**Marshall University**

**Syllabus**

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| Course Title/Number  | **MTH 121B section 105 – Concepts and Applications of Mathematics with Algebra Review (CT) – CRN 3195** |
| Semester/Year | Fall 2014 |
| Days/Time | MTWR 2:00pm – 2:50 pm |
| Location | CH 436 |
| Instructor | Professor Shannon Miller-Mace |
| Office | SH 316 |
| Phone | (304)696-3796 |
| E-Mail | miller207@marshall.edu |
| Office/Hours | MW 4:00 – 4:45 and TR 3:00 – 4:45, or by appointment. |
| University Policies | By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be going to [www.marshall.edu/academic-affairs](http://www.marshall.edu/academic-affairs) and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to <http://www.marshall.edu/academic-affairs/?page_id=802> Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment  |

**Course Description: From Catalog**

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| A quantitative reasoning skills course for non-science majors, this course meets a Core I/Critical Thinking requirement and a Core II/Social Sciences requirement. Topics include logical thinking, problem solving strategies, beginning statistics and probability, exponential and logarithms modeling, formula use, with basic algebra review. (PR: ACT Math 17 – 18, or permission from University College) **4 hrs**. |

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| **Course Student Learning Outcomes**  | **How students will practice each outcome in this Course** | **How student achievement of each outcome will be assessed in this Course** |
| **Students will show mastery of basic Algebra Skills.** | Students will **practice each outcome** during interactive in-class lectures, textbook exercises assigned for homework, in-class group discussions and activities, board work, low-stakes writing, and project rough drafts. | Student **achievement of each outcome will be** **assessed** using in-class quizzes, homework assignments, research projects, group activities, in-class exams. |
| **Students will demonstrate an ability to analyze arguments and construct fallacies.** | Students will **practice each outcome** during interactive in-class lectures, textbook exercises assigned for homework, in-class group discussions and activities, board work, low-stakes writing, and project rough drafts. | Student **achievement of each outcome will be** **assessed** using in-class quizzes, homework assignments, research projects, group activities, in-class exams. |
| **Students will solve real-world problems using unit analysis.** | Students will **practice each outcome** during interactive in-class lectures, textbook exercises assigned for homework, in-class group discussions and activities, board work, low-stakes writing, and project rough drafts. | Student **achievement of each outcome will be** **assessed** using in-class quizzes, homework assignments, research projects, group activities, in-class exams. |
| **Students will interpret and analyze numbers that they will encounter in the real world.** | Students will **practice each outcome** during interactive in-class lectures, textbook exercises assigned for homework, in-class group discussions and activities, board work, low-stakes writing, and project rough drafts. | Student **achievement of each outcome will be** **assessed** using in-class quizzes, homework assignments, research projects, group activities, in-class exams. |
| **Students will demonstrate a proficiency in utilizing formulas from basic financial concepts such as loan payments, credit cards, and mortgages.** | Students will **practice each outcome** during interactive in-class lectures, textbook exercises assigned for homework, in-class group discussions and activities, board work, low-stakes writing, and project rough drafts. | Student **achievement of each outcome will be** **assessed** using in-class quizzes, homework assignments, research projects, group activities, in-class exams. |
| **Students will interpret and analyze statistical studies.** | Students will **practice each outcome** during interactive in-class lectures, textbook exercises assigned for homework, in-class group discussions and activities, board work, low-stakes writing, and project rough drafts. | Student **achievement of each outcome will be** **assessed** using in-class quizzes, homework assignments, research projects, group activities, in-class exams. |
| **Students will create tables and graphs from statistical data.** | Students will **practice each outcome** during interactive in-class lectures, textbook exercises assigned for homework, in-class group discussions and activities, board work, low-stakes writing, and project rough drafts. | Student **achievement of each outcome will be** **assessed** using in-class quizzes, homework assignments, research projects, group activities, in-class exams. |
| **Students will analyze and interpret statistical concepts such as measures of central tendency, measures of variation, and normal distributions.** | Students will **practice each outcome** during interactive in-class lectures, textbook exercises assigned for homework, in-class group discussions and activities, board work, low-stakes writing, and project rough drafts. | Student **achievement of each outcome will be** **assessed** using in-class quizzes, homework assignments, research projects, group activities, in-class exams. |
| **Students will demonstrate a proficiency in the fundamentals of probability including expected value.** | Students will **practice each outcome** during interactive in-class lectures, textbook exercises assigned for homework, in-class group discussions and activities, board work, low-stakes writing, and project rough drafts. | Student **achievement of each outcome will be** **assessed** using in-class quizzes, homework assignments, research projects, group activities, in-class exams. |
| **Students will compare linear growth and exponential growth rates and their real-world applications.** | Students will **practice each outcome** during interactive in-class lectures, textbook exercises assigned for homework, in-class group discussions and activities, board work, low-stakes writing, and project rough drafts. | Student **achievement of each outcome will be** **assessed** using in-class quizzes, homework assignments, research projects, group activities, in-class exams. |
| **Students will apply techniques employing common logarithms to solve equations.** | Students will **practice each outcome** during interactive in-class lectures, textbook exercises assigned for homework, in-class group discussions and activities, board work, low-stakes writing, and project rough drafts. | Student **achievement of each outcome will be** **assessed** using in-class quizzes, homework assignments, research projects, group activities, in-class exams. |

