Central Park Campus
Fall 2016

Course Number: MATH – 1414

Course Title: College Algebra

Instructor's Information:
Instructor's Name: Brandy S. Jumper
Office Number: C 218 *(Main Building)* @CPC
Office Hours: **MW** 12 – 12:45 PM, 3 – 4 PM & **TR** 11:30 a.m. – 2 PM, & **F** "*By appointment only*". The Associate Faculty Office is B-342 and the telephone number is 972.548.6830.
Phone number: 972.548.6614 (Office Voicemail).
Email & Website: bjumper@collin.edu & http://iws.collin.edu/bjumper/
Department office contact in case of emergencies: Office of Academic Affairs, B-122 G and the telephone number is 214.491.6270.

Class Information:
Section Number: C01
Meeting Times: **MW** 1 PM – 2:50 PM (August 22, 2016 – December 11, 2016)
Meeting Location: E 204 *(Main Building)*
CRN: 13713

Minimum Technology Requirement: All students will be expected to bring a graphing calculator to class on a daily basis. Check your college e-mail daily **(return my e-mails in a timely manner)**. If you have not already, sign up for Cougar Alert. You can find details regarding the Cougar Alert system at http://www.collin.edu/cougaralert.html

Minimum Student Skills or Technical Skills: All students will be expected to take notes in class on a daily basis. All students will be expected to maintain prerequisite mathematics skills.

Netiquette Expectations: All students will be expected to check e-mail correspondence prior to each class meeting. Reminders will be sent for all Labs and Tests/Exams. All students will be expected to check CANVAS https://collin.instructure.com/ for resources and **grades** on a daily basis. Your professor has **no access** to your login name or password for either CougarWeb or CANVAS.

Course Description: In-depth study and applications of polynomial, rational, radical, exponential and logarithmic functions, and systems of equations using matrices. Additional topics such as sequences, series, probability, and conics may be included. Graphing calculator required. Lab required. ***Note:*** *Students may take either MATH 1314 or MATH 1414 but not both.*

Course Credit Hours: (4 Credit Hours)
Lecture Hours: 4 (we*ekly contact hours)*
Lab Hours: 1 *(weekly contact hours)*

Course Delivery Method: Lecture/Guided Practice/Lab. Written Labs included.

Placement Assessment(s): Placement in MATH 1314/1414. Consult the Testing Center Director if you have questions about an assessment level.

Prerequisite: Math 1332 or TSI placement or Successful Completion of DM Course Sequence.

Course Resources: The College provides group tutoring and a Math Lab at no charge at each campus to support student success in this class. The Central Park Campus **Math Tutoring Lab** is located in the main building room **C 220**. We will not be using Connect Math online component for this course.

Supplies: A graphing calculator is required and the TI-NSPIRE, TI-NSPIRE **CX**, TI 83, TI 83 Plus, TI 84, or TI 84 Plus, TI 84 **C**, TI 84 Plus **C**, or TI 84 Plus **CE** is preferred. Calculators with a computer algebra system **(CAS)** will **not** be **permitted**. Students will be expected to bring textbook, calculator, pencil and paper to class and take notes accordingly. The following calculators are **NOT ALLOWED** for this class: TI 89 OR TI 92 OR THE TI- NSPIRE (CAS).

Textbook: *College Algebra*, Custom 1st Edition by Julie Miller. **The textbook is required.** New textbooks are available at Collin's Bookstores, and used textbooks are available at Half-Priced Books; McGraw-Hill Publishing. ISBN: 978 – 0 – 0753861 – 3 and MHID: 0 – 07 – 753861 – 7

Student Learning Outcomes:
Upon successful completion of this course, students will:
1. Demonstrate and apply knowledge of properties of functions, including domain and range, operations, compositions, and inverses. (Critical Thinking, Communication Skills)
2. Recognize and apply polynomial, rational, radical, exponential and logarithmic functions and solve related equations. (Empirical/Quantitative Skills, Critical Thinking, Communication Skills)
3. Apply graphing techniques.
4. Evaluate all roots of higher degree polynomial and rational functions. (Empirical/Quantitative Skills)
5. Recognize, solve and apply systems of linear equations using matrices. (Empirical/Quantitative Skills, Critical Thinking, Communication Skills)

