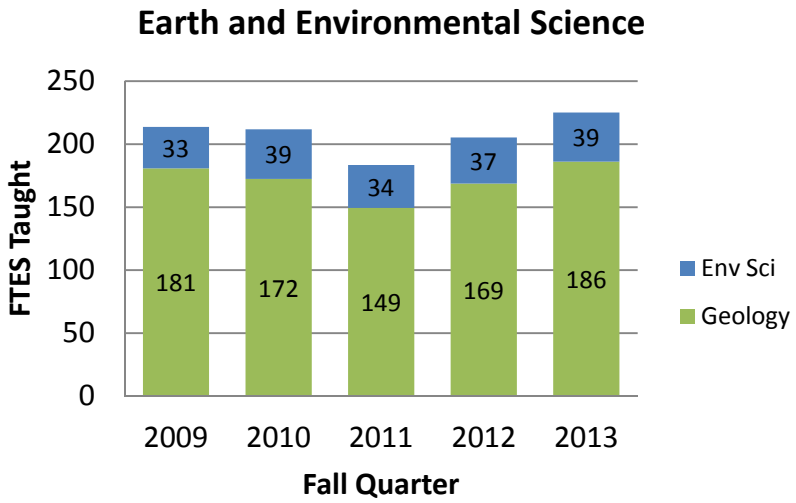
Geology MS Program Annual Report 2013-14

Department of Earth and Environmental Sciences

The Department of Earth and Environmental Sciences in the College of Science offers degrees in Geology (BS, BA, MS) and Environmental Science (BS). The scope of this report is the Geology graduate (MS) program.

Enrollment

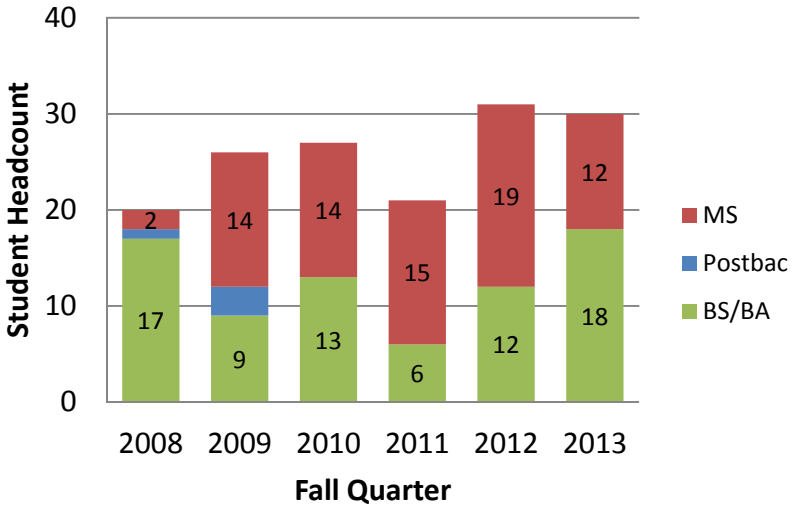
Enrollment in courses offered by the department as measured by Fall Quarter FTES has increased during the past two years and is currently 225 (see figure below), the majority from Geology courses. A large portion of the department's enrollment is due to its participation in the General Education (GE) Program. This includes Freshman Learning Communities (clusters) and upper-division GE. The department taught in four GE clusters during AY 2013-14. We offer a popular online class, GEOL 3401, The Oceans, which has a typical enrollment of about 160 students per quarter (four sections with 40 students each). The class is approved for upper-division Science GE credit.



FTES for courses in Geology and Environmental Science.

Number of Majors

The total number of majors, or student headcount, in the Geology MS program has grown significantly since 2008. There was a decrease in the number of majors between 2012 and 2013 due to a small incoming class, but based on the number of new students admitted to the program we expect the 2014 levels to return to about 20.



Number of majors in Geology programs, 2008-2013.

Student Advising

Advising for students in the Geology MS program is provided by the graduate coordinator and the project or thesis advisor. We created roadmaps for student advisement, which are provided below.

Faculty

The department has five tenure-track or tenured faculty members; one Assistant Professor, two Associate Professors and two full Professors. Our newest faculty member, Michael Massey, joined the department in Fall 2013. His specialty is Environmental Science, and he serves as the Environmental Science Program Coordinator.

Due to the small number of regular faculty, we utilize ten lecturers to teach a variety of courses, including introductory courses for non-majors as well as upper-division and graduate level

courses for majors. Most are part-time and have been teaching in the department for several years. All have at least an MS degree, and seven have a PhD in Geology or a related field.

Staff

The department has two staff members, an Administrative Support Assistant and Instructional Support Technician. The ASA provides office support and the technician prepares and maintains materials for labs.

