

Logarithmic Potentials with External Fields and Distribution of Zeroes of Orthogonal Polynomials

MATH 5399-1

Fall 2012

Course instructor:

Dr. Alexander Solynin

MA 114

MWF

3:00 – 3:50 pm

Office hours:

MWF 10:00-11:00 or by appointment

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TEXT: Your lecture notes.

Complementary texts: *Logarithmic potentials with external fields*. Springer, Berlin, 1997, by Edward B. Saff and Vilmos Totik..

• **Course Description:** This is an introductory course to the Theory of Logarithmic Potentials. We will discuss selected chapters of Edward B. Saff and Vilmos Totik book.

First goal will be to discuss Energy Problem in the complex plane. Then we will study applications of this theory to the theory of special orthogonal polynomials which are solutions to some ODE's.

The prerequisite for the course is a one year course in Complex Variable. Basic knowledge of measure theory and ordinary differential equations is also required.

Learning Outcomes: Upon completion *Logarithmic Potentials with External Fields and Distribution of Zeroes of Orthogonal Polynomials* course students will master concepts and theories of potentials in the complex plane. The main emphasis will be given to applications of these theories to polynomial solutions of Ordinary Differential Equations in the complex plane.

Methods for Assessment of Learning Outcomes: The expected learning outcomes for the course will be assessed through graded activities and ungraded activities. The graded activities include exams, homework, quizzes, and research papers. The ungraded activities will be used to monitor your progress. A variety of these ungraded assessment techniques may be employed, including problems to be completed during class, direct questioning of students, answering students questions in class, one-minute classroom assessment techniques, and discussions during office hours.

Students with Disabilities: Any student who because of a disability may require special arrangements in order to meet course requirements should contact the instructor as soon as possible to make any necessary accommodations. Students should present appropriate verification from AccessTECH. No requirement exists that accommodations be made prior to completion of this approved university procedure.

Absence due to religious observance: The Texas Tech University Catalog states that a student who is absent from classes for the observance of a religious holy day will be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence. Notification must be made in writing and delivered in person no later than 15th class day of the semester.

Absence due to officially approved trips: The Texas Tech University Catalog states that the person responsible for a student missing class due to a trip should notify the instructor of the departure and return schedule in advance of the trip. The student may not be penalized and is responsible for the material missed.

Academic Integrity: It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. There will be no tolerance for cheating or plagiarism. Texas Tech University policies will be enforced in such cases.

STUDENT EVALUATION:

- A student has a choice either take the Final which is a comprehensive, course wide exam or to work on his/her research project related to this topic and present results upon completion.

- ◆ **December 8 FINAL EXAMINATION 4:30p.m. – 7:00 p.m.** **60 pts**
This exam is scheduled before the semester begins.
Students should **eliminate any conflicts NOW.**

- **MIDTERM EXAM/PRESENTATION:** **40 pts**

- **HOMEWORK** (Problems and Exercises): **40 pts**

- **MAXIMAL TOTAL:** **140 pts**

- **Optional Research Projects:** Research projects are optional and may be used to substitute the Final Exam.

GRADING PROCEDURE:

A - 90 - 100%

B - 80 - 89%

C - 70 - 79%

D - 60 - 69%

F - ≤ 59%

OTHER INFORMATION:

Important Dates:

- August 27 - Classes begin
- September 3 - Labor Day Holiday.
- September 12 - Last day to drop a course without penalty.
- October 29 - Last day to drop a course with penalty.
- November 21-25 - Thanksgiving Vacation.
- December 5 - Last Day of classes.
- December 8 4:30 – 7:00pm MA 114 FINAL EXAM**