Attendance Policy: Attendance is expected. Students are responsible for all material and assignments for a missed class. If a student is unable to attend, it is his/her responsibility to contact the professor, and log into CANVAS to obtain any missed assignments. I will take attendance each class—even though attendance is not for a grade. **See the tentative**

course schedule/calendar for all due dates, test dates, ETC. I will follow that schedule. All tests will be given in class. All tests will count including the Final Exam. I do not "drop" a test grade. **Typically, there will be no Make-Up Tests or Labs.** Each written Lab Assignment will be due in class, not via e-mail; the lowest grade given is a zero. ***Once again, attendance is expected of all students.***

Method of Evaluation:

0% **Homework Grades:** Homework will be done through the Julie Miller, Collin Custom 1st Edition textbook. Students can purchase the textbook separately from the bundles in a bookstore like Half-Priced Books or online via Amazon, etc.

0% **Attendance Grades:** Attendance will be taken on a daily basis. Please sign in. If you did not sign the attendance sheet, then you will be counted as absent. There is no distinction between "*excused*" and "*unexcused*" absences. If you are late to class, please sign the roll sheet at the end of the lecture. If you need to excuse yourself early due to a prior commitment or appointment, please inform the professor at the beginning of class—it is a sign of respect for your fellow classmates and your professor. In the event of an emergency, please be polite and excuse yourself quietly; as to not disturb your fellow classmates.

15% **Labs (12 per term 1.25% each): Lab assignments will be found on CANVAS.** They will be handed out in class at the beginning of each unit. In the event that you are absent or you "loose" your Lab Assignment(s), then you are responsible for printing them from CANVAS. Do not attach any extra sheets of paper. Work the Lab Assignments in the spaces provided, **using pencil only.** Points will be deducted for labs done in pen. Late Lab Assignments will not be accepted. *You must show all your work to receive full credit. No exceptions will be granted.* ***There will be no late work accepted.*** NO EXCEPTIONS.

65% **Tests (4 per term 16.25% each): MISSED EXAMS:** MAKEUP TESTS/EXAMS ARE NOT GIVEN. Cheating on an exam will result in a zero on that test or exam. *You must show all your work to receive full credit. No exceptions will be granted.*

20% **Comprehensive Departmental Final Exam: The final exam is mandatory, departmental, comprehensive, and consists of 33 multiple choice questions**. If you do not take it, you will receive a zero. If all the 4 regular tests/exams are taken throughout the semester, your final exam grade *can replace the lowest* of your 4 regular exam grades—clearly assuming the final exam grade is higher—therefore counting twice. ***This replacement will not take place on an exam if a student is found guilty of cheating on that exam, or if the student has a zero test grade.***

Final Semester Grade is based on the following:

Percentage	Grade
89.5 – 100	A
79.5 – 89.4	B
69.5 – 79.4	C
59.5 – 69.4	D
0 – 59.4	F

Withdrawal Policy: "See the current Collin Registration Guide for the last day to withdraw."

Dropping a class means that you remove yourself from the class up to the census date. Dropped classes do not appear on your official transcript. You may now drop online up to the census date. The last date to drop this class is **Tuesday, September 6, 2016**.

Withdrawal from a class means that you remove yourself from the class after the census date. Withdrawn classes appear as a W on your official transcript but are not calculated in your grade point average. Withdrawals are not permitted online. Please read the Fall 2016 Registration guide or contact the admissions office for information on how to withdraw. The last date from this class is **Friday, October 14, 2016**.

Americans with Disabilities Act: Collin College will adhere to all applicable federal, state, and local laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal opportunity. It is the student's responsibility to contact the ACCESS office, CPC-D-118(I) or 972.548.6816 or V/TTD: 972.881.5950 in a timely manner to arrange for appropriate accommodations.

