

**Seminar 299 - The Process & Nature of Integrated Scientific Research  
Biological Sciences, Center for Science Education, Geosciences,  
Mathematical Sciences  
Spring 2003**

**Time/Place:** TR 2:00-3:15 Lap 101

**Text:** Keys to Science Success, Edited by Janet R. Katz

**Blackboard Web Site:** blackboard.imt.uwm.edu

**Alternate Rooms:** LAP 178 and LAP 249

**Caution:** Syllabus subject to change. You are advised to check the blackboard web site regularly for revisions/updates.

Instructor Coordinates			
Name	Department Email	Office Phone	Office Hours
C. Barreto	Biological Sciences barr@uwm.edu	LAP 299 229 2284	WR 9:00-11:00 and by appointment
T. Boundy	Geosciences tboundy@uwm.edu	LAP 354 229 3951	TR 10-noon and by appointment
K. Brucks	Mathematical Sciences kmbrucks@uwm.edu	EMS 404 229 5264	MW 3:30 - 5:00 and by appointment
M. Gruhl	Ctr for Science Education mcg@uwm.edu	LAP 108 229 2342	M 4:00-5:00 and by appointment
K. Kaiser	Academic Opportunity Ctr kal@uwm.edu	MIT 165B 229 3762	MWF 9:00 - 9:50 and by appointment

**Field Trip Dates:** Field trip to M.M.S.D 8:00am to 1:00pm Friday February 28. Field trip to Cedarburg Bog 8:00am to 5:00pm (bring lunch) Saturday March 29.

**Homework:** Students to bring textbook to each class. Homework to be posted on the web is due by 7:00 am on due date. All non-electronic homework to be turned in at class on due date.

**Class Web Site and Reflector:** Our web site and reflector are very valuable learning resources and study tools. Please check them frequently because YOU ARE RESPONSIBLE FOR ALL ANNOUNCEMENTS AND CHANGES TO THE SYLLABUS posted there. (<http://blackboard.imt.uwm.edu/>)

**Final Exam Day:** Monday May 12 from 3:00-5:00pm. Research Project presentations will be given during this period.

**Learning Accommodations:** Students with special needs should please come speak to an instructor during the first week of classes so that we can best accommodate your learning style.

**Dates:** Last date to change to/from audit is February 13; last date to drop without 'w' on academic record is March 17; last date to drop is March 14.

**Learning Objectives:**

- Instruction on research techniques and resources will be given in order to provide students with the background content and skills necessary to thoroughly appreciate the process of scientific inquiry and to conduct scientific research.
- Students will learn and participate in all aspects of the process of scientific inquiry.

**Course Journal:** Each student will maintain a 'Course Journal'. Journal entries are to be made twice weekly (corresponding to each class meeting). Journal checks occur: February 2 and 8, March 4 and 13, April 15, and May 8. Each entry should include reflections and explanation on the following for a given class.

1. Most interesting thing I learned.
2. Most surprising thing I learned.
3. Most confusing thing for me.
4. Least helpful class activity.
5. State at least one question arising from class.
6. Indicate how what you learned relates to your life.

For the final Journal check please include a response to the following: Based on your learning experiences this semester, describe what actions you plan to take to:

- Participate in resolving environmental issues in your community;
- Continue your math and science education.

**Class Participation Guidelines for each class meeting:** (1) Preparedness 5 points; (2) Attentiveness 5 points; (3) Thoughtful contributions 5 points.

**Academic Misconduct:** In this course you are expected to perform to the best of your ability in an honest manner. Cheating, plagiarism, or other acts of misconduct will result in a severe penalty to you, as per University of Wisconsin System Chapter 1.

## Global Course Itinerary

### Part I: Fundamentals of Interdisciplinary Science and Mathematics Research.

<b>Week One:</b>	Getting Started
<b>Week Two:</b>	Discovering Science
<b>Week Three:</b>	How we learn. How Scientists draw conclusions.
<b>Week Four:</b>	Scientific Inquiry: Integration of Science and Mathematics
<b>Week Five:</b>	Scientific Inquiry: Modeling
<b>Week Six:</b>	Scientific Inquiry: Biogeochemical cycles & fresh water research. Field Trip Preparation.