Assessment

The department developed and implemented new assessment materials for the Geology MS program during 2013-14. The revised materials and assessment results for 2013-14 are provided below.

California State University, East Bay

APR Summary Data

Fall 2008 - 2013

Dept. of Earth and Environmental Sciences						
	Fall Quarter					
A. Student Headcount	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
1. Undergraduate	43	45	43	40	48	66
2. Postbaccalaureate	2	5	1	0	0	0
3. Graduate	2	14	14	15	19	12
4. Total Number of Majors	47	64	58	55	67	78
	College Years					
B. Degrees Awarded	**07-08**	**08-09**	**09-10**	**10-11**	**11-12**	**12-13**
1. Undergraduate	3	14	9	6	7	5
2. Graduate	0	0	1	0	2	5
3. Total	3	14	10	6	9	10
	Fall Quarter					
C. Faculty	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Tenured/Track Headcount						
1. Full-Time	4	4	4	4	4	5
2. Part-Time	0	0	0	0	0	0
3a. Total Tenure Track	4	4	4	4	4	5
3b. % Tenure Track	40.0%	40.0%	30.8%	33.3%	30.8%	35.7%
Lecturer Headcount						
4. Full-Time	0	0	0	0	0	0
5. Part-Time	6	6	9	8	9	9
6a. Total Non-Tenure Track	6	6	9	8	9	9
6b. % Non-Tenure Track	60.0%	60.0%	69.2%	66.7%	69.2%	64.3%
7. Grand Total All Faculty	10	10	13	12	13	14
Instructional FTE Faculty (FTEF)						
8. Tenured/Track FTEF	2.2	0.92	3.61	3.33	3.28	4.58
9. Lecturer FTEF	2.48	4.6	3.33	3.73	3.87	4.27
10. Total Instructional FTEF	4.69	5.51	6.94	7.07	7.15	8.85
Lecturer Teaching						
11a. FTES Taught by Tenure/Track	66.5	22.5	63.7	65.2	63.4	68.2
11b. % of FTES Taught by Tenure/Track	48.4%	10.5%	30.1%	35.5%	30.9%	30.3%
12a. FTES Taught by Lecturer	70.9	191.1	148.2	118.3	141.9	156.9
12b. % of FTES Taught by Lecturer	51.6%	89.5%	69.9%	64.5%	69.1%	69.7%
13. Total FTES taught	137.3	213.7	211.9	183.5	205.3	225.1
14. Total SCU taught	2060.0	3205.0	3178.0	2752.0	3079.0	3377.0

D. Student Faculty Ratios	2008	2009	2010	2011	2012	2013
1. Tenured/Track	30.2	24.6	17.6	19.6	19.4	14.9
2. Lecturer	28.5	41.6	44.5	31.7	36.7	36.8
3. SFR By Level (All Faculty)	29.3	38.8	30.5	26.0	28.7	25.4
4. Lower Division	44.3	44.5	41.9	30.9	35.2	24.7
5. Upper Division	15.3	34.0	27.9	25.3	34.8	29.7
6. Graduate	11.0	17.5	4.2	5.6	4.9	6.1
E. Section Size	2008	2009	2010	2011	2012	2013
1. Number of Sections Offered	27.0	26.0	27.0	31.0	32.0	35.0
2. Average Section Size	23.9	35.5	36.2	30.1	34.9	32.1
3. Average Section Size for LD	29.6	40.5	46.1	34.3	36.1	33.3
4. Average Section Size for UD	15.8	30.8	29.9	26.4	35.3	34.2
5. Average Section Size for GD	11.0	17.0	12.0	14.0	14.0	10.0
6. LD Section taught by Tenured/Track	10	1	8	8	9	9
7. UD Section taught by Tenured/Track	4	3	3	2	0	7
8. GD Section taught by Tenured/Track	0	1	2	4	7	4
8a. N sections taught by TT	14	5	13	14	16	20
9. LD Section taught by Lecturer	6	12	4	8	6	9
10. UD Section taught by Lecturer	5	8	8	7	9	8
11. GD Section taught by Lecturer	2	1	2	2	1	0
11a. N sections taught by Lecturers	13	21	14	17	16	17
12. % of Sections taught by TT (#8a / #1)	48.1%	80.8%	51.9%	54.8%	50.0%	48.6%

Source and definitions available at: http://www.csueastbay.edu/ira/apr/summary/definitions.pdf

	Fall Quarter					
Headcount Enrollment	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Environmental Science						
1. Undergraduate	26	36	30	34	36	48
2. Postbaccalaureate	1	2	1	0	0	0
3. Graduate	0	0	0	0	0	0
4. Total Number of Majors	27	38	31	34	36	48
Geology						
1. Undergraduate	17	9	13	6	12	18
2. Postbaccalaureate	1	3	0	0	0	0
3. Graduate	2	14	14	15	19	12
4. Total Number of Majors	20	26	27	21	31	30

