VERIFICATION TEAM REPORT
Geology/Earth Science
02/05/07

A. Geology/Earth Science
1. Program Evaluation and Planning Team Members: Richard Della Valle
2. Verification Team Members: Michael Dow, Dianna Chiabotti, Dean Ehlen, Jose Hernandez.

B. Statement of Completion:
The Geology/Earth Science Report in incomplete in some areas. In the Report under Resources, in all sections, the PEP only addresses what the program’s potential needs are. None of the sections address the strengths and weaknesses of the program that would necessitate the needs listed. Although numerous course outlines are out of date, a timeline is present for updating them. The SLO process is continuing.

C. Strengths of the Program
1. The faculty member in the program, Dr. Richard Della Valle, is highly qualified, innovative, and hard working.
2. The faculty member has a proven record of success and is a consultant to 110 Community Colleges in the development of GISIGPS curriculum.
3. The faculty member is involved in current, and progressive movements in the field bringing notoriety to the program and the college in his outreach efforts.
4. The faculty member facilitates job placements for students in Contra Costa Public Works and with national GIS companies.
5. The faculty are working very hard to meet the needs of the students and also respond to community demands and in a quickly changing and developing field.
6. The faculty are persistent in meeting their needs even when the college at large was/is not responsive.

I interviewed Dr. Della Valle at length and was impressed with his dedication to the field and also his dedication and efforts to bring NVC’s program to the forefront.

D. Areas for Program Improvement
Many of the areas for improvement are not contained within the PEP. I ascertained much of this information in my interview with Dr. Della Valle.

The program has struggled for years to have access to information technology to support the growing needs and current needs of the program. They also struggle with finding qualified faculty to teach. In addition, the faculty need to continue to develop curricula that are GIS-related.

The program has a high need to develop to programs that are proposed in the report. The difficulty is that the college does not have a formal plan or written process for development of new programs. Thus, that ‘process’ is complicated.
The program needs to continue developing course level SLO and updating course outlines of records.

E. Summary of the Verification Team

The Geology/Earth Science provides a vital educational service to the community. The program makes every attempt to be progressive and stay in the forefront of an every changing area of curriculum. The college needs to help facilitate this process by helping by making it a priority to develop and process to develop new programs and possibly assisting in grant writing for the program. I also think their needs to be some attention to whether the program needs and official coordinator, additional FT staff, and also looking at the resource needs of the program.
PROGRAM: GEOLOGY/EARTH SCIENCE

DATE: 2-5-2007

1. MISSION
   A. Program Mission Statement
      Engage Geology/Geography/Earth Science students in high quality relevant instruction so they can understand the complex world around them while making intelligent choices at the ballot box. Students will subsequently succeed in degree applicable and transfer courses, progress towards personal and career goals, and be active, thoughtful participants in a diverse community.

   B. The program falls within one or more of the following categories (check all that apply):
      - Transfer/Degree
      - Vocational
      - Remediation
      - Non-Credit/Community Services

2. CURRICULUM AND INSTRUCTION
   A. Review the course outline data and assess the following:
      - Currency of course outlines. Course outlines must be reviewed every five years. If all course outlines have not been reviewed, include a timeline for review in your unit plans.
        GEOG 120 and 121 are current.
        GEOL 110, 111, 190, 199, 298, GEOG 110, 114, 298, 300, and EART110 will be revised. Other courses will be retired. Please refer to Schedule A: Program/Discipline Plan.
      - Appropriateness of courses to the program.
      - Appropriateness of current pre- and co-requisites and recommended preparation.
        Each level and course builds on the previous ones, so the recommended preparation is appropriate. Our course offerings may change:
        - if skills are recombined,
        - as we integrate SLOs more,
        - and as we retool courses to utilize the GIS laboratory.
      - Appropriateness of the degree and certificate requirements.
        Not applicable. We are not a degree or certificate program.
B. Review the Student Learning Outcomes Program Map and assess the following:

- Complete the SLO Matrix (attached).

- What timeline have you established for developing course-level student learning outcomes?
  - GEOL 110, 111, GEOG 110, 120, and 121 by the end of Spring 2007
  - GEOL 190, 199, and 298 by end of Fall 2007
  - GEOG 114, 298, 300, EART 110 and any new courses by end of Fall 2008

- Once established, in what ways will students in your program demonstrate achievement of stated learning outcomes? Check all that apply:
  - Student internships
  - Complete program competency exams
  - Assessment by departmental rubric
  - Obtain jobs in the field
  - Pass state/national examinations
  - Success in a subsequent course sequence
  - Performance after transfer
  - Portfolios/capstone projects
  - Other: English Placement Test score

- Discuss the methods used (above) to assess whether the students achieved the stated student learning outcomes. What was the success rate?
  No data available. Student Learning Outcomes and their assessment have not been completed or implemented.

- For those students who did not achieve the SLOs, what interventions were used to support those students? What programmatic changes will be made to ensure future SLO achievement?
  No data available. Student Learning Outcomes and their assessment have not been completed or implemented.

