Instructor's Name:

Office Location:

Office Hours:

Office Phone:

E-mail:

Course Description
This course has a minimal review of algebraic skills followed by a study of functions. Functions studied include: polynomial, exponential and logarithmic. Other topics of study include: systems of equations, the theory of equations, matrices, sequences and series, counting techniques, probability, and the Binomial Theorem.

Illinois Articulation Initiative (IAI) number: N/A

Credit and Contact Hours:
Lecture 4
Lab 0
Credit Hours 4

Prerequisites: Satisfactory placement test scores or grades of “C” or better in Math 098 and Math 095 or equivalents

Books, Supplies, and Supplementary Materials

A. Textbooks


or College Algebra Enhanced, etc. w/o Access Code, 6- Ed., 2016, Sullivan, ISBN: 9780134111315, Pearson

B. Other Required Materials

TI-84+ graphing calculator

Methods of Instruction:
Lecture
Online
Student Learning Outcomes: General Education Student Learning Outcomes: 
Students will demonstrate the ability to accurately apply correct mathematical methods and techniques in various applications such as applied sciences, theoretical mathematics, physics, natural sciences and other applied sciences.

Objectives

1. Define and identify a polynomial.
2. State and apply the distance formula.
3. State and apply the midpoint formula.
4. Write the equation of a circle in standard form.
5. Graph a circle given the standard form of its equation.

6. Graph an equation in two variables by plotting points.
7. Use a graphing calculator to graph an equation in two variables.
8. With a graphing calculator be able to
   a. set the range values.
   b. zoom.
   c. trace.
   d. square the viewing rectangle.
9. Compute the slope of a given line.
10. Write equations for lines meeting various conditions.

11. Graph linear equations in two variables.
12. Define a function.
13. Define and determine the domain and range of a function.
14. Determine whether or not a relation is a function.
15. Approximate the relative minima and relative maxima of a function.

16. Define even and odd function and determine whether a function is even or odd or neither.
17. Determine the intervals where a function is increasing, decreasing, or constant.
18. Draw graphs of simple selected functions:
   a. linear
   b. quadratic
   c. cubic
   d. square root
   e. constant
   f. absolute value
   h. piecewise
19. Graph functions using transformations of known simple functions.
20. Find equations for functions when it is determined that its graph is a transformation of a simple function.

21. Define, evaluate, and find the domain for the sum, difference, product, quotient, and composition of functions.
22. Define, determine, and graph the inverse function, if it exists, of a given function.
23. Solve absolute value and nonlinear equations and inequalities in one variable.
24. Graph a quadratic function and determine the graph’s intercepts and vertex.
25. Determine the quadratic function given various conditions for its graph.
26. Determine end behavior of a polynomial function’s graph from its equation.
27. Find the rational zeros of a polynomial.
28. Perform the operations of long and synthetic division for polynomials.
29. State the remainder and factor theorems.
30. Solve problems involving the use of the factor theorem and the remainder theorem.

31. Define a zero of a polynomial.
32. Define imaginary unit.
33. Define complex numbers.
34. Perform the four fundamental operations with complex numbers.
35. Find complex zeros under certain conditions of a polynomial.

36. Define and find vertical, horizontal, and oblique asymptotes, if they exist, for graphs of rational functions.
37. State and use guidelines for graphing rational functions.
38. Define exponential function.
39. Graph exponential functions.
40. Solve compound interest problems.

41. Define logarithmic function.
42. Graph logarithmic functions.
43. State and use the properties of logarithms to rewrite, expand, or condense logarithmic expressions.
44. Solve exponential and logarithmic equations.
45. Solve systems of equations graphically and algebraically.

46. Define a matrix.
47. Solve linear systems of equations using Gauss-Jordan elimination.
48. Perform basic operations (addition, subtraction, scalar multiplication, multiplication) on matrices.
49. Define and find, if it exists, the inverse of a square matrix.
50. Solve linear systems of equations using matrix inverses.

If time permits . . .

51. Find the determinant of a 1 x 1, 2 x 2, and 3 x 3 matrix without a calculator.
52. Find a determinant of a square matrix with a graphing calculator.
53. Use determinants to solve applied problems.
54. Define a sequence.
55. Define and use factorials.

