A. **Academic Division:** Liberal Arts

B. **Discipline:** Mathematics

C. **Course Number and Title:** MATH1030 Variable Relationships; Algebra and Graphing

D. **Course Coordinator:** Christine Shearer  
   **Assistant Dean:** Deb Hysell

Instructor Information:
- Name: Click here to enter text.
- Office Location: Click here to enter text.
- Office Hours: Click here to enter text.
- Phone Number: Click here to enter text.
- E-Mail Address: Click here to enter text.

E. **Credit Hours:** 3 lecture

F. **Prerequisites:** MATH0074 (minimum grade of C-) or qualifying placement test scores

G. **Syllabus Effective Date:** Fall, 2017

H. **Textbook(s) Title:**

   *Variable Relationships: Algebra and Graphing*
   - Author: Clark/Anfinson/Falls
   - Copyright Year: 2012
   - Edition: 1st
   - ISBN: 9781285140681

I. **Workbook(s) and/or Lab Manual:** TI-83, TI83+, TI84 or TI84+ Calculator is required.

J. **Course Description:** This course primarily presents variable relationships, both algebraically, as well as graphically. A short presentation of descriptive statistics is included. Topics includes dimensional analysis, algebra skills, functions, equation solving, ratio and proportion, variation, working with formulas, and additional emphasis on applied problems.

K. **College Wide Learning Objectives:**

<table>
<thead>
<tr>
<th>College-Wide Learning Objectives</th>
<th>Assessment - - How it is met &amp; When it is met</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication – Written</td>
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<td>Communication – Speech</td>
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<tr>
<td>Intercultural Knowledge and Competence</td>
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<tr>
<td>Critical Thinking</td>
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<tr>
<td>Information Literacy</td>
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<tr>
<td>Quantitative Literacy</td>
<td>Value RUBRIC, week 15, project paper and presentation</td>
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</tbody>
</table>
L. **Course Outcomes and Assessment Methods:**

Upon successful completion of this course, the student shall:

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Assessments – How it is met &amp; When it is met</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrate use of mathematical operations with integers and rational numbers including scientific notation.</td>
<td>Homework and Quiz for each topic, as determined by the instructor. Test #1-week 4 Final Exam-week 16</td>
</tr>
<tr>
<td>Calculate new values by converting units from the standard system to the metric system and vice versa.</td>
<td>Homework and Quiz for each topic, as determined by the instructor. Test #1-week 4 Final Exam-week 16</td>
</tr>
<tr>
<td>Set-up and solve application problems and be able to graph the resulting line(s) by using the slope and the y-intercept</td>
<td>Homework and Quiz for each topic, as determined by the instructor. Test #1-week 4 Final Exam-week 16</td>
</tr>
<tr>
<td>Solve systems of equations.</td>
<td>Homework and Quiz for each topic, as determined by the instructor. Test #1-week 4 Final Exam-week 16</td>
</tr>
<tr>
<td>Combine algebraic expressions using addition, subtraction, multiplication and division.</td>
<td>Homework and Quiz for each topic, as determined by the instructor. Test #1-week 4 Final Exam-week 16</td>
</tr>
<tr>
<td>Apply various techniques to factor polynomials.</td>
<td>Homework and Quiz for each topic, as determined by the instructor. Test #2-week 8 Final Exam-week 16</td>
</tr>
<tr>
<td>Solve and graph a quadratic equation.</td>
<td>Homework and Quiz for each topic, as determined by the instructor. Test #2-week 8 Final Exam-week 16</td>
</tr>
<tr>
<td>Determine exponential growth or decay from data and find an exponential model.</td>
<td>Homework and Quiz for each topic, as determined by the instructor. Test #2-week 8 Final Exam-week 16</td>
</tr>
<tr>
<td>Evaluate, solve and graph logarithmic and exponential functions by using appropriate logarithm properties.</td>
<td>Homework and Quiz for each topic, as determined by the instructor. Test #3-week 12 Final Exam-week 16</td>
</tr>
<tr>
<td>Set-up and solve rational expressions.</td>
<td>Homework and Quiz for each topic, as determined by the instructor. Test #3-week 12 Final Exam-week 16</td>
</tr>
<tr>
<td>Demonstrate use of operations with radical functions including simplifying, adding, subtracting, multiplying and dividing.</td>
<td>Homework and Quiz for each topic, as determined by the instructor. Test #4-week 14 Final Exam-week 16</td>
</tr>
<tr>
<td>Identify the components of a specified conic equation and use the information to graph the conic.</td>
<td>Homework and Quiz for each topic, as determined by the instructor. Test #4-week 14 Final Exam-week 16</td>
</tr>
<tr>
<td>Calculate mean, median, mode, and standard deviation for data.</td>
<td>Homework and Quiz for each topic, as determined by the instructor. Test #4-week 14 Final Exam-week 16</td>
</tr>
<tr>
<td>Analyze a quantitative narrative, form mathematical conclusions, and present results.</td>
<td>Week 15</td>
</tr>
</tbody>
</table>
M. **Topical Timeline (Subject to Change):**

