

**Marshall University**  
**Math 460 / 640: Complex Variables 1**

|                          |                                                                          |
|--------------------------|--------------------------------------------------------------------------|
| <b>Semester and Year</b> | Fall 2014                                                                |
| <b>Course Title</b>      | Complex Variables 1                                                      |
| <b>Course Number</b>     | Math 460 / 640                                                           |
| <b>Section Number</b>    | 101                                                                      |
| <b>CRN</b>               | 3276 / 3296                                                              |
| <b>Days and Time</b>     | Monday, Wednesday, Friday : 2:00pm – 2:50pm                              |
| <b>Location</b>          | Smith Hall 509                                                           |
| <b>Credit Hours</b>      | 3                                                                        |
| <b>Prerequisites</b>     | MTH 231 / 527                                                            |
| <b>Instructor</b>        | Dr. Anna Mummert                                                         |
| <b>Office</b>            | Smith Hall 721                                                           |
| <b>Phone</b>             | 304 696 3041                                                             |
| <b>E-mail</b>            | mummerta@marshall.edu                                                    |
| <b>Office Hours</b>      | Tuesday, Thursday : 1:00pm – 3:00pm<br>other office hours 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

<http://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, and Sexual Harassment.

**Course Description**

MTH 460 - Complex Variables I. Complex numbers, analytic functions, properties of elementary functions, integrals, series, residues and poles, conformal mapping. PR: MTH231. 3 hours.

MTH 640 - Complex Variables I. Complex numbers, analytic functions, properties of elementary functions, integrals, series, residues and poles, conformal mapping. PR: MTH527. 3 hours.

| <b>Student Learning Outcomes</b><br>for this course                                                                                                          | How students will practice each<br>outcome in this course | How student achievement of<br>each outcome will be assessed<br>in this course |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------------------------|
| Students will describe the main ideas of the algebra and geometry of the field of complex numbers.                                                           | In class activities, Homework                             | Exams                                                                         |
| Students will identify and use analytic functions appropriately.                                                                                             | In class activities, Homework                             | Exams                                                                         |
| Students will compute derivatives and integrals of analytic functions.                                                                                       | In class activities, Homework                             | Exams                                                                         |
| Students will describe the main ideas of Calculus over the field of complex numbers: derivative and integral.                                                | In class activities, Homework                             | Exams                                                                         |
| Students will describe how the main ideas of Calculus over the field of complex numbers are different or similar to Calculus over the field of real numbers. | In class activities, Homework                             | Exams                                                                         |
| Students will compute Taylor and Laurent series of appropriate functions.                                                                                    | In class activities, Homework                             | Exams                                                                         |
| Students will identify and use residues, poles, and zeros, such as required in Cauchy's Residue Theorem.                                                     | In class activities, Homework                             | Exams                                                                         |

### **Required Texts**

Brown and Churchill. 2009. *Complex Variables and Applications*, 8th edition. McGraw-Hill.

The topics covered in this class correspond to Chapters 1 – 7 from the textbook.

### **Late assignments**

Late assignments will only be accepted with an Excused Absence – university-sponsored activity, student illness, immediate family emergency, short-term military obligation, jury duty or court appearance, religious holiday. Please read the university policy on how to secure an Excused Absence. Most excused absences are obtained from the Dean of Student Affairs.

Late assignment must be turned in within 1 week after you return to class.

**Homework:** Homework will assigned from the textbook and due on Mondays (and Wed, Sept 3).

Please bring any questions that you have about the homework problems to class. We will begin every class with your questions.

**Exams:** Two in-class exams will be given during the semester.

- Friday, October 3 – material through Ch 3.
- Friday, November 7 – material through Ch 5.

**Final exam:** The final exam will be given in Smith Hall 509 on

- Monday, December 8, at 12:45pm – 2:45pm

The final exam will be comprehensive.

### **Grading Policy**

Any student caught cheating will receive a 0 on the assignment and Academic Affairs will be notified.

| <b>Assignment</b> | <b>Percent</b> | <b>Final Grade, Percent</b> | <b>Letter Grade</b> |
|-------------------|----------------|-----------------------------|---------------------|
| Homework          | 25             | 90 - 100                    | A                   |
| Exam 1            | 25             | 80 - 89                     | B                   |
| Exam 2            | 25             | 70 - 79                     | C                   |
| Final Exam        | 25             | 60 - 69                     | D                   |
|                   |                | 0 - 59                      | F                   |

### **Attendance Policy**

Attendance will be taken every day. Students who arrive late will be considered absent and will not be given extra time on exams.

If you are absent with an Excused Absence, then please secure an Excused Absence immediately.

If you are absent for any reason, then it is your responsibility to make up any missed material.

### **Calculators and Other Technology**

You may use a calculator on all work and assignments in this class. You may not use your phone, iPad, laptop, etc. as a calculator on any exam.

Cell phones may not be used in class.

### **Course Webpage**

All important course information will be posted on our class MUOnline page.

### **Tentative Course Schedule** : sections covered

|         |               |
|---------|---------------|
| Week 1  | 1-7           |
| Week 2  | 7-10          |
| Week 3  | 12-18         |
| Week 4  | 18-25         |
| Week 5  | 26-32         |
| Week 6  | 33-34, Exam 1 |
| Week 7  | 37-40         |
| Week 8  | 41-46         |
| Week 9  | 48-56         |
| Week 10 | 57-67         |
| Week 11 | 68-69, Exam 2 |
| Week 12 | 70-75         |
| Week 13 | 76-81         |
| Week 14 | 82-84         |

### **University Schedule**

The complete university schedule can be found at [www.marshall.edu/calendar/academic/fall2014.asp](http://www.marshall.edu/calendar/academic/fall2014.asp)