

The Instructional Program Review Narrative Report

1. College: **Merritt College**

Discipline, Department or Program: **Geology**

Date: **January 2, 2010**

Members of the Instructional Program Review Team: **Dr. Chamberlain and Ms. Williams**

2. Narrative Description of the Discipline, Department or Program:

The Geology Program has been taught at Merritt College since the 1960's and it was initially part of the Environmental Studies Program. It is the primary mission of Geology Program at Merritt College to teach students about the evolution of the earth and foster in them an appreciation and understanding of the processes that created and has changed the Earth over time. These courses are taught using classical instruction, and laboratory and fieldwork that emphasizes critical thinking. Student mastery is demonstrated in their ability to think and write critically about the Earth in a capstone report.

3. Curriculum:

- Is the curriculum current and effective? The current curriculum's effectiveness has been determined Anonymous Assessment data collected from Earth Science students. These data provide instructor feedback on the instructors teaching and assessment methods, and classroom atmosphere. In addition, the program lead is in constant contact with geology professors at CSU Hayward and UC Berkeley to make sure the geology courses at Merritt College are equivalent to introductory Geology courses taught at those 4-year institutions. Have course outlines been updated within the last three years? All course outlines have been updated with as of January 2, 2010.
- Has your department conducted a curriculum review of course outlines? The Physical Science Department has conducted a curriculum review of the course outlines for the Geology Program.
- What are the department's plans for curriculum improvement (i.e., courses to be developed, updated, enhanced, or deactivated)? The program's curriculum is being improved by using educational psychology research and instructor driven Acton Research projects to enhancing

curriculum, improving the classroom environment and structure, and analyzing anonymous assessment data. In addition, a new course “Earth Stewardship” is being developed for Basic Skills students that will combine the field of biology, geology, environments studies and political science. Have prerequisites, co-requisites, and advisories been validated? All prerequisites, co-requisites, and advisories been validated. Is the date of validation on the course outline? No.

- What steps has the department taken to incorporate student-learning outcomes in the curriculum? Student Learning Outcomes have been developed for all program courses. The Student Learning Outcomes are (1) discussed during the first and final lectures, (2) added to the class syllabus, and (3) reevaluated and updated yearly based on student exit interviews.
 - Describe the efforts to develop outcomes at the program level. In which ways do these outcomes align with the institutional outcomes? The program outcomes were developed by merging the institutional outcomes with the educational needs of the students, universities and local community to create the student learning outcomes for this program.
 - Recommendations and priorities.
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4. Instruction:

- Describe effective and innovative strategies used by faculty to involve students in the learning process. Techniques derived from research in educational psychology are used to create safe learning environments that foster student success and psychological healing and knowledge acquisition in the learning environment. How has new technology been used by the department to improve student learning? The college issued computer is used for classroom presentations and for displaying data.
- How does the department maintain the integrity and consistency of academic standards within the discipline? The integrity and consistency of academic standards within the discipline are maintained by discussing updates and changes in the Geologic field with geologist at CSU Hayward, UC Berkeley, and within Peralta Community College District.
- Discuss the enrollment trends of your department. Enrollment has decreased prior to 2004 but has been increasing gradually since 2008. There has been a steady drop in sections offered since 2005 but FTEF has remained steady. Nevertheless, productivity has increased since 2007. What is the student demand for specific courses? The demand is high especially since CSU and UC geology majors are taking course at Merritt College. How do you know? Enrollment has increased 35% in 2010 and the anonymous assessment of curriculum and instruction data validate that there is an increase in geology majors enrolling in geology at Merritt College. What do you think are the salient trends affecting enrollments? According the California Employment Development Department, The occupational projection of

employment for Geographers is expected to grow 4.9% by the year 2016. The demand for Earth Science has increased with the larger number of Earth Science majors enrolling in community colleges because of budget cuts at the CSU and UC level.