Collin College Academic Policies:

7-2.2 Scholastic Dishonesty (from the 2016-2017 Student Handbook)

Every member of the Collin College community is expected to maintain the highest standards of academic integrity. All work submitted for credit is expected to be the student's own work. Collin College may initiate disciplinary proceedings against a student accused of scholastic dishonesty. While specific examples are listed below, this is not an exhaustive list and scholastic dishonesty may encompass other conduct, including any conduct through electronic or computerized means. Scholastic dishonesty shall involve, but is not limited to, one or more of the following acts:

General Scholastic Dishonesty includes, but is not limited to, statements, acts, or omissions related to applications for enrollment, credit or class work, research, and/or the award of a degree; falsifying academic records; using annotated texts or teacher's editions; using information about exams posted on the Internet or other electronic medium; leaving a test site without authority; failing to secure test materials; and/or submitting work that is not one's own. Students are expected to record honestly and accurately the results of all their research. Falsification of research results shall include misrepresentations, distortions, or omissions in data or reports on research.

Plagiarism is the use of an author's words or ideas as if they were one's own without giving credit to the source, including, but not limited to, failure to acknowledge a direct quotation or patch writing. In the preparation of all papers and other written work, students must distinguish their own ideas and knowledge from information derived from other sources. The term "sources" includes not only published primary and secondary materials, but also information and opinions gained directly from other people. Whenever ideas or facts are derived from a source, the source must be indicated by the student.

Cheating is the willful giving or receiving of information in an unauthorized manner during an examination or to complete an assignment; collaborating with another student during an examination without authority; using, buying, selling, soliciting, stealing, or otherwise obtaining course assignments and/or examination questions in advance; unauthorized copying of computer or Internet files; using someone else's work for assignments as if it were one's own; submitting or resubmitting an assignment in whole or in part (i.e. recycling an assignment) for more than one (1) class or institution without permission from each of the professors; or any other dishonest means of attempting to fulfill the requirements of a course.

Collusion is intentionally or unintentionally aiding or attempting to aid another in an act of scholastic dishonesty, including but not limited to, failing to secure academic work; providing a paper or project to another student; providing an inappropriate level of assistance or unauthorized collaboration; communicating answers to a classmate about an examination or any other course assignment; removing tests or answer sheets from a test site; and allowing a classmate to copy answers.

In cases where an incident report has been filed for an alleged violation of scholastic dishonesty, the faculty member is requested to delay posting a grade for the academic work in question until the case is final. Students found responsible for scholastic dishonesty offenses will receive an authorized disciplinary penalty or penalties from the Dean of Student Office. The student may also receive an academic penalty in the course where the scholastic dishonesty took place. The faculty member will determine the appropriate academic penalty.

Students will receive a zero on those assignments where they were found guilty by the Dean of Students for scholastic dishonesty, i.e., cheating, collusion, etc. as stated above; also, for repeated occurrences of these incidences, students will receive a failing grade in this class section. Students are not allowed to submit a late assignment or re-submit any graded assignment (in whole or in part) for a higher grade. There will be no late work or make-up work accepted.

The tentative schedule for MATH 1414-College Algebra (*with review*)-Section C01 (Fall 2016) can be found on page 6 of this course syllabus. *I reserve the right to alter this syllabus at any time during the semester upon previous written notice to students.*

Important Dates to Understand:

Census Date (**Tuesday, September 6, 2016**) - If you drop before the census date, you **will not** receive a "W". The course will not appear on your transcript.

Last Withdrawal Date (**Friday, October 14, 2016**) - If you drop after the Census Date but before the Last Withdrawal Date, you **will** receive a "W" on your transcript.

After the Last Withdrawal Date, you CANNOT drop the class. You will receive the grade you earn in the class (A, B, C, D, or F).