- An accreditation standard requires that the institution makes public expected learning outcomes for its degree and certificate programs. In what ways are the program’s expected learning outcomes made public? Check all that apply:
  - We are not a degree or certificate program. However, our course outlines and brochures are available. As we incorporate SLOs into course outlines, this information will be available. One of our resource requests is funding and technical support for a new brochure and a website.
  - Syllabi
  - Catalog
  - Brochure (planned, pending funding)
  - Articulation/Transfer agreements
  - Website (planned, pending funding)
  - Other ________________________________
C. Describe how your program ensures that the syllabi for each instructor are congruent with the course outline. Describe what measures are taken if any syllabi are incongruent with the course outline.

All instructors are given course outlines and asked to follow them. Instructors turn in copies of syllabi to the program coordinator, who meets with them if there is any incongruence.

D. What methods are used by the program to ensure that similar standards of academic rigor of the course outline of record are followed by all instructors in the discipline?

All instructors for each course use the same textbooks. At department meetings, we discuss levels and classes. Program coordinator makes classroom observations of new faculty and mentors them as needed.

E. What instructional methods are used by the program faculty to address the diverse student population and to encourage retention and persistence of the program's students?

- We use lecture and collaborative activities.
- We put our courses into a cultural context.
- We provide assistance to students by email.
- Our teaching materials and methods are designed to foster the success of diverse groups.
- We have an extensive video library that helps our diverse population.

F. What instructional methods are used by the program faculty to address the differences in learning styles and to encourage retention and persistence of the program's students?

- We incorporate college success skills into all our classes.
- We offer a learning environment that incorporates lecture, discussion, and small group work. Information is presented orally, visually, and experientially.

G. Review existing articulation agreements with high schools and other colleges. Are they adequate? Current? Effective? If not, what changes will be made?

Not applicable.

H. Reflect on your responses in Section 2, Curriculum and Instruction, and write objectives for improvement on Schedule A, Program/Discipline Plan, as needed.

Please see Schedule A.

3. **Student Success and Equity**

A. Review the data on enrollment, retention, and successful course completion (and grade distribution to be phased in). Discuss program trends relative to college-wide trends. Identify areas where disparity exists for any demographic group (ethnicity/race, gender, age, disability).

In looking at the enrollment, retention, and successful course completion of the Geology, Geography and Earth Science classes over the past three years, it appears that student retention and completion rates have remained consistent at 90% and 81% respectively. African Americans tend to have the lowest retention and completion of 83% and 66%. Class sizes average 25.4 showing a minimum of 22 and a maximum average of all classes at 29. There is no relationship of
success to age groups. Disabled groups show a slightly greater (96.7%) success rate when compared to the general population (90.5%).

B. Identify strategies used to identify and assist students at risk. Discuss their effectiveness.
   - Incorporate college success and study skills to all classes.
   - Work with MESA program and college tutoring programs.
   - Make referrals to EOPS, LD Testing, Writing Center, Counseling, Student Support Services and other college programs as needed.
   - Introduce students to other resources available including the Career Center, the library, computer laboratories and student health services.

C. What has the program done to formalize links with support services for students?
   Mid semester reports for EOPS students

D. Review the full-time/part-time instructor ratio. Discuss trends and needs.
   The current ratio is a FT/PT ratio average of 0.85
   It is anticipated that as the GIS program grows there will be an addition of 2 GIS classes per semester. In addition, Energy classes (linked to the development of an Energy Center) will put further pressure on the need for an additional Geography Instructor. The addition of these classes will drive the ratio down to 0.61.

E. Review the data on degree/certificate completion and any job placement data available. Assess the effectiveness of your program. (vocational programs only)
   Not applicable.

F. Reflect on your responses in Section 3 Student Success and Equity and write objectives for improvement on Schedule A, Program/Discipline Plan, as needed.

4. Enroll ment Trends and Student Satisfaction

A. Review the enrollment trends data, and describe recent trends. Are there external factors such as community demographics or the economy that have affected the program? What are the plans to address these factors?
   Our numbers have increased by 6% relative to college credit enrollments. Napa is a low-growth area and enrollments seem to track unemployment. When unemployment is high our numbers seem to increase.

B. Review the load (WSCH/FTEF), productivity (FTES/FTEF), average class size, and financial data and describe recent trends.
   We are averaging 25/4 students per section. WSCH/FTEF averages 434 and the FTES/FTEF averages 14.2. The last two semesters show an increase of 15% in both sets of numbers.
C. Review the schedule of classes for the program and the results of the student satisfaction surveys, and discuss whether the course offerings are scheduled appropriately to meet student need.

65% of the respondents were satisfied with the scheduling of classes and over 70% were satisfied with the course offerings. 16% of the respondents were not satisfied with the time that courses were offered and only 1% were dissatisfied with the course offerings. This survey will make us reexamine lecture/lab classes offered on a single day. Because of this survey, we will consider offering classes on Thursday/Friday.

D. Discuss the results of the student satisfaction survey, identifying areas for improvement and continued success.

50% of the students thought that there was not an adequate balance of lecture and hands-on group activities. Our own SME surveys show the same pattern in other lecture/lab classes. By design, science courses have lecture and lab classes separated in a way that all group work is handled only in the laboratory. Those students that choose to only take lecture will be at a disadvantage with hands-on activity. We will use this survey to answer the shortcomings of hands-on work in the lecture class. We will design short field trips and other group activities that will answer this need.