	College Years					
Degrees Awarded	**07-08**	**08-09**	**09-10**	**10-11**	**11-12**	**12-13**
Environmantal Science						
1. Undergraduate	1	5	6	3	4	4
2. Graduate	0	0	0	0	0	0
3. Total Number of Majors	1	5	6	3	4	4
Geology						
1. Undergraduate	2	9	3	3	3	1
2. Graduate	0	0	1	0	2	5
3. Total Number of Majors	2	9	4	3	5	6

	2008	**2009**	**2010**	**2011**	**2012**	**2013**
D. Student Faculty Ratios	Environmental Science					
1. Tenured/Track	.	.	.	.	.	8.1
2. Lecturer	89.2	61.7	73.9	36.5	45.6	86.9
3. SFR By Level (All Faculty)	89.2	61.7	73.9	36.5	45.6	17.7
4. Lower Division	89.2	61.7	73.9	36.5	45.6	18.4
5. Upper Division	.	.	.	.	.	13.0
6. Graduate	.	.	.	.	.	0.0
E. Section Size						
1. Number of Sections Offered	1.0	2.0	2.0	4.0	3.0	6.3
2. SCU taught	356.0	492.0	592.0	511.0	548.0	585.0
FTES (=SCU/15)	23.7	32.8	39.5	34.1	36.5	39.0
3. Average Section Size	89.0	61.5	74.0	33.3	45.7	27.6
4. Average Section Size for LD	89.0	61.5	74.0	33.3	45.7	27.6
5. Average Section Size for UD	0.0	0.0	0.0	0.0	0.0	0.0
6. Average Section Size for GD	0.0	0.0	0.0	0.0	0.0	0.0
7. LD Section taught by Tenured/Track	0	0	0	0	0	4
8. UD Section taught by Tenured/Track	0	0	0	0	0	2
9. GD Section taught by Tenured/Track	0	0	0	0	0	0
10. LD Section taught by Lecturer	1	2	2	4	3	1
11. UD Section taught by Lecturer	0	0	0	0	0	0
12. GD Section taught by Lecturer	0	0	0	0	0	0
D. Student Faculty Ratios	Geology					
1. Tenured/Track	30.2	24.6	17.6	19.6	19.4	19.8
2. Lecturer	21.3	39.0	38.9	30.1	34.3	33.4
3. SFR By Level (All Faculty)	25.7	36.3	26.9	24.4	26.6	28.0
4. Lower Division	38.4	40.7	34.8	29.1	32.1	28.4
5. Upper Division	15.3	34.0	27.9	25.3	34.8	31.5
6. Graduate	11.0	17.5	4.2	5.6	4.9	6.1
E. Section Size						
1. Number of Sections Offered	26.0	24.0	25.0	27.0	29.0	28.8
2. SCU taught	1704.0	2713.0	2586.0	2241.0	2531.0	2792.0
FTES (=SCU/15)	113.6	180.9	172.4	149.4	168.7	186.1
3. Average Section Size	21.3	33.1	33.0	29.6	33.5	33.0
4. Average Section Size for LD	25.7	36.6	40.5	34.6	33.7	35.5
5. Average Section Size for UD	15.8	30.8	29.9	26.4	35.3	34.2
6. Average Section Size for GD	11.0	17.0	12.0	14.0	14.0	10.0
7. LD Section taught by Tenured/Track	10	1	8	8	9	5
8. UD Section taught by Tenured/Track	4	3	3	2	0	5
9. GD Section taught by Tenured/Track	0	1	2	4	7	4
10. LD Section taught by Lecturer	5	10	2	4	3	8
11. UD Section taught by Lecturer	5	8	8	7	9	8
12. GD Section taught by Lecturer	2	1	2	2	1	0

Department of Earth and Environmental Sciences
California State University, East Bay

ASSESSMENT PLAN 2013-14

GEOLOGY M.S.

27 August 2014

Department of Earth and Environmental Sciences
California State University, East Bay

Assessment Plan 2013-14
Geology M.S.

