

DATA ANALYSIS: OCN 760/ORE 608

Mark Merrifield

Spring 2007

Description: Covers statistical methods commonly used in the analysis of oceanographic datasets. Familiarity with Matlab or a similar programming language is required.

Office Hours: MF 9-10 AM or by appointment, MSB 317c, 956-6161,
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References: Recommended, not required.

Data Analysis Methods in Physical Oceanography - *Emery and Thomson*
Numerical Recipes - *Press, Flannery, Teukolsky, and Vetterling*
Probability, Random Variables, and Stochastic Processes – *Papoulis*
Random Data: Analysis and Measurement Procedures - *Bendat and Piersol*
Spectral Analysis and Its Applications - *Jenkins and Watt*
Spectral Analysis for Physical Applications - *Percival and Walden*
Spectral Analysis and Time Series - *Priestley*
The Fourier Transform and Its Applications - *Bracewell*
Extreme Value Theory in Engineering - *Castillo*

Grading: 50% Homework, 30% Final, 20% Midterm Exam

Topics:

Random variables	Monte Carlo methods
Probability density functions	Stochastic processes
Moments and expected values	Fourier analysis
Statistics of extreme events	Auto-spectra
Estimation and sample distributions	Rotary spectra
Confidence intervals	Cross-spectra
Hypothesis testing	Digital filters
Regression and correlation	Complex demodulation
Serial correlations and degrees of freedom	Empirical orthogonal functions