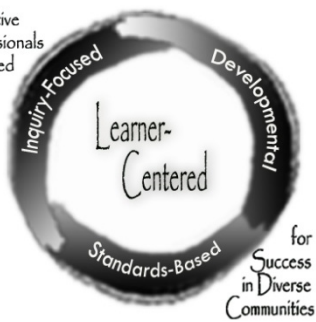


Reflective
Professionals
Prepared



Course Syllabus

M A 313/513 Section 2F

Patterns, Functions, and Algebraic Reasoning

Spring 2013

Instructor: Dr. Sherry Parrish
Office: Education Building, Room 106
E-Mail Address: parrishs@uab.edu
Telephone: w) 205- 934-8364 c) 205-567-6611

Office Hours: By appointment

Text & Supplies: There will be no official textbook for this course. You need an active email address that you check regularly. **You are REQUIRED to have a Blazer ID and UAB email account.** You will need a scientific calculator, a 3-ring binder with at least 6 tabs, graph paper, a ruler, color pencils, and scissors and tape for various tasks.

This course is designed to help fulfill the 12 sem. hrs. of math requirement for ECE and ELE majors. It may not be used to fulfill the general studies math requirement of UAB. YOU SHOULD HAVE COMPLETED YOUR CORE MATH REQUIREMENT BEFORE TAKING THIS COURSE. MA 102 (Intermediate Algebra) should be considered as a prerequisite.

I. Course Description:

The focus of this course will be to help enhance your mathematics background so that you may teach a rich K-6 grades curriculum as specified by the National Council of Teachers of Mathematics' Principles and Standards for School Mathematics and the Alabama State Course of Study: Mathematics. This course will be taught differently from perhaps any mathematics course you have ever taken. It is guided by UAB's participation and collaboration in the Greater Birmingham Mathematics Partnership. This is a joint venture between UAB (Schools of Education, Engineering, and Dept. of Mathematics), Birmingham Southern, the Mathematics Education Collaborative (MEC), and several local school systems- Bessemer, Fairfield, Hoover, Jefferson Co., Mountain Brook, Shelby Co., and Vestavia Hills. The project has its foundations in the work of Dr. Ruth Parker of MEC and the Constructivist view of learning. Constructivism is a theory of teaching and learning based on the work of Jean Piaget. It emphasizes the learner taking an active role in constructing her/his own learning as the learner interacts within an environment.

The goal of this course is that you become mathematically powerful students and that you become competent and confident problem solvers. The content and experiences in this course will lead you toward this goal. My role as the instructor will be to guide and support you as you make sense of mathematics. True understanding will only come when you make sense of a situation. My role is not to tell you everything about the subject, nor is it to answer all of the questions that will arise as you engage in problem solving. You will at times experience confusion and perhaps frustration. This is a natural part of the learning process. I will try to help you reflect and work your way out of confusion before your frustration becomes debilitating to your learning. Don't be afraid of wrong answers. You will not be put on the spot or embarrassed based on a response. Sometimes learning occurs by multiple attempts down wrong paths until you find a correct path.

You will learn while working in teams, in pairs, and as an individual as you solve problems. Collaboration with others is a valued method of learning. Listening to others as you engage in collaborative problem solving will help you see a variety of points of view and several ways of solving a problem. In groups,

you are not to 'teach' someone how to solve a problem and you are not to direct others to think in a certain way. Each person must think for her/himself and make sense of the situation. For many problems, I will insist that you not be satisfied with simply finding one way to solve a problem. Instead, I will push you solve problems in multiple ways. Getting the right answer is not the only goal in solving a problem. Understanding how you got to the answer is also an important goal, as is being able to communicate your understanding to others. While collaborative learning is desired, you are at the same time individually accountable for learning the material.

The content of the course will include problem solving experiences, inductive and deductive reasoning, patterns and functions, and some concepts and applications of geometry. The patterns and functions examined will include linear and quadratic relations, as well as, some functions of a higher order such as cubic or exponential functions. This is not a course in the usual formal methods of algebra as you may know it. We won't be doing extensive polynomial manipulations. Instead, we will be developing algebraic thinking and reasoning. Number sense with the rational number system including fractions, decimals, and percents will also be developed in the context of problems.

