Geology/Africana Studies 103 – Fall 2001
Geology & Development of Modern Africa

Introduction

Tue Aug 28 overview of the continent and the course
Wed Aug 29 physiography and geography of Africa
Thu Aug 30 bedrock geologic maps

Nile River System & Water Resources of North Africa

What happens when humans tamper with a system as large and as complex as the Nile? Do the benefits of damming such a river outweigh the geological and environmental consequences? How have the unique geological features of North Africa influenced human history in the area over the past 8000 years? Why, after thousands of years of relative stability, are Saharan oases in crisis? What are the geological underpinnings of hydropolitics in North Africa?

Fri Aug 31 the Nile River System in an international context

Fri Aug 31 field trip to Adirondacks: leaving at 4 pm from back door of science bldg;
Sat Sep 1 returning by 8:30 pm on Saturday evening

Tue Sep 4 sample analysis from field trip
Wed Sep 5 the Nile Basin
Thu Sep 6 Nile flood patterns and behavior of the Nile
Fri Sep 7 Nile floods & Lake Nasser; intro to Aswan High Dam

Tue Sep 11 Lake Nasser: evaporation and siltation
Wed Sep 12 more on evaporation & siltation
Thu Sep 13 intro to diamonds: part I
Fri Sep 14 introduction to dam failure; dams and seismicity

Tue Sep 18 catastrophic flooding
Wed Sep 19 Black Sea flooding
Thu Sep 20 what if the Aswan High Dam failed?
Fri Sep 21 hydropolitics

Tue Sep 25 intro to diamonds, part II
Wed Sep 26 diamond prospecting in Colorado
Thu Sep 27 connections between flood patterns, physiography, and history
Fri Sep 28 more on connections

Tue Oct 2 intro to ground water, oasis hydrogeology, ^{14}C dating
Wed Oct 3 age of groundwater in the Sahara
Thu Oct 4 more on diamond prospecting
Fri Oct 5 Ghaddafi's underground river project; intro to climate change

Tue Oct 9 *October break*
Wed Oct 10 climate change in the Sahara – analysis of 4 Saharan paleolakes
Thu Oct 11 Saharan climate change over the past 9000 years; Nile river evolution
Thu Oct 11 **7:30 pm: guest speaker on writing (location TBA)**
Fri Oct 12 intro to Algeria project

Diamonds!! The Algeria Project

We're going to take you on a hypothetical boondoggle to southern Algeria to prospect for diamonds. You'll work with a "virtual" team of geologists and samplers to look for those elusive kimberlites that might contain diamonds, and, once you've found some likely targets, you and your team will determine which, if any, have diamond potential. Your ultimate task will be a presentation to a group of "investors", your aim being to convince them that they should put down hard cash for further evaluation of the economic potential of your favorite targets.

Tue Oct 16	pick sample sites for Season I
Wed Oct 17	get first season samples
Thu Oct 18	sample analysis
Fri Oct 19	submit rationale and request for Season II samples
Tue Oct 20	sample analysis
Wed Oct 21	airborne magnetometer surveys
Thu Oct 22	more on airborne magnetometer surveys
Fri Oct 23	Season 3 aeromag survey
Tue Oct 30	define season III targets
Wed Oct 31	work season III targets
Thu Nov 1	work season III targets
Fri Nov 2	work season III targets
Tue Nov 6	in-class work on diamonds project
Wed Nov 7	in-class work on diamonds project
Thu Nov 8	conflict diamonds
Fri Nov 9	diamonds and conflict in Africa; gold and apartheid

The East African Rift Zone

Hominids evolved in East Africa. Was this a chance event that could have happened just as easily elsewhere, or could the rifting of the African continent have driven the evolutionary changes that ultimately led to *Homo sapiens*?

Tue Nov 13	intro to East African Rift and hominid evolution
Wed Nov 14	reconstructing paleoenvironments at 5 different hominid sites
Thu Nov 15	more on paleoenvironments; intro to K/Ar dating
Fri Nov 16	dating hominid remains
Sun Nov 18	**hominid pot luck dinner with Nova video**
Tue Nov 20	hominid lineage
Tue Nov 27	hominid lineage; ***last day to request additional data for diamonds project***
Wed Nov 28	rift zone evolution and sedimentation
Thu Nov 29	more on rift zone evolution and sedimentation
Fri Nov 30	environmental factors in hominid evolution
Tue Dec 4	more on environmental factors in hominid evolution
Wed Dec 5	last gasp on environmental factors in hominid evolution
Thu Dec 6	geologic basis behind mineral resources in Africa
Fri Dec 7	perspectives on international mineral exploration (guest discussion by Dr. Jeffrey Abbott); team presentations of diamond exploration prospects will take place in the afternoon and evening

