

KINGSBOROUGH COMMUNITY COLLEGE  
The City University of New York

CURRICULUM TRANSMITTAL COVER PAGE

Department: Mathematics and Computer Science Date: 3/5/18

Title Of Course Or Degree: MAT 800 - Practical Mathematics for Today's World

Change(s) Initiated: (Please check)

- |   |  |
|---|--|
| <input type="checkbox"/> Closing of Degree        | <input type="checkbox"/> Change in Degree or Certificate Requirements                  |
| <input type="checkbox"/> Closing of Certificate   | <input type="checkbox"/> Change in Degree Requirements (adding concentration)          |
| <input type="checkbox"/> New Certificate Proposal | <input type="checkbox"/> Change in Pre/Co-Requisite                                    |
| <input type="checkbox"/> New Degree Proposal      | <input type="checkbox"/> Change in Course Designation                                  |
| <input type="checkbox"/> New Course               | <input type="checkbox"/> Change in Course Description                                  |
| <input type="checkbox"/> New 82 Course            | <input checked="" type="checkbox"/> Change in Course Title, Numbers Credit and/or Hour |
| <input type="checkbox"/> Deletion of Course       | <input type="checkbox"/> Change in Academic Policy                                     |
|   | <input checked="" type="checkbox"/> Pathways Submission:                               |
|   | <input type="checkbox"/> Life and Physical Science                                     |
|   | <input checked="" type="checkbox"/> Math and Quantitative Reasoning                    |
|   | <input type="checkbox"/> A. World Cultures and Global Issues                           |
|   | <input type="checkbox"/> B. U.S. Experience in its Diversity                           |
|   | <input type="checkbox"/> C. Creative Expression  |
|   | <input type="checkbox"/> D. Individual and Society                                     |
|   | <input type="checkbox"/> E. Scientific World   |

Other (please describe): \_\_\_\_\_

PLEASE ATTACH MATERIAL TO ILLUSTRATE AND EXPLAIN ALL CHANGES

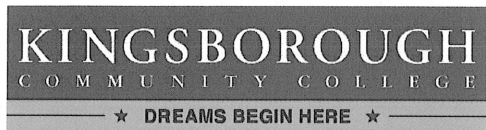
DEPARTMENTAL ACTION

Action by Department and/or Departmental Committee, if required:

Date Approved: 3/7/18 Signature, Committee Chairperson: Max Tran

I have reviewed the attached material/proposal

Signature, Department Chairperson: R Young



TO: Spring 2018 Curriculum Committee

FROM: Department of Mathematics & Computer Science

DATE: March 6, 2018

RE: Change in Number of Course Credits to Practical Mathematics for Today's World  
(MAT 800)

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The Department of Mathematics & Computer Science propose a change in number of course credits for MAT 800:

**FROM:**  
4 credits, 4 hrs.

**TO:**  
3 credits, 4 hrs. (2 lecture hrs., 2 hr. lab)

**Rationale for Change:** Course has been redesigned to include laboratory component.

# CUNY Common Core Course Submission Form

Instructions: All courses submitted for the Common Core must be liberal arts courses. Courses submitted to the Course Review Committee may be submitted for only one area of the Common Core and must be 3 credits. Colleges may submit courses to the Course Review Committee before or after they receive college approval. STEM waiver courses do not need to be approved by the Course Review Committee. This form should not be used for STEM waiver courses.