Contents

Department of Earth and Environmental Sciences
California State University, East Bay

Geology M.S. Program Learning Outcomes

Students graduating with an M.S. in Geology from Cal State East Bay will be able to:

1. attain an advanced understanding of the relationship between geologic materials and their physical and chemical properties. (Geologic Materials)

2. collect, analyze, and interpret data using advanced discipline-specific methods, techniques, and equipment. (Data Analysis)

3. critically analyze geological and environmental issues through the evaluation of current scientific literature, and present an argument clearly and persuasively in written and oral form. (Communication)

4. conduct geologic research, including preparation of a project or thesis; the result should be of high enough quality to be presented at a professional meeting. (Research)

5. understand geologic time, evolution, Earth's place in the Universe, and global-scale processes such as plate tectonics, earth systems interactions, and climate change. (Geologic Time)

Department of Earth and Environmental Sciences
California State University, East Bay

Geology M.S. Program ILO Alignment Matrix

The table below shows which Institutional Learning Outcomes (ILOs) are addressed by each of the Program Learning Outcomes (PLOs) listed above.

	MS PLO 1 Geologic Materials	MS PLO 2 Data Analysis	MS PLO 3 Communication	MS PLO 4 Research	MS PLO 5 Geologic Time
ILO 1: Thinking & Reasoning	X	X	X	X	X
ILO 2: Communication			X	X	
ILO 3: Diversity			X		X
ILO 4: Collaboration		X	X	X	
ILO 5: Sustainability			X		X
ILO 6: Specialized Education	X	X	X	X	X

Curriculum Map for Program Student Learning Outcomes
CSU East Bay, Dept. of Earth & Environmental Sciences
Degree Program: M.S. in Geology

				Program Learning Outcomes				
Assessed	**Field**	**Course**	**Title**	**1. Geologic Materials**	**2. Data Analysis**	**3. Communi-cation**	**4. Research**	**5. Geol. Time**
	GEOL	6020	Seismic Exploration	P	M			
	GEOL	6030	Earthquake Seismology	M	M			M
*	GEOL	6040	Near Surface Geophysics	P	M*			
	GEOL	6300	Quaternary Geology		P	M	P	M
	GEOL	6310	Isotope Geochemistry	I	P	P		M
*	GEOL	6320	Groundwater	I*	M*	P*		P
	GEOL	6411	Engineering Geology	M	M			
	GEOL	6412	Adv. Ig. & Metamorph. Petrol.	M	M			
*	GEOL	6414	Earthquake Geology	P*		M*		M
	GEOL	6415	Adv. Sedimentary Petrology	M	M			
	GEOL	6430	Tectonic Geomorphology	I		P		M
*	GEOL	6811	Graduate Seminar			M*		
*	GEOL	6899	Project		P	P	M*	
*	GEOL	6910	University Thesis		M	M	M*	

Proficiency Levels: I = Introduced; P = Practiced; M = Mastered
*This course used to assess program learning outcomes

This course used for 2013-2014 assessment

CSUEB Geology M.S. Program - CRITICAL THINKING & WRITING RUBRIC

Definition: *Critical thinking* is a habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion. *Written communication* is the development and expression of ideas in writing It can involve working with many different writing technologies, and mixing texts, data, and images.This rubric may be applied to student writing assignments that involve all or parts of any of the M.S. in Geology Program Learning Outcomes (PLOs).

1. Context and Purpose *Consideration of audience, purpose (i.e précis, term papers & reports).*	Demonstrates **thorough understanding** of context, audience & purpose. **Completes** assigned task(s) and focuses all elements of the work.	Demonstrates **adequate understanding** of context, audience & purpose. **Completes** assigned task(s) and focuses all elements of the work.	Demonstrates **awareness** of context, audience & purpose. **Minimally completes and focuses** assigned task(s) and all elements of the work.	Demonstrates **minimal or no attention** of context, audience & purpose. **Barely completes or does not complete** assigned task(s) and focus all elements of the work.
2. Disciplinary Conventions *Formal and informal rules for writing in particular forms and academic fields*	Demonstrates **detailed attention** to, and successful execution of, writing task (s) including organization, content, presentation, formatting, and style.	Demonstrates **consistent attention** to, and successful execution of, writing task (s) including organization, content, presentation, formatting, and style.	Demonstrates **some attention** to, and successful execution of, writing task (s) including organization, content, presentation, formatting, and style.	Demonstrates **poor attention** to, and execution of, writing task (s) including organization, content, presentation, formatting, and style.
3. Syntax and Mechanics	Uses **graceful** language that **skillfully communicates** meaning to readers with **clarity** and **fluency**, and is virtually **error- free**.	Uses **straightforward** language that **generally conveys meaning** to readers. The language in the portfolio has **few errors**.	Uses language that **generally conveys meaning** to readers with **clarity**, although writing may include **some errors**.	Uses **poor** or **inappropriate** language choices that sometimes **impede meaning** because of **errors in usage**.
4. Explanation of Issues	Issue is **stated clearly** and **described comprehensively**, delivering all information necessary for **full understanding.**	Issue is stated, described, and clarified so that **understanding is not seriously impeded by omissions**.	Issue is stated but leaves some terms **undefined, ambiguities unexplored**.	Issue is stated **without clarification or description**.
5. Evidence *Selecting and using information to investigate a point of view or conclusion*	Information is taken from **appropriate** source(s); allows **comprehensive analysis**. Viewpoints of experts are **questioned thoroughly**.	Information is taken from **appropriate** source(s); allows **coherent analysis** or synthesis. Viewpoints of experts are subject to **questioning**.	Information is taken from **mostly appropriate** source(s) **without coherent analysis** or synthesis. Viewpoints of experts are taken as mostly fact, with **little questioning**.	Information is taken from source(s) **without any interpretation or evaluation**. Viewpoints of experts are taken as fact, **without question**.

