MAT285, Differential Equations, 32961, MW 4:30 pm – 5:45 pm, room D 215
Fall 2016
Prof. Larisa Alikhanova

Pre-requisite: MAT K256
Text: Elementary Differential Equations, 6th Edition, C. Henry Edwards and David E. Penney.

Course Description: A continuation of Calculus with introduction of standard techniques of solving differential equations. The following topics will be introduced: first - order differential equations, linear equations of higher order, power series methods, Laplace transform methods, linear systems of differential equations, numerical methods, and modeling by differential equations in a variety of applications in physics, chemistry, engineering, biology, social sciences, and finances.

Measurements Quizzes, projects – 15%, 3 tests, each test – 20%, and final exam – 25%. Grade equivalents: A 93 – 100, A- 90 – 93, B+ 87 -89, B 83 – 86, B- 80 – 82, C+ 77 – 79, C 73 – 76, C- 70 – 72, D+ 67 – 69. D 63 – 66. D- 60 – 62, F below 60.

Attendance: Your attendance in the classroom, participation in classroom work/projects and preparation for each class is required and is essential to success in the course.

Support Services: Tutorial services. Peers. Meeting with me for extra help on an appointment basis.

Office Hours: M W 9:45 am – 10:30 am, 3:15 pm -4:30 pm **Room C104,**
Email lalikhanova@trcc.commnet.edu

Class Cancellation: In case of increment weather, check the college website for class cancellations or call 860-886-0177 for recorded message on the college phone

Plagiarism and Academic Honesty: At Three Rivers we expect the highest standards of academic honesty. The Board of Trustees' Proscribed Conduct Policy prohibits cheating on examinations, unauthorized collaboration on assignments, unauthorized access to examinations or course materials, plagiarism.

MyCommNet Alert: **MyCommNet** is a system that sends text messages and emails to anyone signed up in the event of a campus emergency. Additionally, TRCC sends messages when the college is delayed or closed due to weather. All students are encouraged to sign up for myCommNet Alert. A tutorial is available on the Educational Technology and Distance Learning Students page of the web site.
http://www.trcc.commnet.edu/div_it/educationaltechnology/Tutorials/myCommNetAlert/MIR3.html

MAT285, Differential Equations, 32961, MW 4:30 pm – 5:45 pm, room D 215
Fall 2016
Prof. Larisa Alikhanova

Disabilities If you have a disability that may affect your progress in this course, please meet with a Disability Service Provider (DSP) as soon as possible. Please note that accommodations cannot be provided until you provide written authorization from a DSP.

College Disabilities Service Provider	
Matt Liscum, Counselor (860) 215-9265 Room A113	• Learning Disabilities • ADD/ADHD • Autism Spectrum • Mental Health Disabilities
Elizabeth Willcox, Advisor (860) 215-9289 Room A113	• Medical Disabilities • Mobility Disabilities • Sensory Disability

Digication Statement : All students are required to maintain an online learning portfolio in Digication that uses the college template. Through this electronic tool student will have the opportunity to monitor their own growth in college-wide learning. The student will keep his/her earning portfolio and may continue to use the Digication account after graduation. A Three Rivers General Education Assessment Team will select and review random works to improve the college experience for all. Student work reviewed for assessment purposes will not include names and all student work remain private and anonymous for college improvement purposes. Students will have the ability to integrate learning from the classroom, college, and life in general, which will provide additional learning opportunities. If desired, students will have the option to create multiple portfolios.

