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Winter 2011

CS 499/699-01: Computer Programming for Scientific

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CS 499/699 – COMPUTER PROGRAMMING FOR SCIENTIFIC RESEARCH
WINTER, 2011

Instructor: Dr. Michael Raymer
391 Joshi
775-5110
michael.raymer@wright.edu

Room & Time: Mon & Wed, 6:05 – 7:20 pm, 390 Joshi

Office Hours: Mon/Tue/Wed, 2:30 – 4:00 pm; *or by appointment.*

Lecture Schedule:

Week	Topics
1	Scientific Inquiry and Hypothesis Testing, assignment of term project
2	Just one variable: The Gaussian distribution, and maximum likelihood classification, t-tests error types
3	Many variables: Clustering (k-means, hierarchical), cluster validity
4	Many variables: The pattern recognition task, knn classification and overfitting <ul style="list-style-type: none">o Student discussion/paper
5	Normalization and data transformation
-	Midterm Exam
6	Bayesian classification
7	Linear projections: PCA and LDA <ul style="list-style-type: none">o Student discussion/paper
8	Feature selection and marker identification
9	Student Presentations
10	Student Presentations & Advanced Topics

Some possible advanced topics:

- Support Vector Machines
- Boosting and Bagging, Random Forests
- Genetic Algorithms, Feature Selection and Extraction
- Neural Networks, Machine Learning
- Orthogonally-corrected Projection to Latent Structures
- Bootstrapping and empirical modeling

Grading:	Midterm Exam = 25%	90 – 100 = A; 80 – 89.9 = B;
	Final Exam = 25%	70 – 79.9 = C; 60 – 69.9 = D;
	Presentations = 20%	< 60 = F
	Class Participation = 5%	I <i>may</i> curve the final letter
	Term Project = 25%	grades based on the overall distribution of scores.

Web Page: <http://pilot.wright.edu> – Check this page often for announcements, assignments, and other important information.

Academic Integrity:

Discussion of course contents with other students is an important part of the academic process and is encouraged. However, it is expected that class assignments will be completed **on an individual basis**. Students may discuss general concepts with one another, but may not, under any circumstances, work together on the actual implementation of any course assignment, unless specifically authorized in the written instructions for the assignment. If you work with other students on “general concepts” be certain to **acknowledge the collaboration** and its extent in the assignment. Unacknowledged collaboration will be considered dishonest. “Code sharing” (including code from previous quarters) is strictly disallowed. “Copying” or significant collaboration on any graded assignments will be considered a violation of the university guidelines for academic honesty. If the same work is turned in by two or more students, **all parties involved will be held equally accountable for violation of academic integrity**. You are responsible for ensuring that other students do not have access to your work: do not give another student access to your account, do not leave printouts in the recycling bin, pick up your printouts promptly, do not leave your workstation unattended, etc. If you suspect that your work has been compromised notify me immediately. NOTE: Failure to attend the first day of class, during which time I will explain these academic honesty policies in detail, does not excuse you from following these policies. If you have any questions about collaboration or any other issues related to academic integrity, please see me immediately for clarification.

Other notes:

Students with disabilities or any additional needs are encouraged to set up an appointment at their convenience to discuss any classroom accommodations that may be necessary.