Marshall University
MTH 360 Syllabus

Course Title/Number	MTH 360 Sec 101 (CRN 3088)
Semester/Year	Fall 2015
Days/Time	Monday, Wednesday 5:00-6:15 p.m.
Location	SH 511
Instructor	Dr. Evelyn Pupplo-Cody
Office	Morrow Library 106
Phone	(304) 696-3047
E-Mail	pupploco@marshall.edu
Office Hours	M, T, W, R 1:30 – 2:30 and by appointment
University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to www.marshall.edu/academic-affairs/policies/. Academic Dishonesty/Excused Absence Policy for Undergraduates/Computing Services Acceptable Use/Inclement Weather/Dead Week/Students with Disabilities/Academic Forgiveness/Academic Probation and Suspension/Academic Rights and Responsibilities of Students/Affirmative Action/Sexual Harassment

Course Description: From Catalog

An introductory survey of complex numbers, analytic functions, properties of elementary functions, integrals, series, residues and poles, with a focus on practical applications.

The table below shows the following relationships: How each student learning outcome will be practiced and assessed in the course.

Student Learning Outcomes	**How students will practice each outcome in MTH 360**	**How student achievement of each outcome will be assessed in MTH 360**
Students will demonstrate an ability to interpret and utilize complex numbers algebraically, geometrically, and topologically.	Discussions, group work, board work, low-stakes writing, homework Chapter 1 (Mathews & Howell)	Homework, quizzes, and exams.
Students will demonstrate an ability to apply concepts of real variable calculus to the complex variable setting.	Discussions, group work, board work, low-stakes writing, homework Chapters 2, 3, 4, and 7 (Mathews & Howell)	Homework, quizzes, and exams.
Students will apply their knowledge of complex functions to create images of	Discussions, group work, board work, low-stakes writing,	Homework, quizzes, project, and exams.

important sets and interpret complex functions and their applications.	homework Chapters 5 and 6 (Mathews & Howell)	
Students will apply Residue Theory to find real solutions to real integrals using complex integrals.	Discussions, group work, board work, low-stakes writing, homework Chapter 8 (Mathews & Howell)	Homework, quizzes, and exams.

Course Objectives

Explore the properties of the complex number system algebraically, geometrically, and topologically.
Learn functions and mappings in the single variable complex setting.
Apply and expand knowledge of real variable calculus to complex variables.
Learn fundamental concepts, such as analyticity, residues, and singularities, which make complex variables a unique branch of mathematics.

Required Texts, Additional Reading, and Other Materials

- Complex Analysis For Mathematics and Engineering, 6th Edition, by John H. Mathews and Russell W. Howell (ISBN 978-1-4496-0445-5)
- Notebook
- Calculator
- Mathematica or similar software that works with complex functions

Course Requirements/Due Dates

Exam 1 on Monday, September 28, 2015
Exam 2 on Monday, November 2, 2015
Exam 3 on Monday, December 7, 2015 from 5:00 until 7:00

Grading Policy

Each examination (two in-class exams and a final exam) will be worth 75% of the semester grade. Homework and/or quizzes will be worth 15% of the semester grade. The Project will be worth 10% of the grade.

90.00 – 100	A
80.00 – 89.99	B
70.00 – 79.99	C
60.00 – 69.99	D
Below 60.00	F

Attendance Policy

Students are expected to attend each class. Unexcused absences from **three** classes will result in a reduction of one letter grade for the semester; unexcused absences from **four or more** classes will result in an F. To obtain an excused absence, please go to the Dean of Students' Office in the MSC. Students **must** notify the instructor by phone or e-mail **prior to** an exam if they cannot take a scheduled exam. Students must present a serious reason for missing any exam. Makeup exams will be given to students outside of class time at the convenience of the instructor.

Plagiarism Policy

Plagiarism (stealing) will not be tolerated in any way, shape, or form. Students who plagiarize (including sharing files for assignments) will receive a zero for that assignment.

