MTH131
SURVEY OF COLLEGE MATHEMATICS
3 Credit Hours

Prepared by:
Constance Kuchar
September 2012

Revised by:
Constance Kuchar
January 2015

Ms. Shirley Davenport, Dean, Arts & Science Education
Ms. Linda Abernathy, Math, Science, and Business Division Chair
MTH131 Survey of College Mathematics

I. CATALOGUE DESCRIPTION

A. Course pre-requisite/co-requisite: COMPASS Algebra score of at least 66, or COMPASS College Algebra score of at least 31 within the past two years, or ACT math score of 22 or higher within the past two years, or MTH128 (Intermediate Algebra) with a grade of “C” or better Reading proficiency.

B. 3 semester credit hours

C. Survey of College Mathematics deals with several advanced mathematical topics, many of which are included in College Algebra. This course is not a prerequisite for any mathematics course. A scientific calculator is required (D,O)

II. EXPECTED LEARNING OUTCOMES/CORRESPONDING ASSESSMENT MEASURES

Note: Students will also complete a writing assignment for at least one of these learning outcomes.

<table>
<thead>
<tr>
<th>Expected Learning Outcomes</th>
<th>Assessment Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand and implement various problem-solving strategies including inductive and deductive reasoning, estimation and graphs</td>
<td>Class discussion/practice, homework, quizzes, and tests</td>
</tr>
<tr>
<td>Solve applications by appropriately applying algebraic techniques including linear equations, proportions, and linear inequalities</td>
<td>Class discussion/practice, homework, quizzes, and tests</td>
</tr>
<tr>
<td>Analyze and model data using functions and graphs</td>
<td>Class discussion/practice, homework, quizzes, and tests</td>
</tr>
<tr>
<td>Solve applications involving consumer mathematics</td>
<td>Class discussion/practice, homework, quizzes, and tests</td>
</tr>
<tr>
<td>Analyze data through the use of basic statistical measures</td>
<td>Class discussion/practice, homework, quizzes, and tests</td>
</tr>
</tbody>
</table>

III. OUTLINE OF TOPICS

Required:

A. Problem Solving and Critical Thinking
   1. Inductive and deductive reasoning
   2. Estimation, graphs, and mathematical models
   3. Problem solving
B. Algebra: Equations and Inequalities
   1. Algebraic expressions and formulas
   2. Linear equations in one variable and proportions
   3. Applications linear equations
   4. Linear inequalities in one variable
   5. Quadratic equations (optional)

C. Algebra: Graphs, Functions, and Linear Systems
   1. Graphing and functions
   2. Linear functions and their graphs
   3. Systems of linear equations in two variables
   4. Linear inequalities in two variables (optional)
   5. Linear programing (optional)
   6. Modeling data: exponential, logarithmic, and quadratic functions

D. Consumer Mathematics and Financial Management
   1. Percent, sales tax, and income tax
   2. Simple interest
   3. Compound interest
   4. Annuities, stocks, and bonds
   5. Installment loans, amortization, and credit cards

E. Statistics
   1. Sampling, frequency distributions, and graphs
   2. Measures of central tendency
   3. Measures of dispersion
   4. The normal distribution

Options: a minimum of 2 will be covered from the following:

F. Set Theory
   1. Basic set concepts
   2. Subsets
   3. Venn diagrams and set operations
   4. Set operations and Venn Diagrams with three sets
   5. Survey problems

G. Logic
   1. Statements, negations, and quantified statements
   2. Compound statements and connectives
   3. Truth tables for negations, conjunction, and disjunction
   4. Truth tables for the conditional and the biconditional
   5. Equivalent statements and variations of conditional statements
   6. Negations of conditional statements and De Morgan’s Laws
   7. Arguments and truth tables
   8. Arguments and euler diagrams
H. Number Representation and Calculation
1. Our Hindu-Arabic system and early positional systems
2. Number bases in positional systems
3. Computation in positional systems
4. Looking back at early numeration systems

I. Number Theory and the Real Number System
1. Number theory, prime and composite numbers
2. The integers; order of operations
3. The rational numbers
4. The irrational numbers
5. Real numbers and their properties
6. Exponents and scientific notation

J. Measurement
1. Measuring length; the metric system
2. Measuring area and volume
3. Measuring weight and temperature

K. Geometry
1. Points, lines, planes, and angles
2. Triangles
3. Polygons, perimeter, and tessellations
4. Area and circumference
5. Volume
6. Right triangle trigonometry
7. Beyond Euclidean geometry

L. Counting Methods and Probability Theory
1. The fundamental counting principle
2. Permutations
3. Combinations
4. Fundamentals of probability
5. Probability with the fundamental counting principle, permutations, and combinations
6. Events involving “not” and “or” odds
7. Events involving “and” conditional probability
8. Expected value

M. Voting and Apportionment
1. Voting methods
2. Flaws of voting methods
3. Apportionment methods
4. Flaws of apportionment methods
N.  Graph Theory
   1.  Graphs, paths, and circuits
   2.  Euler paths and Euler circuits
   3.  Hamilton paths and Hamilton circuits
   4.  Trees

IV. METHODS OF INSTRUCTION
   A.  Lecture
   B.  Discussion
   C.  In-class activities
   D.  MyMathLab interactive assignments

V. REQUIRED TEXTBOOK(S)
   B.  MyMathLab Student Access Kit. Boston: Pearson

VI. REQUIRED MATERIALS

   Scientific calculator

VII. SUPPLEMENTAL REFERENCES

   Contained within MyMathLab:
   A.  Student Solutions Manual
   B.  Study plan

VIII. METHODS OF EVALUATION

   A.  Homework:  10-20%
   B.  Classwork/Discussions:  0-20%
   C.  Quizzes:  0-20%
   D.  Tests:  30-60%
   E.  Final examination:  15-25%
F. Grading Scale
   90-100% = A
   80-89% = B
   70-79% = C
   60-69% = D
   Below 60% = F

IX. ADA AA STATEMENT
   Any student requiring special accommodations should inform the instructor and the Coordinator of Disability Support Services (Library; phone 636-481-3169)

X. ACADEMIC HONESTY STATEMENT
   Students who are caught cheating or plagiarizing material in this course will not receive credit for the assignment in question and may be dropped from the course with a failing grade. A detailed description of the Academic Honesty Policy statement can be found in the Jefferson College Student Handbook or online at http://www.jeffco.edu.

XI. ATTENDANCE STATEMENT
   Students earn their financial aid by regularly attending and actively participating in their coursework. If a student does not actively participate, he/she may have to return financial aid funds. Consult the College Catalog or a Student Financial Services representative for more details.