Math 329 Complex Variables Spring 2010

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Text: Complex Variables and Applications by James Ward Brown, Ruel V. Churchill

Course Goals and Content

This course is an introduction to the complex numbers $\mathbb{C}$ and complex functions $f : \mathbb{C} \to \mathbb{C}$. We will study in detail the algebra of complex numbers and the main results of complex function theory including differentiation, analytic functions, meromorphic functions, Taylor and Laurent Series representation of complex functions, integration, residues, and poles. The main content of the course is contained in the first 7 chapters of the text, although we may omit some sections here and there and possibly add some additional topics from later chapters.

Upon completing the course, successful students will be able to compute with complex numbers, understand the nature of analytic and meromorphic functions, be able to compute with such functions, and apply some of the basic results to applications in other areas.

Course Description

The course meets MWF from 8:55 till 10:05 a.m. in PPHAC 331. Homework assignments will be given at each class meeting. Students are expected to complete these assignments by the next class meeting, where they will be discussed. No one can learn mathematics without doing it themselves and so, to the student, homework is the most important part of the course. Since class participation is important, students are expected to attend every class.

Grading

Your final grade will be based on 2-3 hourly exams (about 100 points each), regular graded homework assignments (about 200 points total), class participation (about 50 points), cultural awareness (about 50 points, see below), and a comprehensive final exam (180-200 points). The exams may be in-class, take-home, or a combination of the two.

Attendance

Class attendance is required. You are responsible for all work covered in class and all assignments, even if absent from class. If you must miss more than one class due to illness or emergency, you should notify the instructor. **Make-up tests are given only in extreme cases. If a student has to miss a test it is the student's responsibility to contact the instructor as early as possible.**

You will lose 20% from your class participation grade for each unexcused absence. If you are sleeping in class, you are not there. If you feel the need to leave class before it is over, even if you come back, you are not there. In other words, in any of these cases you will be considered absent and will lose 20% of your class participation grade. You are responsible for all work covered in class

and all assignments, even if absent from class. If you must miss more than one class due to illness or emergency, you should notify the instructor.

Cultural Awareness

One goal for this course is to develop an appreciation of the beauty and utility of algebra in particular and mathematics in general. To help foster this appreciation you are encouraged to spend some time outside of class thinking and discussing algebra and mathematics.

There are no specific assignments for this portion of the course but many opportunities for you to satisfy the requirements. Some examples of activities that foster cultural awareness include: attending talks, giving a talk, reading a paper, or solving a problem.

Some typical cultural events include, but are not limited to

- attending an epsilon talk (5 points)
- attending a Mathematics Colloquium at Moravian (7 points)
- attending a math talk at another LVAIC school (9 points)
- attending the Moravian College Student Mathematics Conference in February (? points)
- review an article on algebra and present it to the class (7 points)
- solving a problem outside the scope of the class (5-infinite points) with 5 additional points available for presenting the solution to the class

If you attend an event relevant to your mathematical growth you need to write a short paper that explains what the event was and how it deepened your appreciation of algebra or mathematics.

At most 3 epsilon talks and 3 Mathematics Colloquiums may count towards your cultural awareness grade. However, once you have reached the 40 points for your cultural awareness grade, you may do additional cultural events for extra credit.

Course Goals

In this course you will be learning the fundamental concepts from the modern theory of algebra. Upon completing the course, successful students will

(a) be able to read, comprehend, and write mathematical proofs,

(b) gain a better understanding of abstract mathematical concepts and why they are important,

(c) improve their communication and technical writing skills by discussing mathematics problems and presenting solutions in written and oral form.

ACADEMIC HONESTY POLICY GUIDELINES

MATHEMATICS COURSES

The Mathematics and Computer Science Department supports and is governed by the Academic Honesty Policy of Moravian College as stated in the Moravian College Student Handbook. The following statements will help clarify the policies of members of the Mathematics faculty.

In all homework assignments which are to be graded, you may use your class notes and any books or library sources. When you use the ideas or thoughts of others, however, you must acknowledge the source. For graded homework assignments, you may not use a solution manual or the help, orally or in written form, of an individual other than your instructor. If you receive help from anyone

other than your instructor or if you fail to reference your sources you will be violating the Academic Honesty Policy of Moravian College. For homework which is not to be graded, if you choose, you may work with your fellow students. You are responsible for understanding and being able to explain the solution of all assigned problems, both graded and ungraded.