

**COURSE SYLLABUS**  
**Natural Science I Seminar (New 243)**  
**The Laboratory Experience**  
**Fall 2003**  
**(H. Blewitt, Carmichael Hall, Phone: 348-4600)**

**I. INSTRUCTOR INFORMATION**

<b>LECTURE/LAB SECTION</b>	<b>INSTRUCTOR</b>	<b>OFFICE HOURS</b>	
NEW-243-001 (Wed. 5-10 p.m.)	H.L. Blewitt 348-4600 or 348-5954	T&Th 10-11:30 a.m. Fri. 2-3:30 p.m.	220 Lloyd 101 Carmichael

**II OBJECTIVES**

The major objectives of this seminar will be:

- A. To attempt to understand what it means to be a scientist in today's complex society.
- B. To begin the process of becoming intelligent laymen in several scientific disciplines.
- C. To understand how the nature of the laboratory experience plays an essential role in the understanding and advancement of science.
- D. To learn to utilize and apply new found confidence and abilities in the sciences to help to understand the scientific basis of global problems.

**III. READING REQUIREMENTS**

- A. Science Matters – by Robert M. Hazen and James Trefil
- B. The Double Helix – by James D. Watson
- C. Lucy; The Beginnings of Humankind – by Donald Johanson and Martland Edey
- D. \* In addition to these books each student will read all the materials listed under “Source of Laboratory Materials and Reading Assignments” (see pages 6 & 7 of this syllabus).

---

\* These materials will be available in the New College office (Rm. 107 Carmichael Hall).

#### IV. GRADING

Lab Write-up	(20 pts each)	100 pts
Prelab Quizzes	(20 pts each)	100 pts
Postlab Exams	(50 pts each)	250 pts
Book Essays	( <u>Sci. Matters</u> , <u>D. Helix</u> & <u>Lucy</u> )	150 pts
Paper/Presentations	(100 pts each)	200 pts
Participation		50 pts
Final Exam		<u>200 pts</u>
<b>TOTAL POINTS</b>		1050 pts

#### Grading Scale

90 – 100 = A-, A, A+	} Pass
89 – 89 = B-, B, B+	
70 – 79 = C-, C, C+	
<u>60 – 69 = D-, D, D+</u>	
< than 60 = F	

Since this scale is set at the beginning of the term, there will be no need to post grades at any time during the term. You may compute your own grade as often as you wish by simply calculating your percentage and then noting where you place in this grading scale. PLEASE NOTE: You are not competing against the rest of the class but primarily against yourself to see where you can place on the scale shown on this page.

A. **Book Essays** (50 points each) – A book report (500 word minimum) will be written on these books. This report should deal critically and in depth with the book. You should specifically comment in detail on why the book should or should not be used in the seminar. You may be asked to lead a discussion concerning these books. The three books are Science Matters, The Double Helix, and Lucy. The due dates will be posted on the Master schedule in the class room. These reports will not be graded if they are turned in late.

B. **Paper/Presentation** (100 points each)

**Paper** – Each student will write a five-page (minimum) typewritten (double-spaced) paper. Any bibliography or reference pages will be in addition to this five-page minimum. Each topic will be approved by the instructor before the paper is begun. Two copies of this paper will be turned in to the instructor prior to the presentation. A 10% late penalty will be assessed if the paper is not submitted on time. The topic will deal with a well-known experiment or set of experiments in the field of geology, biology, chemistry, or physics. The paper should discuss the details of the experiment(s) and explore the significance of the research. Footnotes will be included. At least 5 sources are required.

**Presentation** – (15-20 minutes) The primary objective of the presentation is to provide the class with a basic understanding of why experimental science is important and how your topic exemplifies this principle. You should attempt to teach the class how these experiments were carried out and why they were (are) significant. I would expect you to practice your presentation several times so that your class performance will appear polished and worthwhile to us all. Reading the paper aloud is strongly discouraged and you should rely only (but not too heavily) on notes or an outline. Since this talk will deal with subjects that are unfamiliar to the class, you should make every effort to simplify your presentation so that the class will have a meaningful learning experience. The use of some type of visual aid(s) is strongly encouraged. A 10% penalty will be assessed if the presentation is not given on time. These presentations will be given at the end of the semester and the dates for the talks will be posted in the classroom on the master schedule.

C. **Participation** – (50 points) A participation grade will be given to each student. The instructor will attempt to evaluate each student's involvement in and enthusiasm for the material discussed in class. The maximum grade for participation will be 50 points. The instructor will discuss the methods of evaluating effective participation.

D. **Laboratory** – (250 points) The laboratory experiments will be evaluated using prelab quizzes, lab write-ups and postlab exams. The prelab quizzes (given the week preceding each lab) will be worth a total of 100 points. The postlab exams (given the week following the lab) will be worth a total of 250 points. The laboratory write-ups are worth a total of 100 points and will be explained during the prelab lectures. These lab write-ups will be due the week following the each lab experiment.

## V. SCIENCE NEWS

Each student is expected to read the following magazines and periodicals during this semester. These materials are available in my office and the science library. Questions concerning these articles may be included on your exams and will probably be discussed in class.

1. Science News (periodical)
2. Scientific American (magazine)
3. Time Magazine (the science, medical, and environmental sections only)

## VI. ATTENDANCE POLICY

Attendance will be taken during each class period. Since a participation grade will be given, poor attendance will have a detrimental effect on the participation portion of your grade.