Are courses scheduled in a manner that meets student needs and demand? *Yes, the courses are offered at the optimum time for students. How do you know? The geology courses do not conflict with science courses taught at Merritt and the courses are full.*

- Recommendations and priorities.
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5. Student Success:

- Describe student retention and program completion (degrees, certificates, persistence Rates ASK ANIKA about persistence rates 252, 201) trends in the department. *The student retention rates were as follows: 55% for 2005-06, 80.5% for 2006-07, 89% for 2007-08, and 72.5% for 2008-09. The completions rates were as follows: 45% for 2005-6, 77.5% for 2006-07, 64.3% for 2007-08, and 60% for 2008-09. What initiatives can the department take to improve retention and completion rates? The program will merge Emotional Intelligence and educational psychology teaching techniques with the course curriculum.*
- What are the key needs of students that affect their learning? *The students need new lab equipment, stools, and materials for lecture. What services are needed for these students to improve their learning? Students need knowledgeable compassionate tutors and counseling staff. Describe the department's efforts to access these services. What are your department's instructional support needs?*

Instructional needs for the next three years:

1. A Periodic Table in an Earth Science Context (Poster)

Use: Show the relationship between elements, minerals, rocks and weathering. Total Cost: \$32.95

2. Inflatable/Writable Globe

Use: Allow students to plot information about rocks, mineral, mountain chains, tectonic boundaries distribution directly on a globe. Total Cost: \$194.25

3. World Nation Relief Globe

Use: Hand-on activities in geology and geography to study seasons, weathering

patterns, tectonic boundaries, mountain chain distribution, and climate belts.

Total Cost: \$479.60

4. Giant Earth Model with Built-In Solar Panel Digital Display

Use: Hand-on activities in geology and geography to study seasons, climate belts, weathering patterns, and insolation. Total Cost: \$459

5. Water Tanks: Weather Fronts & Ocean Currents Model

Use: Hand-on activities in geology and geography to study weather, climate

belts, ocean circulation, and convection.
Total Cost: \$119

6. Complete Cloud-Forming Apparatus
Use: Demonstrate a variety of atmospheric conditions. Total Cost: \$348

7. WARD'S Contoured Landform Lab Activity
Use: Map reading, contour line analysis for geology and geography labs. Total Cost: \$65.00

8. Digital Psychrometer
Use: Demonstrate meteorological (climate) data collection methods and analysis. Total Cost: \$495

9. Soil Formation Collection

Use: Illustrate how soils are formed from rocks and minerals for geology and geography lab. Total Cost: \$580

10. Classroom Mineral Collection
Use: Introduction mineralogy is a mandatory lab for geology and geography students. Total Cost: \$612

11. Classroom Rock Collection
Use: Rock identification is a mandatory lab for geology and geography students. Total Cost: \$452

12. Computer Projector
Use: Projection device for laptop computer. Total Cost: \$350.00

13. Computer Printer and Scanner
Use: Printing and Scanning of materials. Total Cost: \$250

- Describe the department's effort to assess student learning at the course level. Describe the efforts to assess student learning at the program level. In which ways has the department used student learning assessment results for improvement? **An anonymous assessment tool has been developed to obtain instantaneous feedback from students about the learning environment, courses curriculum design and rigor, instructional support and homework, and exam relevance. By using this tool, monthly student learning can be assessed. The anonymous assessment data will be used to assess and drive curriculum and instruction decisions at the course and program level.**
- Recommendations and priorities.

6. Human and Physical Resources (including equipment and facilities)

- Describe your current level of staff, including full-time and part-time faculty, classified staff, and other categories of employment. **There is one full-time Geology Instructor**
- Describe your current utilization of facilities and equipment.

1. Computer Projector: Light bulb is almost dead. Lack of a new projector light bulb limits the use of a computer, and this creates a substandard learning experience for students.
2. Laptops used in every class for powerpoint slides, computer simulations, laboratory exercises, and curriculum research for classes. Laptop computer is used to supplement substandard laboratory materials and equipment.
3. 20-inch Television with poor resolution and sound – used monthly to show simulation of Earth Science processes. The television creates a substandard learning environment and educational experience for students.
4. Lab equipment old and broken (rock and mineral kits, and demonstration models) – they are used daily and they create a substandard learning environment and educational experience for students.
5. Lab Materials old and parts missing, world maps from the 1960's – they are used daily and they create a substandard learning environment and educational experience for students.
6. Laboratory tables are old with sharp edges that cut students, and damage their clothing, backpacks, and textbooks - they are used daily and they create a dangerous substandard learning environment and educational experience for students.
7. Laboratory stools are old and damaged - they are used daily and they create a dangerous substandard learning environment and educational experience for students.