In addition, while 60% of the students were satisfied with how classes were taught, a small cross-section (16%) of students thought that the instruction should answer a broader cross-section of learning styles. We will work with faculty to answer these shortcomings by meeting and discussing the various ways we can expand our presentations to cover the various learning styles more effectively.

E. What documented labor market demand does this program address? Does the program offer unique training (and not represent unnecessary duplication of manpower training) in the area? (vocational programs only)

Not applicable.

F. Reflect on your responses to Section 4 Enrollment Trends and Student Satisfaction, and write objectives for improvement on Schedule A, Program/Discipline Plan, as needed.

See Schedule A.

5. COMMUNITY OUTREACH

A. What recruitment and/or community outreach activities has the program engaged in or initiated?

- Visits to surrounding high schools and development of college courses to be delivered at the HS campus.
- Work with the California Community College Economic and Workforce Development Program.
- Developed several successful grants working with the Regional Occupational Education deans, local CANS (Contra Costa-Alameda-Napa-Solano) Community College Consortium.
- Regular visits to businesses in the environment, health and safety business.
- Regular visits to the legislature.
- Students ask for classes on a regular basis
- We often get many foreign students taking classes and students travel in from all parts of the US to attend our short-course programs.
- We often place students in full-time jobs working with state agencies and with private firms. We have a successful program with Contra Costa Public Works in giving our students on-the-job skills in this fast-expanding field

B. What has the program done to establish relationships with secondary schools and/or four-year institutions?
The program has worked closely with local high schools developing environmental programs. The program plans to work closely in the future on developing Geographic Information Systems classes and certificates.

C. What has the program done to establish relationships with the business community (if a vocational program)?
- We attend the advisory board meetings of the SBDC.
- We are consulting members to the California Community College Board of Governors on Economic Development as it relates to Environment, Health, Safety and Homeland Security.
- Member of the California Environmental Business Council.

D. How has the involvement of the advisory committee helped in improving and/or promoting the program? (vocational programs only)
Not applicable.

E. Reflect on your responses in Section 5 Community Outreach and Articulation and write objectives for improvement on Schedule A, Program/Discipline Plan, as needed.
See Schedule A.

6. **ACCREDITATION AND EXTERNAL REVIEWS**

A. Review the [Accreditation Self-Study Planning Agenda](#), [Accreditation Final Report](#), and results of previous program evaluations that are included in the attached data. Discuss the recommendations of the review teams relevant to the program and how the program responded.
Not applicable.

B. Indicate the sources of information used in Question 6A.
- Accreditation Self-Study Planning Agenda
- Accreditation Final Report
- Previous program evaluation recommendations
Not applicable.

C. Review the recommendations from any other licensing or accreditation bodies. Discuss the recommendations of the review teams relevant to the program and how the program responded.
Not applicable.
D. Reflect on your responses in Section 6 Accreditation and External Reviews and write objectives for improvement on Schedule A, Program/Discipline Plan, as needed.

7. **RESOURCES**

The results of program evaluation feed into the planning and budget process. Consider the staffing and financial data provided, as well as the Program/Discipline Plan forms you completed during this evaluation, while answering the questions in this section. Requests must be linked to the 2005-2011 NVC Strategic Plan Goals and Objectives.

**A. Staffing**

Summarize the staffing resource needs identified in the Program/Discipline plans. Discuss any changes needed. (Complete Schedule B, Request for New Permanent Faculty and Staff, as needed)

We need a ½ time IA with excellent tech support skills for the new SME computer lab and a full time Geography Instructor.

**B. Program-Specific Equipment**

Discuss the strengths and weaknesses of the program-specific equipment available to enhance program success. What needs remain? What strategies are planned to meet those needs? (Complete Schedule D, Program-Specific Equipment Request, as needed.)

- 25 workstations
- 1 color printer
- 1 42 inch plotter/scanner
- 1 ArcIMS server
- 15 GPS units

Strategies planned to meet needs include:

- Work with NVC Foundation to increase support to the program.
- Additional Economic and Workforce Development grants
- Work with local high schools to increase student awareness.
- Work with local high schools and ROP programs on mini certificate programs.
- Work with SBCD to increase business awareness.
- Continue to work with Chancellor’s Office.
- Work with NVEDC and local Chamber of Commerce.

**C. Facilities Improvement/Renovation**

Discuss the strengths and weaknesses of the physical resources available to enhance program success. What needs remain? What strategies are planned to meet those needs? (Complete Schedule F, Facilities Improvement/Renovation Request, as needed.)

Needs:

- Lecture Hall with room for specimen cabinets and wall area for maps and charts.
- Computer facility for 25 stations with instructor demonstration area.
- Strategic goals and objective in unit plan.
D. Technology

Discuss the strengths and weaknesses of the technology available to enhance program success. What needs remain? What strategies are planned to meet those needs? (Complete Schedule E, Technology Request, as needed.)

Needs:
- 25 computer workstations
- Instructor station
- LCD projector
- DVD/VHS player
- Color printer
- 42 inch plotter/scanner
- ArcIMS Server
- 15 GPS Professional units

E. Professional Development

1) Using the results of the Faculty/Staff Accomplishments survey, summarize the professional development activities undertaken by faculty and staff.