Modified from: Critical Thinking Value Rubric, AAC&U http://www.aacu.org/value/rubrics/WrittenCommunication.cfm

CSUEB Geology M.S. Program - ORAL COMMUNICATION VALUE RUBRIC

Definition: Oral communication is a prepared, purposeful presentation designed to increase knowledge, to foster understanding, or to promote change in the listeners' attitudes, values, beliefs, or behaviors. This rubric may be applied to student oral presentation assignments that involve all or parts of the M.S. in Geology Program Learning Outcomes (PLOs) 2 (Data Analysis), 3 (Communication), 4 (Research), and 5 (Geologic Time).

	Exemplary 3	**Accomplished** 2	**Competent** 1	**Insufficient Evidence** 0
1. Organization	Organization is **clear, consistent, observable** and **skillful** and content is **cohesive**.	Organization is **clear**, **consistent** & **observable**.	Organization is **intermittently observable**.	Organization is **poor** or **not observable**.
2. Language	Language is **clear**, **accurate**, **compelling**, and **enhances** the **effectiveness** of the presentation, and audience **appropriate**	Language is **clear**, **thoughtful** and supports the effectiveness of the presentation, and audience **appropriate**	Language is **mundane**, **commonplace** and partially supports the effectiveness of the presentation, and audience **appropriate**	Language choice is **unclear**, **informal** and minimally supports effectiveness of presentation. Language in presentation is **not appropriate** to audience.
3. Delivery	Delivery techniques make presentation **compelling**. Speaker appears **polished** and **confident**.	Delivery techniques make presentation **interesting**. Speaker appears **comfortable**.	Delivery techniques make the presentation **understandable**. Speaker appears **tentative**.	Delivery techniques **detract** from the understandability of the presentation. Speaker is **uncomfortable**.
4. Supporting Material	Appropriate type(s) of supporting materials make reference to information or analysis that **significantly supports** the presentation or establishes the presenter's credibility/authority on the topic.	Appropriate type(s) of supporting materials make reference to information or analysis that **generally supports** the presentation or establishes the presenter's credibility/authority on the topic.	Appropriate type(s) of supporting materials make reference to information or analysis that **partially supports** the presentation or establishes the presenter's credibility/authority on the topic.	**Insufficient** supporting materials
5. Central Message	Message is **compelling** (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is **clear** and **consistent** with the supporting material.	Central message is **basically understandable** but is not often repeated and is **not memorable**.	Central message can be deduced, but is **not explicitly stated** in the presentation.

Modified from: Oral Communication Value Rubric, AAC&U http://www.aacu.org/value/rubrics/WrittenCommunication.cfm

Assessment Results, 2013-2014

Overview

We present four assessments from the M.S. program in Geology that span a range of learning outcomes, but here we focus on our PLO #3 (Communication), both written and oral, based on traditional term papers, précis of journal articles, oral presentations of timely and topical subjects, and University theses and their associated prospecti. These four assessments analyze 38 separate pieces of student work, and in only one case did a student not meet the competency standard set forth in the pertinent grading rubric. Furthermore, there was only one case where a student failed to achieve basic competence (minimum score), otherwise students scored above the level "competence".

GEOL 6310 – Groundwater: Term Paper

Graduate-level term paper. A course average of 8.5/15, where 5/15 indicates “competence” and 10/15 indicates “accomplishment”. The large standard deviation (3.87) indicates that there is a wide range of abilities, and the lowest average scores in the area of ‘Syntax & Mechanics’ is consistent with difficulties in writing for many of our students.

We would be wise to continue and in fact increase the number of writing assignments in order to produce students with stronger writing and analysis skills.

GEOL 6414 – Earthquake Geology: Complex Journal Article Précis - Mid-Term

Précis of a difficult and complex journal article. Used a modified rubric that takes into account the requirements of the précis. Course average is 6.1/9 , where 3/9 indicates competence and 6/9 indicates accomplishment. The lowest scores indicate that the rigorous nature of the précis style is difficult to apply.

