Liberal Arts Mathematics
56-1723 (MA), Spring 2012

Department of Science & Mathematics
Columbia College Chicago
600 South Michigan Avenue
Chicago, Illinois 60605

Course Title: Liberal Arts Mathematics
Document date: Spring 2012
Course Number: 56-1723
Section Number: 01
Credits: 3.0
Designation: MA
Meeting Days and Times: Wednesday, 9 – 11:50am
Meeting Location: 623 S. Wabash, Room 216

Instructor Name: Dr. Christopher Shaw
Office location: 623 South Wabash, room 500-M
Office phone: 312-369-7732
Email address: cshaw@colum.edu
Mail delivery: Mail may be brought to room 500 of the 623 South Wabash building and given to the student worker for delivery to my mailbox.
Departmental office: 623 South Wabash, room 500
Departmental phone: 312-369-7368
Departmental fax: 312-369-8075
Availability: Tuesday/Thursday, 1pm – 3pm; also by appointment


Instructional Resource Fees: $40.00

Course Description: The course covers essential mathematical concepts, with an emphasis on rigorously understanding definitions, using problem-solving, and discovering applications. Topics include number systems, algebraic equations, exponential and logarithmic functions, and combinatorial counting methods.

Course Rationale: Mathematical reasoning provides a way of looking at the world analytically, and a solid framework for solving problems that can be useful in a variety of applications, as well as other fields. The ability to apply mathematical reasoning is a skill that is developed through exposure to new concepts, followed by careful practice in applying them. The province of this course to create an environment in which such exposure and practice are natural and everyday occurrences. This course satisfies the Mathematics requirement of the Liberal Arts and Sciences Core Curriculum.

Prerequisites: Basic Math Skills (56-1710) or COMPASS Math score of 34, or permission of instructor.
**General Mathematics Objective:** Students will be proficient in the mathematical skills and concepts to support their chosen career and to function effectively in society.

**Liberal Arts and Sciences Core Objectives:**
This course satisfies the Mathematics requirement of the Liberal Arts and Sciences Core Curriculum. Students will be able to:

- understand and use basic mathematical concepts and skills.
- utilize various tools of analysis to enable critical thinking.

**Learning Outcomes:** At the conclusion of this course, students will be able to:

- Apply logical reasoning to frame many types of real-life situations in a mathematical way.
- Use mathematical modeling to create and solve symbolic equations based on word problems.
- Use sound deductive reasoning to argue the truth of quantitative statements.
- Work in each of the basic number systems and understand their importance in using mathematics to model our world.
- Understand and manipulate exponential and logarithmic functions, and apply them in mathematical models.
- Apply basic probabilistic and combinatorial counting methods.

**Grading and Evaluation:** Your final grade will be assigned using the scale below:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A-</td>
<td>90-93</td>
</tr>
<tr>
<td>A</td>
<td>94-100</td>
</tr>
<tr>
<td>B-</td>
<td>80-83</td>
</tr>
<tr>
<td>B</td>
<td>84-86</td>
</tr>
<tr>
<td>B+</td>
<td>87-89</td>
</tr>
<tr>
<td>C-</td>
<td>70-73</td>
</tr>
<tr>
<td>C</td>
<td>74-76</td>
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<tr>
<td>C+</td>
<td>77-79</td>
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<tr>
<td>D</td>
<td>60-69</td>
</tr>
<tr>
<td>F</td>
<td>0-60</td>
</tr>
</tbody>
</table>

Using the following parameters:

- Homework: 20%
- Quizzes: 25%
- Midterm: 25%
- Final exam: 25%
- Participation: 5%

Note: Students will be expected to read each week’s assigned chapter before class. As such, the quiz grade includes four in-class quizzes, as well as a brief reading quiz for each week.

**Attendance Policy:** Missing class will have an adverse effect on the learning process and on your course grade.

**Late Work and Makeup Policy:**
*Late homework:* There is a 24 hour grace period after the due date in which assignments will still be accepted for full credit. After the grace period, no late homework will be accepted.
*Quizzes and exams:* Students must be present for the quizzes, midterm, and final exam. There are no makeup quizzes; the lowest quiz score will be dropped. Make-up exams are only given in the
case of documented illness, emergency, or conflict with another college course. Students must contact their instructor, either by phone or email, as soon as possible in order to schedule a makeup exam.

**Food and drink:** Three hours is a long time to hold a continuous class meeting, and as such it is acceptable to bring food and/or drink for consumption during class. However, the classroom must be kept clean. In order to meet the high standards of professionalism expected of Columbia students, students should make sure to throw out all garbage items associated with any consumables, and wipe up any spills or crumbs. If messiness begins to pervade the classroom, the instructor reserves the right to revoke the eating and drinking privileges of the class.