Computers

Students will be required to use Mathematica or similar software that works with complex functions.

Calculators

Students are required to have a graphing calculator during the course.

Course Schedule and Homework

Mathews–Howell Complex Analysis , 6th Edition

MTH 360 Sec 101 Weekly Schedule and Homework

Week	Topic	Reading	Writing
1	Course Introduction Algebra 1 Geometry 1	pp. 1–10 pp. 11–19 pp. 21–25	p10: 1, 2, 3, 5ab, 7 p19: 3, 5, 6ab, 7, 9 p25: 3bd, 6, 7, 17, 22
2	Geometry 2 Algebra 2	pp. 27–34 pp. 36–41	p34: 1abcd, 2b, 4, 5abcd, 9 p41: 2, 5abd, 7, 9, 11
3	Topology Functions and Linear Maps Power Functions	pp. 43–50 pp. 53–65 pp. 67–73	p50: 1ab, 3ab, 5b, 9b, 17 p65: 3ab, 7, 8, 9b, 13b p73: 1c, 3, 6, 7, 9
4	Limits and Continuity Review; Branches of Functions Reciprocal Transformation	pp. 75–82 pp. 84–89 pp. 90–95	p82: 1de, 2, 6, 10, 11 p89: 1ab, 2, 4, 6, 8 p95: 1, 4, 10, 11, 15
5	Differentiable and Analytic Functions Cauchy-Riemann Equations Review	pp. 97–102 pp. 104–114 Review	p102: 1, 2, 7ab, 11, 13 p114: 1cd, 3, 6, 11ab, 15 Review
6	**Exam 1** Harmonic Functions Sequences and Series	None pp. 116–123 pp. 127–135	None p123: 1, 2, 4, 5ab, 6 p135: 1, 5, 7, 12, 17
7	Julia and Mandelbrot Sets (Project) The Geometric Series Power Series Functions Review	pp. 136–143 pp. 145–150 pp. 151–157 Review	p144: 4, 5, 7, 9, 11 p150: 1, 2, 3, 5ab, 12 p157: 3abcde, 4, 6, 9, 12 Review
8	Complex Exponential Complex Logarithms Complex Exponents	pp. 159–164 pp. 167–172 pp. 174–179	p164: 1, 3, 4ac, 5bd, 12 p172: 1abef, 3ab, 4, 9, 10 p179: 1ab, 2ab, 3, 7, 8
9	Complex Trigonometry Complex Integrals Complex Integrals	pp. 180–190 pp. 199–203 pp. 204–217	p190: 1, 2, 5b, 6ab, 11 p203: 1ab, 2, 3, 4ab, 5 p218: 3, 5, 9, 10, 11
10	The Cauchy-Goursat Theorem (mechanics) Cauchy-Goursat (proofs) Fundamental Theorems	pp. 220–233 Review pp. 235–239	p233: 1, 2, 3, 4, 5 Review p239: 3, 5, 7, 11, 17
11	Review **Exam 2** Cauchy Integral Formulas	Review None pp. 241–245	Review None p245: 1, 3, 5, 13, 15
12	Morera and Liouville Uniform Convergence Taylor Series	pp. 247–253 pp. 255–261 pp. 262–269	p253: 2, 5, 6, 7, 11 p261: 3, 5, 6, 7, 9 p270: 1, 4, 5, 7, 9
13	Laurent Series Singularities, Zeros, and Poles The Residue Theorem	pp. 273–280 pp. 282–289 pp. 297–305	p280: 1, 2, 3, 6, 12 p289: 1ad, 2ad, 3ad, 5, 6 p305: 1ac, 3ac, 4, 5, 7
14	Trigonometric Integrals Improper Integrals Review	pp. 308–311 pp. 312–316 Review	P311:1, 3, 5, 6, 8 p316: 1, 3, 5, 7, 9 Review
	Final Exam		