<b>College</b>	<b>Kingsborough Community College</b>
<b>Course Prefix and Number (e.g., ANTH 101, if number not assigned, enter XXX)</b>	MAT 0800
<b>Course Title</b>	Practical Mathematics for Today's World
<b>Department(s)</b>	Mathematics and Computer Science
<b>Discipline</b>	Mathematics
<b>Credits</b>	3
<b>Contact Hours</b>	4
<b>Pre-requisites (if none, enter N/A)</b>	A passing score of the CUNY Mathematics Skills Test, OR a passing score on the CMAT exam; OR successful completion of CUNY mathematics remediation
<b>Co-requisites (if none, enter N/A)</b>	N/A
<b>Catalogue Description</b>	This course is designed to provide students with critical-thinking and mathematical skills useful in making informed decisions on many aspects of modern life involving quantitative concepts. Topics include putting number in perspective, mathematics of finance, investments and loans, statistical reasoning, probability and risk assessment.
<b>Special Features (e.g., linked courses)</b>	
<b>Sample Syllabus</b>	Syllabus must be included with submission, 5 pages max recommended

**Indicate the status of this course being nominated:**

current course   
  revision of current course   
  a new course being proposed

### CUNY COMMON CORE Location

**Please check below the area of the Common Core for which the course is being submitted. (Select only one.)**

**Required Core**

- English Composition
- Mathematical and Quantitative Reasoning
- Life and Physical Sciences

**Flexible Core**

- World Cultures and Global Issues (A)
- US Experience in its Diversity (B)
- Creative Expression (C)
- Individual and Society (D)
- Scientific World (E)

## Learning Outcomes

In the left column explain the course assignments and activities that will address the learning outcomes in the right column.

### I. Required Core (12 credits)

#### A. English Composition: Six credits

A course in this area must meet all the learning outcomes in the right column. A student will:

- Read and listen critically and analytically, including identifying an argument's major assumptions and assertions and evaluating its supporting evidence.
- Write clearly and coherently in varied, academic formats (such as formal essays, research papers, and reports) using standard English and appropriate technology to critique and improve one's own and others' texts.
- Demonstrate research skills using appropriate technology, including gathering, evaluating, and synthesizing primary and secondary sources.
- Support a thesis with well-reasoned arguments, and communicate persuasively across a variety of contexts, purposes, audiences, and media.
- Formulate original ideas and relate them to the ideas of others by employing the conventions of ethical attribution and citation.

#### B. Mathematical and Quantitative Reasoning: Three credits

A course in this area must meet all the learning outcomes in the right column. A student will:

Through out the course devoted to analyzing a variety of data curves, utilizing the formula, table, and graph of each in conjunction.  
For examples: (1) Using a table of monthly income in one column and monthly expenses in another column to calculate monthly cash flow. (2) Using a table and the corresponding saving plan formula with monthly compounding of interest to find how much money is in a bank account after a year when making regular deposit of \$50/month. (3) Using the 68-95-99.7 rule of a Normal curve and the z-score table of the standard normal curve to find how likely it is to get a 790 SAT score.

- Interpret and draw appropriate inferences from quantitative representations, such as formulas, graphs, or tables.

Two chapters ( 5 & 6) are devoted to statistical thinking, including tables and graphs, numerical measures of center and variation. For example: Calculate the mean and standard deviation of a data set, and then determine if the data values exhibit a normal distribution. Students will understand the importance of the mean as the average for a group of scores and the standard deviation as a measure of how spread out the data are away from the mean. The students are asked what a small standard deviation implies, namely that the data values are close together, whereas a large standard deviation implies that the data values are much more spread out. They will also visualize this using a typical bell-curve where the mean always lies at the center. A small standard deviation corresponds to a bell-curve that is tall and narrow whereas a large standard deviation corresponds to a bell-curve that is short and wide.

- Use algebraic, numerical, graphical, or statistical methods to draw accurate conclusions and solve mathematical problems.

Exercises are regularly interspersed through out the course on translating quantitative problems from the everyday world into mathematical format. One instance from the percentage chapter ask the student to consider the following situation: Because of losses by your employer, you agree to accept a temporary 10% pay cut. Your employer promises to give you a

- Represent quantitative problems expressed in natural language in a suitable mathematical format.