II. Course Objectives:

1. Students will be able to solve a variety of math problems related to concepts taught in grades K-6.
2. Students will be able to define and use a variety of mathematics terms and concepts.
3. Students will be able to apply inductive and deductive reasoning to problems.
4. Students will be able to identify patterns in mathematics.
5. Students will be able to solve problems involving patterns that form linear functions.
6. Students will be able to solve problems involving patterns that form quadratic functions.
7. Students will be able to apply problem solving strategies such as guess and check, working backwards, solve a simpler problem, etc. to a variety of problems.
8. Students will be able to identify properties of geometric figures and apply these in problems.
9. Students will demonstrate knowledge of concepts of number and number relationships, number systems, number theory, estimation, and computation in the context of problem solving.
10. **Students will communicate mathematical ideas orally and in writing.**
11. **Students will demonstrate a positive disposition toward persistence and reflection in doing mathematics.**

III. Course requirements:

1. Class attendance, observation, and *participation* in all sessions. More than 3 absences may result in your grade being lowered by 1 level. Participation is a key part of the instruction and you can't participate if you are not here! **Tardiness is a disruption to the learning process. Cumulative tardies may be counted as absences at the instructor's discretion. If you are involved in a practicum, then you should try to make arrangements with your UAB instructor and the school so that you arrive to class on time. If you are a teacher in a school, you should try to make arrangements so that you will be to class on time.**
2. Complete individual menus of problems, group tasks, and homework problems. Homework is primarily for reinforcement and extension of class sessions.
3. Complete article reviews and other readings.
4. Complete a Midterm Performance Task and a Final Performance Task in class near the middle of the course and at the end.
5. Develop a Final Mathematics Portfolio.
6. Have a positive and productive disposition toward yourself, your classmates, and mathematics. Be respectful of fellow classmates and the instructor as you share ideas.

Students Enrolled in MA 513: In addition to the above requirements, you will be expected to submit additional items for the Final Mathematics Portfolio, Menus, and Assessments.

IV. Projected Course Outline

**The dates and topics are tentative, except for Midterm and Final, and may be adjusted as needed. The instructor reserves the right to adapt the syllabus.

Date	Topic
Jan. 10	Course overview; Pre-Assessment
Jan. 15	Group Task; Groups of 4 Rules; Number Talk
Jan. 17	Group Task; Intro to Menu I: Linear Functions
Jan. 22	Menu I; Define “Complete Work”
Jan. 24	Menu I
Jan. 29	Group Task; Menu I
Jan. 31	Process Group Task; Menu I; Function Machine; Group Task
Feb. 5	Graphing Linear Equations; Menu I
Feb. 7	Menu I; Quick & Easy Score
Feb. 12	Group Task
Feb. 14	Processing and Menu I
Feb. 19	Menu I
Feb. 21	Group Task; Menu I DUE at the beginning of class
Feb. 26	Return Menu I; Number Talk; Midterm Practice
Feb. 28	Midterm – Linear Functions Performance Task
Mar. 5	Midterm Feedback; Introduce Menu 2: Linear and Quadratic Functions
Mar. 7	Processing and Menu 2; Navigating the Pentagon
Mar. 12	Menu 2
Mar. 14	Menu 2
Mar. 19	Spring Break
Mar. 21	Spring Break
Mar. 26	CCSS Mathematical Practices; Number Talks; Menu 2
Mar. 28	Group Task; Menu 2
Apr. 2	Peer Score Group Task; Menu 2
Apr. 4	Navigating the Pentagon II; Processing Menu 2
Apr. 9	Menu 2; Processing
Apr. 11	Menu 2; Processing
Apr. 16	Menu 2; Processing
Apr. 18	Group Task
Apr. 23	Group Task
Apr. 25	Article Discussion; Navigating the Pentagon III; Menu 2 DUE at beginning of class
Apr. 30	LAST CLASS – Portfolios Due at beginning of class ; Return Menu 2
May 2	NO CLASS – Weather Make Up Day
May 7 4:15pm - 6:45 pm	Final Performance Exam for Linear and Quadratic Functions

