,9,11,17,19,21,25,27,29,31,33,37,39,41
18.2	498-500	5,7,9,11,17,19,21,23,25,27,33,35,45,47,51,53
3.1	83-84	13,15,17,19,21,23,25
3.2	87-88	5,7,9,11,13,15,17,18,19,21
3.4	94-95	5,7,9,11,13,15,17,19,21
3.5	100-101	5,7,9,11,13
3.6	104	1,3,5,7,9
21.1	562	1,5,7,9,13,15,17,19,41
21.2	567	5,7,11,15,21,25,29,31,33,37
5.1	137	5,7,9,11,13,15,17,19,21,27,29
5.5	157	5,7,9,11,13,15,17,19,21,23,25,33,41
5.7	167	3,5,7,9,11,13,15,17,19,21,23,25,27
7.1	216	9,11,13,15,17,19,21,23,25,27,29,31
7.2	219	3,5,7,9,11,13,15,17,19,21,23,31,34
7.3	222-223	5,7,9,11,13,15,17,19,21,23,25,27,37,39,46,53
11.1	316	5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35
11.2	320	5,7,9,11,13,15,17,19,21,23,25,33,35,39,41,43
11.3	324	5,7,9,11,13,15,17,19,21,23,25,27,29
11.4	326	3,4,5,6,7,8,9,11,13,15,17,27,29
11.5	329-330	5,7,9,11,13,15,17,19,21,25,29,31,33,35,37
14.4	405	5,6,7,8,9,11,13,35
4.1	111	5,7,9,11,13,15,17,19,21,23,25,27,33,35,39,41,45
4.2	115	3,5,13,17,19,21,23
4.3	118-119	9,13,15,17,19,25,27,29,33,35,37,41,49,51
4.4	123	9,11,13,15,17,19,21,23,25,33,35,37,39
4.5	126	3,5,7,9,11,13,15,17,19,21
8.1	234	3,5,7,9,11,13,15,17,23,27,29,33,37
8.2	239	5,7,9,11,13,15,17,19,21,23,25,27,29,31,33,35,39,41,43
8.3	243-244	5,7,11,13,17,19,21,23,25,29,33,37,39,41,45,49,53,55
8.4	248-249	5,7,9,11,13,15,17,20,22,23,25,27
10.1	291	3,5,7,9,11,13,15,19
10.2	294-295	3,5,7,9,15,23,30
10.3	298	3,4,5,6,8,9,11,13
20.1	531-532	7,9,11,13,15,19,21,27,29,31,33
20.5	547	5,6,8,9,11,16,17,21,23,31
9.1	258-259	5,6,7,15,17
9.2	261-262	5,7,9,11,13,15,17,21,22
9.3	267	3,5,7,11,15,17,19,21,27,31
12.1	336-337	5,7,9,11,13,15,17,19,21,23,25,27,33,35,39,41
12.2	339	5,7,9,11,13,15,17,19,21,23,25,27,33,39
12.3	341	9,11,13,15
12.4	344	3,5,7,9,11,13,15,19,21,23,29,31
12.6	352	5,7,9,11,13,15,17
13.1	364	3,5,7,9,13,19
13.2	368-369	5,7,9,11,13,15,17,19,21,25,29,31,33,35,39,41
13.3	373	9,11,13,15,21,23,25,29,31,33,37,39,41,43
13.4	376	3,5,7,9,11,13,15,17,19,21,25,27
13.5	379	3,5,7,9,11,13,15,17,19,21,23,25,27,31,39
13.6	382-383	3,5,7,9,11,15,19,21,23,25,31,33,47