<p>10% pay raise after six months. Will the pay raise restore your original salary? After some straightforward calculation with some arbitrary chosen salary, the answer is no.</p> <p>An instance from the financial math chapter involves expressing all the quantities given in a mortgage application into numbers that can be use in the appropriate formula to calculate the monthly payment and total payment. Students are ask to do this for a 15 year mortgage and 30 year mortgage plan, then they must compare the monthly payments and total payment of the two plans and explain under what circumstances one is better than the other.</p>	
<p>Exercises are regularly interspersed through the course in interpreting the result of a calculation in terms of what it means to our daily life in either a written or oral form.</p> <p>For example: A recent poll finds that 52% of surveyed voters plan to vote for Smith, and she needs more than 50% of the vote to win without a runoff. The margin of error is 3 percentage points. Will she win?</p> <p>Solution: We subtract and add the margin of error of 3 percentage points to find a confidence interval from <math>52\% - 3\% = 49\%</math> to <math>52\% + 3\% = 55\%</math>. We can be 95% confident that the actual percentage of people planning to vote for Smith is in the confidence interval 49% to 55% of the vote. Since this confidence interval leaves open the possibility of a majority and less than a majority, the race is too close to call.</p>	<ul style="list-style-type: none"> <li>Effectively communicate quantitative analysis or solutions to mathematical problems in written or oral form.</li> </ul>
<p>Specific questions on reasonableness are given as a follow-up to other work. Example: (1) If farm land in NY are priced at \$12,000 per acre and 20 acres are bought does \$600 total cost seems reasonable.? Using units analysis to check. The answer \$600 was obtained by dividing "12,000 by 20". When the operations are done with the units: <math>\\$12,000 / \text{acre} \div 20 \text{ acre} = \\$12,000 / \text{acre} \times 1/20 \text{ acre} = \\$600 / \text{acre} \times \text{acre}</math>, we see that the unit of acre did not cancel. The correct results when done with units is \$240,000:  <math>\\$12000 / \text{acre} \times 20 \text{ acre} = \\$240000 \text{ acre/acre} = \\$240,000</math> since <math>\text{acre/acre} = 1</math>.</p> <p>(2) Two friends are doing a rough calculation of how much garbage NYC residents produce per day. They estimate that each of the 8.3 million resident produces 1.8 pounds, 0.0009 ton, of garbage each day. The total garbage is <math>8.3 \times 10^6 \text{ persons} \times 0.0009 \text{ ton/person}</math>. One friend uses a calculator a got the answer of 225 tons. Is this reasonable? Using estimation we can quickly check <math>8.3 \times 10^6</math> is nearly <math>10^7</math> and <math>0.0009 = 9 \times 10^{-4}</math> is nearly <math>10^{-3}</math> so the product should be nearly <math>10^7 \times 10^{-3} = 10^{(7-3)} = 10^4 = 10000</math> ton. Clearly 225 ton is too small.</p>	<ul style="list-style-type: none"> <li>Evaluate solutions to problems for reasonableness using a variety of means, including informed estimation.</li> </ul>

<p>Some examples of applied problems:</p> <p>1. Use of scientific notation in astronomy and biology. Students will see how many quantities in these fields are best expressed in scientific notation. For example: the distance between the earth and the center of the galaxy is <math>3 \times 10^{17}</math> kilometers, the mass of the galaxy is <math>4 \times 10^{41}</math> kilograms, the human brain has <math>3 \times 10^{10}</math> neurons. Students learn to multiply, divide and raise to a power numbers in scientific notation. For example: The sun is 93,000,000 miles from the earth and light travels 186,000 miles per second. Use scientific notation to find how many seconds does it takes light from the sun to reach the earth? Answer:  <math>(9.3 \times 10^7) / (1.86 \times 10^5) = (9.3 / 1.86) \times 10^{(7-5)} = 5 \times 10^2 = 500</math> seconds.  This is <math>500 / 60 = 8.33</math> minutes.</p> <p>2. The Fundamental Counting Principle for setting up phone numbers and license plates. For example: in the original plan for 3-digit area codes devised by the Bell System in 1945, the first digit can be 2-9, the second digit can be 0 or 1, and the third digit can be 1-9. How many possible area codes are there? Answer: there are 8 possibilities for the first digit, 2 possibilities for the second digit and 9 possibilities for the third digit. By the Counting Principle the total number of area codes are: <math>8 \times 2 \times 9 = 144</math>.</p>	<ul style="list-style-type: none"> <li>Apply mathematical methods to problems in other fields of study.</li> </ul>
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**C. Life and Physical Sciences:** Three credits