Tentative Course Calendar/Fall 2016 Schedule:

College Algebra *with Review* Schedule Math 1414.C01 - Fall 2016

*(Math 1414 – Miller 1st ed.)*16 Weeks -2 day/week class (MW)

Date	Day	Section/Coverage	Written Lab Assignments
8/22	1	Introduction, Syllabus, Graphing Calculator, Textbook & *CANVAS*	**HW: *Read the Course Syllabus!!!***
8/24	2	2.3 Functions and Relations & 2.1 The Rectangular Coordinate System and Graphing Utilities	
8/29	3	2.6 Transformations of Graphs	**LAB 1 (2.6)— DUE 8/31 in class**
8/31	4	2.7 Analyzing Graphs of Functions and Piecewise-Defined Functions & 1.7 Linear Inequalities and Compound Inequalities & 1.8 Absolute Value Equations and Inequalities	**LAB 2 (2.7)— DUE 9/7 in class**
9/7	5	2.8 Algebra of Functions and Function Composition	**LAB 3 (2.8)— DUE 9/12 in class**
9/12	6	**Test 1 (Chapter 2)**	
9/14	7	3.1 Quadratic Functions and Applications & R.6 Factoring & 1.4 Quadratic Equations	**LAB 4 (3.1)— DUE 9/19 in class**
9/19	8	3.2 Introduction to Polynomial Functions	
9/21	9	3.3 Division of Polynomials and the Remainder and Factor Theorems & 1.3 Complex Numbers	**LAB 5 (3.2, 3.3, 3.4)— DUE 9/28 in class**
9/26	10	3.4 Zeroes of Polynomials & R.5 Polynomials	
9/28	11	3.5 Rational Functions	
10/3	12	1.6 More equations and Applications & 1.2 Applications and Modeling with Linear Equations	**LAB 6 (3.5 & 1.6)— DUE 10/5 in class**
10/5	13	**Test 2 (Chapter 3)**	
10/10	14	4.1 Inverse Functions & R.7 Rational Expressions and More Operations on Radicals	**LAB 7 (4.1)— DUE 10/12 in class**
10/12	15	4.2 Exponential Functions & R.3 Integer Exponents and Scientific Notation & R.4 Rational Exponents and Radicals	
10/17	16	4.3 Logarithmic Functions	**LAB 8 (4.1, 4.2, 4.3)— DUE 10/19 in class**
10/19	17	4.4 Properties of Logarithms	
10/24	18	4.5 Exponential and Logarithmic Equations	
10/26	19	4.5 Exponential and Logarithmic Equations *continued*	**LAB 9 (4.4, 4.5, 4.6)— DUE 11/2 in class**
10/31	20	4.6 Modeling with Exponential and Logarithmic Equations	
11/2	21	**Test 3 (Chapter 4)**	
11/7	22	6.1 Solving Systems of Linear Questions Using Matrices	
11/9	23	6.2 Inconsistent Systems and Dependent Equations	**LAB 10 (6.1 & 6.2)— DUE 11/14 in class**
11/14	24	8.1 Sequences and Series	
11/16	25	8.2 Arithmetic Sequences and Series	
11/21	26	8.3 Geometric Sequences and Series	**LAB 11 (8.2 & 8.3)— DUE 11/28 in class**
11/28	27	**Test 4 (Chapters 6 & 8)**	**LAB 12 (Critical Thinking Assessment)— DUE 11/30 in class**
11/30	28	Review for Final Exam (departmental & comprehensive)	
(W) 12/7	29	**FINAL EXAM: 1 PM – 3 PM** (departmental & comprehensive)	Scantrons provided *33 multiple choice questions*

Additional Instructor Information:

Section 51.907 of the Texas Education Code: A student is limited to SIX withdrawals (W's) for their entire college career. This includes any course a transfer student has withdrawn from at another Texas institute of higher education.