Nuts and Bolts

General expectations:

I expect you to:

- take responsibility for your own learning
- come prepared for class and be an enthusiastic participant during class
- treat others with tolerance and respect
- act responsibly and reliably in group work
- set high standards for your work
- teach me something

You can expect me to:

- help you become a better self-learner and teacher
- create interesting and challenging ways for you to learn geology and its connections with human events, rather than talking at you about my knowledge
- set high standards for the class
- treat you with fairness and respect
- take an interest in you and learn something from you
- be excited and knowledgeable about course material

Getting help:

- Barb: Science 104, x4713, or btewksbu (by e-mail); virtually anytime during the day.
- TAs: Matt Clarke (mwclarke), Dave Greene (dgreene), and

Bring to every class meeting:

- your Africa course notebook, a pencil and eraser, a calculator, paper to take notes on

Books and materials:

- purchase at the bookstore: *Geology*, by Chernicoff (2nd edition) and *The Nature of Diamonds*, by Harlow
- buy from the Science Building secretaries: Africa course notebook ($20); cost covers maps, photocopying for the semester, plus assorted materials you will be using during the semester.

Class meeting times

- Our class meeting times are a bit odd, so I'm repeating them here so that you won't blunder and miss a class:

Tuesday 1-2:15; Wednesday 2:45-3:45; Thursday 1-2:15; Friday 12-12:50

Class meetings outside the normal times:

Field trip: We will leave at 4 pm on Friday, August 31, departing from the back door of the Science Building. We will return in the evening on Saturday the 1st. The Department will cover the cost of food, lodging, and transportation. **We will go regardless of weather, so come prepared!**

Writing plenary sessions: This is a writing intensive course, and the Writing Program has organized the following plenary sessions for students taking writing intensive courses. I expect you to attend all four sessions, so please put them on your calendar. More details later:

September 5 at 7:30 pm: faculty panel on writing
September 12 at 7:30 pm: student panel on writing
September 20 at 6:30 pm: guest speaker Barry Seaman
October 11 at 7:30: guest speaker Richard Pinsky

Evening bash: On Sunday, November 18th, we will have a pot luck dinner and see a couple of excellent videos on hominid evolution.

Evening classes: We may occasionally meet in the evening to make up for a class that I will have to miss if I am out of town. I will always give you plenty of warning.

Policy on attendance – please read and heed!!!

- This is not a lecture-based course, and what you will be *doing* during class time is a vitally important aspect of how you will learn in this course. You will also be working in groups during many of the classes, and you will have serious responsibilities to other people in the class that go beyond what would normally be expected of you in a standard lecture setting.
- Attendance is mandatory, and I will take attendance at every class meeting. Now for the difficult part. *Your final semester grade will be penalized 2 points for **each** unexcused absence.* Whatever you do, don't be casual and let yourself get into a fix in terms of your grade. This happens to a couple people every semester, and it's nearly as painful for me as it is for them (honest and truly). So, don't let yourself get into a bind.
- I will accept notification from the Health Center verifying that you were too sick to come to class (and they *will* notify faculty if you are really too sick to come to class; if they will not give you an excuse, it's because they think you're well enough to go to class), and I will accept legitimate absences for athletic commitments up to the limit set by the Faculty.
- If you miss a class for *any* reason, I will expect you to make up *all* of the work that you missed *before* the next class meeting, including work presented by someone else. Absence from one class does not exempt you from coming prepared to a subsequent class. I will expect you to take the responsibility to get the assignment from me for the following class ***before class*** and to come fully prepared to the class immediately after the one you missed. Please don't expect me to be cheerful and gracious if you miss a class and breeze in the following class and ask, "Can I get the assignment for today?"

Due dates for assignments:

You will have two types of assignments. One type will be individual worksheets and questions; a second type will be preparation for group work during class.

- **Individual worksheets and questions.** Due dates will be marked clearly on each sheet. Late assignments will be penalized 10%, and late assignments not submitted before graded assignments are returned will receive a zero.
- **Preparation for in-class group work.** Many of the assignments will prepare you for work during class. If you do not have your class prep ready to turn in at the start of class, you will be a liability to anyone with whom you might work during class. If you haven't done

your work, you may sit in the gulag at the back of the room and listen, but you will be marked as absent from class (in other words, the light's on, but nobody's home). See attendance policy above for the resulting grade penalty.