- Are the human and physical resources, including equipment and location, adequate for all the courses offered by your department (or program)? **No.**

What are your key staffing and facilities needs for the next three years?

No part-time instructor is need in the geology program for the next three years.

Facilities Needs are:

1. New Laboratory tables
2. Laboratory stools
3. Electronic classrooms
4. New shelving in storage room
5. New flooring
6. New chalk board
7. New demonstration desk

- Recommendations and priorities.

7. Community Outreach and Articulation

For vocational programs:

- Describe the department's connection with industry. Is there an Advisory Board or Advisory Committee for the program? If so, how often does it meet? Is the program adequately preparing students for careers in the field? How do you know?
- Have students completing the program attained a foundation of technical and career skills? How do you know? What are the completion rates in your program?
- What are the employment placement rates? Include a description of job titles and salaries. What is the relationship between completion rates and employment rates?
- What industry trends are most critical for the future viability of the program? How do you know? What are the implications of these trends for curriculum development and improvement?

For transfer programs:

- Describe the department's efforts in meeting with and collaborating with local 4-year institutions. **The program lead meets with professors at CSU Hayward and UC Berkeley yearly to discuss ways to ensure that the geology courses taught at Merritt College are similar to the courses taught at their institutions.** Is the program adequately preparing students for upper division course work? **The Geology Program at Merritt College adequately prepares students for Upper Divisions course work but the laboratory preparations are substandard when compared to 4-year institutions.** How do you know? **The program lead is in contact with some Earth Science transfer students at 4-year institutions, and they have told the program lead that Earth Science program at Merritt College adequately prepared them to do course work at their transfer institution.**

For all instructional programs:

- Describe the department's effort to ensure that the curriculum responds to the needs of the constituencies that it serves. **The program lead meets with professors at 4-years institution who teach introductory geology courses, and follows the latest trends in Earth Science education by reading science and developmental education journals. Those trends are used to drive curriculum and instructional development.**
- Recommendations and priorities.

Instructional Program Review Resource Needs Reporting Template

| Division: II | | Department/Program: <i>Geology</i> | | Contact: T. Williams | |
|--|----------------------------|--|--|---|---|
| Item Identified in Program Review (justification) | Human Resources (Staffing) | Physical Resources (Facilities) | Technology and/or Equipment | Supplies Budget | Curriculum |
| Need equipment and supplies to create standard laboratory educational experiences for students | None | New Laboratory tables Laboratory stools Electronic classrooms New shelving in storage room New flooring New chalk board New demonstration desk | \$2,000 budget New Projector New DVD player New Printer New Television Laboratory Equipment | \$3,500 budget Laboratory Supplies | \$400 budget for books/materials for curriculum development |
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Integrated Planning Template

| Division: <i>II</i> | | Department/Program: Geology | | | Contact: Williams | |
|--------------------------------|----------------------------------|------------------------------------|----------|----------|-------------------------------|--|
| Strategic Direction __: | | | | | | |
| Institutional Goal __: | | | | | | |
| Objective: | | | | | Priority: | |
| Activities/Tasks | Responsibility Lead person(s) | Resources | Timeline | Comments | College Planning Link(s) * | |
| 1. | | | | | | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |
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*College Planning Links:
 Budget Committee
 Facilities Committee
 Technology Committee
 Curriculum Committee
 Learning Assessment (SLO) Committee