Dr. Richard Della Valle continues as Director for the Environmental Health, Safety and Homeland Security Initiative at the State chancellor’s office. Dr. Della Valle will continue to attend all Economic and Workforce Development conferences, CCCAOE conferences and National and Statewide GIS/Environmental conferences. Dr. Della Valle Chairs the SME Energy, Environment, and Sustainability Committee. He will continue to pursue statewide Economic Development grants, as well as National Science Foundation grants.

2) Based on the goals that resulted from this program evaluation, complete Schedule G, Professional Development Needs, to indicate what areas of focus have been identified for future faculty/staff development. Note: Budget requests for Travel and Conference should be addressed or requested in the question 7G.

F. Learning Resources

What learning resources (e.g., books, periodicals, videos) are needed to enhance program success? (Complete Schedule H, Learning Resources/Media Materials Request, as needed.)

See Schedule H.

G. Operational Budget

Are operational funds appropriate to enhance program success? If not, how would additional operational funds be used to enhance program success? (Complete Schedule C, Request for Operating Budget Augmentation, as needed.)

Geology/Geography/Earth Science supports a substantial increase to the SME operational budget. This budget has not increased since 1994. Most items used for laboratories in our field have doubled in price since 1994.
PROPOSAL: GIS COMPUTER LABORATORY

Need
A state-of-the-art multipurpose GIS/SME Computer Laboratory, with software and hardware for individual instruction, classes and group work. It should support our mission of providing high quality relevant instruction for GIS/SME students so that they can know and understand the earth’s physical environment, understand sustainability concepts, understand environmental justice and know the social, cultural and economic concepts from a spatial and regional perspective.

Benefits to the College
- Increasing enrollments in SME classes
- Increasing retention and success of SME students
- Earning additional FTES through laboratory classes
- Making Napa Valley College a center for energy and environmental sustainability
- Attracting professionals in the field for advanced classes
- Being a marketing draw for students in general

Laboratory Layout
- 25 workstations able to handle advanced GIS/GPS software
- Instructor’s station with built in document camera
- LCD projector, VCR/DVD player
- Smart Board
- 42 inch plotter/scanner
- ArcIMS Server
- Color/B&W Laser printer

Software for
- Business classes: Business Analyst
- Administration of Justice Classes: Crime Analyst
- Surveying and Engineering classes: Survey Analyst
- Viticulture classes: Spatial Analyst
- CAD Program: 3D Analyst
- Geology/Geography: Geostatistical Analyst
PROPOSAL: CENTER FOR ENERGY, ENVIRONMENT, AND SUSTAINABILITY

Vision Statement
The installation of the Solar Array allows a unique opportunity for the college to take the lead in the county and region in promoting sustainable energy and environmental practices for businesses and individuals. The SME Division will take the lead in developing academic and vocational courses and use the facility as a teaching laboratory.

The computer facility will help support the following:
The Development of the Center for Energy, Environment, and Sustainability. The Center will be responsible for the following:

- Business Assistance for implementing Green Technologies and the use of new fuels
- Consumer Advice for energy transitioning—home based PV, passive and new fuels
- Academic – Development of academic course work in the areas of energy, environment and sustainability
- Vocational—Development of short term and long term technical level training in the new emerging areas of PV installation and maintenance.
- Promotion of GIS technologies for sustainable solutions
- assist in the promotion of sustainability concepts as a campus wide effort
- development of grants

We are currently writing a statewide NSF-ATE application to establish this center. With an emphasis on two-year colleges, the Advanced Technological Education (ATE) program focuses on the education of technicians for the high-technology fields that drive our nation's economy. The program involves partnerships between academic institutions and employers to promote improvement in the education of science and engineering technicians at the undergraduate and secondary school levels. The ATE program supports curriculum development; professional development of college faculty and secondary school teachers; career pathways to two-year colleges from secondary schools and from two-year colleges to four-year institutions; and other activities. A secondary goal is articulation between two-year and four-year programs for K-12 prospective teachers that focus on technological education. The program also invites proposals focusing on applied research relating to technician education. Our application will be focusing on Environmental training in the areas of Photovoltaic Engineering and Geospatial education.
Program Evaluation Summary for
GEOLOGY/Earth Science

Complete the following sections based on the program evaluation completed. This summary will be forwarded to the Planning Committee after the verification phase is complete.

