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SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

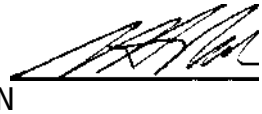
COURSE TITLE: MATHEMATICS

CODE NO. MTH 254-4 SEMESTER:

PROGRAM: ARCHITECTURAL/COMPUTER ENGINEERING, CIVIL, ELECTRICAL, ELECTRONIC, AND MECHANICAL TECHNICIANS

AUTHOR: W. MACQUARRIE

DATE; AUGUST 1991 PREVIOUS OUTLINE DATED: JUNE 1988

APPROVED: 

DEAN DATE/'

MATHEMATICS | MTH 254-4

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TOTAL CREDIT HOURS: 64

PREREQUISITE(S): MTH128-4, MTH220-5 or MTH426-4

I. PHILOSOPHY/GOALS:

When the student has successfully completed this course, he will have demonstrated an acceptable ability to pass tests based upon the course topics as listed elsewhere. If, after completing the course, the student takes further courses (or employment) in which he is required to apply this material, he/she should then, through practice be able to develop a good command in this subject matter.

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will:

1. Use special products, factoring, lowest common multiple procedures to manipulate technical scientific formulae.
2. Be able to solve quadratic and simultaneous equations.
3. Calculate distances, areas and volumes on/of solid figures and calculate various weights and costs of composite shapes.
4. Understand and use algebra techniques and graphs to study straight lines and the conic sections.
5. Use analytic geometry and various algebraic processes to find a linear or non-linear empirical equation from laboratory raw data.

The basic objectives are that the student develop an understanding of the methods studied, demonstrate a knowledge of the facts presented and show an ability to use these in the solution of problems. To accomplish these objectives, exercises are assigned. Test questions will be of near equal difficulty to questions assigned in the exercises. The level of competency demanded is the level required to obtain an overall passing average on the tests. The material to be covered is listed below.

III. TOPICS TO BE COVERED:

1. Algebra review including special products, factoring, lowest common multiple, exponents, formula manipulation, quadratic and systems of equations.
2. Solid Mensuration.
3. Analysis Geometry of straight lines and conic sections.
4. Linear and on-linear empirical equations.

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IV. LEARNING ACTIVITIES:

TOPIC NO,	PERIODS	DESCRIPTION	**REQUIRED RESOURCES**
			ESSENTIALS OF MATHEMATICS PERSON, 5TH EDITION
(1)		ALGEBRA REVIEW -special products, factoring -lowest common multiple -exponents -formula re-arrangement -quadratic equations (complete the square) -simultaneous equations	Ch.13 Pgs. 209-233, Ex. 13.1,13.2,13.3,13.4,13.5, 13.6,13.7,13.10,13.11, 13.12,13.13,13.16 Pgs. 30-32, 248, Ex. 2.4 Handout Pgs. 75,76, 141-143, 150-159, 331-349, Ex. 10.1, 18.1, 18.2, 18.3 Ch.ll and 15, Pgs. 173-186, 259-276, Ex. 11.3, 15.4, 15.5, 15.7 Ch.20, Pgs. 376-392, Ex. 20.2,20.3(Emphasize),20.4
(2)	16	SOLID MENSURATION -composite distances -composite areas -composite volumes,weights -cost estimates	Ch.17, Pgs. 319-323, Ch. 16, Pgs. 284-300, Ex. 17.2,17.3,16.1,16.2,16.3 (Emphasize), 16.5 Review Chapters 26 to 33 Misc. problems from each exercise. Handout sheets of composite problems by the professor.
(3)	16	ANALYTIC GEOMETRY -points & straight lines -conic sections - circle parabola, ellipse, axis translation -general 2nd degree equation -graphs properties and equations of each	Ch. 17, Pgs. 314-318, 326-330 Ch. 23, Pgs. 448-460 Handout sheets - college manuscript problems
(4)	7	EMPIRICAL EQUATIONS -linear empirical equations; two pt. method, method of averages, method of least squares (optional) -non-linear equations; general polynomial function, power functions (3-methods)	RICE & KNIGHT 2nd edition, Ch. 6 Handout sheets provided

(Computer Eng., Electrical, Electronic)
(Civil, & Mechanical Technicians)

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IV. LEARNING ACTIVITIES:

TOPIC NO.	PERIODS	DESCRIPTION	**REQUIRED RESOURCES**
			Text: Basic Technical Mathematics with Calculus - A.J. Washington
(1)		ALGEBRA REVIEW -special products/ factoring	Pages 149-162, Ch. 5, Ex. 5.1,5.2,5.3, Pg.31-34, Ch.l, Ex. 1.9
		-lowest common multiple (L.C.M.)	Ex. Handout Sheet
		-exponents	Ch.l Pgs. 14-20, Ex. 1.5 Ch.10, Pgs.288-298, Ex. 10.1,10.2,
		-formula re-arrangement	Ch.l Pgs. 38-44,Ex.1.11,1.12
		-quadratic equations (complete the square)	Ch.5 Pgs. 177-184, Ex.5.7
		-simultaneous equations	Ch.6 Pgs. 190-193, Ex.6.2 Ch.4 Pgs. 116-126, Ex.4.3, 4.4, Pgs. 133-137 Ex.4.6
(2)	16	SOLID MENSURATION -composite distances -composite areas -composite volumes,weights -cost estimates	Appendix "C" Pgs. A-18 to A-25 Hand out sheets of composite probes by the professor.
(3)	16	ANALYTIC GEOMETRY -points & straight lines	Ch.2 Pgs. 54-64, Ex. 2.3,2.4, Pgs. 109-116 Ex. 4.2
		-conic sections - circle, parabola, ellipse, axis translation	Ch.20 Pgs. 558-586 & 593-600 Ex. 20.1, 20.2, 20.3, 20.4, 20.5, 20.7, 20.8
		-general 2nd degree equation	
		-graphs, properties & equations of each	
(4)		EMPIRICAL EQUATIONS -linear empirical equations, -2 pt.method, method of averages, method of least squares (optional)	Rice & Knight 2nd Edition Ch. 6 Pgs. 334-341 Teacher provided handout sheets.
		-non-linear empirical equations, general polynomial function, power function (3 methods)	Ch.14, Pgs. 334-341 Teacher provided handout sheets.

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V. EVALUATION METHODS:

The students will be assessed by written tests, including major periodic tests based upon large blocks of the subject matter and some unannounced short quizzes on current work, the latter being given at the discretion of the instructor. A final test on the whole course may also be included. A letter grade will be based upon a student's average of all his test results. See also the mathematics department's annual publication "MATHEMATICS DEPARTMENT EVALUATION GUIDELINES" for further details. This publication is made available to the students early in each academic year.

GRADING:
A+ = 90 - 100%
A = 80 - 89%
B = 65 - 79%
C = 55 - 64%
I, X or R = less than 55%

VI. REQUIRED STUDENT RESOURCES:

Person, R., "Essentials of Mathematics", (5th Edition), Wiley Publ. **OR**

Washington, "Basic Technical Mathematics with Calculus", 5th edition, Benjamin Cummings (Metric Version).

VII. SPECIAL NOTES:

Students with special needs (e.g. physical limitations, visual impairments, hearing impairments, learning disabilities) are encouraged to discuss required accommodations confidentially with the instructor.

Your instructor reserves the right to modify the course as he/she deems necessary to meet the needs of students.