**[Weeks 1-4]**
- Perform mathematical operations with integers and rational numbers. Solve linear equations. Convert numbers from scientific notation to decimal notation and vice versa.
- Convert values from one unit of measurement to another unit. Convert units from standard system to the metric system and vice versa.
- Set-up and solve application problems. Use equations of a line to determine slope and interpret its meaning. Graph the line using the slope and y-intercept. Determine if an equation is a function, identify the domain and range of a function and use function notation.
- Solve systems of equations using graphing, numerical, substitution and elimination methods and identify consistent and inconsistent systems.
- Use rules of exponents to simplify expressions, including negative exponents. Recognize the relationship between exponents and radicals. Combine algebraic expressions using addition, subtraction, multiplication and division. Combine functions using composition and its application.

**[Weeks 4-8]**
- Apply various techniques to factor polynomials, including special factoring techniques.
- Identify a quadratic and its characteristics from its graph and equation. Graph a quadratic using the vertex form and determine its domain and range. Solve quadratic equations using various techniques including completing the square, factoring and the quadratic formula.
- Determine exponential growth or day from data and find an exponential model. Graph exponential functions by hand and find its horizontal asymptote.

**[Weeks 9-12]**
- Use logarithm properties to evaluate logarithms, graph logarithms and find the domain and range of logarithmic functions. Use the inverse relationship of logarithmic and exponential functions.
- Identify rational functions; find the domain of rational functions. Set-up direct and inverse variation problems. Perform operations with rational expressions including simplifying, dividing, multiplying, adding and subtracting. Solve rational expressions.

**[Weeks 12-14]**
- Use radical functions to graph, find domain and range and to model applications. Perform operations with radical functions including simplifying, adding, subtracting, multiplying and dividing.
- Identify the focus, directrix and the equation of a parabola. Graph a circle and identify its center and radius.

**[Weeks 15-16]**
- Calculate mean, median, mode, and standard deviation for data.
- Analyze a quantitative narrative, form mathematical conclusions, and present results.

N. **Course Assignments:**

**Homework:** Homework exercises will routinely be assigned and graded. This will ensure students are learning the material and keeping up to date.

**Quizzes:** Quizzes will provide feedback to the students so that they will know which topics they understand.

**Tests:** Tests will assess student learning over larger blocks of material.

**Presentations:** Students will present case studies involving several of the concepts and skills developed in the course.

