1. **Course Title**: Contemporary Mathematics
   Course Number: MATH 1100-80
   Number of Credits: 3

2. **Department**: Mathematics

3. **Semester Offered**: Winter 2018/2019

4. **Faculty Name**: Prof. M. Rosar
   E-mail Address: rosarm@wpunj.edu

5. **Required Texts**:
   Smith, Karl J., *The Nature of Mathematics*, Edition 12E, (or later) Brooks/Cole Publishing Co., CA, 2012

   Suggested Readings:
   a. Jani, Mahendra and Miller, David, Basic Concepts of Mathematics, Prentice Hall Publishers, PA, 1998 Johnson, David B. and Mowry, Thomas A., Mathematics: A Practical Odyssey, Third Edition, Brooks/Cole Publishing Co., CA, 1998
   b. Bello, I., and Britton, J., Topics in Contemporary Mathematics, Houghton Mifflin Co., MA, 1997
   c. Billstein, R., Libeskind, S., and Lott, J., A Problem Solving Approach to Mathematics for Elementary School Teachers, Addison-Wesley Publishing Co., New York, 1993

   Other Reading Materials:
   d. American Mathematical Monthly
   e. Mathematics Magazines
   f. The mathematical intelligencer
   g. The New York Times & Other Local Newspapers

   Other Materials for Study:
   www.ams.org
   www.maa.org

6. **Course Objectives**:
   Basic course objective is to introduce the student to some of the ideas of contemporary mathematics with emphasis on applications. In particular, the objectives are
   - To be able to approach a problem systematically
   - To be able to realize math patterns and use these patterns to solve problems
   - To learn the basic ideas of logic used in elementary mathematics and able to derive valid logical conclusions
   - Understand the basic notions related to sets
   - Be familiar with the basic notions of probability
   - Able to read simple graphs and understand the basic notions of measures of central tendency
   - To be able to present data using line, bar and pie graphs
   - Learn basic applications of matrices
   - Appreciate and apply the basic concepts of Algebra and Geometry

7. Student Learning Outcomes:
   Students will be able to:
   a. Effectively express themselves in written and oral form
   b. Demonstrate ability to think critically
   c. Locate and use information
   d. Demonstrate ability to integrate knowledge and idea in a coherent and meaningful manner
   e. Work effectively with others.

8. Topical Outline of the Course Content:

Chapter 1	**The Nature of Problem Solving**	.5 week
	1.1 Problem Solving	
	1.2 Inductive and Deductive Reasoning	
	1.3. Scientific Notation and Estimation	
Chapter 3	**The Nature of Logic**	.5 week
	3.1 Deductive Reasoning	
	3.2 Truth Tables and Conditionals	
	3.3 Operators and Laws of Logic	
	3.2 The Nature of Proof	
Chapter 2	**The Nature of Sets**	.25 week
	2.1 Sets, Subsets and Venn Diagrams	
	2.2 Combined Operations with Sets	
Chapter 12	**The Nature of Counting**	.25 week
	12.1 Permutations	
	12.1 Combinations	
	12.3 Counting without Counting	
Chapter 13	**The Nature of Probability**	.5 week
	13.1 Introduction to Probability	
	13.2 Mathematical Expectation	
	13.3 Probability Models	
	13.4 Calculated Probabilities	
Chapter 14	**The Nature of Statistics**	.5 week
	14.1 Frequency Distribution and Graphs	
	14.2 Descriptive Statistics	
	14.3 Normal Curve	
	14.4 Correlation and Regression	
Chapter 5	**The Nature of Numbers**	.5 week
	5.1 Natural Number	
	5.2 Prime Numbers	
	5.3 Integers	
	5.4 Rational Numbers	
	5.5 Irrational Numbers	
	5.6 Groups, Fields, and Real Numbers	
	5.7 Discrete Mathematics	

9. **Teaching Methods:** This course is taught entirely on-line. There will be:
   a. Eight lessons and problem sets
   b. Assignment Homework
   c. Assignment Summaries
   d. Final Exam

10. **Course Expectations:**
    This course is run over the internet. Instead of attending traditional lectures, you will study from the **MATH 1100** website, which serves as a comprehensive interactive online complement to the textbook. The material of the website covers some topics from the book The Nature of Mathematics, Edition 12 E (or later), Karl J. Smith, Brooks/Cole Publishing (2012).

    MATH 1100-Online is divided into **eight lessons**. Each lesson presents new material and it has the following sections:

- **Lecture Notes**
  Lectures introducing new topics to be studied.

- **Reading Assignments**
  Chapters of the textbook that **must be read and studied**.

- **Problem Sets**
  A list of representative problems from each chapter to help you understand the material. Problem sets will constitute a minimum requirement to get to understand the course material. You are encouraged to read more topics on your own during (and after you finished this) course.

- **Lesson Homework**
  Every assignment has a corresponding homework assignment, which is a list of exercises that **must be completed** online by its due date.

  Lesson Summary
  For each lesson you need to submit a short summary highlighting what you have learned and consider most important about the topics, including any real-world applications. It must be submitted online. As with homework assignments, it **must be completed** online by its due date.

- **Final Exam**

Academic Honesty

Academic honesty is highly valued at online courses just as it is on William Paterson University campus. You must always submit work that represents your original words or ideas. If any words or ideas are used that do not represent your original words or ideas, you must cite all relevant sources. You should also make clear the extent to which such sources were used. Words or ideas that require citations include, but are not limited to, all hardcopy or electronic publications, whether copyrighted or not, and all verbal or visual communication when the content of such communication clearly originates from an identifiable source. All submissions fall within the scope of words and ideas that require citations if used by someone other than the original author.

Academic dishonesty in an Online learning environment could involve:

- Having a tutor or friend complete a portion of your assignments
- Having a reviewer make extensive revisions to an assignment
- Copying work submitted by another student to a public class meeting
- Using information from online information services without proper citation

Plagiarism is a serious form of academic dishonesty.
Please read the UNIVERSITY REGULATIONS AND DISCIPLINARY PROCEDURES FOR STUDENTS, section II, B q (*http://ww2.wpunj.edu/admroot/adminsrv/hr/facultyhandbook2000/studentcodeofconduct.htm*)
Suggested Reading: Avoiding Plagiarism by Sharon Williams
(*http://www.hamilton.edu/academic/Resource/WC/AvoidingPlagiarism.html***)**