A course in this area must meet all the learning outcomes in the right column. A student will:

	<ul style="list-style-type: none"> <li>Identify and apply the fundamental concepts and methods of a life or physical science.</li> </ul>
	<ul style="list-style-type: none"> <li>Apply the scientific method to explore natural phenomena, including hypothesis development, observation, experimentation, measurement, data analysis, and data presentation.</li> </ul>
	<ul style="list-style-type: none"> <li>Use the tools of a scientific discipline to carry out collaborative laboratory investigations.</li> </ul>
	<ul style="list-style-type: none"> <li>Gather, analyze, and interpret data and present it in an effective written laboratory or fieldwork report.</li> </ul>
	<ul style="list-style-type: none"> <li>Identify and apply research ethics and unbiased assessment in gathering and reporting scientific data.</li> </ul>

**II. Flexible Core (18 credits)**  
Six three-credit liberal arts and sciences courses, with at least one course from each of the following five areas and no more than two courses in any discipline or interdisciplinary field.

**A. World Cultures and Global Issues**

A Flexible Core course must meet the three learning outcomes in the right column.

	<ul style="list-style-type: none"> <li>Gather, interpret, and assess information from a variety of sources and points of view.</li> </ul>
	<ul style="list-style-type: none"> <li>Evaluate evidence and arguments critically or analytically.</li> </ul>
	<ul style="list-style-type: none"> <li>Produce well-reasoned written or oral arguments using evidence to support conclusions.</li> </ul>

A course in this area (II.A) must meet at least three of the additional learning outcomes in the right column. A student will:

	<ul style="list-style-type: none"> <li>Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring world cultures or global issues, including, but not</li> </ul>
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**KINGSBOROUGH COMMUNITY COLLEGE  
THE CITY UNIVERSITY OF NEW YORK**

**COURSE SYLLABUS: Mathematics 800**

**1. DEPARTMENT, COURSE NUMBER, AND TITLE (SPEAK TO ACADEMIC SCHEDULING FOR NEW COURSE NUMBER ASSIGNMENT): Department of Mathematics & Computer Science, Math 800, Practical Mathematics for Today's World**

**2. DOES THIS COURSE MEET A GENERAL EDUCATION/CUNY CORE CATEGORY?**

- Life and Physical Science
- Math and Quantitative Reasoning**
- A. World Cultures and Global Issues
- B. U.S. Experience in its Diversity
- C. Creative Expression
- D. Individual and Society
- E. Scientific World

**IF YES, COMPLETE AND SUBMIT WITH THIS PROPOSAL A CUNY COMMON CORE SUBMISSION FORM.**

**3. DESCRIBE HOW THIS COURSE TRANSFERS (REQUIRED FOR A.S. DEGREE COURSE). IF A.A.S. DEGREE COURSE AND DOES NOT TRANSFER, JUSTIFY ROLE OF COURSE, E.G. DESCRIBE OTHER LEARNING OBJECTIVES MET:**

Course MAT 800 is equivalent to:

Borough of Manhattan Community College: Math 160 - Quantitative Reasoning

New York City Tech: MA 180 - Mathematical Concepts and Applications

City College: Math 15000 - Mathematics for the Contemporary World

**4. BULLETIN DESCRIPTION OF COURSE:**

This course is designed to provide students with critical-thinking and mathematical skills useful in making informed decisions on many aspects of modern life involving quantitative concepts. Topics include putting number in perspective, mathematics of finance, investments and loans, statistical reasoning, probability and risk assessment.