**Final Exam:** A comprehensive final examination will be administered at the end of the semester

**Tentative Schedule:**
Syllabus
Lecture: Appendix A
Supplement-Pgs 2,3,20

Lecture: 1.3, 1.7
Lecture: 2.3, 3.1
Supplement –Pg 5 (II D b)
Supplement-Pgs 4-5 (II A, B, C 1)

Lecture: 1.1
Lecture: 2.1, 2.2
Lecture: 3.2, 3.3
Supplement-Pgs 6 (II E a,b)

TEST 1
Lecture: 3.4
Supplement-Pg 6 (II E c)
Lecture: 4.1, 4.2

Lecture: 4.4, 4.5
Lecture: 5.1

TEST 2
Lecture: 6.3
Lecture: 7.1
Lecture: 7.2
Supplement-Pg 5 (II C.2, 3)
Lecture: 7.3
Supplement-Pg 6 (II F.1)
Lecture: 7.4
Supplement-Pgs 6-7 (II F.2)
Lecture: 7.5

TEST 3
Lecture: 8.1, 8.2
Supplement-Pg 5 (II D a,c)
Lecture: 8.3
Supplement-Pg 27 (#14, #15)

Project Paper Due
Value RUBRIC-Quantitative Literacy
Lecture: Statistics Handout

PRESENTATIONS

FINAL EXAM – part 1
FINAL EXAM – part 2

O. Recommended Grading Scale:

<table>
<thead>
<tr>
<th>NUMERIC</th>
<th>GRADE</th>
<th>POINTS</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>93–100</td>
<td>A</td>
<td>4.00</td>
<td>Superior</td>
</tr>
<tr>
<td>90–92</td>
<td>A-</td>
<td>3.67</td>
<td>Superior</td>
</tr>
<tr>
<td>87–89</td>
<td>B+</td>
<td>3.33</td>
<td>Above Average</td>
</tr>
<tr>
<td>83–86</td>
<td>B</td>
<td>3.00</td>
<td>Above Average</td>
</tr>
<tr>
<td>80–82</td>
<td>B-</td>
<td>2.67</td>
<td>Above Average</td>
</tr>
<tr>
<td>77–79</td>
<td>C+</td>
<td>2.33</td>
<td>Average</td>
</tr>
<tr>
<td>73–76</td>
<td>C</td>
<td>2.00</td>
<td>Average</td>
</tr>
<tr>
<td>70–72</td>
<td>C-</td>
<td>1.67</td>
<td>Below Average</td>
</tr>
<tr>
<td>67–69</td>
<td>D+</td>
<td>1.33</td>
<td>Below Average</td>
</tr>
<tr>
<td>63–66</td>
<td>D</td>
<td>1.00</td>
<td>Below Average</td>
</tr>
<tr>
<td>60–62</td>
<td>D-</td>
<td>0.67</td>
<td>Poor</td>
</tr>
<tr>
<td>00-59</td>
<td>F</td>
<td>0.00</td>
<td>Failure</td>
</tr>
</tbody>
</table>
P. **Grading and Testing Guidelines:**

Homework------------------20%
Project---------------------10%
Tests------------------------50%
Final Exam-------------------20%

Q. **Examination Policy:**

Click here to enter text.

R. **Class Attendance and Homework Make-Up Policy:**

Click here to enter text.

S. **Classroom Expectations:**

Click here to enter text.

T. **College Procedures/Policies:**

**Attendance Requirements:** All students are required to attend all scheduled classes and examinations. Each faculty member has the right to establish regulations regarding attendance that he/she considers necessary for successful study.

Students who do not attend classes may be administratively withdrawn from those classes. However, failure to attend classes does not constitute withdrawal, and students are expected to process a formal withdrawal through the Student Records Office in Kee Hall.

**Student engagement requirements:**

Student engagement is based on the “active pursuit” of learning which can be measured by class attendance, class participation (in class or online), taking required quizzes/examinations, and submission of work assignments or papers. Student engagement consists of a student attending at least 60% of the class sessions (there should be attendance throughout the term) and/or completing 75% of the assignments listed on the syllabus at the midpoint in the term. Exceptions can be made when there is on-going communication between the student and faculty member. The communication must be documented and the faculty member and student must be in agreement regarding the exception. Students not meeting the expectation will be administratively withdrawn from class. If a student believes he/she was administratively withdrawn in error, he/she may file an appeal. Being administratively withdrawn may have program and financial aid implications.