Again, we would be wise to continue and in fact increase the number of writing assignments in order to produce students with stronger writing and analysis skills. The précis is a writing form that encourages the student to focus on reading, critical analysis and written communication. Students are well served by these exercises in that they easily transfer to the writing of critical or executive summaries, journal abstracts, and articles.

GEOL 6414 – Earthquake Geology: Oral Presentation on Earthquake or Region

A 30-45 minute oral presentation on an important earthquake or earthquake-producing region. Students are asked to focus on substance rather than style and use discipline-specific language in a formal presentation. Course average is 7.8/12, where 4/12 is ‘competent’ and 8/12 is ‘accomplished’. One student barely met the competence threshold (5/12), but otherwise the results are strong.

Oral presentations are an important aspect to our M.S. students training, however focus should remain on organization and presentation, projecting a comfort with the material, and using discipline-specific terminology and a professional rather than informal speaking style.

GEOL 6910 – University Thesis: Prospectus and Thesis

Approved thesis and associated prospectus. The department is one of the few in which students produce University Theses. With a sample size, n=2, the statistics are not important relative to the accomplishment of proposing, producing and bringing to successful completion a proper thesis that passes not only 3 member faculty review, but often outside advisors from industry and government agencies. Students from the M.S. Program in Geology have been awarded the Harrington Award for Outstanding University Thesis in 2013 (Daniel Segal) and 2014 (Pamela Beitz).

CSUEB Geology M.S Program Assessment

Rubric:	**Wrtten Comm.**	**Class Average:**	**8.5/15**
Course:	GEOL 6320	**Std. Dev.**	**3.87**
Quarter:	Winter 2014	Min. Competance	5.0/15
Assignment:	Term Paper		

Student	Context & Purpose	Disciplinary Conventions	Syntax and Mechanics	Explanation of Issues	Evidence	Total
1	1	1	0	0	0	2
2	2	1	1	2	3	9
3	1	2	2	2	2	9
4	3	3	2	3	2	13
5	3	3	3	3	2	14
6	1	1	1	2	1	6
7	3	2	2	3	3	13
8	1	1	2	1	1	6
9	1	2	2	1	1	7
10	1	1	1	1	2	6
Class average	**1.7**	**1.7**	**1.6**	**1.8**	**1.7**	**8.5**
Standard deviation	**0.95**	**0.82**	**0.84**	**1.03**	**0.95**	**3.87**

CSUEB Geology M.S Program Assessment

Rubric:	**Oral Communication**	**Class Average:**	**7.8/12**
Course:	GEOL 6414/4414	**Std. Dev.**	**1.22**
Quarter:	Winter 2014	Min. Competence	4.0/12
Assignment:	EQ Region Presentation		

Student	Organization	Language	Delivery	Supporting Material	Total
1	2	2	3	2	9
2	2	2	2	2	8
3	2	2	2	1	7
4	2	2	2	3	9
5	2	2	2	2	8
6	2	2	2	2	8
7	2	2	2	2	8
8	2	2	2	2	8
9	2	2	3	2	9
10	1	2	1	2	6
11	2	2	2	2	8
12	2	2	3	2	9
13	2	1	2	2	7
14	2	2	2	2	8
15	1	1	1	2	5
Class average	**1.8**	**1.8**	**2.0**	**2.1**	**7.8**
Standard deviation	**0.39**	**0.39**	**0.60**	**0.29**	**1.22**

CSUEB Geology M.S Program Assessment

Rubric:	**Crit. Think/Writing**	**Class Average:**	**6.1/9**
Course:	GEOL 6414/4414	**Std. Dev.**	**1.24**
Quarter:	Winter 2014	Min. Competence	3.0/9
Assignment:	Midterm Journal Article Precis		

Student	Genre & Conventions	Syntax & Mechanics	Explanation	Total
1	2	2	2	6
2	2	3	2	7
3	2	2	2	6
4	2	1	2	5
5	3	3	2	8
6	2	1	3	6
7	2	2	2	6
8	3	2	2	7
9	2	2	2	6
10	2	2	1	5
11	3	3	2	8
12	2	1	2	5
13	1	1	2	4
Class average	**2.2**	**1.9**	**2.0**	**6.1**
Standard deviation	**0.58**	**0.79**	**0.43**	**1.24**

CSUEB Geology M.S Program Assessment

Rubric:	**Crit. Think/Writing**	**Class Average:**	**12.0/15**
Course:	GEOL 6910	**Std. Dev.**	**1.41**
Quarter:	Winter 2014	Min. Competence	5.0/15
Assignment:	University Thesis & Prospectus		

