Mathematics 6399.01-02I- Special Topics in Mathematics –
Summer I 2017
MTWRF 2:40–4:10p.m., MAGC 1.302

Instructor: Dr. Bao-Feng Feng

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Office Hours: MTWRF: 11:20a.m.-12:00p.m.

Textbook: *Galois’s Theory of Algebraic Equations*
by Jean-Piere Tignol

Prerequisite: Graduate students or with math or engineering major

Material: The material to be covered in this course is mostly in the chapters 2–3, Chapters 6–8 and Chapters 10, 14 of the text.

Grading: There is no written exam. A final report based on your presentation is required. Your attendance for the classes, your presentation performance and the final report will decide your final grade.

Contents: In this special topics, we will follow the history on how to solve algebraic equations: cubic equation and quartic equation, then we will arrive at a modern theory, which is called Galois’s theory. We will study how the mathematicians, such as Lagrange, Vandemonde, Gauss and Galois gave their own contributions on this classical but interesting topic.

**Mandatory Course Evaluation Period**

Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (http://my.utrgv.edu); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades.

**Students with Disabilities**

If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time. Brownsville Campus: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone
at (956) 882-7374 (Voice) or via email at accessibility@utrgv.edu. Edinburg Campus: Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at accessibility@utrgv.edu.

Sexual Harassment, Discrimination, and Violence

In accordance with UT System regulations, your instructor is a responsible employee for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

Course Coverage

Chapter 2

- Section 2.1 Priority disputes on the solution of cubic equations
- Section 2.2 Cardano’s formula
- Section 2.3 Developments arising from Cardano’s formula

Chapter 3

- Section 3.1 The unnaturalness of quartic equations
- Section 3.2 Ferrari’s method

Chapter 6

- Section 6.1 Viete on cubic equations
- Section 6.2 Descartes on quartic equations
- Section 6.3 Rational solutions for equations with rational coefficients
- Section 6.4 Tschirnhaus method

Chapter 7

- Section 7.1 Introduction
- Section 7.2 The origin of de Moivres formula
Section 7.3 The roots of unity
Section 7.4 Primitive roots and cyclotomic polynomials

Chapter 8
Section 8.1 Introduction
Section 8.2 Warings method
Section 8.3 The discriminant

Chapter 10
Section 10.1 The theory of equations comes of age
Section 10.2 Lagranges observations on previously known methods
Section 10.3 First results of group theory and Galois theory

Chapter 11
Section 11.1 Introduction
Section 11.2 The solution of general equations
Section 11.3 Cyclotomic equations

Chapter 14
Section 14.1 Introduction
Section 14.2 The Galois group of an equation
Section 14.3 The Galois group under field extension
Section 14.4 Solvability by radicals
Section 14.5 Applications