Course Syllabus for
MAT 106
Elements of Geometry and Logic
Spring 2006, 4 credit hours
Prince George’s Community College
Department of Mathematics

Course Description: Designed for students in elementary education. Review and analysis of geometrical principles, logic, and the application of computer methods to these topics.

Important Note: Although this course satisfies the General Education requirement for graduation at Prince George’s Community College and transfers to UMCP as MATH 211, it is primarily for those who will teach in the preschool or elementary school. It is not meant to teach the how of the topics typically taught in preschool and elementary school; its purpose is to teach the why of those topics. This class meets five hours per week and includes lab time.

Prerequisite: MAT 105 Elements of Mathematics or permission of the Department. Students are responsible for meeting the prerequisites of this course and will accept all consequences for staying in the course without having met the prerequisites.

Course Format: Although addressing the mathematics you will teach as elementary teachers, this course is not a course of pedagogy (how to teach). However, best practices of teaching mathematics will be used in the course so that you may learn mathematics in a way that will help you to teach it better. The course will include a significant portion of laboratory and activity-based learning in groups. Students are expected to participate in all in-class activities within a collaborative environment. If you are not comfortable working in groups and helping your fellow group members learn, my class may not be for you. The course is designed to include lecture format, small group work, explorations, writing, manipulative use, and applications of technology. In addition, because you as a teacher must have a greater understanding of the material than the students you are teaching, the problems, content, and activities we use will not always be geared at the elementary level. You are expected to read and work through the textbook examples according to the tentative schedule as part of your out-of-class preparation. In class lectures and activities will assume your familiarity and will extend these basic concepts further.

Instructor Contact Information:

Name: Andy D. Jones, Associate Professor
Office: Marlboro Hall 3027
Mailing Address: Department of Mathematics
Prince George’s Community College
301 Largo Road
Largo, Maryland 20774
E-mail Address: JonesAD@pgcc.edu - To facilitate email communication with me, include the code NM231 in the subject line of emails to me during the spring 2006 semester. (The code allows legitimate email messages but stops SPAM from entering the PGCC network.)
Course Webpage http://academic.pgcc.edu/~ajones
Office Phone: (301) 322-0595. Please leave a message on my voicemail, and I will return your call as soon as possible. Speak clearly and slowly when you leave your message. Remember to state your name and phone number, preferably twice.
Office Hours:

<table>
<thead>
<tr>
<th>Mondays</th>
<th>Wednesdays</th>
<th>Fridays</th>
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<tr>
<td>11 a.m. – 12 noon</td>
<td>4 p.m. – 5 p.m.</td>
<td>1 p.m. – 2 p.m.</td>
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<tr>
<td>Math Learning Center (Marlboro 3104)</td>
<td>Wednesday 12 noon – 1:00 p.m.</td>
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<td>Other times by appointment.</td>
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Required Materials:
- Your own calculator (TI-83, TI-83 Plus, or TI-84 calculator is highly recommended) **required at every class**
- Access to the Internet
- A **Blackboard** Log-in and password.
- Three-ring binder (at least 2”) with loose-leaf paper for homework
- Pencils: All graded work must be submitted in pencil.
- Compass, protractor, and straightedge

Optional Materials:
- Student Solutions manual
- Supplies such as pens, colored pencils, markers, scissors, tape, sticky notes, graph paper, and plain 8½ x 11” paper

Blackboard: All students should obtain a **My PGCC** and **Blackboard** log-in as soon as possible. Besides being able to check your grades, you will also find assignments, handouts, resources, and course documents on Blackboard.

Organization:
One important skill for a teacher is learning how to organize your own learning and progress for others to evaluate as you may do in a professional teaching portfolio. While this collection is not a portfolio in the strictest sense, you will collect all work from this course in an organized way. Include all homework assignments, returned exams, activities, quizzes, etc. This binder should be the record of your progress and accomplishment in MAT 106 and should be available for inspection at a moment’s notice. You may want to keep this binder for subsequent coursework, as a resource for your own classroom teaching, or for inclusion as part of your A.A.T. portfolio.

