



3 credit hours

Where the course fits in the program or study

Prerequisite: Minimum grade of "C" or Special permission from the Instructor

Course Objectives

Course Objectives

1. Course title/number, number of credit hours

Thermal Infrared Remote Sensing and Applications (SI956)

2. Course prerequisites, corequisites, and

3. Course objectives

Version 5.0 (2019)

This is a live on-line course with 2 lab

Learning Objectives

Course Objectives

To provide an understanding of the advanced topics in thermal infrared remote sensing and applications.

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Department of Computer & Electrical Engineering and Computer Science

Florida Atlantic University

Course Syllabus

EECS-4150 - Numerical Methods

Spring 2018

Version 1.0

1. Course Description	
EECS-4150	Numerical Methods
Credit Hours:	3
Prerequisites:	EECS-3100, MATH-2020, MATH-2030
Offered:	Spring
Course Description:	This course covers numerical methods for solving engineering problems. Topics include numerical differentiation, numerical integration, numerical solution of ordinary differential equations, numerical solution of systems of linear equations, and numerical solution of nonlinear equations. The course also includes error analysis and convergence criteria.
2. Learning Objectives	
Upon completion of this course, students will be able to:	<ul style="list-style-type: none">Solve engineering problems using numerical methods.Analyze the accuracy and convergence of numerical methods.Implement numerical methods in software.
3. Course Content	
3.1. Numerical Differentiation	Derivatives, finite differences, divided differences, numerical differentiation formulas, error analysis.
3.2. Numerical Integration	Riemann sums, trapezoidal rule, Simpson's rule, Gaussian quadrature, error analysis.
3.3. Numerical Solution of Ordinary Differential Equations	Initial value problems, Euler's method, Runge-Kutta methods, multi-step methods, stiff equations, error analysis.
3.4. Numerical Solution of Systems of Linear Equations	Matrix operations, direct methods (Gaussian elimination, LU factorization), iterative methods (Jacobi, Gauss-Seidel, SOR), error analysis.
3.5. Numerical Solution of Nonlinear Equations	Root-finding methods (Bisection, Newton-Raphson, Secant, Muller's method), error analysis.
4. Assessment	
4.1. Exams:	Two mid-term exams and one final exam.
4.2. Assignments:	Homework assignments, programming projects, and lab exercises.
4.3. Grading:	Final grade based on exams (60%), assignments (20%), and participation (20%).
5. Special Course Requirements	
All required assignments must be submitted on or before the due date.	

6. References	
6.1. Textbook:	Numerical Methods for Engineers, 7th Edition, by R. C. Hibbit, S. P. Sorensen, and K. S. Chen.
6.2. Software:	Matlab, Octave, or Python for numerical computation.
6.3. Online Resources:	numericalmethodsengr.com, Numerical Methods for Engineers, and other online lecture notes and videos.
7. Contact Information	
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**Department of Computer & Electrical Engineering
and Computer Science
Florida Atlantic University
Course Syllabus**

Week 1: Theoretical background of Thermal Infrared Remote Sensing

Week 2: Geometric Calibration of Thermographic Cameras with lab demonstration

Week 3: Thermal Infrared Spectroscopy in the Laboratory and Field assignments due