Program Achievements  (major achievements, changes, implementations, progress since last program review)

- Successful grants generated that funded the Math, GIS and MESA laboratories. Grants totaled $500,000/year for 2 years
- Created GIS lab, math lab and MESA laboratory
- Developed new courses in GIS, Geography and Earth Science
- Updated all course descriptions
- Served on Statewide Public Safety Committee
- Authored several statewide grants for the Community College System

Strengths (unique characteristics, special capacities)

Despite limited resources and a number of adjunct faculty, the Geology/Geography/Earth Science Department has professional, highly qualified instructors with a deep commitment to our students. Our department has a track record for being innovative developers of the latest curriculum and keeping up with local business trends and needs. Dr. Richard Della Valle leads this effort. Dr. Della Valle has the following qualifications in the areas of GIS and GPS:

- Leads the Chancellor’s Office in instituting an Enterprise (Systemwide) Level GIS and GPS program for statewide demographic analysis.
- Lead consultant to 110 Community Colleges in the development of GIS/GPS curriculum.
- Lead negotiator for statewide ESRI ArcView, ArcEditor and ArcInfo licenses. ArcView, ArcEditor and ArcIMS (all ESRI products) are the pre-eminent GIS software products. Eighty percent of all GIS installations use ESRI products. Unlike other map making programs the ESRI products specialize in the database management functions of a true GIS. Other suppliers (such as AutoDesk, a map making program) and MapInfo (a true GIS) have a very small market share. Any educational program that prepares its students for both 4 year transfer and work related training must use the ESRI products.
- Developed the statewide support helpdesk for all GIS/GPS software and hardware installations.
- Developed key concepts for Senate Bill 70 (the $57 million Community College, High School Partnership legislation) that used GIS and GPS High School Academies as a basis for legislation.
- Dr. Della Valle places students in apprenticeship programs at Contra Costa Public Works and with national GIS companies.
GIS and GPS courses developed at Napa Valley College have been accepted by the UC system as fulfilling GE science requirement. This is no small accomplishment. Our classes are fully academic and science based. These courses are also being used by Environmental Systems Research Institute (ESRI, the supplier of GIS software) as model courses for all California statewide courses.

Students are asking for classes that we creating. We are especially interested in the applications of GIS and GPS technologies to Precision Viticulture. We are currently working closely with several vineyards to bring qualified teachers to GIS that have experience with Precision Viticulture techniques. The development of these courses are critical to the economy of the Valley. Napa Valley College must take the leadership in this area.

The demographics of our student population are also a strength to the program. Many farm workers are Hispanic and classes in Precision Viticulture, GIS/GPS and agricultural engineering will assist them in job advancement.

**Challenges** (concerns, difficulties, areas for improvement)

- Finding and retaining qualified instructors
- Lack of institutional support and resources for new courses
- Outdated computer lab
- No current resources established for ongoing lab maintenance and staffing
- IA support when needed.

**Optional:** What additional data, if any, would have been helpful to effectively evaluate the program?

Educators need to develop GIS-related curricula. The University Consortium for Geographic Information Science (UCGIS) recently completed the Model Curricula Body of Knowledge. This document will be published by American Association of Geographers in summer 2006. This effort by the UCGIS Education Committee is the first edition of a continuing work to define the Body of Knowledge (BoK) for the domain of geographic information science and technology (GIS&T). The domain is partitioned into 10 Knowledge Areas (KAs) that are further segmented into units. Each unit has a title and a short definition and is further partitioned into topics. Each topic includes educational objectives specific to that topic with different levels of mastery. More than 350 educational objectives in 79 units are included in 10 KAs. [For additional information on BoK, see the accompanying article, "Developing a GIS Curriculum—UCGIS Model Curricula Body of Knowledge 2006."]. NVC is following this model.

While the document was created to aid in building a GIS&T curriculum, it has also been used by other organizations such as the GIS Certification Institute (GISCI). GISCI has certified more than 1,000 GIS professionals and is using the document to help determine if courses taken by the applicant can be counted toward certification. Recently, the United States Geospatial Intelligence Foundation (USGIF) decided to develop an accreditation program for courses or degrees focused on geospatial intelligence analyst programs. BoK is being used to identify knowledge areas needed in programs that qualify to become accredited under the USGIF Academy.
Although GIS is spreading across college and university campuses, much work needs to be done. Many courses, certificates, and degrees are offered that incorporate the use of GIS. The ESRI Searchable Database of GIS Programs, available from the ESRI Higher Education Web site, lists more than 525 programs at colleges and universities. These programs are offered in many different departments. Some programs are housed in GIS departments or centers.

This year more than 500 educators met at the ESRI Education User Conference August 5–8, 2006, in San Diego, California, to discuss the ways GIS has been incorporated into programs. Past conference papers and papers relative to education and curriculum development can be found at the ESRI Virtual Campus Library.

Many efforts are under way to create materials specific to different disciplines. Some areas that have had resources created are hydrology, geography, first responders, agriculture, geology and earth science. More materials need to be created to help schools of business, health care, epidemiology, engineering, and history, to name a few.

Many National Science Foundation (NSF) grants have focused on the use or incorporation of GIS into programs. One current grant is Spatial Perspectives on Analysis for Curriculum Enhancement (SPACE). This grant helps instructors of undergraduate courses in the social sciences develop materials that enhance the use of spatial concepts. New texts and laboratory exercises have been developed but more discipline-specific materials and training opportunities are needed. Our SB70 grants have been providing links and training for K–12 and college faculty. Our NSF ATE application will help educators learn GIS and use it in their courses.

These efforts will help students progress from high school to graduate school as programs are introduced at all levels. Grants are also working on agreements for transferring credits between institutions (i.e., articulation agreements), and SDSU has developed an undergraduate course (Introduction to GIS 104) that has been qualified as a general education requirement under quantitative reasoning. UC acceptance of the NVC classes will greatly assist this area and gives our program a great deal of credibility.

