Montgomery County Community College
MAT 104
Foundations of Mathematics II
3-3-0

COURSE DESCRIPTION:
This is the second course in the sequence MAT 103, MAT 104. Topics include geometry, measurement, probability, statistics, and problem solving. This course does not satisfy the MAT 100 prerequisite requirement for MAT 125, MAT 140 or MAT 161.

REQUISITE(S):
Previous Course Requirements
    * MAT 103 Foundations of Mathematics with a minimum grade of "C"

Concurrent Course Requirements
None

COURSE COMMENTS
    − Quantitative Reasoning, Algebra, and Statistics Accuplacer of 251 or higher <u>or</u> an Advanced Algebra and Functions Accuplacer of 0-236.

LEARNING OUTCOMES Upon successful completion of this course, the student will be able to:	LEARNING ACTIVITIES	EVALUATION METHODS
1. Recognize that mathematics has applications that shape the world around them and influence their everyday lives.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams
2. Solve problems involving two- and three-dimensional geometry involving basic geometric shapes, parallelism, and perpendicularity.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams
3. Solve problems in geometry using congruence and similarity.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
4. Use standard and nonstandard units to measure length, area, surface area and volume.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams
5. Organize data using simple statistical methods.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams
6. Solve problems involving measures of central tendency and dispersion.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams
7. Solve problems involving sampling and standardize test scores.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams
8. Solve problems involving experimental and theoretical probability.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams
9. Solve problems using basic probability rules including conditional probability.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams
10. Solve problems involving expected values and odds.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams
11. Solve problems in statistics using the normal curve.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams

LEARNING OUTCOMES	LEARNING ACTIVITIES	EVALUATION METHODS
12. Solve binomial probability problems using the binomial probability formula.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams
13. Solve percent application problems including percent change.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams
14. Add, subtract, and multiply matrices.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams
15. Solve systems of equations by using 2 by 2 matrices.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams
16. Work with mathematical systems, understand what is a group, finite mathematical systems and modular arithmetic.	Lecture Small and Large Group Discussion Videos Assignments	Assignments Exams

At the conclusion of each semester/session, assessment of the learning outcomes will be completed by course faculty using the listed evaluation method(s). Aggregated results will be submitted to the Associate Vice President of Academic Affairs. The benchmark for each learning outcome is that *70% of students will meet or exceed outcome criteria.*

SEQUENCE OF TOPICS:
1. Operations with Matrices, Using Matrices to Solve Systems of Equations
2. Metric System, Length, Area, Volume, Mass and Temperature
3. Dimensional Analysis with the Metric System, Percent Problems
4. Geometry, Points, Lines, Planes, Angles, Polygons, Perimeter and Area
5. Groups, Finite Mathematical Systems and Modular Arithmetic
6. Empirical and Theoretical Probability, Odds
7. Expectation, Tree Diagrams, "Or" and "And" Problems
8. The Counting Principle and Permutations, Combinations
9. Sampling Techniques, Misuses of Statistics, Frequency Distribution
10. Statistical Graphs, Measures of Central Tendency, Measures of Dispersions, the Normal Curve

LEARNING MATERIALS:

Textbook:
Angel. (2017). *A Survey of Mathematics with Applications* (10th.). Pearson Publishing

Calculator
TI-30X IIS

Other learning materials may be required and made available directly to the student and/or via the College's Libraries and/or course management system.

COURSE APPROVAL:

Prepared by:	Joseph A. Freiwald and Walter R. Hunter	Date:	9/2003
Revised by:	Paul Winterbottom	Date:	8/2004
Revised by:	Mark McFadden	Date:	10/30/2012
VPAA/Provost or designee Compliance Verification:	Victoria L. Bastecki-Perez, Ed.D.	Date:	5/23/2013
Revised by:	Mark McFadden	Date:	10/9/2014
VPAA/Provost or designee Compliance Verification:	Victoria L. Bastecki-Perez, Ed.D.	Date:	10/9/2014
Revised by:	Marion Graziano/Debbie Dalrymple	Date:	8/2/2017
VPAA/Provost or designee Compliance Verification:		Date:	8/24/2017

This course is consistent with Montgomery County Community College's mission. It was developed, approved and will be delivered in full compliance with the policies and procedures established by the College.