**5. CREDITS AND HOURS\* (PLEASE CHECK ONE APPROPRIATE BOX BELOW BASED ON CREDITS):**

1-credit:	<input type="checkbox"/> 1 hour lecture <input type="checkbox"/> 2 hours lab/field/gym
2-credits:	<input type="checkbox"/> 2 hours lecture <input type="checkbox"/> 1 hour lecture, 2 hours lab/field <input type="checkbox"/> 4 hours lab/field
3-credits:	<input type="checkbox"/> 3 hours lecture <input checked="" type="checkbox"/> 2 hours lecture, 2 hours lab/field <input type="checkbox"/> 1 hour lecture, 4 hours lab/field <input type="checkbox"/> 6 hours lab/field

- 4-credits:      4 hours lecture  
                    3 hours lecture, 2 hours lab/field  
                    2 hours lecture, 4 hours lab/field  
                    1 hour lecture, 6 hours lab/field  
                    8 hours lab/field

More than 4-credits:    Number of credits: \_\_\_\_ (explain mix lecture/lab below)

      \_\_\_\_ Lecture                    \_\_\_\_ Lab

Explanation: \_\_\_\_\_

**\*Hours are hours per week in a typical 12-week semester**

**6. NUMBER OF EQUATED CREDITS IN ITEM #5: N/A**

**7. COURSE PREREQUISITES AND COREQUISITES (IF NONE PLEASE INDICATE FOR EACH)**

**A. PREREQUISITE(S):** A passing score on the CUNY Mathematics Skills Test; OR a passing score on the CMAT exam; OR Successful completion of CUNY Mathematics remediation; OR Math Exemption

**B. COREQUISITE(S):**            N/A

**C. PRE/COREQUISITE(S):**    N/A

**8. BRIEF RATIONALE TO JUSTIFY PROPOSED COURSE TO INCLUDE:**

**A. ENROLLMENT SUMMARY IF PREVIOUSLY OFFERED AS AN 82 (INCLUDE COMPLETE 4-DIGIT 82 COURSE NUMBER) : N/A**

**B. PROJECTED ENROLLMENT:** Over 60 students per semester

**C. SUGGESTED CLASS LIMITS:**        30

**D. FREQUENCY COURSE IS LIKELY TO BE OFFERED:** FALL AND SPRING

**E. ROLE OF COURSE IN DEPARTMENT'S CURRICULUM AND COLLEGE'S MISSION**

This course is designed to provide students with critical-thinking and mathematical skills useful in making informed decisions on many aspects of modern life involving quantitative concepts. Topics include putting number in perspective, mathematics of finance, statistical reasoning and probability. Students will learn to communicate solutions to mathematical problems in written and oral form and will gain an understanding of various approaches to problem solving; interpretation and analysis of quantitative information in other sciences; including basic statistical analysis to interpret data presented in graphs, tables, and formulas.

**9. LIST COURSE(S), IF ANY, TO BE WITHDRAWN WHEN COURSE IS ADOPTED (NOTE THIS IS NOT THE SAME AS DELETING A COURSE): N/A**

**10. IF COURSE IS AN INTERNSHIP, INDEPENDENT STUDY, OR THE LIKE, PROVIDE AN EXPLANATION AS TO HOW THE STUDENT WILL EARN THE CREDITS AWARDED. THE CREDITS AWARDED SHOULD BE CONSISTENT WITH STUDENT EFFORTS REQUIRED IN A TRADITIONAL CLASSROOM SETTING: N/A**

**11. PROPOSED TEXT BOOK(S) AND/OR OTHER REQUIRED INSTRUCTIONAL MATERIAL(S):**

Using and Understanding Mathematics: A Quantitative Reasoning Approach, Jeffrey Bennett and William Brigs, Pearson Addison Wesley, 2009.