V. Evaluation: All course objectives will be measured by the following measures (see note * below for exceptions)**

Item 1. Scores on completed Math Menus	20%
Item 2* Participation, Attendance, and instructor’s judgment of effort & persistence	05%
Item 3. Article Reviews and Discussions	10%

Item 4. Midterm Performance Assessment	25%
Item 5. Final Performance Assessment	30%
Item 6. Mathematics Portfolio	10%

*** Item 2 is intended to reward those who put forth a maximum effort and demonstrate persistence in problem solving. The instructor will use his best professional judgment in awarding the 5% for this item based on a student's full participation in class activities, attempts at completion of challenging tasks, and may be influenced by a student's attempts or non-attempts at dessert items from the menu problems. The score may also be influenced by the instructor's observation of a student's ability to work independently on problems. A student who gives too much assistance to others on problems may be penalized for interfering with the learning process. 5% will be awarded to students who: have 3 or fewer absences (and make up the work for any absences), actively participate in all group and independent tasks, demonstrate persistence in pursuing challenging problems and tasks, show craftsmanship in solving problems and seek to extend their thinking on problems, stay on task without reminders during class activities, show the ability to work independently on tasks, demonstrate the ability to work with others on tasks without providing too much assistance, complete all required tasks on the menus and give good faith attempts at some of the desserts on the menus. If in the judgment of the instructor a student fails to meet all of the above, the instructor will assign a score between 0 and 5% with appropriate credit given for partial successes in meeting course goals. The instructor's decision here is based on her professional experience and is the final judgment on this item.**

Characteristics of an A student

0. Student is regular in attendance (3 or fewer absences) and fully participates in all course activities.
1. Demonstrates evidence of persistence when solving problems;
2. Completes all requirements of the course including **full participation**, homework, assessment tasks, and portfolio;
3. Oral and written communications are clear, convincing, and mathematically sound;
4. Able to explain why equations make sense geometrically;
5. Makes connections within a problem (its various representations) and to other problems;
6. Demonstrates procedural fluency with real number operations and symbolic manipulations;
7. Demonstrates the ability to represent linear and quadratic relationships using a variety of accurate representations (e.g. equations, tables, graphs, etc.); and
8. Frequently extends thinking beyond the immediate problem.

Characteristics of a B student: (0 through 6 above, plus)

7. Consistently represents linear relationships using a variety of accurate representations (e.g. equations, tables, graphs, etc.);
8. Generally represents quadratic relationships using a variety of accurate representations (e.g. equations, tables, graphs, etc.); and
9. Frequently extends thinking beyond the immediate problem.

Characteristics of a C student: (1 through 4 above, plus)

5. Makes connections within a problem and its various representations;
6. Demonstrates procedural fluency with real number operations and symbolic manipulations;
7. Consistently represents linear relationships using a variety of accurate representations (e.g. equations, tables, graphs, etc.);

Characteristics of a D student: (1 through 2 above, plus)

3. Oral and written communications are somewhat clear, somewhat convincing, and generally

- mathematically sound;
4. Sometimes is able to explain why equations make sense geometrically;
 5. Usually makes connections within a problem and its various representations;
 6. Demonstrates procedural fluency with real number operations; and
 7. Usually represents linear relationships using a variety of accurate representations (e.g. equations, tables, graphs, etc.);

Characteristics of an F student: Fails to meet the criteria for a D or above.

