



## Learning Community

General Education Biology College Algebra Fall 2007

Juan Morata Biology

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Miguel Montanez Mathematics

## Your Building Blocks to Exponential Learning!



## Objectives

- Integration of biology and algebra
  - Joint group projects
  - Joint case studies
  - Class examples and exercises
  - Joint Class Assessment Techniques (CATs)
  - Increase students' grades
    - Pass Rate Increase
    - Retention Rate Increase
    - Develop metrics by comparing data from Fall 2006 and Fall 2005
  - Understand the field of Biology
  - Overcome Math Anxiety
  - Community Outreach into the classroom
    - Service Learning component: 20 hours minimum per student to complete the project.



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## Implementation

- Target courses: General Education Biology (BSC1005) and College Algebra (MAC1105)
- Max students: 20 (5 groups; 4 members each)
  - "Closed community"; namely, same students will be attending both classes.
  - Classes "back-to-back" meeting twice a week.
- Development of a Web page for class
- Syllabi Mapping



## Syllabi Mapping (examples)

MATH	BIOLOGY
Graphing	Scientific Method
Functions	Data Analysis
Charts	Genetics
Data presentation	Evolution
Linear modeling	Evolution
Rate of Change	Ecosystems
Exponential modeling	Genetics
Exponential Growth/Decay	Population
Logistic Modeling	Human Impact
	Cell Replication
Logarithmic Modeling	pH Analysis
Properties of Logarithms	



## **Overcoming Enrollment Challenges**

- Aggressive marketing / advertising
  - Flyers/Brochures
  - E-mail to Intermediate Algebra students
  - Article in college newspaper (Metropolis) to "spread the word"
- Open communication with Advisement



## Assessment

- <sup>001</sup> Four (4) tests (20% each)
  - One (1) Group Project (20%)
    - Scores will count simultaneously for the math and biology course.
    - Final grade will be based on a rubric designed by the math and biology instructors.
    - Final grade will be based on the report (60%) and presentation to the disciplines (40%).
    - 3-4 students per group.
    - In order to avoid repetition, groups will be challenged with a different project theme.



## Semester Timeframe

- Week 3: outline of proposal
- Week 6: progress report presentation (i.e. details of progression)
- Week 10 and 11: final report and presentations



## Projects

#### Current Projects:

- College Demographics: Does Race Exist?
- Miami Dade County Population Analysis
- Genetics and Human Traits Analysis

### Projects Under Review:

- Waste to Energy Management
- Sustainability: Water Resources



### College Demographics: Does Race Exist?

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Through the analysis of the college demographics data and graphs, and with the interviewing of the students at the campus, the dual enrollers will be asked to be a human population geneticist.

 Students should demonstrate skills on survey design and hypothesis formulation. Broad mathematical applications and data analysis will be required.





### Miami Dade County Population Analysis

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Miami-Dade College

 Students will collect, observe, analyze data and draw conclusions on Miami-Dade county's population growth and its implications to the local economy, ecology and environment.







### **MD** County Demographics Comparison

			Demo	graphics	2005-2	006	5 Oraduat	03				
	Bachelor of Science		Associate in Arts		Associate in Science		Credit Certificate		Vocational Certificate			
											Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total Graduates	0	0.0%	927	100.0%	149	100.0%	37	100.0%	46	100.0%	1,159	100.0%
Ethnicity:												
White Non-Hispanic	0	0.0%	124	13.4%	25	16.8%	4	10.8%	2	4.3%	155	13.4%
Black Non-Hispanic	0	0.0%	208	22.4%	26	17.4%	6	16.2%	17	37.0%	257	22.2%
Hispanic	0	0.0%	560	60.4%	97	65.1%	22	59.5%	27	58.7%	706	60.9%
Other	0	0.0%	16	1.7%	1	0.7%	3	8.1%	0	0.0%	20	1.7%
Not Reported	0	0.0%	19	2.0%	0	0.0%	2	5.4%	0	0.0%	21	1.8%
Gender:												
Female	0	0.0%	545	58.8%	102	68.5%	11	29.7%	23	50.0%	681	58.8%
Male	0	0.0%	382	41.2%	47	31.5%	26	70.3%	23	50.0%	478	41.2%
Native Language:												
English	0	0.0%	381	41.1%	57	38.3%	15	40.5%	12	26.1%	465	40.1%
Spanish	0	0.0%	418	45.1%	75	50.3%	17	45.9%	24	52.2%	534	46.1%
French/Creole	0	0.0%	79	8.5%	6	4.0%	3	8.1%	8	17.4%	96	8.3%
Other	0	0.0%	49	5.3%	11	7.4%	2	5.4%	2	4.3%	64	5.5%
Age:												
17 or Younger	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
18-20	0	0.0%	106	11.4%	1	0.7%	1	2.7%	2	4.3%	110	9.5%
21-25	0	0.0%	495	53.4%	29	19.5%	7	18.9%	8	17.4%	539	46.5%
26-30	0	0.0%	161	17.4%	29	19.5%	7	18.9%	16	34.8%	213	18.4%
31-35	0	0.0%	69	7.4%	29	19.5%	10	27.0%	5	10.9%	113	9.7%
36 or Older	0	0.0%	96	10.4%	61	40.9%	12	32.4%	15	32.6%	184	15.9%
Mean Age:			26.00		35.33		34.84		31.98		27.72	
Graduation Term:												
Fall	0	0.0%	336	36.2%	59	39.6%	11	29.7%	19	41.3%	425	36.7%
Spring	0	0.0%	318	34.3%	55	36.9%	20	54.1%	22	47.8%	415	35.8%
Summer	0	0.0%	273	29.4%	35	23.5%	6	16.2%	5	10.9%	319	27.5%
Honors Graduate:	0	0.0%	182	19.6%	49	32.9%	0	0.0%	0	0.0%	231	19.9%
Top 3 Majors*			1) Business Adm		1) Logal Assisting		1) Comp Design Acent		1) Business Super/Mat			
100 0 110010 1			2) Pro-Bac	holor Δrts	Diototic Tochnision		2) CISCO Notwork		<ol> <li>Duameaa Supervivigt</li> <li>Fire Eighting</li> </ol>			
			<ol> <li>Pre-Dac</li> <li>Pre-Nuc</li> </ol>	sina	3) Human Services		3) Comp Design Opera		3) Accounting Operations		าร	
* Majors with at loast 5 gradus	atos nor awa	rd type	-,	Sourco: TE	S08 as of 00	20/06	-, -omp B		-,			

\* Majors with at least 5 graduates per award type. Gradrpt, last modified 10/5/06





### Genetics and Human Traits Analysis

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Dual enrollers will use principles of heredity and will determine probability of human alleles expressions of the MDC Wolfson campus gene pool.

 Students should demonstrate skills on survey design and hypothesis formulation. Broad mathematical applications and data analysis will be required.



# Inheritance patterns of particular traits – Can be traced and described using pedigrees



## Indigenous skin color distribution