56. Define and use summation notation.
57. Write and use formulas for the nth terms of a sequence.
58. Evaluate recursion formulas.
59. State the Binomial Theorem.
60. Expand a binomial raised to a positive integer power by using the Binomial Theorem.
61. Find any term in the expansion of a binomial without writing all the terms.
62. Define and apply in problems the fundamental counting principle, permutations, and combinations.
63. Solve simple probability problems.
### TOPICAL OUTLINE

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<tr>
<th>Days</th>
<th>Topic or Class Activity</th>
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<td>Graphs</td>
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<td>Linear and Quadratic Functions</td>
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<td>Functions and Their Graphs</td>
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<td>Theory of Equations</td>
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<td>Tests and leeway*</td>
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#### Graded Assignments and Policies

**Graded Assignments**

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<th>Item</th>
<th>Weightage</th>
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<tr>
<td>In class Quizzes</td>
<td>0 – 20%</td>
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<tr>
<td>Participation</td>
<td>0 - 5 %</td>
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<tr>
<td>Projects</td>
<td>0 – 20%</td>
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<td>Homework</td>
<td>0 – 30%</td>
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<tr>
<td>Tests</td>
<td>50 - 85%</td>
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<td>Final</td>
<td>15 – 30%</td>
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</tbody>
</table>

**Grading Policy**

The individual instructor will determine which items he or she considers essential for the student to memorize without error and test accordingly.

Each instructor will set minimum standards for performance on tests.

**Grading Scale**

- 90-100% A
- 80-89% B
- 70-79% C
- 60-69% D
- 0-59% F

**Major Tests and Quizzes**

The individual instructor will determine which items he or she considers essential for the student to memorize without error and test accordingly. Each instructor will set minimum standards for performance on tests. A comprehensive final examination will be given.

### Classroom Policies and Procedures

**General Information**

**Attendance Policy**
Make-up Policy

Extra-credit Policy

Final Exam Information
A comprehensive final examination will be given.

Academic Honor Code
The objective of the academic honor code is to sustain a learning-centered environment in which all students are expected to demonstrate integrity, honor, and responsibility, and recognize the importance of being accountable for one’s academic behavior.

College Statement about grades of “F” and Withdrawal from Class
Students may withdraw from a course by processing an add/drop form during regular office hours through the Registration and Records Office at Main Campus or Romeoville Campus, or by phone at 815-744-2200. Please note the withdrawal dates listed on your bill or student schedule. Every course has its own withdrawal date. Failure to withdraw properly may result in a failing grade of “F” in the course.

At any time prior to the deadline dates established, an instructor may withdraw a student from class because of poor attendance, poor academic performance or inappropriate academic behavior, such as, but not limited to, cheating or plagiarism.

Intellectual Property
Students own and hold the copyright to the original work they produce in class. It is a widely accepted practice to use student work as part of the college’s internal self-evaluation, assessment procedures, or other efforts to improve teaching and learning and in promoting programs and recruiting new students. If you do not wish your work to be used in this manner, please inform the instructor.

Student Code of Conduct
Each student is responsible for reading and adhering to the Student Code of Conduct as stated in the college catalog.

Sexual Harassment Joliet Junior College seeks to foster a community environment in which all members respect and trust each other. In a community in which persons respect and trust each other, there is no place for sexual harassment. JJC has a strong policy prohibiting the sexual harassment of one member of the college community by another. See the Catalog or Student Handbook.

Student Support http://jjc.edu/services-for-students/pages/default.aspx

a. Disability Services: http://www.jjc.edu/disability-services/Pages/default.aspx
Student Accommodations and Resources (StAR): If you need disability-related accommodations, specialized tutoring, or assistive technology in this class, if you have emergency medical information you wish to share with me, or if you need special arrangements in case the building must be evacuated, please inform me immediately. Please see me privately after class. New students should request accommodations and support by scheduling an appointment with the Student Accommodations and Resources (StAR) Office, Campus Center 1125, (815) 280-2230.
b. Tutoring: http://jjc.edu/tlc/Pages/default.aspx
c. Counseling and Advising: http://www.jjc.edu/counselingadvising/Pages/default.aspx
d. Academic Resources: http://www.jjc.edu/academic-resources/Pages/default.aspx
e. Support Programs and Services: http://www.jjc.edu/support-programs-services/Pages/default.aspx
f. Technology Support: http://jjc.edu/services-for-students/Pages/technology-support.aspx
g. My Degree Progress: My Degree Progress is a computerized system to track a student’s progress toward graduation. The report indicates every course and places these courses into their appropriate category as a General Education, Major Course, or Elective, according to the degree requirements. This tool is useful for preparing before an advising appointment, for planning, for registering, and for checking that the student is on track for graduation. https://eresources.jjc.edu

* Instructor reserves the right to modify, add to or change the syllabus. Any changes to the syllabus or schedule will be announced in class.
Prepared by: Prof. John Bialas
Mathematics Department

Reviewed by: Prof. Jean McArthur
Department Chair

Revised 5/15
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Revised 11/98
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Revised 08/96

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Revised 08/92
Revised 02/92
Revised 11/91
Revised 11/89