Note: Courtesy and respect for your fellow students and for any teachers, student instructors, or staff you come in contact with is expected. That includes being on time for class, not leaving class early unless it is an emergency, and not talking in class. If you cannot participate positively in class, you will be asked to leave. ALL electronic devices (cell phones, laptops, iPads, tablets and anything else invented during the semester) must be turned off during class.

Course Requirements: Attend class as scheduled and complete the required outside of class HW, Tests, Lab Assignments, and Comprehensive Final Examination, and any other assignments required by the Professor. Students will be expected to bring textbook, calculator, pencil and paper to class each day and take notes accordingly. With the exception of a graphing calculator, all electronic devices are expected to be switched **off** during class, unless an exception is obtained from the Professor in advance. Students are not permitted to leave early without prior permission. Arrange for appropriate child care when needed—children are not allowed. ***Attendance does NOT ensure a passing grade.***

Electronic Devices Policy: As per Section 6.1 Academic Etiquette and the College Experience (pg. 147, paragraph 3) of the *Collin Student Handbook* with the exception of a calculator, all electronic devices are to be switched off during class, unless an exception is obtained from the instructor in advance. All electronic devices (including cell phones, laptop computers, iPods, MP3, etc.) must be turned **OFF** and stored out of sight during class. Students who are using any electronic devices for text message, IM, email, and **etc.** during the class time will be asked to leave the class without returning for the remaining time; considered absent for that class meeting. Students will also be reported to the Dean of Students Office (DOS) at the second offence. If an emergency arises which necessitates the use of a cell phone, the please exit the classroom in an orderly fashion. Please do not disturb the lecture—otherwise every student needs prior approval.

Homework Policy: The homework problems out of the Julie Miller, Collin College Custom 1st Edition, textbook are expected to be completed after each corresponding lecture and before the next class period. The textbook assignments are not turned in for a grade; however these problems will prepare you for each in-class test and lab assignment. **See page 9 for details.**

Exam Policy: All exams/tests will be given in class during normal lecture hours—observe the tentative course calendar on this syllabus. **BE PRESENT on the class days that TEST/EXAMS are given!** All tests will count including the Final Exam. I do not "drop" a test grade. **Typically, there will be NO Make-Up Tests.** If an emergency arises, please contact your Professor immediately. The Professor reserves the right to refuse a make-up test.

A student may request a make-up test to be administered in the campus testing center for documented medical and/or family EMERGENCIES ONLY**. This make-up exam will be administered in the Central Park Campus Testing Center located in room A 109 in McKinney.** One example of the use of this policy is: a death in the family--proper documentation is REQUIRED. All instances must be approved by the Professor. This is a privilege—no guarantees. If all the regular exams are taken throughout the semester, your final exam grade *can replace the lowest* of your 4 regular exam grades—clearly assuming the final exam grade is higher—therefore counting twice. *This replacement will not take place on an exam if a student is found guilty of cheating on that exam, or if the student has a zero test grade.*

Lab Policy: Lab Assignments are opportunities for students to apply the concepts taught in class. They should be meaningful and fulfill the course's learning outcomes while assessing the core objectives skills of critical thinking, communication skills, and empirical/ quantitative skills. Because we receive funding for four contact hours per student for three hours of class time, the lab assignments must be completed outside of class. Students are expected to see a clear connection between lab assignments and the course outcomes. There are 12 written Lab Assignments per semester; 2 – 4 per unit test. I do not "drop" a Lab grade. The lowest grade given is a zero. **There will be NO Make-Up Labs. *There will be no late work accepted*.** NO EXCEPTIONS.

Standards for Instructor Response and Availability: The Professor will respond to Student's e-mails and voicemail messages within 24 – 48 hours. All grades will be posted on CANVAS within 24 – 48 hours of the deadline for each assignment or test day.

Make-Up Policy: Typically, there will be NO Make-Up Tests or Labs allowed.

Additional Math Resources:

I.) Math Lab at all campuses:

Staffed with student tutors, as well as some faculty tutors
Student solution manuals are available.
TI calculators are available for use in the lab.
Private tutor list is available in the Math Lab. You are responsible for contacting any private
tutor and making the arrangements.