***** A typical grading formula (based on 10% grade range, A=90|100, B=80|89, etc.) will be used with the following exceptions: More than 3 absences may result in lowering your grade by at least 1 level, to earn an A a student must average at least 80% on the combined midterm and final, to earn a B a student must average at least 70% on the combined midterm and final, to earn a C a student must average at least 60% on the combined midterm and final, to earn a D a student must average at least 50% on the combined midterm and final.**

VI. COURSE POLICIES

Policy Regarding Reasonable Accommodations

If you are registered with Disability Support Services (DSS), please make an appointment with your instructor to discuss accommodations that may be necessary. If you have a disability but have not contacted DSS, please call 934-4205 or visit DSS at 516 Hill University Center. Students with disabilities must be registered with DSS and provide an accommodation request letter before receiving accommodations in this class.

Policy Regarding Student E-Mail Requirement

The University of Alabama at Birmingham requires that each student have an e-mail address. If you do not have an e-mail account, please contact Office of Academic Computing and Technology at 934-7065.

Policy Regarding Oral and Written Communication

Faculty in the UAB School of Education expects all candidates to be proficient in the areas of spoken and written communication. Consequently, the course instructor reserves the right to recommend remediation for any candidate whose oral and written communication skills are considered unsatisfactory. This remediation might include an objective diagnostic writing evaluation or completion of EDU 210.

Policy Regarding Academic Misconduct

UAB Faculty expects all members of its academic community to function according to the highest ethical and professional standards. Academic dishonesty and misconduct includes, but is not limited to, acts of abetting, cheating, plagiarism, copying homework, fabrication, and misrepresentation. Candidates are expected to honor the UAB Academic Code of Conduct as detailed in the most current *UAB Student Catalog*. Please consult this resource for additional information regarding the specific procedures to be undertaken when a student violates the UAB Academic Code of Conduct.

Policy Regarding Student Absences

Your presence in class is essential for success in this course. If there are extenuating circumstances, please contact your instructor.

Attendance and Tardiness/Early Departure Policy. Attendance and punctuality are important to your overall success in this class. Absences from class must be documented by a doctor's excuse to the instructor on the class day following the absence. You are allowed one absence without excuse as there are times that unexpected events happen. If you are going to be absent from class, you are still responsible for all work

presented and assigned during the class period. In the event of an emergency, email me prior to class. It is your responsibility to talk with your peers regarding what you missed, ask classmates to turn in your assignments, etc. You will be held responsible for content during your absence. Two or more unexcused absences will result in a negative effect on your grade. Two unexcused absences equal one letter grade deficit. Additionally, tardiness to class and early departures are disrespectful to the instructor and your classmates. Class roll will be taken at the beginning of each class period and recorded. Always sign in as documentation of your attendance and punctuality. Additionally, a disposition form might be completed related to professional conduct for excessive tardies/absences. **The UAB School of Education Policy on Professional Dispositions will be enforced in this course. See the email copy on Assessment of Professional Dispositions for more details. Ask the instructor if you need clarification**

Policy Regarding Late Assignments/Revisions

All assignments are due at the indicated/assigned due date and time in Blackboard unless otherwise instructed. In the event the instructor will accept a late assignment, ten percent of the assignment grade will be deducted per day late. No revisions will be possible unless requested by the instructor. If the instructor requests a revision of an assignment, the grade you receive will be an average of the first and second attempts.

Policy Regarding Academic Misconduct

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Policy Regarding Cell Phones and Lap Top Computers

Cell phones should be put in book bags, purses, or other concealed location and should not be seen or heard by the instructor during class time. If you have EXTENUATING circumstances that require that you are accessible by phone, let the instructor know. Laptops are not allowed unless otherwise approved by the instructor.

Drop/Add:

This course follows UAB policy concerning drop/add and will adhere to the university date of Jan. 16, 2013 being the last date to drop/add a course. Students registering late, until Jan. 16, 2013 will be able to make up all class items that have been missed. The last day to withdraw from this course with a grade of "W" is March 28, 2013.

Honesty and Plagiarism:

The awarding of a university degree attests that an individual has demonstrated mastery of a significant body of knowledge and skills of substantive value to society.