**Academic Integrity:** Students at Columbia College enjoy significant freedom of artistic expression and are encouraged to stretch their scholarly and artistic boundaries. However, the college prohibits all forms of academic dishonesty. For present purposes, "academic dishonesty" is understood as the appropriation and representation of another's work as one's own, whether such appropriation includes all or part of the other's work or whether it comprises all or part of what is represented as one's own work (plagiarism). Appropriate citation avoids this form of dishonesty. In addition, "academic dishonesty" includes cheating in any form, the falsification of academic documents, or the falsification of works or references for use in class or other academic circumstances. When such dishonesty is discovered, the consequences to the student can be severe. (Taken from the Columbia College Chicago Student Handbook.)

**Services for Students with Disabilities:** Columbia College Chicago seeks to maintain a supportive academic environment for students with disabilities. Students who self-identify as having a disability should present their documentation to the Services for Students with Disabilities (SSD) office. After the documentation has been reviewed by the SSD office, a Columbia College accommodation letter will be provided to the student. Students are encouraged to present their Columbia accommodation letters to each instructor at the beginning of the semester so that accommodations can be arranged in a timely manner by the College, the department, or the faculty member, as appropriate. Accommodations will begin at the time the letter is presented. Students with disabilities who do not have accommodation letters should visit the office of Services for Students with Disabilities, Room 304 of the 623 S. Wabash building (312-369-8296).

**Learning Studio:** The Learning Studio, located at 618 S. Michigan Avenue, first floor, is a relaxed, open, and personal environment. Tutors can help you with a wide range of subjects at all levels. The environment of the learning studio is non-judgmental when working with a tutor. Using the Learning Studio is a good idea for working in a number of disciplines, including Accounting, Math, Science, and with writing assignments. You can make an appointment through Oasis (using the “Make Appointments” tab) or call the Learning Studio at 312-369-8130. Please visit the website at [www.colum.edu/learningstudio](http://www.colum.edu/learningstudio). It’s super helpful and free!

**Course Calendar:**
| Week one     | Jan. 17 – 20 | Introduction & overview; using mathematical reasoning for basic problem-solving; introduction to sets in mathematics  
|             |             | Chapters 1.1, 1.2, 2.1, 2.2  
| Jan. 21: last day to add a class |             |  
| Week two    | Jan. 23 – 27 | Sets and infinity; deductive reasoning; understanding proof; using logic in problem-solving  
|             |             | Chapters 2.3, 2.4, 3.1, 3.2, 3.3, 3.4, 3.5  
| Jan. 28: last day to drop a class |             |  
| Week three  | Jan. 30 – Feb. 3 | Class Quiz 1; Number systems: overview and history; modular arithmetic and binary representation  
|             |             | Chapters 4.1, 4.2, 4.3, 4.4, 5.7  
| Week four   | Feb. 6 – 10 | Number systems: integer, rational, irrational, and real numbers  
|             |             | Chapters 5.1, 5.2, 5.3, 5.4, 5.5, 5.6  
| Week five   | Feb. 13 – 17 | Class Quiz 2; Algebraic expressions & symbolic manipulation; algebra in problem-solving  
|             |             | Chapters 6.1, 6.2, 6.4, 6.5, 6.6  
| Week six    | Feb. 20 – 24 | Ratios, proportions, percents, and further modeling  
|             |             | Chapters 6.7, 6.8, 6.9  
| Week seven  | Feb. 27 – Mar. 2 | Geometry; trigonometry  
|             |             | Chapters 7.1, 7.2, 7.3, 7.5  
| Week eight  | Mar. 5 – 9 | Midterm exam; Exploration of trigonometric functions on the real numbers  
|             |             | Handout on periodic functions  
| Mar. 10: last day to withdraw from a class |             |  
| Week nine   | Mar. 12 – 16 | Graph theory, networks, and circuits  
|             |             | Chapters 8.1, 8.2, 8.3  
| Week ten    | Mar. 19 – 23 | Class Quiz 3; Exponential and logarithmic functions & algebra; growth & decay  
|             |             | Chapters 10.1, 10.2, 10.3  
| Mar. 26 – 30: Spring Break |             |  
| Week eleven | Apr. 2 – 6 | Finance: definitions and applications of growth and decay functions  
|             |             | Chapters 11.1, 11.2, 11.3, 11.4  
| Week twelve | Apr. 9 – 13 | Class Quiz 4; Permutations, combinations, factorials; modeling  
|             |             | Chapters 12.1, 12.2, 12.3  
| Week thirteen | Apr. 16 – 20 | Probability: counting, expectation; experiments and modeling  
|             |             | Chapters 13.1, 13.2, 13.3, 13.4  
| Week fourteen | Apr. 23 – 27 | Statistics: definitions, applications, and a hint about calculation; Review  
|             |             | Chapters 14.1, 14.2, 14.3  
| Week fifteen | Apr. 30 – May 4 | Final exam  

Disclaimer Statement: This syllabus may be amended as the course proceeds. You will be notified of all changes.