Support from industry, government, and professional organizations is helping colleges and universities incorporate geospatial technologies. NVC GIS is partnered with the following organizations:

- Small Business Development Centers
- Regional Environmental Business Resource Assistance Centers
- Centers for Applied Competitive Technologies
- The Advanced Transportation Technology and Energy Initiative of the California Community Colleges
- Partnership for Environmental Technology Education
- UC Berkeley
- Sonoma State
- Contra Costa Public Works
- Napa County Public Works
- Contra Costa Sheriff’s Department
- California Air Resources Board
- Environmental Systems Research Institute
• Chevron
• Napa Economic Development Corporation
• Diablo Valley College
• Solano College
• Las Positas College
• Tetratek
• FEMA
• The Federal Office of Homeland Security
• CH2M Hill
• Geomatrix Consultants.
• Kenney/Jenks Consultants

Although more work needs to be done, these initiatives are helping NVC offer programs that will help students enter the expanding geospatial industries or use the spatial thinking skills they develop for better decisions no matter their final profession.
The program evaluation report is reviewed by the program faculty or staff, signed by the program evaluation chair and division chair or supervisor, and forwarded to the Office of Research, Planning, and Development by _____________________, for the verification phase.

Program Evaluation Chair Signature: ______________________________
Division Chair/Supervisor Signature: ______________________________
Date: ______________________________

**VERIFICATION PHASE**

The verification team will review the Program Evaluation Report for accuracy and completeness, and the process used to develop the report (see verification team duties). The program evaluation will be verified by ______________________. Once the report is verified and shared with the PEP team, will be forwarded to the appropriate Vice President or President (for administrative services) by _________________________.

Verified on: ______________________________
Verification Committee
Signatures: ______________________________

**ACKNOWLEDGEMENT PHASE**

The Vice President (or President for administrative services) will read and acknowledge the program and planning document and send a letter to the program team and discipline/program faculty or staff, with copies to the Academic Senate President, the Planning Committee, and the President of the college (who will forward them to the Board of Trustees). The vice presidents and/or President will use program review results to 1) base discussions and decision making on data and evaluation provided by program evaluation; 2) inform program planning; and (3) advocate for program needs.

Vice President/President ______________________________
Date Letter Sent: ______________________________
Recommend review in 2 years: Yes _____ No _____
## PROGRAM EVALUATION AND PLANNING

### STUDENT LEARNING OUTCOME (SLO) MATRIX

### GEOLOGY/EARTH SCIENCE

<table>
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<th>Course</th>
<th>#1 Earth's Physical Environment</th>
<th>#2 Sustainability</th>
<th>#3 Spatial Awareness</th>
<th>#4 Job Skills</th>
<th>#5 Environmental Justice</th>
<th>#6 Analyze Information</th>
<th>#7 Communicate Clearly</th>
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<tr>
<td>GEOG 121</td>
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<tr>
<td>GEOG 300</td>
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</tr>
</tbody>
</table>
PROGRAM EVALUATION AND PLANNING

STUDENT LEARNING OUTCOMES: PROGRAM LEVEL

GEOLOGY/Earth Science

1. Know the earth’s physical environment, and geologic/geographic perspectives regarding the relationship between the environment and society.
2. Understand energy sources and usage and how important the concepts of conservation and sustainability are to the maintenance of life on the earth.
3. Know the social, cultural and economic concepts from a spatial and regional perspective.
4. Know how geologic/geographic techniques, skills and concepts are applied by professionals.
5. Understand how the concepts of environmental justice impact the community and region.
6. Analyze geologic/geographic information and apply interpretation of data toward problem solving or modeling.
7. Interpret and effectively communicate spatial information geographically/geologically and/or with statistics.
<table>
<thead>
<tr>
<th>NVC Strategic Goal #1 - 5</th>
<th>Program Evaluation Section</th>
<th>Objectives</th>
<th>Priority In Rank Order</th>
<th>Program Activities/Actions</th>
<th>Resources*</th>
</tr>
</thead>
</table>
| 3                          | 5                          | Establish more effective and consistent outreach and marketing. | 1                      | 1. Create program brochure  
2. Create website  
3. Work with local high schools | Funding for new brochure and website development |
| 1                          | 3                          | Improve long-term persistence of students in classes. | 2                      | 1. Create Energy, Environment, and Sustainability, Center  
2. Link courses to Center  
3. Work with MESA program | 1. Dedicated IA to assist students and help operate Center and Computer Lab  
2. Additional Geography instructor |
| 1,4                        | 2                          | Revise curriculum to make use of GIS lab. | 3                      | 1. Revise course outlines as per timeline (see addendum following).  
2. Develop capstone classes with MESA.  
3. Develop assessment tools. | Funding for additional Geography instructor to assist with course outlines, capstone classes, and assessment tools |

* New requests should be defined on resource forms and included in the unit budget.
# Schedule A Addendum: Curriculum Revision Plan: Geology, Geography, Earth Science