Student	Context & Purpose	Disciplinary Conventions	Syntax and Mechanics	Explanation of Issues	Evidence	Total
1	3	3	2	3	2	13
2	2	2	2	3	2	11
Class average	**2.5**	**2.5**	**2.0**	**3.0**	**2.0**	**12.0**
Standard deviation	**0.71**	**0.71**	**0.00**	**0.00**	**0.00**	**1.41**

GEOL6320 Groundwater

Term paper Assignment:
A key assignment for the course is a research paper about one of the well-studied groundwater contamination sites listed below. The papers should be about 10-12 pages of text (1.5 spaced, 11 point font), not including references. Draw mainly from journal articles and please be certain to cite your references within the paper as well as at the end in the reference section. Use a citation manager such as EndNote or Zotero to keep track of and store citations. Get started with your search at: http://library.csueastbay.edu/online-resources/databases/?sub=69. Beginning your search on the site name/location should give you a good start.

The sites listed have been examined extensively by academics, government agencies, and consultants, and are thoroughly described in the scientific literature. Your paper should describe the basic hydrogeologic setting and the contamination issue(s) at the site, but should focus on **what new information was learned about contaminant transport** through studies carried out at the site. Be sure to discuss how the hydrogeologic setting affected transport (advection and dispersion) of contaminants, and how the contaminant(s) at the site behaved with respect to retardation, natural attenuation, biodegradation, abiotic degradation, etc. If there was active remediation at the site, discuss the method(s) used and how effective they were. It's okay to focus on one contaminant or one biogeochemical process once you've described the basic hydrogeologic setting and overall contamination issue(s). I will discuss how the paper should be organized during class but keep in mind that you should follow technical writing conventions as exemplified by peer-reviewed scientific literature. Draft versions of the paper are due on Nov. 20th. Submit your paper on Blackboard using Turn-It-In. You will have an opportunity to improve upon the draft, based on my comments, and turn in the final version on Dec. 4th.

Choose one of these sites – there will be 2 or 3 other students working on the same site:
Borden Aquifer – Ontario, Canada (landfill – multiple)
Bemidji, MN (hydrocarbons)
Nevada Test Site/Yucca Mountain, NV (radionuclides)
Cape Cod, MA (sewage)

During the last class meeting on December 4, you will present a poster showing the results of your literature research, as a team (with the other students working on the same site). The poster should mainly display figures with captions, and have sections on hydrogeologic setting, contaminants and contaminant transport, and major findings that advanced the understanding of contaminant transport. The team will talk us through the poster as a way of presenting the material to the rest of the class.

GEOL6414-4414 Spring 2014

Midterm Precis

Please find either *Yue, Suppe & Hung, 2011* or Sylvester, 1988 on the course Blackboard site; chose one to read and write a précis in the strict style we have been following in class for textbook chapter.

Please refer to the Precis Writing Guide that is also posted in the course Bb space or see me if you have any questions.

Due at the end of week 6.

GEOL4414/6414 – Earthquake Geology **Spring 2014**

Writing a Précis

As Graduate students you are ideally expected to do many critical readings, to assess arguments, hypotheses or models, and then to present an informed argument of an article and to reproduce the logical development of the argument in as cogent a form as possible *in your own words*. In order to demonstrate that you have assimilated the central argument and proof of another scholar's critical interpretation, you must be able to compose a *précis* of an argument. Another way to think of a précis is that it is an *executive summary* in the academic world.

A summary or a précis is NOT a personal interpretation of a work or an expression of your opinion of the idea (you will never use the first-person I in a précis); it is, rather, *an exact replica in miniature of the work, often reduced to one-quarter to one-fifth of its size, in which you express the complete argument!* You will not write such things as*: "the authors conclude…,* but will rather simply state the conclusion of the paper. You are to write this as though YOU are the author, but you are even better in that you will be even more focused and briefer!

What actually happens when you write a précis? First, *you must understand the complete work so that you can abstract the central argument and express it cogently and completely*. Next, you must develop the argument exactly as the writer has presented it AND reduce the work by 75-80% (and for this class with some of these 30-40 page papers - 90%) of its original size.

The key word here is assimilation. When you read the material, it is probable that you will understand only those parts that have associations within your own experience. Don't get bogged down by mathematics if things are not initially clear: look at the terms and their arrangement – try to recognize fundamental relationships and try to verify them with your reading of the text.

- *How you actually go about writing a précis depends largely on your ability to restate the writer's central ideas after you have assimilated them in your own mind.*

Steps to writing an effective précis:

1. Read the article many times most carefully.
2. Write a précis of the article in which you state the entire argument and also to present the logical progression (the development) of the argument.
3. Reduce the article to around one-fifth to one-quarter of its original length and omit nothing from the *essential* argument. This is, in reality, the key to the whole enterprise!
4. Type the précis and begin with your abstraction of the central, informing idea of the article. Having understood and written the central idea, present the essential argument(s) in as cogent manner as possible.
5. Here is a central rule: ***Do not copy a single sentence from the article!*** You may use key words and phrases only when you are expressing ideas which are technically precise or when you feel comfortable using the writer's

own words, i.e., you understand exactly he or she means, and there is really no better way to express the concept.

