Course Objective The purpose of this course is to provide a background in mathematics, as distinct from the teaching of mathematics or mere computational techniques, to students preparing for careers as teachers in grades K through 8. Course material will focus on the parts of mathematics commonly taught in those grades, but will also include topics suitable for use with K through 8 students to motivate curiosity in mathematics. The material will be taught with a view to conceptual understanding rather than mechanical learning of techniques, and examinations and homework will reflect this.

Required Text There is no required text for this course. Handouts will be frequent, and readings may be put on reserve at Hale.

Course Organization Class meetings will vary in structure, usually following a lecture or discussion format. Examinations will be in class, except for the final which will be in two parts, one take-home, the other to be written during the scheduled examination time during finals period. Absolutely faithful attendance, while not required, is strongly encouraged, as the presentation of most required material will be made in class. Also, class participation has the possibility of resulting in extra credit.

Course Requirements

All students will be required to complete eight course requirements, in addition to which opportunities for extra credit will be provided. Each course requirement, with the exception of the Gateway Quizzes, will be graded out of 100 points as described below. The use of scores on these requirements and extra credit to compute the course grade will be outlined in the last section.

I. Gateway Quizzes All students will be required to pass a sequence of seven Gateway Quizzed to demonstrate proficiency in elementary and junior high school mathematics.

- Quiz 1: Arithmetic
- Quiz 2: Number Theory
- Quiz 3: Fractions
Quiz 4: Decimals
Quiz 5: Ratios and Proportions
Quiz 6: Geometry
Quiz 7: Measurement

As outlined on the webpage for accessing these quizzes,
https://www.math.ksu.edu/math320/quiz/ ,
each quiz may be attempted multiple times, and each attempt allows for one try at fixing wrong answers. However, the passing score for each quiz is 100%, and to attain a C in the course (as required for credit in your major) you must pass all seven Gateway Exams, to earn a grade better than an F you must pass at least six of them.

A handout detailing procedures for taking the Gateway Quizzes will be distributed at the second or third class. In addition to the possibility of taking the quizzes outside of class, three class periods (Friday 9 September, Friday 30 September, and Friday 11 November) will be set aside for students to take Gateway Quizzes during class.

All Gateway Quizzes must be passed by the last day of classes. It is strongly urged that students who have not passed at least two of them by the last date for withdrawal without a W withdraw from the course.

The first seven topics covered in the course will include material relevant to the Gateway Quizzes, but with a broader scope than is necessary the minimal proficiency tested by the Quizzes.

II. Midterm Examination I An exam scored out of 100 points will be given in class on 23 September.

III. Midterm Examination II An exam scored out of 100 points will be given in class on 21 October.

IV. Midterm Examination III An exam scored out of 100 points will be given in class on 18 November.

V. Term Paper A ten to sixteen page paper will be required. The topic for the paper must be chosen by 17 October. A first draft will be due for review on 18 November. Reviewed drafts will be returned by 30 November, and a final version will be due on 2 December. Suggested topics include: the life and work of an eminent mathematician, a history of a branch of mathematics represented in the K-8 curriculum, a famous theorem from geometry or number theory, non-arabic enumeration systems, mechanical computing devices (e.g. the abacus or the Roman calculus), a history of the mathematical content of the K-8 curriculum in the U.S. from 1900 to the present, or a comparison of the mathematical content of the K-8 curriculum world-wide. Topics must be
approve by me. Topics dealing with methods of teaching mathematics will not be approved as they are outside the scope of the course.

The paper will be graded as follows: a score out of 10 will be assigned to the first draft; a score out of 90 will be assigned to the final draft; your score (out of 100) for the paper will be the sum of these scores. Specific requirements regarding style, use of sources, and the like will be provided in October on or about the date when topics are due.

VI. Homework Regularly throughout the semester, homework assignments will be made. Short assignments will be graded out of 10 points, longer assignments out of 20. The lowest 20 points (either a single long assignment or two short assignments) will be dropped and the remaining scores will be scaled to give a single score of 100 points to the final course average.

VII. Final Examination—Take Home Part Half of your final exam will be a choice of essay questions. It will be handed out at the last class, due at the scheduled final (11:50 AM Wed. 14 Dec.), and graded out of 100 points.

VIII. Final Examination—Timed Part Half of your final exam will be a one-hour exam (during the first hour of the assigned final period: 11:50 AM-12:50 PM Wed. 14 Dec.) consisting of short-answer questions and questions of a computational nature. It will be written at the scheduled final-exam session, and graded out of 100 points.

Extra Credit
From time-to-time extra credit will be offered in the form of extra homework, extra exam problems, or in class or outside group projects. Some extra credit will also be awarded for exceptional class participation (quality, not just quantity). Extra credit will be added to your final course score after a curve has been drawn up (thus it is really extra; not doing it cannot lower your course grade. All extra credit will be recorded in points representing an addition to the final (percentage) course average. (For example, 1 point of extra credit is more valuable than 6 points on an exam.)

Excuses
With the exception of one “free” late homework assignment, homework and drafts of the term paper will be accepted late, and permission will be given to take exams at other than the scheduled time, only upon presentation of documentary or physical evidence of illness or serious personal or family emergency.

Course Grade
Your course grade will be computed as follows:

1. All students’ course averages will be computed as follows:

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\text{course average} = 0.10(\text{lowest of the seven scores}) + 0.15(\text{sum of the other six scores})
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A curve will be drawn up (the curve will be made to give a class average GPA of about 2.4, unless the class seems exceptionally good or exceptionally bad, but in no event will the curve be harsher than the usual 90-100 = A, 80-89 = B, 70-79 = C, 60-69 = D).

2. The course average plus extra credit will be compared to the curve to assign a tentative letter grade.

3. Any student who has passed all seven Gateway Quizzes and has completed all of the other seven course requirements will be assigned the higher of a C or the letter grade earned on the other seven course requirements at stage 2.

4. Any student who has passed all seven Gateway Quizzes, but has failed to fulfill one of the other seven course requirements (in the case of homework, this means turning in fewer than half of the assignments) will be assigned the grade computed at step 2.

5. Any student who has passed only six of the Gateway Quizzes will be assigned a course grade of D if the grade at step 2 was an A or B or in the top 1/3 of the C range, and an F otherwise.

6. Any student who has passed fewer than six of the Gateway Quizzes will be assigned an F for the course.

Boilerplate:

From Affirmative Action: If you have any condition, such as a physical or learning disability, which will make it difficult for you to carry out the work as I have outlined it or which will require academic accommodations, please notify me in the first two weeks of class.

Re: Academic Dishonesty: Plagiarism and cheating are serious offenses and may be punished by failure on the exam, paper or project; failure in the course; and/or expulsion from the University and a letter placed in your permanent file. All aspects of this course are governed by the University Honor Code. For more information about the Honor Code and policies relating to academic dishonesty, see the University Handbook.