**Marshall University**

**Syllabus**

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| Course Title/Number | **MTH 121 SEC 109 (CRN: 3006) – Concepts and Applications of Mathematics (CT)** |
| Semester/Year | Fall 2015 |
| Days/Time | Tues. & Thurs. 11:00am – 12:15pm |
| Location | SH 516 |
| Instructor | Rob-Roy Mace |
| Office | SH 743E |
| Phone | (304) 696-7040 |
| E-Mail | [mace22@marshall.edu](mailto:mace22@marshall.edu) OR MUOnline/Blackboard |
| Office/Hours | Monday thru Friday 9:00am – 10:00am 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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| Critical thinking course for non-science majors that develops quantitative reasoning skills. Topics include logical thinking, problem solving, linear modeling, beginning statistics and probability, exponential and logarithms modeling, and financial concepts. **3 hrs**. (PR: MTH 099 or Math ACT 19 or above) |

**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, 6th Ed. 2. Students will be required to create critical thinking papers/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. 4. Students may access supplemental course materials using **MUOnline/Blackboard.** |

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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.** | interactive in-class lectures, group discussions, low-stakes writing, and out-of-class homework exercises and project rough drafts | in-class quizzes, activities, exams, and out-of-class homework assignments and project final drafts |
| **Students will demonstrate an ability to analyze arguments and construct fallacies.** | interactive in-class lectures, group discussions, low-stakes writing, and out-of-class homework exercises and project rough drafts | in-class quizzes, activities, exams, and out-of-class homework assignments and project final drafts |
| **Students will solve real-world problems using unit analysis.** | interactive in-class lectures, group discussions, low-stakes writing, and out-of-class homework exercises and project rough drafts | in-class quizzes, activities, exams, and out-of-class homework assignments and project final drafts |
| **Students will interpret and analyze numbers that they will encounter in the real world.** | interactive in-class lectures, group discussions, low-stakes writing, and out-of-class homework exercises and project rough drafts | in-class quizzes, activities, exams, and out-of-class homework assignments and project final drafts |
| **Students will demonstrate a proficiency in utilizing formulas from basic financial concepts such as loan payments, credit cards, and mortgages.** | interactive in-class lectures, group discussions, low-stakes writing, and out-of-class homework exercises and project rough drafts | in-class quizzes, activities, exams, and out-of-class homework assignments and project final drafts |
| **Students will interpret and analyze statistical studies.** | interactive in-class lectures, group discussions, low-stakes writing, and out-of-class homework exercises and project rough drafts | in-class quizzes, activities, exams, and out-of-class homework assignments and project final drafts |
| **Students will create tables and graphs from statistical data.** | interactive in-class lectures, group discussions, low-stakes writing, and out-of-class homework exercises and project rough drafts | in-class quizzes, activities, exams, and out-of-class homework assignments and project final drafts |
| **Students will analyze and interpret statistical concepts such as measures of central tendency, measures of variation, and normal distributions.** | interactive in-class lectures, group discussions, low-stakes writing, and out-of-class homework exercises and project rough drafts | in-class quizzes, activities, exams, and out-of-class homework assignments and project final drafts |
| **Students will demonstrate a proficiency in the fundamentals of probability including expected value.** | interactive in-class lectures, group discussions, low-stakes writing, and out-of-class homework exercises and project rough drafts | in-class quizzes, activities, exams, and out-of-class homework assignments and project final drafts |
| **Students will compare linear growth and exponential growth rates and their real-world applications.** | interactive in-class lectures, group discussions, low-stakes writing, and out-of-class homework exercises and project rough drafts | in-class quizzes, activities, exams, and out-of-class homework assignments and project final drafts |
| **Students will apply techniques employing common logarithms to solve equations.** | interactive in-class lectures, group discussions, low-stakes writing, and out-of-class homework exercises and project rough drafts | in-class quizzes, activities, exams, and out-of-class homework assignments and project final drafts |

**Course Requirements / Due Dates**

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| 1. Basic Skills Quizzes – Students will take 7 to 10 quizzes (time permitting) that focus on the mathematics required to understand the focus of each section. See the Calendar for approximate quiz dates. 2. In-Class Activities – Students will engage one another during class by completing worksheet activities that help them to discover the concepts in each section. See the Calendar for approximate activity dates. 3. Homework Exercises – Student will be assigned textbook problems that relate to the lecture and activity. Due dates will be announced in-class and will be approximately every other class period. 4. Projects – Students will complete a Critical Thinking Project focusing on their ability to synthesize Information Literacy with Quantitative Thinking and presented using Communication Fluency. Due dates will be at midterm and before the final exam. 5. Exams – Students will take four in-class exams covering about six sections each from the textbook. See the Calendar for approximate exam dates. |

**Grading Policy**

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| **Basic skills assessments** will count as **10%** of the semester grade.  **Classroom activities and homework** will be worth **15%** of the semester grade. The **project** will count for **20%** of the grade. Each of the **four in-class** **exams** will be worth **10%** of the semester grade. The **Final Exam** will count for **15%** of the grade.  Basic Skills Assessments (7-10 assessments) – 10%  Activities/Homework (collectively one grade) – 15%  Project**\*\*\*** (rough and final drafts) – 20%  Semester Exams (4 exams @ 10% each) – 40%  Final Exam\* (1 exam @ 15%) – 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 are required to submit a GEAR artifact before the end of the semester. \*\*\*** |

