La Follette Math Prep: Summer 2015

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Office Hours: See link below. 10am-noon on July 8, July 22, August 5, and August 19.
*You may be prompted to download and install the Blackboard Launcher utility while accessing the link to Online Office Hours. Please contact Andrew Lambert, lambert@lafollette.wisc.edu, with any technical questions regarding this.

Course Website: http://learnuw.wisc.edu

Course Description: This course will cover all of the basic algebra that you need to know to succeed in your first semester La Follette coursework. Although the topics covered are included in courses that are prerequisites for admission into the La Follette School, students often enter the program with a significant lag between their last exposure to these concepts, leading to difficulty in first semester courses.

Required Text: There is no required text for this course. In constructing the course, we have excerpted parts of Beecher, Judith A., Penna, Judith A., and Bettinger, Marvin L. (2008). College Algebra, Third Edition, Pearson Publishing (hereafter BPB). This is a prior edition text that can be purchased in good condition for less than $10 on Amazon.com.

Calculator: No calculator is required for the course. All computations can be done by hand.

Course Structure: This self-guided course is divided into 13 sequential topic modules starting with Properties of Exponents and ending with Set Theory and Venn Diagrams. Each topic module contains an introduction, some learning tools in the form of videos and book excerpts, some sample problems (with answers), and a set of quizzes. To complete a topic module you must receive a threshold clearing score on one of three topic module quizzes. The threshold clearing score for each quiz is provided in the quiz instructions.

At the beginning of each topic module there is a short introduction to the topic introducing the topic and how it fits in the context of the first semester courses. At the end of the topic introduction you will see a listing of skills required to complete the module and at least one sample question. The list of skills and the sample question are designed to allow you to self-assess how familiar you are with the topic. If you believe you possess the required skills and can easily complete the sample question(s), you may be ready to try your hand at a quiz with the aim of moving quickly through the topic. If you know that you do not possess the required skills and cannot fathom how to complete the sample question(s), it is probably best to start with the most basic introduction to the topic (typically the videos).

Learning Resources: Learning resources for each topic come in the form of videos, most of which come from Khan Academy (https://www.khanacademy.org/), and excerpts from BPB. The videos take the place of a lecture or classroom setting and generally provide an easy introduction to and exposition of each topic. The disadvantage of the videos is that it does take a considerable amount of time to watch them all. The book excerpts are consistent with what you would expect to find in a standard college algebra text: an introduction to a topic, perhaps a few properties listed, and some example
problems. Generally the book excerpts will provide a less introductory, but quicker coverage of a topic. For most modules there is considerable overlap between the videos and the book (where there is not, it is noted). Depending on your comfort with the material you may not want to spend the time to watch all of the videos and review the book excerpts.

Practice Questions: For each topic there are also a set of practice questions and answers. The sample problems always appear as practice questions so their answers can be found in the practice question answers. These practice questions are designed to provide you with an opportunity to practice working through quiz type questions on your own.

Quizzes: There are a maximum of 3 quizzes for each module. In order to pass a topic module you must pass at least one of unit’s quizzes. The quizzes are short, ranging from 3 to 7 questions, and are designed to assess whether you have mastered the concepts associated with each topic module. The threshold score needed to pass each quiz is listed in the quiz instructions. Quiz questions are formatted as self-grading short answer questions with a few graphing questions mixed in on the quizzes for the Graphing Linear Equations topic module. You can review your past quiz grades and answers by accessing the "Course Administration / Grades" link in the lower part of the left-hand toolbar.

In putting together this course our primary objectives were:

- For the course to be economical for students (no required text or subscriptions),
- For the course to be efficient in terms of allowing students who have a good grasp of the material to get through it quickly while simultaneously providing resources for less well equipped students to relearn the material.
- For the course to be self-grading.

I believe that we have done a good job meeting the first two objectives. I am less sure about the third objective. First, the course is not entirely self-grading as there are graphing questions that will need to be instructor graded. I will go through and grade these quizzes manually every week. Secondly, the short answer format means that answers need to be precisely entered in order to be scored as correct. While I tried to allow for some leeway in the entering of answers, it is unlikely that I accounted for all the possible combinations of correct answers. At the beginning of each quiz there are fairly detailed instructions on how to format your answers. Please follow these instructions carefully. If you feel like you got a question correct, but it was graded as not correct and you need to get the question correct to progress, please flag the question and contact me.

How Long Should You Spend on Each Topic? This is a difficult question to answer as it depends on your familiarity with the topic and your aptitude for relearning algebra. Students who are really knowledgeable may be able proceed to the quiz without reviewing any of the material and complete the topic in several minutes. At the other extreme, students that struggle with math may end up watching videos multiple times and working through all of the examples provided in the text and in the practice questions. In this case it could take several hours to complete a topic. Despite this uncertainty about topic completion times, some reasonable upper time bounds for the various topic modules are provided below. These bounds place the overall completion time for the course at under 16 hours.

1. Properties of Exponents: less than one hour.
2. Order of Operations: less than one hour.
3. Polynomial Operations: less than 1:10
4. Simple Equations: less than 1 hour
5. **Graphing Linear Equations**: less than 2.5 hours - there are a series of lengthy "basic" videos for this topic that many students will not need to watch. My guess is that the vast majority of students will be able complete this topic module in less than 1 hour.

6. **Rational, Radical, and Absolute Value Equations**: less than 1 hour

7. **Linear Inequalities**: less than 1.5 hours

8. **Systems of Equations**: less than 1.5 hours

9. **Polynomial Functions**: less than 45 minutes

10. **Exponential Functions, Compound Interest, and e**: less than 2 hours

11. **Logarithmic Functions and Expressions**: Less than 1 hour

12. **Summation Notation**: Less than 45 minutes

13. **Set Theory and Venn Diagrams**: Less than 45 minutes.