**Academic Misconduct** is any activity that tends to compromise the academic integrity of the college, or subvert the educational process. Examples of academic misconduct include, but are not limited to:

1. **Violation of course or program rules** as contained in the course syllabus or other information provided to the student; violation of program requirements as established by departments and made available to students.

2. **Plagiarism** including, but not limited to, submitting, without appropriate acknowledgment, any written, visual or oral material that has been copied in whole or in part from the work of others (whether such source is published or not) even if the material is completely paraphrased in one’s own words. This includes another individual’s academic composition, compilation, or other product, or a commercially prepared paper. Plagiarism also includes submitting work in which portions were substantially produced by someone acting as a tutor or editor.
Such practices constitute plagiarism regardless of motive. Those who deny deceitful intent, claim not to have known that the act constituted plagiarism, or maintain that what they did was inadvertent are nevertheless subject to penalties when plagiarism has been confirmed.

3. **Cheating** and dishonest practices in connection with examinations, papers and projects, including but not limited to using unauthorized notes, study aids or information on an examination; obtaining help from another student during an examination; taking an exam or doing work for another student; providing one’s own work for another student to copy and submit as his/her own; or allowing another student to do one’s work and then submitting the work as one’s own. Also included would be altering a graded work after it has been returned, then submitting the work for re-grading; or submitting identical or similar papers for credit in more than one course without prior permission from the course instructors.

4. **Fabrication** including but not limited to falsifying or inventing any information, data or citation; presenting data that were not gathered in accordance with defined appropriate guidelines, and failing to include an accurate account of the method by which data were collected.

5. **Obtaining an Unfair Advantage** including, but not limited to stealing, reproducing, circulating, or otherwise gaining access to examination materials prior to the time authorized by the instructor; unauthorized collaborating on an academic assignment; taking, hiding or altering resource material; or undertaking any activity with the purpose of creating or obtaining an unfair advantage over another student’s academic work.

6. **Aiding and Abetting Academic Dishonesty** including, but not limited to providing material, information or other assistance to another person with the knowledge that such aid could be used in any of the violations stated above, or providing false information in connection with any inquiry regarding academic integrity.

7. **Alteration of Grades or Marks** including but not limited to, action by the student in an effort to change the earned credit or grade.

In addition, cases of academic dishonesty may involve photocopied materials. Materials used may fall under the Copyright Act. Violations of said Act may subject the user and/or the College to sanctions.

**Statement on Disabilities:** Any student who requires reasonable accommodations related to a disability should inform the course instructor and the Coordinator of Specialized Services (Room 138 in Kee Hall; phone 419-755-4727).

Students who encounter difficulty in any of their courses are encouraged to visit the Tutoring Resource Center (Room 119 in Fallerius Technical Education Center) for tutoring assistance, and the Student Success Center (Room 136 in Kee Hall) for academic assistance, advising services, referrals for personal counseling and Learning Disability (LD) Testing.

**Statement on Withdrawals:** As a student, you are expected to attend class. If you are unable or choose not to attend class, or if for whatever reason you are unable to keep up with the requirements of a course, you need to officially drop the class at the Student Records Office. Refund dates and withdrawal dates will vary slightly from term to term. Contact the Student Records Office for applicable dates. Additionally these dates are posted on the academic calendar available on the college’s website, [www.ncstatecollege.edu](http://www.ncstatecollege.edu), under the Academics heading on the home page and are available at the Student Records Office in Kee Hall. Students should go to the Student Records Office (Room 142 in Kee Hall) to process their withdrawal from any class.

If you choose to walk away from your class without officially withdrawing from it, the faculty member teaching the class must grade your classroom performance on the material available to him or her. This normally results in an “F” grade. An “F” grade can lower your grade point average considerably depending on the total credits accumulated.