**12. REQUIRED COURSE FOR MAJOR OR AREA OF CONCENTRATION? NO**

**13. IF OPEN ONLY TO SELECTED STUDENTS SPECIFY POPULATION:** Students who met the required prerequisites.

**14. EXPLAIN WHAT STUDENTS WILL KNOW AND BE ABLE TO DO UPON COMPLETION OF COURSE:**

Students will be able to put numbers into proper perspective and evaluate the solutions to problems for reasonableness using informed estimation and units analysis.

Students will have the basic knowledge of financial management to make decisions on savings plans and investments, loan payments, and mortgages.

Students will understand the fundamentals of statistics, statistical tables and graphs, correlation and causality, data distribution, measures of variation, and the normal distribution, enabling them to interpret tables, graphs in the media and make statistical inferences.

Students will know the fundamentals of probability, the law of large numbers, and how to combine probabilities and use them to assess risk and make decisions based upon their risk assessment.

Students will understand the theory of voting and will thereby be able to evaluate the strengths and weaknesses of the various voting systems in use today.

Students will learn effective communication of quantitative analysis or solutions to mathematical problems in written and oral form.

**15. METHODS OF TEACHING –E.G. LECTURES, LABORATORIES, AND OTHER ASSIGNMENTS FOR STUDENTS, INCLUDING ANY OF THE FOLLOWING: DEMONSTRATIONS, GROUP WORK, WEBSITE OR E-MAIL INTERACTIONS AND/OR ASSIGNMENTS, PRACTICE IN APPLICATION OF SKILLS, ETC.:**

Instruction will be based upon classroom lectures and homework assignments, or other methodologies that the instructor feels are appropriate such as group work and oral presentation by students.

**16. ASSIGNMENTS TO STUDENTS:**

Homework exercises from each section and teacher-prepared assignments.

**17. DESCRIBE METHOD OF EVALUATING LEARNING SPECIFIED IN #15 - INCLUDE PERCENTAGE BREAKDOWN FOR GRADING. IF A DEVELOPMENTAL COURSE INCLUDE HOW THE NEXT LEVEL COURSE IS DETERMINED AS WELL AS NEXT LEVEL PLACEMENT.**

Evaluation will be based on tests, assignments and a final examination. (Test generator software is available. ) With tests being 60% of the grade, assignments 20% and the final 20%.

**18. TOPICAL COURSE OUTLINE FOR THE 12 WEEK SEMESTER (WHICH SHOULD BE SPECIFIC REGARDING TOPICS COVERED, LEARNING ACTIVITIES, AND ASSIGNMENTS):**

Hours	Sections	Topic	Problems
2	2A	The problem-solving power of units	Pg 93: 21, 25, 31, 39, 55, 61, 67
	2B	Metric and U.S. Customary Systems of measurement	Pg 109: 37, 49, 51, 57, 59
	2C	Problem-Solving Guidelines	Pg 122: 9-11