**Required Texts, Additional Reading, and Other Materials**

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| 1. Using and Understanding Mathematics: A Quantitative Reasoning Approach by Jeffrey Bennett and William Briggs, 5th Ed.
2. Students will be required to create critical thinking papers and projects using a **computer**. There are many computer labs located around campus.
3. Students are required to have a **scientific or graphing calculator** for the course.
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**Course Requirements / Due Dates**

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| 1. Basic Skills Quizzes – Due at the beginning of class.
2. In-Class Activities – Due at the end of class.
3. Homework – Due every other class period.
4. Projects – Due every 3 weeks.
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**Attendance Policy**

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| Students are expected to attend each class. Unexcused absences from **four** classes will result in a reduction of one letter grade for the semester; unexcused absences from **six or more** classes will result in an F. To obtain an excused absence, please go to the Dean of Students’ Office in the MSC. Students **must** notify the instructor by phone or e-mail **prior to** an exam if they cannot take a scheduled exam. Students must present a serious reason for missing any exam. Makeup exams will be given to students outside of class time at the convenience of the instructor.  |

**Grading Policy**

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| Each of the **four in-class** **exams** will be worth **10%** of the semester grade. **Classroom activities and homework** will be worth **15%** of the semester grade. **Basic skills assessments** will count as **10%** of the semester grade. **Five projects** will count as **20%** of the grade. The **Final Exam** will count for **15%** of the grade.Semester Exams – 40%Activities/Homework – 15%Basic Skills Assessments – 10%Projects – 20%Final Exam\* – 15%Total – 100%A student’s final letter grade will be determined on the following scale:90.00 – 100% A 80.00 – 89.99% B 70.00 – 79.99% C 60.00 – 69.99% D Below 60.00% F\*Students must take the MTH 121B Comprehensive Final Exam in order to complete the class and receive a letter grade. The exam is scheduled for Monday, December 8th, 2014 at 12:45 – 2:45 in CH 436. |

**Academic Support:**

There are a number of ways students can access **tutoring** during the semester.  The Mathematics Department Tutoring Lab, located in Smith Hall 115, provides a **free service** that is available for walk-in service daily, Monday – Friday.  Approximately two weeks after the semester begins, a schedule will be posted on the 5th floor of Smith Hall and at the following web address:

<http://muwww-new.marshall.edu/math/tutoringlab.asp>.

A second location for tutoring can be found within The University College in Laidley Hall.  This is also a **free tutoring service** available in a lab setting through walk in service, but students can also schedule one-on-one meetings with a personal tutor.