<table>
<thead>
<tr>
<th>Course</th>
<th>Description</th>
<th>Last Revised</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOL 01</td>
<td>Physical Geol</td>
<td></td>
<td>retire, 5-1-07</td>
</tr>
<tr>
<td>GEOL 02</td>
<td>Geology Lab</td>
<td></td>
<td>retire, 5-1-07</td>
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<tr>
<td>GEOL 03</td>
<td>History of Life</td>
<td></td>
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<tr>
<td>GEOL 04</td>
<td>Hist Geo Lab</td>
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<tr>
<td>GEOL 05</td>
<td>Env Geol Bay</td>
<td></td>
<td>retire, 5-1-07</td>
</tr>
<tr>
<td>GEOL 112</td>
<td>Fossils, Time, and Earth History</td>
<td></td>
<td>retire, 5-1-07</td>
</tr>
<tr>
<td>GEOL 116</td>
<td>Geology Hazards and Humanity</td>
<td></td>
<td>retire, 5-1-07</td>
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<tr>
<td>GEOL 190</td>
<td>Special Field Trip in Geology &amp; Natural History</td>
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<td>12/1/2007</td>
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<td>GEOL 298</td>
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<tr>
<td>GEOL 298</td>
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<td>GEOL 50</td>
<td>Field Trips</td>
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<tr>
<td>GEOG 01</td>
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</tr>
<tr>
<td>GEOG 04</td>
<td>Cult &amp; Hist Geol</td>
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<td>Belongs to Sociology</td>
</tr>
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<td>3/1/1989</td>
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<td>GEOG 102</td>
<td>Human Geography</td>
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<td>GEOG 114</td>
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<td>12/1/2007</td>
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<td>GEOG 120</td>
<td>Geographic Information Systems and Science 1</td>
<td>5/1/2006</td>
<td>NA</td>
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<td>GEOG 121</td>
<td>Geographic Information Systems and Science 2</td>
<td>5/1/2006</td>
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<td>GEOG 298</td>
<td>Select Topic Geog</td>
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<td>Selected Topics in Geography</td>
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<td>GEOG 98</td>
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<td>retire, 5-1-07</td>
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<tr>
<td>EART 10</td>
<td>Earth's Environment</td>
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<td>retire, 5-1-07</td>
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<tr>
<td>EART 111</td>
<td>Earth Sea Sky TV</td>
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<td>retire, 5-1-07</td>
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<tr>
<td>EART 112</td>
<td>Earth Sea Sky Lab</td>
<td></td>
<td>retire, 5-1-07</td>
</tr>
</tbody>
</table>
REQUEST FOR NEW PERMANENT FACULTY AND STAFF

Accreditation reference: Human resource planning is integrated with institutional planning. The institution systematically assesses the effective use of human resources and uses the results of the evaluation as the basis for improvement.

Project additional needs above and beyond the current status. Please include in your projected needs any known position that will be vacated due to retirement. List in priority order. Replacement positions are not guaranteed. Information will be used in the faculty and staff prioritization processes.

<table>
<thead>
<tr>
<th>Job Title &amp; Justification</th>
<th>N/R*</th>
<th>FTE</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional Assistant/Technical Support</td>
<td>New</td>
<td>1.0</td>
<td>TBA</td>
</tr>
<tr>
<td>This position is needed to keep the new GIS laboratory open and functioning.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GIS/GPS/Geography Instructor</td>
<td>New</td>
<td>1.0</td>
<td>TBA</td>
</tr>
<tr>
<td>The Earth and Environmental Sciences Department can grow if resources are added to the division. A new Energy, Environment and Sustainability Center could work effectively in generating an environmental focus to the campus. The wine region has been a home to environmentally conscious individuals, yet the wine industry has a major impact on this small valley. The college could be the center for developing and delivering training in sustainable agriculture practices for the valley. Part of this sustainable agriculture is the use of advanced GIS and GPS technologies. The GIS curriculum will be of the highest level, so the wineries can make use of it with both an agricultural and a business focus. GIS is useful in the tracking of diseased plants to the developing of sustainable watering practices that will not severely impact erosion. GIS is also very useful in the marketing and business end. A winery sales force could generate consumer “desire maps” in order to better evaluate the stores that would be ideal in the selling of wine production. For the GPS side, I would have to say that this is not your grandmother’s GPS. GPS has become so sophisticated that plate tectonic movement must now be taken into consideration in your long-term mapping needs. The county will soon be requiring GPS maps of all agriculture land and all building projects. This is survey-level GPS that could easily award certificates to surveyors and become the basis of an engineering course for our engineering program.</td>
<td></td>
<td></td>
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</tbody>
</table>

*N=New, R=Replacement

Submitted by: ___________________________ Approved by: ___________________________

Budget Center Manager President/Vice President

APRIL 2006
REQUEST FOR OPERATING BUDGET AUGMENTATION

Budget Center _________________________ Activity ___________________

Accreditation Reference: Financial planning is integrated with and supports all institutional planning.

Operating Budget
This section is used to request and justify non-capital outlay additions to your department’s budget. This form applies only to Account Codes 113XX, 114XX, 523XX, 524XX, 54XXX and 55XXX. List in priority order.