Expected Course Outcomes (as taken from the Master Course Syllabus, January 2006):
Upon successful completion of this course, students will…
1. Develop and determine validity of arguments using formal and informal elementary logic.
2. Identify, name, and represent basic geometric shapes in one-, two-, and three-dimensions.
3. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about their relationships.
4. Apply appropriate techniques, tools, and formulas to determine standard and non-standard measurements in one-, two- and three dimensions.
5. Investigate geometric relationships through basic geometric constructions with and without technology.
6. Specify locations, describe spatial relationships, and measure attributes using coordinate geometry and equations.
7. Apply transformations and use symmetry to analyze mathematical situations.
8. Use visualization, spatial reasoning, and geometric modeling to solve problems.
9. Communicate effectively about geometry.
10. Use technology and manipulatives appropriately to enhance the learning of mathematics.

Important Dates:
- Wednesday, February 15 - Last day to apply for spring graduation
- Monday, February 20 - Presidents’ Day – College closed - No classes
- Friday, March 3 - Last day to change from "audit" to "credit" or "credit" to "audit"
- Monday - Sunday, April 10-16 - Spring Break – College closed - No classes
- Friday, April 21 - Last day to withdraw from full-semester classes
- Tuesday - Monday, May 9-15 - Final exam period/last week of classes
- Thursday, May 25 - Commencement, 7 p.m.

Cancellation/Delayed Opening of Classes: In the event of inclement weather, the College will notify local area radio and TV stations to announce all College closures/late openings. In addition, the College’s main number, 301-336-6000 or the College’s website, should be accessed for continuous opening/closure information. Should class be cancelled on a day for which a test or other assessment is scheduled, we will resume the schedule on the next day the class meets. When the college announces a delayed opening, all classes with at least 45 minutes of class time remaining at the time of the opening will be held. For example, in the event of a 10 a.m. opening, a 9:25-10:50 a.m. class will be held beginning at 10 a.m. This procedure applies to all credit classes.
Assessment

Participation

25 points

In general, expect to have textbook homework assignments every class period. Assignments will consist of both written work and readings. It is expected that you will come to class prepared to participate in the discussions and activities related to these assignments. Your participation will be assessed at every class meeting using the provided Daily Observation Rubric.

Praxis Practice

25 points

Many students are unsuccessful with the Praxis exam because they do not prepare themselves well enough for it. Taking a practice Praxis exam in a realistic testing situation will familiarize you with the type of questions the Praxis will ask as well as with the level of content it will cover. This will help you be more aware of the importance of MAT 106 (and MAT 105 and MAT 116) on your Praxis success. Details and specifics will be given in a separate document.

Geometer's Sketchpad

25 points

Besides being able to perform basic constructions in the traditional compass-straightedge manner, you will also explore technologically-based constructions using a computer software package called Geometer’s Sketchpad. The software is available in the Mathematics Learning Center in Marlboro 3104, and course activities will familiarize students with the software before the assignment is distributed.

Teaching Project

75 points

As you make progress towards your education degree, you should begin to consider how you will incorporate what you are learning in this course in the day-to-day responsibilities of teaching sound and engaging mathematics to children. You will develop a teaching project that will showcase these teaching responsibilities. The project will include research of a geometry topic, development of a teaching objective and lesson plan, incorporation of manipulatives and/or technology, and brief presentation to peer groups. Details of the project and an assessment rubric will be distributed in a separate handout.

Homework Quizzes

75 points

There will be approximately 10 short quizzes that will consist of exact questions assigned as homework problems. These quizzes are designed to encourage you to complete your assigned homework. These quizzes will be given in-class under a time constraint (generally 10 minutes) and cover the homework assigned from the week before. If you are absent, these assignments cannot be made up. I will drop the lowest individual quiz score. Each quiz is worth 10 points. The total points will be scaled to a possible 75 points.

