UNIVERSITY COLLEGE OF THE FRASER VALLEY

COURSE INFORMATION

DEPARTMENT: MATHEMATICS **IMPLEMENTATION DATE:** Jan.1994

Mathematics 322	Complex Variables	3
NAME & NUMBER OF COURSE	**DESCRIPTIVE TITLE**	**UCFV CREDIT**

CATALOGUE DESCRIPTION:

An introduction to complex analysis, and its applications. Topics include: Algebra and geometry of the complex plane, analytic functions, contour integration, residue theory, conformal mappings.

COURSE PREREQUISITES: Math 211

COURSE COREQUISITES:

HOURS PER TERM FOR EACH STUDENT	**Lecture**	**60 hrs**	**Student Directed Learning**		**hrs**
	Laboratory	**hrs**			
	Seminar	**hrs**	**Other - specify:**		
	Field Experience	**hrs**	_____		**hrs**
			TOTAL	**60**	**HRS**

UCFV CREDIT TRANSFER ☐ **UCFV CREDIT NON-TRANSFER** ☐ **NON-CREDIT** ☐

TRANSFER STATUS (Equivalent, Unassigned, Other Details)

UBC credits TBA

SFU credits TBA

UVIC units TBA

Other

Math Cirr. Committee	J.D. TUNSTALL Ph.D.
COURSE DESIGNER	**DEAN OF ACADEMIC STUDIES**

Math 322
NAME & NUMBER OF COURSE

COURSES FOR WHICH THIS IS A PREREQUISITE:	**RELATED COURSES**
None	Upper level Physics and Math courses

TEXTBOOKS, REFERENCES, MATERIALS (List reading resources elsewhere)

TEXTS: Complex Variables and Applications, R.V. Churchill and J.W. Brown, McGraw-Hill.

OBJECTIVES: The student will be introduced to the fundamental ideas of complex analysis as they are needed in physics, engineering and mathematics itself.

METHODS:

STUDENT EVALUATION PROCEDURE:

Students will write 2 to 3 midterm exams during the semester, as well as a cumulative final exam. They will also be expected to turn in assignments periodically. The approximate weightings will be as follows:

Midterm exams	40%
Final exams	40%
Assignments	20%

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COURSE CONTENT

An introduction to the theory and applications of complex numbers. Topics will include:

1. The complex number field (modulus, conjugate, functions, regions, n'th root of unity, the fundamental theorem of algebra.)

2. Analytic functions (Cauchy-Riemann equations, exponential functions, log function, trig. functions, branch points, harmonic functions.)

3. Curves and contour integration. (Cauchy's theorem, Cauchy's integral formula, the maximal principle.)

4. Taylor series and Laurent series, term-by-term differentiation and integration.

5. Singularities, residues and poles, the residue theorem and applications.

6. Introduction to conformal mapping. Bilinear transformations, Schwartz-Christoffel transformation (time permitting.)

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