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| **WILLIAM RAINEY HARPER COLLEGE MATHEMATICS AND SCIENCE DIVISION GENERAL COURSE OUTLINE** | | | |
| Course Prefix | Course Number | Course Title | *Contact Hours* |
| MTH | 097 | BASIC TECHNICAL MATHEMATICS | 3 Lecture/Demonstration  1. *Lab/Studio* 2. 3 *Credit Hours* |
| Department Coordinator: Kurt J. Billsten Phone: 847-925-6149 [kbillste@harpercollege.edu](mailto:kbillste@harpercollege.edu)  **Course Description**  Reviews arithmetic, introduces basic algebraic and right triangle trigonometric techniques. Includes arithmetic, elementary algebra, geometry, ratio and proportions, measurements, right triangle trigonometry and their application to solve a variety of career and technical problems. Draws practical problems the student’s career area, including emergency services, graphic communications, building trades, culinary arts and information technology. Intended for students pursuing Harper degrees and certificates in career program fields. This course:  is not transferable, does not satisfy the prerequisite for any other mathematics course, and does not satisfy any general education requirements.  **Topical Outline**   1. Whole Numbers    1. Addition of Whole Numbers    2. Subtraction of Whole Numbers    3. Multiplication of Whole Numbers    4. Division of Whole Numbers    5. Negative Whole Numbers (Integers), Properties of Zero and One, Exponents and Square Roots    6. Combined Operations with Whole Numbers 2. Common Fractions    1. Introduction to Common Fractions    2. Addition and Subtraction of Common Fractions    3. Multiplication of Common Fractions    4. Division of Common Fractions    5. Combined Operations with Common Fractions 3. Decimal Fractions    1. Introduction to Decimal Fractions    2. Addition of Decimal Fractions    3. Subtraction of Decimal Fractions    4. Multiplication of Decimal Fractions    5. Division of Decimal Fractions    6. Decimal and Common Fraction Equivalents    7. Combined Operations with Decimal Fractions 4. Averages, Percent, and Percentage    1. Averages    2. Percent and Percentage (%)    3. Unit Conversion       1. English to Metric       2. Metric to English       3. Conversion of Derived Units 5. Measurements | | | |

1. Linear Measure
2. Area Measure
3. Volume Measure
4. Equivalent Measurement Units and Conversion
5. Calculating Ratio and Proportion
6. Equations and Formulas
   1. Solving Linear Equations
   2. Solving Literal Equations
   3. Evaluation of Algebraic Expressions and Solving for Indicated Variable
7. Right-Triangle Trigonometry
   1. Solving Similar and Right Triangles
   2. Evaluating Trigonometric Functions
   3. Elementary Right Triangle Applications

### Method of Presentation

1. Lecture
2. Other:
   1. Group Activities
   2. Guided Individual Work

### Student Outcomes (The student should)

1. be able to perform arithmetic operations on whole numbers.
2. be able to perform arithmetic operations on fractions.
3. be able to perform arithmetic operations on decimal fractions
4. be able to compute percentages.
5. be able to compute averages.
6. be able to make linear measurements and communicate them using correct units.
7. be able to read measurements from various devises that are used to make linear measurements and communicate them using correct units.
8. be able to compute area from linear measurements and communicate it using correct units.
9. be able to compute volume from linear measurements and communicate it using correct units.
10. be able to make angular measurements and communicate them using correct units.
11. be able to convert the units in a measurement and communicate the result effectively.
12. be able to determine measurements from a scaled representation and communicate them effectively.
13. be able to solve proportion problems.
14. be able to convert English units to metric units.
15. be able to convert metric units to English units.
16. be able to write and solve equations.
17. be able to evaluate formulas.
18. be able to read graphs and communicate the information effectively.
19. be able to construct graphs.
20. be able to use the right triangle trigonometric ratios to solve problems.
21. be able to use the law of sines and the law of cosines to solve problems.

### Method of Evaluation

* 1. *Typical classroom assessment techniques*

Projects

Class participation

Objective tests

Studio/Lab performance

X Final exam

Portfolios

Essays/Term papers

Oral examination

Research report

* 1. *Course content learning outcomes*

X Quizzes

Group participation

Case study assignments

Homework

Midterm Exam

X Exams

* 1. *Additional assessment information (optional).*
     1. Guided individual activities
     2. Guided group activities

### Textbook

1. *Required*

R A Carman and H M Saunders. Mathematics for the Trades: A Guided Approach. Upper Saddle River, 2011 ISBN: 9780136097082

## Supplementary materials

***None*** *Software* ***None***

# Prepared by: Nilay Patel Fall 2012

CID: 3423

Language on the syllabi course materials developed by INAM funds:

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