MAT285, Differential Equations, 32961, MW 4:30 pm – 5:45 pm, room D 215
Fall 2016
Prof. Larisa Alikhanova

Course outline and Content

Chapter 1 Sec. 1.1-1.8 **8/29/2016 – 9/26/2016**
Differential Equations and Mathematical Models
Integrals as General and Particular Solutions
Slope Fields and Solution Curves (Existence and Uniqueness of Solutions)
Separable Equations and Applications
Linear First Order Equations and Integrating Factors
Substitution Methods and Exact Equations
Population
Acceleration-Velocity models

TEST (Chapter 1) 9/26/2016

Chapter 2, Sec. 2.1-2.8 **9/28/2016 – 10/24/2016**
Second Order Linear Equations
General Solutions of Linear Equations
Homogeneous Equations with Constant Coefficients
Mechanical Vibrations
Nonhomogeneous Equations and Undetermined Coefficients
Forced Oscillations and Resonance
Endpoint Problems and Eigenvalues

TEST (Chapter 2) 10/24/2016

Chapter 3, Sec. 3.1-.3.3 10/26/2016 – 11/07/2016
Introduction and Review of Power Series
Series Solutions Near Ordinary Points

Chapter 4, Sec. 4.1-4.6 11/09/2015 - 11/21/2016
Laplace Transforms and Inverse Transforms
Transformation of Initial Value Problems
Translations and Partial Fractions
Derivatives, Integrals, and Products of Transforms
Periodic and Piecewise Continuous Input Functions
Impulses and Delta functions

TEST (Chapters 3, 4) 11/21/2016

Chapter 5 Sec. 5.1-5.2 **11/28/2016-12/05/2016**
First Order Systems and Applications
The Method of Elimination

Chapter 6 Sec. 6.1-6.3 **12/12/2016 – 12/19/2016**
Numerical Approximation, Euler's Method
The Runge-Kutta Method (time permitting)
Review

FINAL EXAM 12/19/2016

MAT285, Differential Equations, 32961, MW 4:30 pm – 5:45 pm, room D 215
Fall 2016
Prof. Larisa Alikhanova

Outcomes

Upon successful completion of this course, the student will be able to:

1. Solve first order equations – separable, linear .
2. Solve first order equations by substitution method.
3. Solve first order homogeneous, Bernoulli equations.
4. Solve the first order exact differential equations.
5. Solve reducible second order differential equations.
6. Use first order equations for modeling.
7. Identify and solve applications on first order equations.
8. Solver homogenous linear second and higher order DEs with constant coefficients.
9. Solve non-homogeneous nth order linear differential equations by the method of undetermined coefficients.
10. Solve second order eigenvalue problems
11. Solve equations by power series methods.
12. Find Laplace transforms of a function.
13. Find inverse Laplace transforms.
14. Solve initial value problems by Laplace transforms.
15. Identify translation on the s- and on the t – axes.
16. Find transforms of periodic and piecewise continuous input functions.
17. Solve First Order Linear Systems by analytical and numerical methods.
18. Use system of equations to model applications
19. Convert higher order equations to systems of equations.

MAT285, Differential Equations, 32961, MW 4:30 pm – 5:45 pm, room D 215
Fall 2016
Prof. Larisa Alikhanova

Homework(odd numbers): This is a guide only. Assignments may vary.
p. 8. 1 – 9, 13 – 21, 27, 33, 37, 41
p. 17 1 – 21, 27, 29
p. 27 11, 13, 15
p. 43 1 – 27, 33, 35, 39
p. 54 1 – 17
p. 72 1, 5, 7, 11, 15, 17 – 25, 31, 43, 49
p. 83 1 – 11, 15
p. 93 2
p. 111 3, 9, 11, 25, 33 – 41, 47
p. 122 3, 9, 13, 21
p. 134 1 – 13, 23, 33
p. 145 3, 5
p. 161 1 – 19, 21, 23, 31
p. 171 3, 7, 9, 11, 19
p. 179 5
p. 192 1, 3
p. 206 3, 5, 7, 15, 19
p. 216 3, 7, 9, 17
p. 231 3, 9, 9, 17
p. 275 3, 5, 27, 29, 31
p. 287 1 - 9
p. 296 1 – 5, 11, 13
p. 303 1, 5, 7, 15
p. 314 1, 3, 11, 13
p. 324 1, 3, 9
p. 335 1, 3, 5, 11, 13, 15
p. 345 1 - 11
p. 439 1, 5
p. 449 1, 3
p.459 3, 5