The UAB Academic Honor Code

<http://main.uab.edu/Sites/undergraduate-programs/general-studies/academic-success/67537/>

UAB expects all members of its academic community to function according to the highest ethical and professional standards. Students, faculty, and the administration of the institution must be involved to ensure this quality of academic conduct. Academic misconduct undermines the purpose of education. Such behavior is a serious violation of the trust that must exist among faculty and students for a university to nurture intellectual growth and development. Academic misconduct can generally be defined as all acts of dishonesty in an academic or related matter.

Academic dishonesty includes, but is not limited to, the following categories of behavior:

- ABETTING is helping another student commit an act of academic dishonesty. Allowing someone to copy your quiz answers or use your work as their own are examples of abetting.

- CHEATING is the unauthorized use or attempted use of unauthorized materials, information, study aids, the work of others, or computer-related information.
- PLAGIARISM means claiming as your own the ideas, words, data, computer programs, creative compositions, artwork, etc., done by someone else. Examples include improper citation of referenced works, the use of commercially available scholarly papers, failure to cite sourced, or copying another person's ideas.
- FABRICATION means presenting falsified data, citations, or quotations as genuine.
- MISREPRESENTATION is falsification, alteration, or the misstatement of the contents of documents, academic work, or other materials related to academic matters, including work substantially done for one class as work done for another without receiving prior approval from the instructor.

ADA Considerations:

Every reasonable request for accommodation will be met where possible. If you feel you need additional consideration, please contact L. Ross Hunter with UAB disability Support Services at 934-4025 and notify your instructor of your request. <http://main.uab.edu/Sites/students/services/disability-support/>

Non-harassment, hostile work/class environment:

The UAB College of Arts and Sciences expects students to treat fellow students, their Course Instructors, other UAB faculty, and staff as adults and with respect. No form of hostile environment or harassment will be tolerated by any student or employee. In this class we will only use constructive criticism and will work to build a community of life long learners.

Technology requirements

Students must have:

- A UAB e-mail account that you can access on a daily basis.
- E-mail software capable of sending and receiving attached files.
- Access to the Internet with a 1.0 mb per sec modem or better (DSL or Cable).
- A personal computer capable of running Internet Explorer 8.0 or above, or current versions of Firefox or Safari. Students who use older browser versions will have compatibility problems with Blackboard.
- Java must be installed and updated to version 1.6.31
- Microsoft Word software. (The Course Instructor cannot grade anything she cannot open. This means NO MS-Works, NO Wordpad, NO Wordperfect, NO pdf, NO wps, NO html, etc).
- All assignments must be submitted in the format required by the rubric associated with that assignment.
- Virus protection software, installed and active, to prevent the spread of viruses via the Internet and email. It should be continually updated!
- Internet Access:
 - Students must have access to a working computer and access to the Internet. Students can use the UAB computer lab, a public library, etc. to insure they have access.
 - Not having a computer, computer problems, computer crashes, loss of Internet and/or lose of electricity are not acceptable excuses for late work, incomplete work or a request for an assignment deadline extension. Students are expected to have a back-up plan in case any of these occur.

Technical support information - If technical problems are experienced, contact the UAB AskIT Help Desk. <https://ask.it.uab.edu/>

Turnitin - UAB reserves the right to use electronic means to detect and help prevent plagiarism. By enrolling at UAB, students agree to have course documents submitted to www.Turnitin.com or other means of electronic verification. All materials submitted to Turnitin.com will become source documents in Turnitin.com's restricted

access database, solely for the purpose of detecting plagiarism in such documents. Students may be required by instructors to individually submit course documents electronically to Turnitin.com.

Early Alert System (EAS) - The EAS is designed to help students be more successful academically at UAB. If you receive an e-mail with EAS in the title, please open it, read it, and take advantage of the support that UAB offers to all students. UAB is committed to ensuring that students receive academic support and that students are aware of the resources available that will assist them in successfully completing their degree program.

Library support - The Libraries at UAB provide access to materials and services that support the academic programs. The address of the UAB Library Website is <http://www.mhsl.uab.edu/>. This site provides access to the resources of all Campus and Regional Libraries, as well as to resources such as the Library's Catalog and Databases.