Activity Points

75 points

Throughout the semester there will be points assigned to in-class activities and short laboratory tasks. These points may be from group work, specially assigned homework, internet activities, presentations, written reflections, or other forms. Each assignment will be worth 10 points. However, I will drop the two lowest scores. Together, these assignments will be scaled to a possible 75 points.

Exams

300 points

There will be three major out-of-class exams given in the Testing Center. These major exams will assess your knowledge of a limited number of topics covered in class. Each is worth 100 points.
- Exam #1: Logic and Basic Geometry Shapes and Properties
- Exam #2: Measurement, Congruence, and Similarity
- Exam #3: Constructions and Coordinate Geometry

Final Exam

200 points

The final exam will be comprehensive and will measure the expected learning outcomes for the whole course. The final exam will be given in class during the Final Exam period scheduled by the College under my supervision. It cannot be taken early so plan accordingly. The final exam will count 200 points.
- Final Exam: Comprehensive with emphasis on Translations and Graph Theory

800 points Total Points Possible

Your semester grade will be assigned as follows:

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<thead>
<tr>
<th>Grade</th>
<th>Points</th>
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<tbody>
<tr>
<td>A</td>
<td>90% of total and above</td>
</tr>
<tr>
<td>B</td>
<td>80% to 89% of total</td>
</tr>
<tr>
<td>C</td>
<td>70% - 79% of total</td>
</tr>
<tr>
<td>D</td>
<td>60% - 69% of total</td>
</tr>
<tr>
<td>F</td>
<td>59% of total and below</td>
</tr>
</tbody>
</table>

Superior work far above peers; sets the standard in understanding, insight, or skill.

High quality, solid work; clearly reflects a high level of understanding, insight, or skill.

Competent, adequate work and readiness to continue further mathematical study.

Low quality work showing minimal understanding; indicates un readiness to continue in the sequence.

Representative of work clearly inadequate and unworthy of credit.
POLICIES:

Attendance Policy: Because this class requires active participation in class discussion, "hands-on" experiences, and cooperative group learning, on-time attendance is essential! Missing class will affect your overall grade directly and indirectly. As stated in the PGCC Catalog, the college in general expects that students will regularly attend the classes for which they are registered. Attendance will be taken at every class. Attendance is a critical predictor of your overall performance in this class. Do not miss this class unless absolutely necessary. Although I certainly encourage you to visit me during office hours, it is impossible to recreate the discussions, explorations, and laboratory activities missed during an absence. If you do miss a class, you are responsible for all material covered in your absence and you must complete all required assignments, quizzes, and exams on time. It is your responsibility to find out what was missed and what is due the next class period. Please note that any in-class activity points you miss during an absence cannot be made up (see Make-up Policy below.) With the exception of extenuating circumstances, students who miss more than four classes during the semester may receive a failing grade. **Students who are habitually tardy may be denied entry into the classroom until a break in classroom discussions occurs.**

Make-up Policy: It is my general policy that no make-up exams or quizzes will be given. Exceptions to this policy are extremely rare. Students who cannot take exams on time due to an extenuating circumstance **must contact me before the exam or quiz and provide a written request with documentation of circumstance.** In-class activity points, collected homework, and laboratory points cannot be made up for any reason. Late projects and other out-of-class assignments will not receive full credit.

**Academic Integrity:** The College is an institution of higher learning that holds academic integrity as its highest principle. In the pursuit of knowledge, the college community expects that all students, faculty and staff will share responsibility for adhering to the values of honesty and unquestionable integrity. To support a community committed to academic achievement and scholarship, the Code of Academic Integrity advances the principle of honest representation in the work that is produced by students seeking to engage fully in the learning process. The complete text of the Code of Academic Integrity is in the 2005-2006 Student Handbook (pages 42-45) and posted on the college’s website. All charges of academic dishonesty will be taken seriously. This includes cheating or copying on exams and quizzes, submitting another’s out-of-class work as your own, and plagiarizing from sources such as books, magazines, and the internet. Students who engage in academic dishonesty will receive a failing grade of zero for that particular assignment. Any repeated incident will result in a course grade of “F.” **I take academic dishonesty seriously!**

Classroom Conduct: Every student is expected to behave in a way which promotes a learning atmosphere. Respect for others, both students and instructor, is crucial to the success of all, and anything less will not be tolerated. Students are expected to add positively to the learning environment.

