ASEN5307 – Engineering Data Analysis Methods - Fall 2021

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Class Time	TTh 2:50 pm – 4:05 pm
Class Location	AERO 111
Class Web Page	http://canvas.colorado.edu
Office Hours	11:00-12:30, 4:15-5:00 TTH & by appt.
Teaching Assistant	(.@colorado.edu)
Required Text	, 2015, 4th Edition by Martin H. Trauth, Springer

Syllabus – ASEN5307
Engineering Data Analysis Methods

I. Introduction

1. Collecting Data
2. Data Calibration and Interpolation
3. Data Editing
4. Presenting Data

II. Statistics and Error Handling

1. Uncertainties in Measurements
2. Empirical Distributions
3. Theoretical Distributions
4. t-test, F-test, F2 test
5. Confidence Intervals
6. Correlation Coefficient
7. Degrees of Freedom
8. Estimation Methods
9. Curve Fitting
10. Covariance and Error Analysis
11. Residual Analysis and Data Editing
12. Linear Regression Analysis
13.

IV. Signal Processing

1. Linear Time Invariant Systems
2. Convolution and Filtering
3. Recursive and Nonrecursive Filters
4. Impulse and Frequency Response
5. Filter Design
    a. Running Mean Filters
    b. Lanczos-window Cosine Filters
    c. Butterworth Filters
    d. Frequency Domain Filtering

V. Spatial Analysis of Data Fields
1. Gridding and Contouring
2. Spherical Harmonics
4. Objective Analysis, Kriging
5. Principal Component Analysis (including SVD)
6. Independent Component Analysis
7. Empirical Orthogonal Functions

SYLLABUS S

addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the

RELIGIOUS HOLIDAYS

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have c