### Field Trip to M.M.S.D. 8:00 am to 1:00 pm Friday February 28th

<b>Week Seven:</b>	Research Projects: Questions → Hypotheses
<b>Week Eight:</b>	Research Projects: Title, Literature Search, and Introduction
<b>Week Nine:</b>	Goal setting, time management and Field Trip Preparation

### Field Trip to Cedarburg Bog 8:00 am to 5:00 pm (bring lunch) Saturday March 29<sup>th</sup>

### Part II: Research Project Design and Literature Searches.

<b>Week Ten:</b>	Science Readings & Literature Searches.
<b>Week Eleven:</b>	Designing an Experiment
<b>Week Twelve:</b>	Collecting and analyzing data. Collaborations/research groups.
<b>Week Thirteen:</b>	Do It! Data Collection and Analysis
<b>Week Fourteen:</b>	Do It! and Graphics, References
<b>Week Fifteen:</b>	Conclusions and 'Mock up Day'
<b>Final Exam Period:</b>	Research Project Presentations

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<b>Due Date</b>	<b>Assignment</b>	<b>Point Value Possible</b>	<b>Point Value Received</b>
Tuesday January 22	Class Participation	15	
Thursday January 24	Class Participation	15	
Tuesday January 28	Class Participation	15	
Thursday January 30	Class Participation	15	
	Water Homework Problems	25	
	Activity 2.4 responses posted on web	10	
Tuesday February 4	Class Participation	15	
	Chapter 3 Exercises pages 55-61	15	
	Activity 2.4 'Skills' posted on web	10	
	Journal Check #1	25	
Thursday February 6	Class Participation	15	
	Probability Homework	25	
	Complete Activity 3.1 for class	10	
Tuesday February 11	Class Participation	15	
	Probability Homework	25	
	Activity 3.2 posted on web	10	
Thursday February 13	Class Participation	15	
	Poster Fieldtrip Homework	80	
Tuesday February 18	Class Participation	15	
	Activity 3.3 posted on web (first installment)	10	
	Journal Check # 2	25	
Thursday February 20	Class Participation	15	
Tuesday February 25	Class Participation	15	
	Bootsma Homework	25	
	Activity 3.3 posted on web (second installment)	10	
Thursday February 27	Class Participation	15	
Friday February 28	MMSD Field Trip	75	
Tuesday March 4	Class Participation	15	
	Activity 3.3 posted on web (third installment)	10	
	Journal Check # 3	25	
Thursday March 6	Class Participation	15	
	Water Quality Questions posted on web	50	
Tuesday March 11	Class Participation	15	
	Research Project Title	50	
	Activity 2.2	10	
Thursday March 13	Class Participation	15	
	Journal Check # 4	25	

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<b>Due Date</b>	<b>Assignment</b>	<b>Point Value Possible</b>	<b>Point Value Received</b>
!! Spring Break !!			
Tuesday March 25	Class Participation	15	
	Activities 4.1 and 4.2	20	
	Research Project Introduction Draft 1 posted on web		
Thursday March 27	Class Participation	15	
	Introduction Critiques	30	
Saturday March 29	Cedarburg Bog Field Trip	75	
Tuesday April 1	Class Participation	15	
	Activity 2.3 - Dante's Peak	20	
Thursday April 3	Class Participation	15	
	Research Project Introduction Draft 2 posted on web	50	
Tuesday April 8	Class Participation	15	
	Activity 9.1 Questions 1 and 2		
Thursday April 10	Class Participation	15	
Tuesday April 15	Class Participation	15	
	Journal Check # 5	25	
Thursday April 17	Class Participation	15	
	Materials and Method Section	50	
	Materials and Method Presentation	25	
Tuesday April 22	Group Meeting on Research Project	25	
Thursday April 24	Group Meeting on Research Project	25	
Tuesday April 29	Group Meeting on Research Project	25	
Thursday May 1	Graphics and References Participation	25	
	Repeat Activity 2.4 posted on web	10	
Tuesday May 6	Conclusions Participation	25	
Thursday May 8	Mock Up Participation	25	
	Final Journal Check	50	
Final Exam Period	Class Participation	50	
	Project Presentation	75	
Research Project	Title	5	
	Introduction	25	
	Materials and Methods	25	
	Results	50	
	Graphics	25	
	Discussion	50	
	Conclusion	50	
	References	25	
	Group Evaluation	100	
	Self Evaluation	100	
<b>GRAND TOTAL</b>			