- **Be in class on time. I do not tolerate tardiness.** It shows a lack of interest on your part and a lack of respect for the instructor and other classmates. Plan accordingly for traffic, parking, and other activities. Tardiness is defined as arriving after attendance has been taken.
- **Actively participate** in all class lectures, activities, and discussions, asking questions when things are unclear. Your participation is valued and assessed.
- **Limit side conversations.** Direct all comments and questions to your full group or the entire class as appropriate for the benefit of all.
- **Prepare for class** by having your homework and questions ready. **Always bring your book, notebook, calculator, paper, and pencil.** Read the sections in advance. You should expect to spend 2 hours of out-of-class time for every one hour of in class time. For this class, expect to spend at least 10 hours per week of study/reading/homework time.
- **Cell phones should be turned off completely.**
- **Visitors who are not registered for the course may not sit in the class.** School liability prevents those who are not officially registered, including students’ children, from being in the classroom

The Prince George’s Community College Code of Conduct defines the rights and responsibilities of students and establishes a system of procedures for dealing with students charged with violations of the code and other rules and regulations of the college. A student enrolling in the college assumes an obligation to conduct himself/herself in a manner compatible with the college’s function as an educational institution. Refer to the 2005-2006 Student Handbook, beginning on page 41, for a complete explanation of the code of conduct, including the Code of Academic Integrity and the procedure for dealing with disruptive student behavior.
College Resources and Support Services:

Mathematics Learning Center: Various mathematical resources are available in Marlboro Hall 3104. These resources include a computer lab, professional teaching journals, and small rooms for group study. Faculty and teaching staff are available for homework questions on a first-come first-served basis. Students needed in-depth tutoring should make an appointment with the Tutoring Center in Bladen Hall (see below).

Tutoring Center: I encourage you to get free math help from tutors in the Tutoring Center in Room 107 of the Bladen Wing. Students should go to the Tutoring Center early and familiarize themselves with the facilities and staff who work there. Appointments are required so stop by or call (301) 322-0748. Do not wait until the day before an exam because slots fill up fast.

Disability Support Services: Students requesting academic accommodations are required to contact the Disability Support Services Office (Marlboro Hall, Room 1042) or call (301) 322-0838 (voice) or (301) 322-0122 (TTY) to establish eligibility for services and accommodations. Students with documented disabilities should discuss the matter privately with their instructors at the beginning of the semester and provide a copy of their Student/Faculty Accommodation Form. Accommodations cannot be provided until this form is provided to me.

Open Computer Labs: Computer access is available in the open computer lab in the Bladen Wing and in the Mathematics Learning Center in Marlboro Hall 3104.

Student Assessment Services Center (Testing Center): Students will take the midterm examination and the practice Praxis exams in the testing Center located in Bladen Hall, Room 100. Call 301-322-0090 or consult the web site www.pgcc.edu/pgweb/pgdocs/student_services/student_assessment_services.htm for hours, policies, and procedures.

Hints to Perform Successfully in this Course
1. Come to class everyday on time. You can never really make up the learning you miss.
2. Do all homework, tests, and quizzes in pencil. Please do not use pen. Do all homework on separate paper from your notes.
3. Be prepared for class everyday. This includes completion (to the best of your ability) of any homework that was assigned in a previous class. Have questions or problems ready to ask the instructor. Preparedness also includes being ready to learn new material by reading and previewing upcoming material in the book before coming to class.
4. Be organized. I suggest you maintain and organize a binder with all class notes, corrected homework, returned quizzes, handouts, and tests. You will find that all these resources will be beneficial when studying for a test.
5. Go to the Tutoring Center on a regular basis. Get to know the facilities and the staff early. Do not wait until the day before the exam to get help. Reinforce your knowledge with the tutors even if you feel like you are achieving satisfactorily.
6. Ask questions when you need to. Do not get behind. As a class we can always slow down but can very rarely revisit entire concepts. If you are not comfortable asking questions in a group, visit the instructor during office hours.
7. Find a study partner or group from this class. Identify a resource to call or e-mail if you are absent or need some information.
8. Learn to use a graphing calculator effectively and efficiently. Don't let unfamiliarity with technology affect your performance. Use the same calculator on exams as you use during homework.
## Tentative Schedule for MAT 106 Elements of Geometry and Logic