Finally, in order to complete this assignment, you will have to read the work most carefully, ask questions about the work repeatedly, and reach into your own geologic background so that you can best shape the writer's concepts!

These kinds of assignments are not easy! When you have completed it well, you will likely never forget the argument, the examples, and the development of the article. More than likely you will also be learning that, when you write research papers and other critical papers, you ability to write the précis is central to the basics of analysis, synthesis, comparison, and other key, higher order thinking skills absolutely required for your success in college and in the profession or career you have chosen when you graduate.

California State University, East Bay
Department of Earth and Environmental Sciences

SUGGESTIONS FOR THE PREPARATION OF A PROSPECTUS FOR A MASTER'S THESIS

GENERALITIES

A thesis prospectus is a document which is required from all graduate students who plan to complete a Master's thesis in Geology. It is one of the requirements which must be fulfilled in order to be *advanced to candidacy*, a step necessary to begin work on a thesis project.

The prospectus must present convincing evidence that the student is able to complete independent research; specifically, there must be evidence that:

- The student is familiar with the proposed thesis topic:
  1. by his/her ability to state clearly the research objectives and to demonstrate mastery in the methods to be used in carrying out these objectives.
  2. by his/her academic background.
  3. by his/her knowledge of pertinent geologic literature.

- The student will be able to carry out the proposed research within a realistic framework of:
  1. reasonable project scope and size.
  2. available time.
  3. available equipment.
  4. other available resources.

- The student is able to write in clear and grammatically correct English.

Prior to beginning work on a prospectus, a student must first make sure that he/she has achieved *classified status.* One of the university requirements to reach this status is the completion of the *Writing Skills Test;* normally this test is completed during the first quarter of attendance at CSUEB The other major requirement is that all undergraduate course deficiencies have been removed. Once these requirements are satisfied, a student must consult with faculty members and the Graduate Coordinator to select a *Thesis Adviser.* The Thesis Adviser will be appointed by the Department Chair to act as Chair of the student's Thesis Committee. Students are encouraged not to wait until the completion of all course work before beginning thesis research. As soon as they have reached classified status, they should begin to think about areas in which they may wish to specialize. They will be helped in their search by the Graduate Coordinator who will also advise them on their status in the program. The Department Chair will also appoint other colleagues who will act as thesis committee members of whom at least one (in addition to the Adviser) must be a regular member of the faculty of the Department of Earth and Environmental Sciences, the other can be from outside the Department or University. **Please keep in mind that <u>no thesis research can begin prior to acceptance of the prospectus.</u>**

CALIFORNIA STATE UNIVERSITY EAST BAY

Academic Roadmap

Department of Earth and Environmental Sciences
M.S. in Geology

Note: This roadmap is an example of one schedule that will enable you to graduate in two years. There are many different ways to complete the required coursework in a timely manner. Your actual schedule will likely be different.

	UNITS	WINTER	UNITS	SPRING	UNITS	NOTES
Graduate Geology Course	(4)	Graduate Geology Course	(4)	Graduate Geology Course	(4)	
Approved Elective	(4)	Approved Elective	(4)	Approved Elective	(4)	
				GEOL 6811 - Graduate Seminar	(2)	
TOTAL UNITS	8	TOTAL UNITS	8	TOTAL UNITS	10	
				TOTAL UNITS FOR YEAR	26	

Year 1 (0 – 24 units)

You should . . .

Meet with the Graduate Coordinator
Complete any course deficiencies
Take the Writing Skills Test if needed

and consider . . .

Participate in a student organization:
Cummings Earth Science Club,
AAPG, or SEG.

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	UNITS	WINTER	UNITS	SPRING	UNITS	NOTES
Graduate Geology Course	(4)	Graduate Geology Course	(4)	GEOL 6811 - Graduate Seminar	(2)	
GEOL 6910 - University Thesis	(2)	GEOL 6910 - University Thesis	(3)	GEOL 6910 - University Thesis	(4)	
TOTAL UNITS	6	TOTAL UNITS	7	TOTAL UNITS	6	
				TOTAL UNITS FOR YEAR	19	

Year 2 (25 – 45 units)

You should . . .

Meet with Graduate Advisor
Submit prospectus
Advance to candidacy
File for graduation

and consider . . .

Meet with AACE advisor
Attend a career fair
Attend a professional conference

TOTAL UNITS ON PLAN	45
MAJOR UNITS	33-45
6000-LEVEL UNITS	33-45