Writing:

– While this course is officially designated as a "writing intensive" course, the writing you will do is not solely designed to help you become a better writer. Writing will be an integral part of learning the material we cover in the course. Unless a person processes information in one way or another, he/she will not learn very much. Many courses ask students to process information by studying and taking exams. This course has no exams, and you will be processing information in this course by doing a good deal of writing and teaching. I will grade your writing according to the grading guidelines on the attached sheet.

Policy on hats:

– Barb grew up at a time when it was considered unutterably impolite to wear a hat indoors, and she reacts badly to seeing people in class with hats on. Because a happy Tewksbury is a good thing, there will be Hat Gulag at the door of the classroom. You may choose to wear a hat in class, but, because of Barb's personal failings, she may not give you as much attention as you deserve if you are wearing a hat.

Grades:

– Your final grade will be calculated using the following *approximate* percentages:

worksheets , class prep	35%
Algeria project	35%
summary papers	30%
Total	100%

Standards:

– In this course, you will be graded on both your written work and your oral work. Some papers will receive standard number grades out of 100 (*e.g.*, homework problems involving calculations, short-answer problems, etc.). Other papers do not lend themselves as well to number grades, and those papers will be graded on a scale of 0 to 5, with each number reflecting a clearly-defined standard for the assessing your efforts. Those criteria are outlined on the next page. I will do this, rather than give you a letter or standard number grade, because I want you to focus on what kind of work you have done and what kind of work I expect from you, not on what grade you have gotten. *A satisfactory job on an assignment will earn a 3.* To earn a 4, you must do more than an average workmanlike job, and a 5 requires that you really knock my socks off. Yes, the standards are high in this course.

– On the next page, you'll find both the general criteria for the 0-5 scale and a general view of where "satisfactory work" stands in terms of the College's grading system. Please notice that a B is *good* work, not merely satisfactory. So. This handout will let you know at the outset what it takes to get a B or an A in this course, both of which involve work above a satisfactory job on assignments, and that's the last time you'll see standard grades in this course. From now on, you'll simply receive a grade on the scale from 0-5 in the hopes that you can then focus on the quality of the product you produce in the course, not on the letter grade.

Content

grade	criteria	approximate grade
5	outstanding explanation with superior supporting information; unusual insights and flashes of brilliance; creative and original analyses and thoughts; goes well beyond minimum required for assignment.	98 (A^+)
4	good solid job on explanation, with excellent support from examples, data, figures, etc.; excellent reasoning, or excellent explanations; goes beyond the minimum required for the assignment.	88 (B^+)
3	satisfactory job; does what the assignment asks; decent reasoning or explanations; decent support by data, examples, figures, etc.	78 (C^+)
2	decent explanation but too general ***or*** some inaccuracies or flaws in reasoning ***or*** coverage is accurate but cursory and does not meet the minimum required for a complete answer.	68 (D^+)
1	doesn't effectively address assignment; fails to support assertions with data or examples; unclear explanations; inadequate understanding; major flaws in reasoning or explanations.	58 (F)
no credit	answer missing or does not answer the question.	0

Writing

grade	criteria	approximate grade
5	meets criteria for 4, but also has a sense of style, going beyond grammatical correctness to real readability.	98
4	excellent paper/paragraph organization, interesting sentences, good grammar, very few spelling errors, does not read like a first draft.	88
3	decent organization; serviceable prose; reads like a first draft; a paper with excellent writing will still earn a 3 if it contains many spelling errors and is clearly not proofread.	78
2	disorganized; awkward sentence structure; poor grammar; poor spelling.	68
1	similar problems to 2s, but worse.	58

Assignment Schedule – Geology/Africana Studies 103 – 2001

Please note that this is a *tentative* schedule of due dates for assignments over the course of the semester. I will issue updates if (when?!?) we get off track at any point. ***Schedule indicates on what date the assignment is due. All assignments are due at the start of class. "C" followed by page numbers indicates reading in Chernicoff, while "Harlow" indicates reading in Harlow (your diamonds book). Reading is to be completed before class on the day indicated.***

	Tuesday	**Wednesday**	**Thursday**	**Friday**
week of Aug 27		– read entire syllabus and information on course policies – buy course notebook before Wednesday class –intro to Nile reading and questions	geologic map assignment	prep for Nile in an international context; Physiography and Geography of Africa (from Wednesday class)
week of Sep. 3		essay on intro to Cussler's *Atlantis*;; C389-404	Nile Basin worksheet from class on Wednesday C404-419, 155-158	group and individual reports on samples from field trip
week of Sep. 10	Nile floods worksheet from class on Thursday & Nile discharge worksheet from class on Friday read 393-394, fig 14-7	evaporation and siltation calculations		**C**48, 58-60, 480, 302 **Harlow**116-141, 228-238, 249-254, 105-115, 23-47
week of Sep. 17	prep for intraplate earthquakes and induced seismicity C266-286	prep for catastrophic flooding	prep for hydropolitics	
week of Sep. 24	worksheet on diamonds **Harlow**186-213, 78-104	worksheet from Front Line video	prep for connections between Nile System and civilization	refresher on atoms and isotopes; C37-38, 41-43, 220-226 C507-525, 493-502,
week of Oct. 1	Aswan High Dam final assignment Part I	refresher on scientific notation	journal entry on prospecting for diamonds in Colorado	prep for Ghaddafi's Great Man-Made River Project