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| MTH 121B Course Calendar (subject to change) |
| MTWR Class Fall 2014 |
|   | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
| Week 1 |   |  |  |  |  |  |  |
| 8/25 - 8/28 | Syllabus, Prologue | Ch 1 Activity Order of Operations | 1A | 1B |   |   |   |
| Week 2 |   |  |  |  |  |  |  |
| 9/1 - 9/4 | Labor Day - No Class  | [1C] Sets of Numbers  | 1D |  **BSQ #1** |   |   |   |
| Week 3 |   |  |  |  |  |  |  |
| 9/8 - 9/11 | Fractions | 2A Powers of 10 | 2B  | **BSQ #2** Ch 2 Activity |   |   |  |
| Week 4 |   |   |   |   |   |   |   |
| 9/15 - 9/18 | **Review for Exam 1 Project One Due** | ***Exam 1*** | Percentages and Ratios | 3A |  |   |  |
| Week 5 |   |   |   |   |   |   |   |
| 9/22 - 9/25 | 3B | Scientific Notation | 3C | **BSQ #3** |   |   |  |
| Week 6 |   |   |   |   |   |   |   |
| 9/29 - 10/2 | Ch 3 Activity | Powers and Roots | 4B Algebra  | Algebra with Powers and Roots |   |   |   |
| Week 7 |   |   |   |   |   |   |   |
| 10/6 - 10/9 | **BSQ #4** | 4C/4D | **Review for Exam 2 Project Two Due** | ***Exam 2*** |   |   |  |
| Week 8 |   |   |   |   |   |   |   |
| 10/13 - 10/16 | Ch 4 Activity | \*5C\* | [5E] | Ch 5 Activity  |   |   |   |
| Week 9 |   |   |   |   |   |   |   |
| 10/20 - 10/23 | **BSQ #5** |  \*6A\* | \*6B\* | \*6C\* |   |   |  |
| Week 10 |   |   |   |   |   |   |   |
| 10/27 - 10/30 | **Review for Exam 3 Project Three Due** | ***Exam 3*** | Fractions \*7A\* | Ch 7 Activity |   |   |  |
| Week 11 |   |   |   |   |   |   |   |
| 11/3 - 11/6 | \*7B\* | \*7E\* | **BSQ #7**  | Ch 8 Activity |   |   |   |
| Week 12 |   |   |   |   |   |   |   |
| 11/10 - 11/13 | Basics of Logarithms Logarithm Laws | 8A | **BSQ #8** | 8B |   |   |  |
| Week 13 |   |   |   |   |   |   |   |
| 11/17 - 11/20 | [9C] | **BSQ #9** | **Review for Exam 4 Project Four Due** | ***Exam 4*** |   |   |  |
| Week 14 |   |   |   |   |   |   |   |
| 11/24 - 11/27 |  | Thanksgiving Break - No Classes |  |  |
| Week 15 |   |  | **Dead Week** |  |  |  |  |
| 12/1 - 12/4 | **Review for Final** | Make Up Exams | **BSQ #6 and 10** | **Review for Final** | **Project Five Due** |   |   |
| Week 16 |   |  | **Finals Week** |  |  |  |  |
| 12/8 - 12/11 | FINAL EXAM |   |   |  |  |  |   |

**Homework:**

Students will be assigned to **READ** a portion of the textbook **BEFORE** a lesson is covered **IN CLASS**. **HOMEWORK** is assigned **AFTER** the classroom discussion for each lesson. The assignments mainly consist of suggested exercises from the textbook, publisher activities, or other assignment created by the instructor. **Students will need to *work at least 2-4 hours outside of class for every 1 hour spent in class,* studying notes and the textbook, and completing homework and other assignments to meet the requirements of the course.**

**Basic Skills Quizzes:**

Students will be **assessed** using a series of quizzes designed by members of the Mathematics Department in order to test certain Mathematical skills considered basic to every college-educated person. **Up to 10** **quiz grades** will be counted toward the student’s final grade. Some quiz topics are:

Logic and Venn Diagrams Probability and Statistics

Order of Operations Powers and Roots

Fractions Exponential and Logarithmic Equations

Scientific Notation Reading and Interpreting Graphs

Algebra Geometry and Formulas

**In-Class Activities:**

Students will **work in groups** on the **Activity** listed at the beginning of each chapter or one chosen by the instructor. There may be **up to a 7 Activities** that will be included in the Activities/Homework portion of the grade for the course.