(subject to change)

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Sections</th>
<th>Assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>January 23, 25, 27</td>
<td>Appendix Topic 1 Course Introduction and Mathematical Logic and Reasoning</td>
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<tr>
<td>2</td>
<td>January 30, February 1, 3</td>
<td>Sections 12.1 and 12.2 Basic Two-dimensional Geometry Shapes, Terminology, and Properties</td>
<td>Homework Quiz 1</td>
</tr>
<tr>
<td>3</td>
<td>February 6, 8, 10</td>
<td>Sections 12.3 and 12.4 Lines, Angles, and Regular Polygons</td>
<td>Homework Quiz 2</td>
</tr>
<tr>
<td>4</td>
<td>February 13, 15, 17</td>
<td>Sections 12.5 Three-dimensional Shapes; Catch-up and Review</td>
<td>Homework Quiz 3</td>
</tr>
<tr>
<td>5</td>
<td>February 20, 22, 24 <strong>No class 2/20 - Presidents' Day</strong></td>
<td>Section 13.1 Units of Measurement</td>
<td>Exam 1</td>
</tr>
<tr>
<td>6</td>
<td>February 27, March 1, 3</td>
<td>Section 13.2 Length, Perimeter, and Area</td>
<td>Homework Quiz 4</td>
</tr>
<tr>
<td>7</td>
<td>March 6, 8, 10</td>
<td>Sections 13.3 and 13.4 Surface Area and Volume</td>
<td>Homework Quiz 5</td>
</tr>
<tr>
<td>8</td>
<td>March 13, 15, 17</td>
<td>Sections 14.1 and 14.2 Congruence and Similarity of Triangles</td>
<td>Homework Quiz 6</td>
</tr>
<tr>
<td>9</td>
<td>March 20, 22, 24</td>
<td>Section 14.3 Catch-up and Review; Basic Euclidean Constructions</td>
<td>Exam 2</td>
</tr>
<tr>
<td>10</td>
<td>March 27, 29, 31</td>
<td>Sections 14.4 and 14.5 More Constructions and Problem Solving with Congruence and Similarity</td>
<td>Homework Quiz 7</td>
</tr>
<tr>
<td>11</td>
<td>April 3, 5, 7</td>
<td>Sections 15.1 and 15.2 Basics of Coordinate Geometry</td>
<td>Homework Quiz 8 Geometer's Sketchpad Assignment due</td>
</tr>
<tr>
<td>12</td>
<td>April 10, 12, 14 <strong>No class 4/10, 4/12, and 4/14 Spring Break</strong></td>
<td>Spring Break</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>April 17, 19, 21</td>
<td>Section 15.3 More Coordinate Geometry Catch-up and Review</td>
<td>Homework Quiz 9</td>
</tr>
<tr>
<td>14</td>
<td>April 24, 26, 28</td>
<td>Sections 16.1, 16.2 and 16.3 Transformations</td>
<td>Exam 3 Teaching Projects</td>
</tr>
<tr>
<td>15</td>
<td>May 1, 3, 5</td>
<td>Appendix Topic 3 Graph Theory</td>
<td>Homework Quiz 10; Teaching Projects</td>
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<tr>
<td>16</td>
<td>May 8, 10* <strong>No class on 5/10; Final Exam Week</strong></td>
<td>Review for Final</td>
<td>Teaching Projects</td>
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<td></td>
<td>May 15*</td>
<td>Final Exam</td>
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*- The Final Exam for this course is scheduled for Monday, May 15 from 9:00 a.m. – 11:00 a.m.*