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PM

CHAMINADE UNIVERSITY OF HONOLULU

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MATHEMATICS 100 SURVEY OF MATHEMATICS FALL SEMESTER, 1999

INSTRUCTOR: Ms V. KILTY Office: H-18 Phone 739-4681 Home: 395-8258
Office hours: Tues. & Thurs. (to be announced)
and by appointment

SECTION 100 TUES.-THURS. 11.00--12.20 Henry Hall Room 104

TEXTBOOKS: Smith, Karl J., THE NATURE OF MATHEMATICS, 8th Edition, 1998, Brooks/Cole Publishing Co., Pacific Grove, Calif., 93950. ISBN 0-534-34988-9. Pappas, Theoni, The Joy of Mathematics, 1989, World Wide Publ./Tetra, San Carlos.CA, 94070, ISBN: 0-933174-65-9

COURSE DESCRIPTION: (3 CREDITS) Introductory course for humanities majors. Selected topics to acquaint the student with the field of mathematics. Emphasis on pattern recognition, critical and deductive reasonings. Fulfills Track A general education requirements in mathematics. This course does not prepare for MA103,110, or MA210. EN102 and COM140 are recommended before taking this course.

OBJECTIVES: To acquaint the student with a wide variety of topics in mathematics with emphasis on mathematical reasoning: to encourage a logical approach to the solution of problems in mathematics: to create a positive attitude towards mathematics and to foster an appreciation of the beauty and power of mathematics. It is not a review of elementary and high school mathematics.

EVALUATION: Final grade for the course will be based on:

a. Homework & Class Participation: Includes group miniprojects, Notebook, Attendance and tardiness --30%
b. Individual independent research project--10%
c. Midterm Exam and Tests--30%
d. Final Comprehensive Exam 30%

ATTENDANCE: A student should be aware that instruction in class will include a significant amount of material which is not otherwise available. Also note that class participation is a part of your grade. Absence should not be taken lightly.

HOMEWORK: All assigned homework MUST be submitted on its "due date". Collected homework will be corrected and returned promptly. If a test is missed because of an unavoidable and varifiable reason, see the instructor immediately--
--BEFOREHAND --is preferable. Makeup MAY be allowed, at the sole discretion of the Instructor.
After an opportunity to ask questions, students may be called on to present their homework solutions at the next class meeting.

Students are to keep a notebook for the semester which is to include home practice assignments and other materials which will be specified in class. This notebook will represent a major part of the homework grade percentage.

The required individual project will involve independent research and a class presentation. Group projects require the same.
Each student hereby acknowledges an understanding of the University regulations regarding. plagarism and academic dishonesty as stated in the College Catalog.

COURSE OUTLINE: A wide variety of topics will be introduced to meet the objectives of the course. The textbook will serve as the starting point to explore these topics, and homework will be assigned from it as well as from supplementary sources including library reference books and instructor provided materials. Mathematical puzzles and games will be used frequently.

Each student should have a calculator (with exponential functions), a compass to draw circles, protractor, straightedge, colored pencils or pens, required types of graph paper, and various other materials as required during the semester. Access to a computer is helpful but not required.

Most, but not all, of the following topics will be covered. Selected topics may include but are not limited to:
The nature of problem solving
How to use your calculator
Inductive and deductive reasoning, mathematical patterns, sets, logic, Venn diagrams
Pascal Triangle and its many applications
Binary and number systems in other bases
Fibonacci Sequence and other number sequences
Spiral of Archimedes, the Golden Ratio
Applications of Ratio, Proportion and Percent
The power of Compound Interest
Geometric topics: area, volume, perimeter,similar triangles, Pythagorean Theorem with applications, Euler-Descartes formula, Mobius strips, Klein bottles, networks, topography, genus of objects, four-color map theorem
Fractals: Their beauty and uses, fractal and higher dimensions, non-Euclidian geometry
Sieve of Eratosthenes, prime numbers, factorization, divisibility
Magic Squares
Simple algebraic equations and operations
Famous mathematical paradoxes and problems
The nature of Computers; their history, importance, fundamental principles, uses,etc.
Statistics: with applications, measures of central tendency, deviation, normal curve of distribution, and "How To Lie With Statistics".
Probability: applications, fundamental counting principle, combinations, permutations
Mathematical Illusions
What is Infinity?

NOTES:

Probably you have not taken a math class like this one before. Note that it is a SURVEY of math. It's purpose is not to teach high school math, but rather a course which will introduce you to some unexpected facets and applications of math which you may not have considered mathematical at all. Success in this course will depend on your willingness to do some original and independent thinking, to persevere in your search for solutions, to use your imagination, and to set aside mathematical prejudices (remember, "prejudice" means to prejudge. Have you pre-judged math for whatever reason without exploring its possibilities for enriching your thinking and your life?

Mathematics is not a "dead" subject. It is changing our lives on a daily basis: no math, no computers or calculators, no telephone or TV, no eyeglasses---the list goes on and on. Did you know that you can be a millionaire by the time you are 65 for a relatively small investment at the age of 20 by the power of compound interest? Albert Einstein called that formula the most amazing formula he knew. Do you think Ed McMann has $10,000,000 in hand when he rings your doorbell?

Just as you cannot be a great, or even good, ball player or pianist, or whatever, without going to practice and practice on your own, so you cannot master math without practice. Math practice is called "homework". I do not intend to do an example on the board and send you home to do 20 more just like it--that is slavery. My aim is to get you to THINK for yourself. Granted, that is more work for you, but the only way to learn is to understand--that is, to "see it for yourself". So here goes for a successful semester.

MATH 100 LESSON # 1 PASCAL TRIANGLE FALL, 1999

READING ASSIGNMENT

1. Text: pp. viii through ix (Preface) and page xiii (To the Student) and pp. (2--8)
2. Joy of Mathematics (JM): "Introduction" page and pp 40-41, 88, 137, 184-186
3. Thumb through your text and JM to become familiar with their format, read a bit here and there of its cartoons and special features,.
4. ***Construct*** the first 16 rows of the Pascal Triangle
   Label the sum of each row and also express that sum as a power of 2.
   What is the formula (rule) for finding the sum of any row?
5. ***Write approximately one page*** in which you discuss your attitudes towards mathematics. Express your honest feelings. Tell of any good or bad experiences, discuss your strengths and weaknesses, your hopes, your fears. Would you enrol in any math class as an elective if it were not required? Do tests make you nervous or anxious, and if so, why do you think this is true? Do you plan to teach math to elementary students? What do you consider the most important attributes of a good math teacher?
6. ***Write an analysis (about 1 page)*** of how the reading in Item 1 above applies to you personally.
   Include in this the questions (1--5) on page 15 as they apply .

HAND IN 5,AND 6 at next class session

MATH 100 LESSON #2 CRITICAL THINKING & PROBLEM SOLVING

HAND IN TODAY---Items 5 and 6 from Lesson # 1

CLASS ACTIVITY

Review Pascal Triangle for completeness
Discussion: Set 1.1 , Ditto #1, Ditto #2, 16page Ditto "Critical Thinking and Problem Solving"

HOMEWORK-- Set 1.1 Ex. 37,38,39,and all of (44--57)
Ditto #1 ***For Further Thought*** **--Logic puzzles**
Ditto #2 ***Inductive Reasoning*** **--Circles**
Read 16 page handout--*Critical Thinking & Problem Solving*

Put all of this homework in your NOTEBOOK except the **Circles** which are to be **handed in** at the next class meeting for grading.