**Projects:**

Students will complete **Five Projects**. Each project should contain at least two pages of text, along with tables, graphs, and a bibliography. Students will submit a paper copy for hand grading AND an electronic version to be checked for plagiarism. The following structure should be utilized for each project:

1. Title page (at most one page)
	1. Name/Title
	2. Class Info/Date
	3. Selected Topic Problem Stated
2. Content (at least two pages of text NOT including pictures, graphs, etc.)
	1. Intro
	2. Body
	3. Conclusion
3. Reflection (at most one page)
	1. What questions/challenges arose as you worked through the project?
	2. What did you learn?
	3. How could you improve your next project?
4. Bibliography (at most one page)

The following are possible project question topics students may consider.

**PROJECT ONE** – Chapter 1 and 2

1A – p. 22 #44 *Health Care Debate*

1B – no suggestion

[1C] – p. 53 #89 *U.S. Presidents* (include table with names/info about each President)

1D – p. 65 #67 *The Pythagorean Theorem*

2A – p. 96 #88 *Polar Ice Melting* (include two page summary, not one page)

2B – p. 112 #89 *Alcohol Poisoning*

**PROJECT TWO** – Chapter 3 and 4

3A – no suggestion

3B – p. 160 #75 *Nuclear Fusion*

3C – p. 171 #77 *Global Warming*

4B – no suggestion

4C – p. 247 #79 *Dow Jones Industrial Average*

4D – p. 265 #60 *Scholarship Scams*

\*4E\* – p. 278 #64 *Fairness Issues*

**PROJECT THREE** – Chapter 5 and 6

\*5C\* – p. 335 #48 $CO\_{2}$ *Emissions*

[5E] – p. 366 #42 *Success in the NFL*

\*6A\* - p. 381 #44 *Education Statistics*

\*6B\* - p. 391 #30 *Computing the Standard Deviation*

\*6C\* - p. 400 #48 *SAT Scores*

**PROJECT FOUR** –Chapter 7, 8 and 9

\*7A\* - p. 428 #71 *Accidents*

\*7B\* - p. 438 #60 *HIV Probabilities*

\*7C\* - p. 448 #40 *The Morality of Gambling*

\*7E\* - p. 468 #60 *Amazing Coincidence*

8A – p. 480 #31 *Computing Power*

8B – p. 490 #60 *World Population Growth*

[9C] – p. 549 #50 *Radiometric Dating*

**PROJECT FIVE -** Chapter 10, 11, and 12

Choose any of the possible project questions previously not chosen, or one from the following uncovered sections:

[10A] – p. 566 #88 *The Geometry of Ancient Cultures*

[10C] – p. 592 #34 *Fractal Research*

[11A] – p. 601 #23 *Mathematics and Music*

[11B] – p. 614 #37 *Art and Mathematics*

[11C] – p. 623 #28 *Fibonacci Numbers*

[12A] – p. 640 #43 *Election 2000*

**Domains**: Critical Thinking -- Quantitative Thinking; Information Literacy; Communication Fluency.

**Critical Thinking Course Objectives:**

This course will focus on domains of **Critical Thinking** as a basis for understanding and interpreting mathematical topics that will enable students to develop the quantitative reasoning skills they will need for college, career, and life. Emphasis will be placed on **improving Algebraic skills** necessary for future science classes.

 The **Quantitative Thinking** domain objectives ask to students to **analyze** real-world problems, **formulate** plausible estimates, **assess** the validity of visual representations of quantitative information, and **differentiate** valid from questionable statistical conclusions.

 The **Information Literacy** domain objectives ask students to **revise** their search strategies and **employ** appropriate research tools, **integrate** relevant information from reliable sources, **question** and **evaluate** the complexity of the information environment, and use information in an ethical manner.

 The **Communication Fluency** domain objectives ask students to **develop** cohesive oral, written, and visual communication **tailored** to specific audiences.

***\*\*Students are required to submit a GEAR artifact before the end of the semester. \*\****

**Important Dates:**

The following are a few dates that are noteworthy:

9/1/14 **Labor Day – University Closed**

10/20/14 **Freshman/Sophomore Midterm Grades Due**

10/31/14 **Last Day to Drop a Full Semester Course**

11/24/14 – 11/29/14 **Thanksgiving/Fall Break – No Classes**

12/1/14 – 12/6/14 **Dead Week**

12/8/14 **MTH 121B - 105 Final Exam Day - CH 436**

**(12:45 p.m. – 2:45 p.m.)**