Preston Ridge Campus	**Math Lab F 148**	**972-377-1639**
Spring Creek Campus	**Math Lab D 203**	**972-881-5921**
Central Park Campus	**Math Lab C 220**	**972-548-6896**

II.) Access Office (D 118) here at CPC

III.) Library

Calculators can be borrowed for up to 4 hours. Contact Library personnel to confirm.

IV.) Please check your Cougar Mail daily. **This is how the college and your professors communicate with you. Please adhere to proper e-mail etiquette. *If you need this defined, please ask.***

Math 1414 Homework Practice Problems

Text: **College Algebra**, 1st Edition, Julie Miller, McGraw Hill Publishing

Review HW problems in RED

Practice problems are automatically assigned after the respective sections are covered in class and should be completed by the next class meeting.

Section	Page	Exercises
2.3	222	#15-59 odd, 85-111 odd
2.1	204	#31 – 65 odd
2.6	270	#15-20 all, 21-37 odd, 54, 56, 57, 59, 61-71 odd, 75, 79
2.7	287	#13-23 odd, 25, 26, 27-31 odd, 33c, 35d, 37e, 39-51 odd, 53-56 all,61, 63, 65, 89-95 odd, 97-102 all, 112
1.7	175	#1 – 6 all, 13 – 29 odd, 39 – 53 odd
1.8	184	#17 – 31 odd, 37 – 47 odd
2.8	303	#25-44 all, 63, 64, 65-75 odd, 23, 61
3.1	328	#9-15 odd (parts a – h), 17-21 odd (parts b – h), 27-29 odd (parts a – h), 31, 34, 35
R.6	74	#25 – 83 all
1.4	145	#15 – 34 all, 57 – 72 all, 81 – 98 all
3.2	344	#29-45 odd, 55-61 odd (part c only), 63-73 odd
3.3	357	#17-18 (part a only), 19-23 odd, 29, 35-43 odd, 47-51 odd, 59, 60, 63-64 (part c only)
1.3	133	#59 – 102 all
3.4	373	#15-20 all, 25-34 all, 73-83 odd
R.5	61	#21 – 54 all
3.5	392	#17-22 all, 27-30 all, 35-41 odd (part a only), 47 – 48 (slant asymptotes only), 53 – 54 (slant asymptotes only), 75, 77, 81, 87, 96, 97, 98
1.6	166	#51-54 all
1.2	121	#31 – 34 all, 43 – 52 all
4.1	440	#21-27 odd, 37-41 odd, 47-57 odd, 59, 60, 81, 82
R.7	87	#15 – 21 odd, 25 – 69 odd
4.2	453	#19, 21, 25-28 all, 45, 47-51 all, 55, 63, 65
R.3	36	#13 – 69 odd
R.4	49	#15 – 55 odd, 59 – 105 odd
4.3	468	#19-54 all, 59-74 all
4.4	480	#1-6 all, 17-34 all, 35-67 odd
4.5	492	#11-38 all, 41-62 all
4.6	506	#23, 24, 25, 26, 31, 33, 35, 40
6.1	600	#15-38 all, 47-65 odd
6.2	609	#25-44 all, 56
8.1	719	#9-13 odd, 19, 21, 51-63 odd, 75, 78
8.2	729	#13-16 all, 21-28 all, 41-44 all, 49, 50, 55, 58, 61, 63, 65, 70
8.3	741	#15-18 all, 25-28 all, 31-33 all, 41-47 odd, 55-57 all, 65-67 all, 79-82 all, 86

Religious Holy Days: In accordance with section 51.911 of the Texas Education Code, the college will allow a student who is absent from class for the observance of a religious holy day to take an examination or complete an assignment scheduled for that day within a reasonable time. A copy of the state rules and procedures regarding holy days and the form for notification of absence from each class under this provision are available from the Admissions and Records Office. Please refer to the current *Collin Student Handbook.*