	Tuesday	**Wednesday**	**Thursday**	**Friday**
week of Oct. 8	*October break*	Aswan High Dam final assignment Part II;	Nile evolution worksheet C168, 207-220, 421-443	
week of Oct. 15	technology & water use essay; Season I rationale & sites due at end of class	final Sahara climate change paper - due later than this	letter back home	rationale & sample sites for Season II
week of Oct. 22	TBA	summary of results of Seasons I and II	reading TBA	aeromag survey worksheet (from Thursday classes)
week of Oct. 29	summary of aeromag survey results and presentation of targets for Season III	TBA	***data requests for Algeria project must be made by 5pm today; next data requests may not be made until Friday, November 9***	TBA
week of Nov. 5	TBA	TBA	prep on conflict diamonds	rationale and additional requests for data
week of Nov. 12	prep work on EAR & reading on hominid discoveries C154-181	C69-77, 95-116;	C220-225, 232-237	
week of Nov. 19 ***Sunday night - hominid pot luck dinner!!***	C337-340, 249-255	*Thanksgiving break*	*Thanksgiving break*	*Thanksgiving break*
week of Nov. 26	prep work on plate tectonics; ***last day to request additional data for Algeria project***			
week of Dec. 3			C260-261, 343-355, 84-87, 188-151	final team presentations of diamonds prospects

Final essay due on Friday, December 14.

Final Writing Assignment **Due 5pm, Friday, December 14**

The overall aim of this course has been to give you an understanding of geology and geologic processes and to open your eyes to the underlying influence of geology on human events. I have tried to help you see that geology can be crucial in helping us reconstruct a clearer view of our *human* past, understand the modern world, and help predict the future. Knowing something about geology and geologic processes gives us a deeper understanding of causation than we would have if we looked solely at the human influences on events.

Part I: re-evaluation of *Atlantis Found*

Ground rules for Part I: You may discuss any aspect of this question with people in this class, with the TAs, or with me, but you must prepare and write your own answer.

As you know, in the prologue to *Atlantis Found*, Clive Cussler postulates that a meteorite more than 15 km in diameter slammed into the Earth in the year 7120 BC (9076 ypb). He describes a series of geologic and historical consequences of the proposed impact, including formation of Hudson Bay in Canada, global geologic changes of many types, mass extinction, and destruction of advanced human societies, including the lost continent and civilization of Atlantis (*quelle surprise*….).Earlier in the semester, I asked you to use your knowledge of geology and geologic processes to evaluate the plausibility of his hypothesis. Since your wrote your first essay, you have learned things that should help you be better able to evaluate Cussler's hypothesis.

Using what you have learned in this course, write a short essay re-evaluating the plausibility of his claim that a 15-km diameter meteorite slammed into the Earth at Hudson's Bay in 7120 BC (9076 ybp) and caused the effects described in the introduction to his book. Choose specific claims, and make arguments that draw on your increased knowledge of the geology and human history of North Africa, of the nature and rates of geologic processes and evolution, of the age of the Earth and the length of geologic time, and of the character of the geologic record. At the end of your essay, add a short paragraph explaining whether your assessment of Cussler's hypothesis is different now than it was in September and, if so, in what ways.

Part II: what you have learned about how geologists solve problems

Ground rules for Part II: You may discuss any aspect of this question with people in this class, with the TAs, or with me, but you must prepare and write your own answer.

We began the course with the Nile River region, where we have spotty historical records for events back to about 5000 ybp. That length of time is only one ten thousandth of one percent of the entire history of the Earth! How do geologists reconstruct events during the other 99.9999 percent of Earth history? How do geologists determine what the Earth was like at various times, what happened when, and so on? Write a *short* essay that conveys a clear understanding of what kinds of questions geologists ask, what kinds of data geologists collect and why, and how geologists use these date to help them build up a picture of past events. You may use examples to illustrate your points.

Part III: extending what you have learned in this course

Ground rules for Part III: You may discuss ideas for this question ***only with me****. You may not discuss this question with other members of the class.*