

Syllabus

CE 597 Adjustment of Geospatial Observations, Fall 2012

Session	Date	Subject
1	Mon. 20 Aug.	Introduction, course mechanics, Purdue computer resources, measurement errors, functional and stochastic models, redundancy, weights, condition equations, residuals
2	Wed. 22 Aug.	Why least squares? Maximum likelihood
3	Fri. 24 Aug.	Indirect observations, LS objective function, longhand solution
4	Mon. 27 Aug.	Matlab tutorial, matlab programming, vector & matrix review
5	Wed. 29 Aug.	Linear independence/dependence, rank, solution of linear system, condition number, matrix inverse
6	Fri. 31 Aug.	Constrained minimization
	Mon. 03 Sep.	Labor Day Holiday
7	Wed. 05 Sep.	Observations only
8	Fri. 07 Sep.	Matrix derivation, indirect observations
9	Mon. 10 Sep.	Matrix derivation, observations only
10	Wed. 12 Sep.	Applications: curve fitting, surface fitting, leveling
11	Fri. 14 Sep.	Coordinate transformations, 2D rotation matrix
12	Mon. 17 Sep.	Nonlinear equations, models, newton iterations 1D, nD, convergence, strategies for obtaining partial derivatives
13	Wed. 19 Sep.	Nonlinear models, range observation
14	Fri. 21 Sep.	Nonlinear models, azimuth, angle, direction observation
15	Mon. 24 Sep.	Generic network adjustment
16	Wed. 26 Sep.	Matlab symbolic processing
17	Fri. 28 Sep.	Statistics, normal, Chi-sqr, t, F, MVN distributions
18	Mon. 01 Oct.	Covariance matrices
19	Wed. 03 Oct.	Hypothesis tests, Chi-square test
20	Fri. 05 Oct.	Derivation of error propagation law
	Mon. 8 Oct.	October Break (Mon. & Tue.)
21	Wed. 10 Oct.	Error propagation, confidence intervals
22	Fri. 12 Oct.	Eigenvalues & eigenvectors
23	Mon. 15 Oct.	Error propagation, confidence ellipse, confidence circle
24	Wed. 17 Oct.	Rotation matrices & parameterizations

25	Fri. 19 Oct.	Exam 1
26	Mon. 22 Oct.	General LS (mixed model)
27	Wed. 24 Oct.	General LS
28	Fri. 26 Oct.	3D coordinate transformation
29	Mon. 29 Oct.	GPS signal structure
30	Wed. 31 Oct.	GPS signal structure
31	Fri. 02 Nov.	GPS pseudorange observable & adjustment
32	Mon. 05 Nov.	Parameter constraints
33	Wed. 07 Nov.	Parameter constraints
34	Fri. 09 Nov.	Unified LS
35	Mon. 12 Nov.	Unified LS
36	Wed. 14 Nov.	Sequential estimation
37	Fri. 16 Nov.	Sequential estimation
38	Mon. 19 Nov.	Kalman filter
	Wed. 21 Nov.	Thanksgiving Holiday (W,Th,F)
	Fri. 23 Nov.	Thanksgiving Holiday
39	Mon. 26 Nov.	Kalman filter
40	Wed. 28 Nov.	Extended kalman filter
41	Fri. 30 Nov.	Blunder detection, Data snooping, IRLS
42	Mon. 03 Dec.	Blunder detection, L1 norm minimization
43	Wed. 05 Dec.	Blunder detection, L1 norm minimization
44	Fri. 07 Dec.	Last Day of Class
	Mon. 10 Dec.	Final Exam Week (Date of exam TBA)
45	Tue. 13 Dec.	Exam 2 1:00-3:00pm POTR 268
	Fri. 16 Dec.	