Student technical support is now provided 24/7 for students at 972.377.1777 or sts@collin.edu

Tutoring Services: All students are expected to study daily for this course. The material you learn "today" will be used "tomorrow". If you find that you need extra help, please:

- Attend office hours as posted in your syllabus. If my office hours are not conducive to your schedule, then e-mail me specific questions and I will reply within 24 – 48 hours.
- Take advantage of the Math Lab. It is a free tutoring center for math students enrolled at Collin. There are math labs on all three campuses. The CPC math lab is located in the main building room C-220. Call 972-548-6896 for hours.
- Fill out a tutor request form at the ACCESS office in D-118 (CPC). The ACCESS office provides each student with FREE group tutoring or FREE on-line tutoring.
- Form a study group with a few classmates. The best way to learn is to teach one another.

College Repeat Policy: Beginning Fall 2016, Texas residents attempting a course more than twice at Collin College are subject to regular tuition plus an additional $50 per semester credit hour. Undergraduate courses attempted at Collin with a graded status of A, B, C, D, F, I, W (withdrawals *after* census), and AU will be evaluated for repeat limits. ***If you drop this class before census day, it will not count against you.***

Census Date: **September 6, 2016**
Last Date to Withdraw: **October 14, 2016**
Thanksgiving Holiday: **November 23 – 27, 2016**
Final Exam Week: **December 5 – 11, 2016**

Course Content: Proofs and derivations will be assigned at the discretion of the instructor. The student will be responsible for knowing all definition and statements of theorems for each section outlined in the following modules.

Module 1

1. Evaluate functions including the Difference Quotient and Piecewise-Defined Functions.
2. Determine the domain and range of functions.
3. Determine intervals over which functions are increasing, decreasing, or constant.
4. Find relative maxima or minima of functions from graphs.
5. Determine if functions are even, odd or neither from equations and graphs.
6. Graph common functions including linear, quadratic, cubic, square root, cube root, reciprocal,
   absolute value, and piecewise-defined functions.
7. Interpret transformations on common functions including shifts, reflections, stretches and shrinks (compressions).
8. Form the Sum, Difference, Product, Quotient, and Composition of functions.
9. Use the Horizontal Line Test to test for one-to-one functions.
10. Verify or find inverses of functions algebraically and graphically.

Module 2

11. Sketch quadratic functions.
12. Solve application problems using parabolas and solve related equations.
13. Identify zeros of polynomials and their multiplicity.
14. Sketch graphs of polynomial functions.
15. Use synthetic division to find zeros and factors of polynomial functions.
16. Evaluate polynomial functions for given values using the Remainder Theorem.
17. Find complex zeros of polynomial functions.
18. Apply the Rational Zero Theorem.
19. Know that complex zeros occur in conjugate pairs.
20. Know the implications of the Fundamental Theorem of Algebra.
21. Know the implications of the Linear Factorization Theorem.
22. Determine the domain of rational functions.
23. Determine the vertical, horizontal, and oblique (slant) asymptotes of rational functions.
24. Apply rational and radical functions and solve related equations.

Module 3

25. Graph exponential and logarithmic functions including transformations.
26. State the domain, range and asymptotes of exponential and logarithmic functions.
27. Evaluate logarithms.
28. Use properties of logarithms.
29. Solve exponential and logarithmic equations.
30. Apply solution techniques to solve application problems relating to growth and decay.

Module 4

31. Convert systems of linear equations to augmented matrix form.
32. Use Gauss-Jordan Elimination to solve systems of linear equations with two and three variables and equations using elementary row operations.
33. Use matrices to solve real life applications.
34. Write the terms of a sequence.
35. Use sigma notation for sums.
36. Determine the common difference of arithmetic sequences.
37. Determine the common ratio of geometric sequences.
38. Find the formula for the $n^{\underline{th}}$ term of arithmetic and geometric sequences.
39. Find the sum of the first n terms of arithmetic and geometric sequences.
40. Find the sum of an infinite geometric series.