# MATH 520.01 - LOGIC AND FOUNDATIONS OF MATH

# FALL 2019

**Instructor:** Dr. Antonia Cardwell

**Office:** 206B Wickersham Hall

**Phone:** x7306 (From off-campus: (717) 871-7306)

**E-mail:** antonia.cardwell@millersville.edu

**Lecture Hours:** 1:00pm - 1:50pm, MWF, 219 Wickersham Hall

**Office Hours:** 9:00am - 9:50am MTRF; 12:00pm - 12:50pm MWF. As necessary, additional office hours will be posted on D2L.

If you would like to meet with me but cannot make the posted times, see me after class or email me and we'll set an appointment.  I am also around at other times, so feel free to drop in.

**Description:** MATH 520 is a 3-credit course in mathematical proof and abstract structures.  In this course you will learn the essentials of first- and second-order logic and set theory; learn about the different types of proofs and how to write them; learn about some of the fundamental structures of mathematics, such as functions and relations; and learn the basics of writing mathematical prose.

**Course Objectives:** The student will:

- Learn the major techniques for writing proofs,

- Become acquainted with important abstract structures (such as sets and partial orders),

- Learn the basics of first- and second-order logic,

- Gain experience in writing proofs.

**Required Text:** *Book of Proof* (3rd Edition) by Richard Hammack.  This book can be found online (for free) at  http://www.people.vcu.edu/~rhammack/BookOfProof/index.html or a paperback copy may be purchased through amazon.com or Barnes & Noble.

We will likely cover the following sections in the text: 1.1 - 1.8, 2.1 - 2.10, 4.1 - 4.5, 5.1 - 5.3, 6.1 - 6.4, 7.1 - 7.4, 8.1 - 8.3, 9.1 - 9.3, 10.1, 10.2, 11.1 - 11.4, 12.1, 12.2, 12.4 - 12.6, and 14.1 - 14.3.   If you miss class please contact me or a classmate, or check the D2L website, as soon as possible to find out what you missed.

**Calculator:** You may find a graphing calculator useful.  The department supports the TI 82, 83, 84, 85 and 86 graphing calculators.  Please note that you cannot share a calculator with someone else during an exam.

**Desire2Learn:** A D2L site has been set up for this course.  Daily and hand-in homework assignments will be posted there, as well as copies of all handouts distributed in class.

**Attendance:** Attendance is not compulsory but is *highly* recommended (and you lose points if you miss graded work).

**Homework:** Homework will be assigned daily and is an essential part of the course.  I will specify which of the problems I would like you to hand in to be graded.  The deadlines for the homework assignments will be announced in class and posted on D2L.  Homework will not be accepted past the posted deadline without a valid excuse.  You may work with other people on homework, but verbatim copying is not permitted.  You must write up your solutions in your own words.  You must justify all nontrivial statements - correct answers without justification receive no credit.  If you are not sure if you've said enough - ask me.  Note that you will be required to typeset certain homework exercises. Links to resources for typesetting mathematics can be found on D2L.

**Exams:** The final exam for this section will be held on Wednesday, May 8th, 2019, from 10:15am - 12:15pm.

You will need a documented excuse to take a test at any time other than the scheduled time. If possible, contact me ahead of time so that alternative arrangements can be made. Tests will not be rescheduled to accommodate vacation travel - be sure to make your travel arrangements so that they do not conflict with exams, class times or deadlines.

**Grading:** Your grade will be calculated based on the following point distribution:

| | |
|---|---|
| 3 In-class Exams (100 points each): | 300 |
| Final Exam: | 150 |
| Homework: | 120 |
| **Total Points:** | **570** |

Grades will be assigned based on the following scale:

| Percentage Range | Grade |
|---|---|
| 93.0 - 100.0 | A |
| 90.0 - 92.9 | A- |
| 87.0 - 89.9 | B+ |
| 83.0 - 86.9 | B |
| 80.0 - 82.9 | B- |
| 77.0 - 79.9 | C+ |
| 73.0 - 76.9 | C |
| 70.0 - 72.9 | C- |
| 67.0 - 69.9 | D+ |
| 63.0 - 66.9 | D |
| 60.0 - 62.9 | D- |
| 0 - 59.9 | F |

**Academic Honesty/Integrity:** The University's policies regarding academic honesty can be found at http://www.millersville.edu/about/administration/policies/pdf/academics/Academic Policy - Academic Honesty and Dishonesty.pdf. Students should observe these policies as I will enforce them.

**Special Accommodations:** It is University policy to provide reasonable accommodations to students with disabilities. Please contact the Learning Services Office, 352 Lyle Hall, 717-871-5554, to discuss accommodation needs.

**Title IX Reporting:** Millersville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment, comply with Title IX of the Education Amendments of 1972, 20 U.S.C. §1681, et seq., and act in accordance with guidance from the Office for Civil Rights, the University requires faculty members to report to the University's Title IX Coordinator incidents of sexual violence shared by students. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report to the person designated in the University Protection of Minors policy incidents of sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred. Information regarding the reporting of sexual violence, and the resources that are available to victims of sexual violence, is available at http://www.millersville.edu/socialeq/title-ix-sexual-misconduct/index.php.