Student Learning Outcomes Reporting Template (Course Level Outcomes)

| Division: II | | Department/Program: <i>Geology</i> | | Course: Geol 1 | | Contact: Williams |
|---|--|--|--|---|-----------------------------|---|
| Student Learning Outcome | Outcome Measure | Definition of Data (Sample/Population) | Method of Data Collection & Source | Expected Level of Performance | Actual Level of Performance | Plan of Action |
| Basic scientific and mathematical competence in geology | 1.Can understand and apply basic principles of chemistry and physics to geologic issues. 2.Understands the fundamental principles of geology. 3.Has knowledge of a diversity of subjects that form the core topics of geology. | Samples of rocks, minerals, fossils, and landforms | Grading assignments in groups using grading rubric | Successfully passing embedded assessment questions/exercises in the core geology courses. | | 1. Create exercises and classroom activities for this learning outcome 2. Create a grading rubric for this outcome |
| Field and laboratory technical competence | 1.Can identify and classify basic geologic materials, including minerals, rocks, fossils, structures, and landforms, and knows their basic material and/or biological properties or characteristics. 2.Can collect and describe samples of geologic materials in support of field investigations. | Laboratory exercises and mandatory field trips | Grading assignments in groups using grading rubric | Successfully completing the laboratory and field trip components of course | | 1. Create exercises and classroom activities for this learning outcome 2. Create a grading rubric for this outcome |
| Basic critical thinking, and problem solving skills | 1.Can critically read and critique research articles. 2.Can analyze, interpret, and integrate diverse datasets. | Critical thinking reading and writing assignments | Grading assignments in groups using grading rubric | 1.Carrying out exercises or small projects within courses that have a research or laboratory component. | | 1. Create exercises and classroom activities for this learning outcome 2. Create a |

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| | | | | 2.Successfully completing capstone project. | | grading rubric for this outcome |
| Development of individual learning skills | Can develop the skills necessary to engage in independent learning. | Homework assignments and in class activities | Self-grading rubric to measure Emotional Intelligence and classroom maturity | Exercises throughout the time of study | | 1. Create exercises and classroom activities for this learning outcome 2. Create a grading rubric for this outcome |
| Competence in technical communication | 1.Can communicate effectively in written form through words, graphs, and tables. 2.Can communicate orally using prepared presentations. 3.Can create scientific documents such as reports using the correct formats | Written assignments | Grading assignments in groups using grading rubric | Preparing lab reports and oral presentations as required in courses. | | 1. Create exercises and classroom activities for this learning outcome 2. Create a grading rubric for this outcome |
| Ability to work effectively on a professional team | 1.Can communicate effectively with team members through personal and electronic means. 2.Can work responsibly as a member of a team and demonstrate professional levels of conduct. | Group assignment and activities in class | Grading assignments in groups using grading rubric | Successfully completing team-based assignments in laboratories, field camp, and course work. | | 1. Create exercises and classroom activities for this learning outcome 2. Create a grading rubric for this outcome |

Student Learning Outcomes Reporting Template (Program Level Outcomes)

| Division: II | | Department/Program: <i>Geology</i> | | Contact: Williams | | |
|---|---|--|------------------------------------|-------------------------------|-----------------------------|----------------|
| Student Learning Outcome | Outcome Measure | Definition of Data (Sample/Population) | Method of Data Collection & Source | Expected Level of Performance | Actual Level of Performance | Plan of Action |
| Master the basic knowledge and skills demanded for entry-level competence in typical careers in Earth Science. | 1. Understands the fundamental principles of Earth Science. 2. Has knowledge of a diversity of subjects that form the core topics of the Earth Sciences. | Varies | Varies | Varies | Varies | Varies |
| Cultivate the specific scientific and technical skills that will allow them effectively to serve their employers and to enhance their own career development. | Can identify and classify basic geologic materials, landforms, and weather and climate analysis. Demonstrates competence in basic computer tools including word processors, graphical applications, spreadsheets, presentation software, and Internet utilization. | Varies | Varies | Varies | Varies | Varies |
| Develop increased capacity in the skills of independent learning, critical thinking, problem definition, and problem solving. | Has the confidence to critically analyze charts and graphs, and read maps. | Varies | Varies | Varies | Varies | Varies |
| Communicate effectively and professionally through oral, written, and | Can read and write critically and with confidence individually and in | Varies | Varies | Varies | Varies | Varies |

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| graphical means and to participate effectively in their workplace and in individual and team-related activities. | groups about Earth Science. | | | | | |
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