2 Lab	3A	Uses and Abuses of Percentages: Three ways of using percentages: using percentages as fractions, using percentages to describe change, using percentages for comparisons.	Pg 141: 17-33 odd, 39, 45, 55, 57, 63-75 odd, 81-87 odd, 95, 97, 101
	3B	Putting Numbers in Perspective: Writing large and small numbers, converting to and from scientific notation, arithmetic operations with scientific notation, approximations with scientific notations (through example 2 only)	Pg 157: 19, 21, 23, 25, 29
1	3E	How numbers can be deceiving, unless we interpret them carefully; Simpson's Paradox	Pg 191: 13-19 odd
2 Lab		Review and EXAMINATION 1	
2	4A - 4B	Budget Basics. The Power of Compounding: Simple versus compound interest; the compound interest formula; compound interest as exponential growth. Calculations for different compounding periods: annually; quarterly; $n$ times a year; continuous compounding. Annual Percentage Rate (APR); Annual Percentage Yield (APY); planning ahead with compound interest.	Pg 194: 31 - 34 Pg 223: 33, 43, 47, 53, 55, 59, 65, 67
2 Lab	4C	Savings Plans and Investments: The Savings Plan Formula; planning ahead with savings plans; total and annual return. Brief review of algebra with powers and roots.	Pg 244: 23 - 33 odd
2	4D	Loan Payments, Credit Cards and Mortgages: Loan Basics: principal; annual interest rate; installment loans; The Loan Payment Formula; choices of rate and term. Credit Cards: paying off credit card debt; avoiding credit card trouble. Fixed Rate Mortgages; prepayment strategies;	Pg 263: 31, 39, 45, 47
2 Lab		Review and EXAMINATION 2	
2	5A	Population, sample, basic steps in a statistical population, sample, basic steps in a statistical study, sampling methods, treatment and control groups, single-blind and double-blind experiments, margin of error in a confidence interval	Pg 307: 15-19 odd, 27-39 odd, 47
1 Lab	5B	Bias in choosing a sample, variables of interest in a statistical study, guidelines for evaluating a statistical study	Pg 318: 9-19 odd
1 Lab	5C	Frequency table, relative and cumulative frequency. qualitative and quantitative data, bar graphs, pie charts, histogram, line chart, time-series diagram	Pg 332: 15-27 odd
1	5E	Correlation, scatter diagram, possible explanations for a correlation, cause-and-effect relationship, guidelines for establishing causality	Pg 364: 13 - 16
1	6A	Mean, median, mode, outlier, symmetry and skewness, variation,	Pg 379: 13, 15, 21 - 25 odd
1	6B	Range, quartiles, five-number summary, boxplot, standard deviation	Pg 389: 13, 15a-d, 21

2 Lab	6C	Normal distribution, 68-95-99.7 rule, standard score (z-score), percentiles	Pg 399: 19-23 odd, 29, 31
2	6D	Statistically significant, sampling distribution, confidence interval, hypothesis testing	Pg 410: 21, 27, 33, 39
2 Lab		Review and EXAMINATION 3	
2	7A	Fundamentals of Probability: Outcome, event, theoretical and empirical probability, probability distribution, odds	Pg 426: 23, 27, 31-43 odd, 51-61 odd, 65 67
3	7B	Combining Probabilities: independent, dependent, overlapping and non-overlapping events	Pg 437: 11, 13, 19, 27, 29, 31, 35, 47, 45, 47, 51
2 Lab	7C, 7D	Law of Large Numbers, expected value, gambler's fallacy. Assessing Risk: accident and death rate, life expectancy	Pg 445: 15-23 odd Pg 455: 15, 25, 39
2	7E	Counting and Probability: arrangement with repetition, permutations, combinations	Pg 466: 23-433 odd, 47-53 odd
2 Lab		Review and EXAMINATION 4	
2 Lab	12A	Election Rules: Majority rule; the American electoral system; super-majority rules; the filibuster; vetoes and overrides; constitutional amendments; plurality and majority; runoff elections.  Preference-schedule election methods: pluralities; single runoffs; sequential runoffs; successive eliminations; the Borda count and other point systems; pairwise comparisons and the Condorcet paradox.  Analysis and comparison of the various election methods.	Pg 637: 27-33 odd
2	12B	Theory of Voting: The Four Basic Fairness Criteria; determining which of the Fairness Criteria are satisfied by each election method; Arrow's Impossibility Theorem. Approval Voting; coalitions and voting power; electoral vote power.	Pg 647: 35, 37, 45
4 Lab		Review, supplemental material, student presentations	

#### 10. SELECTED BIBLIOGRAPHY AND SOURCE MATERIALS:

1) For All Practical Purposes: Mathematical Literacy in Today's World:, Seventh Edition, W.H. Freeman and Company, 2006, ISBN# 2005933990.

2) Johnson and Mowry, Mathematics: A Practical Odyssey: Fifth Edition, Thompson-Brooks/Cole, 2004, ISBN# 2002115284.

3) Pirnot, Mathematics All Around: Second Edition, Pearson/Addison Wesley, 2004, ISBN# 0201795116.

*Max Tran, Revised Dec. 2017*