**Attendance Policy**

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| Students are expected to attend each class. **Unexcused absences** from the class will result in the following categories:  Absent for **10%** of the class (**3 class periods**) = reduction of **one**  **letter grade** for the semester.  Absent for **20%** of the class (6 **class periods**) = results in an **F**  **letter grade** for the semester.  Only **excused absences** will warrant missed assignments to be turned in past the original due date. 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. |

**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.

**Course Schedule**

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| **MTH 121 Course Calendar (subject to change)** | | | | | | | | | | | | | | |
| **TR Class Spring 2015** | | | | | | | | | | | | | | |
|  | | Mon | Tuesday | | | Wed | Thursday | | | Fri | | Sat | | Sun |
| Aug | | 24 | 25 | | | 26 | 27 | | | 28 | | 29 | | 30 |
| Week One | |  | Syllabus Prologue  *Order of Operations*  Ch 1 Activity - Zombies  1A | | |  | Ch 1 Activity - Zombies  1B  *Overlapping Circles*  1C | | |  | |  | |  |
| Aug - Sept | | 31 | 1 | | | 2 | 3 | | | 4 | | 5 | | 6 |
| Week Two | |  | 1D  **BSQ #1**  *FDP Patterns* | | |  | *Fraction Action*  1E CT Guidelines  Ch 2 Activity – Problem Solving | | |  | |  | |  |
| Sept | | 7 | 8 | | | 9 | 10 | | | 11 | | 12 | | 13 |
| Week Three | |  | 2A *Powers of 10*  2B | | |  | **BSQ #2**  2A PS Hints  **Review for Exam 1** | | |  | |  | |  |
| Sept | | 14 | 15 | | | 16 | 17 | | | 18 | | 19 | | 20 |
| Week Four | |  | ***Exam 1*** | | |  | *Ratios and Percentages*  3A | | |  | |  | |  |
| Sept | | 21 | 22 | | | 23 | 24 | | | 25 | | 26 | | 27 |
| Week Five | |  | 3B  *Scientific Notation* | | |  | 3C  **BSQ #3** | | |  | |  | |  |
| Sept - Oct | | 28 | 29 | | | 30 | 1 | | | 2 | | 3 | | 4 |
| Week Six | |  | Ch 3 Activity – Earth, Moon, & Sun  *Exponents*  *and Roots* | | |  | 4B  *Algebra* | | |  | |  | |  |
| Oct | | 5 | 6 | | | 7 | 8 | | | 9 | | 10 | | 11 |
| Week Seven | |  | *Algebra w/ Powers and Roots*  **BSQ #4**  4C | | |  | 4D  **Review for Exam 2** | | | **FIRST DRAFT DUE** | |  | |  |
| Oct | | 12 | 13 | | | 14 | 15 | | | 16 | | 17 | | 18 |
| Week Eight | |  | ***Exam 2*** | | |  | CH 4 Activity – Marginal Tax Rates, 5C, 6A | | |  | |  | |  |
| Oct | | 19 | 20 | | | 21 | 22 | | | 23 | | 24 | | 25 |
| Week Nine | |  | **BSQ #5**  6B  6C | | |  | CH 6 Activity – Are we Smarter than our Parents? | | |  | |  | |  |
| Oct - Nov | | 27 | 27 | | | 28 | 29 | | | 30 | | 31 | | 1 |
| Week Ten | |  | **Review for Exam 3** | | |  | ***Exam 3*** | | |  | |  | |  |
| Nov | | 2 | 3 | | | 4 | 5 | | | 6 | | 7 | | 8 |
| Week Eleven | |  | Ch 7 Activity – Let’s Make a Deal *Fractions* | | |  | 7A  7B  7E | | |  | |  | |  |
| Nov | | 9 | 10 | | | 11 | 12 | | | 13 | | 14 | | 15 |
| Week Twelve | |  | **BSQ #7**  *Basics of Logarithms**Logarithm Laws* | | |  | 8A  **BSQ #8**  Ch 8 Activity – Rule of 70 | | |  | |  | |  |
| Nov | | 16 | 17 | | | 18 | 19 | | | 20 | | 21 | | 222 |
| Week Thirteen | |  | 8B  **Review for Exam 4** | | |  | ***Exam 4*** | | |  | |  | |  |
| Nov | | 23 | 24 | | | 25 | 26 | | | 27 | | 28 | | 29 |
| Thanksgiving Break - No Classes | | | | | | | | | | | | | | |
| Nov - Dec | 30 | | | 1 | 2 | | | 3 | 4 | | 5 | | 6 | |
| Week Fourteen |  | | | **Review BSQ**  **and Homework**  Make Up Exams |  | | | **FINAL DRAFT DUE Review for Final** |  | |  | |  | |
| Dec | 7 | | | 8 | **9** | | | 10 | 11 | | 12 | | 13 | |
| Week Fifteen |  | | |  |  | | | FINAL EXAM  10:15AM – 12:15AM  Thursday, Dec. 10th |  | |  | |  | |