**VII. ACADEMIC MISCONDUCT POLICY**

“All acts of dishonesty in any work constitute academic misconduct. The Academic Misconduct Disciplinary Policy will be followed in the event of academic misconduct.”

**VIII. DISABILITY ACCOMODATIONS:** “To request disability accommodations, please contact the Disability Services (348-4285).” After initial arrangements are made with that office contact your professor, Dr. Blewitt.

## LABORATORY SYLLABUS

	<b>NO.</b>	<b>DATE</b>	<b>TITLE</b>	<b>FACULTY MEMBERS Assisting with Lab Instruction</b>
Geology	1	Wed., Sept. 3 <sup>rd</sup>	Fundamental Properties of Minerals	Dr. Gary Hooks Emeritus Professor, Geology  Dr. H. L. Blewitt
	2	Wed., Sept. 3 <sup>rd</sup>	Identification of Unknown Minerals	
Paleontology	3	Wed., Sept. 3 <sup>rd</sup>	Introduction to the Paleontology Laboratory	
Biology	4	Wed., Sept. 24 <sup>th</sup>	The Microscope	Dr. Tom Graham Professor of Biology
	5	Wed., Sept 24 <sup>th</sup>	The Cell Concept	
Physics	6	Wed., Oct. 15 <sup>th</sup>	Intro. to the Spectroscope	Dr. Jerry Busenitz Asst. Professor, Physics & Astronomy
	7	Wed., Oct. 15 <sup>th</sup>	Grating and Prism Spectroscopes: Analysis of Spectra	
Chemistry	8	Wed., Nov. 5 <sup>th</sup>	Heat Capacity of a Calorimeter	Dr. H. L. Blewitt & Marcy Whitney Chemistry Lab Coordinator
	9	Wed., Nov.5 <sup>th</sup>	Calorimetry: Specific Heat of a Metal	
	10	Wed., Nov. 5 <sup>th</sup>	Empirical Formula	
Modern Scientific Instrumentation	11	Wed., Nov. 19 <sup>th</sup>	Gas Chromatography	Dr. W. Bertsch Associate Professor of Chemistry
	12	Wed., Nov. 19 <sup>th</sup>	Mass Spectroscopy	

## **SOURCE OF LABORATORY MATERIALS AND READING ASSIGNMENTS\***

### **I. GEOLOGY – Experiments 1 & 2**

These experiments are taken from Investigations Into Physical Geology by Mazzulo (1997), pages 1-24.

Students should also read:

1. Physical Geology, Exploring the Earth by Monroe & Wicander (3<sup>rd</sup> Ed., 1998); Chap. 1 & 2 (pages 1-53).

### **II. PALEONTOLOGY – EXPERIMENT 3**

This experiment is designed especially for this course by Dr. Ed Hooks and Dr. H. L. Blewitt and will be distributed to the class early in the term.

Students should read:

Lost Worlds in Alabama Rocks by Jime Lacefield (1<sup>st</sup> edition, published by the Alabama Geological Society in 2000) pages 78-94

### **III. BIOLOGY – Experiments 4 & 5**

These experiments are taken from Laboratory Manual I, Biology The Essential Principles by Tom Graham (3<sup>rd</sup> Ed., 1997). Students should read experiment 1 (pages 1-13) and experiment 3 (pages 25-44).

Students should also read:

1. Biology, Life Features by Tom Graham (2<sup>nd</sup> Ed., 1998); Chap. 1 (pages 2-10), Chap. 2 (pages 11-28), Chap. 3 (pages 29-46), Chap. 4 (pages 47-77), and Chap. 5 (pages 78-99)

### **III. PHYSICS – Experiments 6 & 7**

These experiments are adapted from PH 101/102 Laboratory Manual, University of Alabama. Students should read experiment 19 (pages 82-86) and experiment 22 (pages 97-99).

Students should also read:

1. Conceptual Physics by Paul G. Hewitt (8<sup>th</sup> Ed., 1998); Chap. 25 (pages 452-457), Chap. 29 (pages 541-550), and Chap. 30 (pages 559-565).
2. Chemistry the Central Science by Brown, LeMay & Bursten (7<sup>th</sup> Ed., 1997); Chap. 6 (pages 183-195).

---

\* These materials will be available in the New College office and in my office in 101 Carmichael Hall.

#### IV. **CHEMISTRY – Experiments 8, 9, & 10**

These experiments are adapted from Science I – A Laboratory Manual/Tarkio College by H. Blewitt, et. al. (1970). Students should read copies of these three experiments, which will be distributed to the class early in the term.

Students should also read:

1. Chemistry: A First Course by Kroschwitz & Winosur (2<sup>nd</sup> Ed., 1987); pages 371-375.
2. Fundamentals Chemistry by Ralph A. Burns (1<sup>st</sup> Ed., 1992); pages 69-72.

#### V. **MODERN SCIENTIFIC INSTRUMENTATION – Experiments 11 & 12**

These experiments (lecture/lab demonstrations) will be prepared by Dr. W. Bertsch, & Dr. H. L. Blewitt and will be distributed to the class early in the term.

Students should also read:

1. Organic Chemistry by Morrison & Boyd (6<sup>th</sup> Ed., 1992); pages 585-589.
2. Organic Chemistry by McMurry (4<sup>th</sup> Ed., 1996); pages 424-433.