

**George Mason University**  
**Electrical and Computer Engineering Department**

**ECE 738: ADVANCED DIGITAL SIGNAL PROCESSING**  
**Spring 2006**

**Syllabus**

Date	Problem Set		Project		Reading	Lecture Topic
	Out	Due	Out	Due		
1/23	1				Ch. 1, 2.0-2.3	Introduction and DSP Review
1/30	2	1			Ch. 3	Random Processes Review
2/6	3	2	I		6.0-6.2, 6.9	Estimation and Optimal Filtering
2/13	4	3			5.0-5.3	Introduction to Nonparametric Spectral Estimation
2/20	5	4			5.5	Multitaper Spectral Estimation
2/27			II	I	5.4	Coherence and Cross Power Spectrum Estimation
3/6						<b>Midterm Exam covers material through 2/20</b>
3/13						<i>Spring Break</i>
3/20	6				9.5-9.6	Minimum Variance, MUSIC, & ESPRIT Methods
3/27	7	6			11.0-11.2	Introduction to Array Processing
4/3			III	II	11.3-11.4	Optimum Array Processing
4/10	8	7			11.6	Introduction to Adaptive Beamforming
4/17	9	8			TBA	Recursive Least Squares Beamforming
4/24	10	9			TBA	Advanced Topic (TBA)
5/1				III		Final Project Presentations
5/15						<b>Final Exam, 4:30-7:15pm</b>

**Reading**

Reading assignments indicated in the syllabus are out of the main textbook for the course: *Statistical and Adaptive Signal Processing* by D.G. Manolakis, V.K. Ingle, and S.M. Kogon (Artech House, 2005). Additional reading may be assigned.

**Homework**

Homework will be assigned weekly. Note that Problem Sets 5 and 10 are for practice; they will not be turned in.

**Projects**

There will be three projects assigned during the term. These projects will involve analytical work, computer simulations, and analysis of real data. For the third project, each student will select a paper from the recent literature to analyze. The final day of class will be devoted to short presentations of these papers.

**Important Dates for Spring 2006**

- February 7: Last date to drop without tuition liability
- February 7: Last date to add courses
- February 24: Last date to drop
- March 12-19: Spring Break
- May 6: Last day of classes
- May 8-9: Reading days (Monday all day; Tuesday until 4:30pm)