<table>
<thead>
<tr>
<th>Account No. &amp; Description</th>
<th>Additional Amt Requested</th>
<th>Justification (Link to Plan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructional Materials</td>
<td>$2,000</td>
<td>See below</td>
</tr>
<tr>
<td>Software Licensing (yearly)</td>
<td>$3,000</td>
<td>See below</td>
</tr>
</tbody>
</table>

Justification:
Our current budget is $250 per year. We need an increase to cover books, DVDs and other instructional materials and resources. Ongoing funding is needed for software licensing, IA support and a new Geography instructor. Yearly software licenses are needed for ArcINFO-level work. The ARCInfo license would be good for every computer on campus and would allow Public Safety, Scheduling, and other administrative offices the use of critical software that would help in the operation of the campus. The Chancellor’s Office in Sacramento is instituting an enterprise-level GIS that will be impacting every campus in the state (all 111 of them). The software license would cover all machines and will result in a savings of well over $50,000 for the level of software purchased. Instructional materials have continued to increase in cost every year while our budgets remain the same. The $2,000 allocation is justified with the ever-increasing cost-of-living index. Furthermore, we would like the college to entertain the radical idea of linking this instructional budget to this index.

Submitted by:           Approved by:
___________________________________   __________________________________
Budget Center Manager        President/Vice President

APRIL 2006
**PROGRAM-SPECIFIC EQUIPMENT REQUEST**

**Accreditation rationale:** Equipment supports student learning programs and services and improves institutional effectiveness.

Examples of program specific equipment include maps, skeletons, microscopes, artifacts, etc. They may be located in each classroom or centrally located in a workroom. For this request, consider equipment with a value greater than $200. All technology requests should be listed on Schedule E. **List in priority order.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Estimated Cost</th>
<th>Estimated Annual Maintenance Cost</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Instructional</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer hardware for GIS Lab</td>
<td>$100,000</td>
<td>$5,000</td>
<td></td>
</tr>
<tr>
<td>Software</td>
<td>$5,000</td>
<td>$200</td>
<td></td>
</tr>
<tr>
<td>GPS Equipment</td>
<td>$60,000</td>
<td>$2,000</td>
<td></td>
</tr>
</tbody>
</table>

**Justification:**
The lab will help support the Center for Energy, Environment and Sustainability, the Engineering Program, Chemistry, Biology, and Physics classes. The lab will have the following equipment:
- 25 workstations
- overhead LCD projector
- Instructors station
- ArcIMS Server
- Color Printer Small Format
- 42” Scanner/Plotter

The lab will become the center of activities for all science classes. We envision groups of students working on different problems at the same time. These problems will be linked to environmental problems of the valley, and students will be working on the engineering, science and mathematical aspects of real-world problems.

B. Non-instructional

Submitted by: ____________________________  Approved by: ____________________________

Budget Center Manager  President/Vice President

APRIL 2006
TECHNOLOGY REQUEST

Accreditation reference: Technology planning is integrated with institutional planning. The institution assures that any technology support it provides is designed to meet the needs of learning, teaching, college-wide communications, research, and operational systems.

In order to determine the feasibility of your idea, it is necessary to consult with the Information Technology (IT) Department. It is important that all computer related technology be centrally coordinated. This will allow the IT Department to know the full picture of the need, to plan for adequate capacity of equipment and infrastructure, and to ensure standardized equipment is purchased, if possible. It is equally important that all technology requests are consistent with the NVC Technology Plan.

List in priority order.
Provide a general description of the project that includes:
1. Equipment needed, students and/or staff who will be served, and how often it will be used.
2. Will installation and maintenance support be required?
3. Where will the equipment be located? Will space need to be modified?
4. Describe the infrastructure requirements (e.g., network, power, connectivity, security, etc.)
5. Software support needed (i.e. new licenses, upgrades, system integration, ongoing support)
6. Is additional furniture necessary?
7. Useful life of equipment—when will the equipment need to be replaced?

Geographic Information Systems Computer Lab equipment
- 25 computer stations
- Instructor station
- LCD/VHS/DVD projector and player
- ArcIMS Server
- Color printer
- 42 inch plotter/scanner
- Location in a new room on campus. This room is not currently part of the general plan.

Life of equipment is expected to be approx. 5 years

Justification
- Equipment will be used every day, with scheduled and unscheduled groups.
- Installation and maintenance will be required.
- Equipment could be located in the T building area.
- Networking, power, security will be needed.
- Software will need to be purchased on a yearly basis
- New computer furniture will be needed.
- Five-year life on computer is estimated.

Cost estimates will be provided for priority projects only.

Submitted by: ______________________  Approved by: ______________________

Budget Center Manager              President/Vice President

APRIL 2006
SCHEDULE F

FACILITIES IMPROVEMENT/RENOVATIONS REQUEST

Accreditation reference: Facilities support student learning programs and services and improve institutional effectiveness. Physical resource planning is integrated with institutional planning.

This request is for small capital construction projects such as remodeling a small area, reconfiguring walls, building shelving, etc. Generally, projects should be under $5,000. Larger scale projects will be considered in bond construction and renovation plans.

In order to make sure that your idea meets legal requirements or is even feasible, we ask that you consult with the Director, Facilities Services, and address the following items on the form.

List in priority order.
Provide a description of the project that includes:
1. How the project supports the mission and objectives of your program
2. Project description
3. Location of the proposed project
4. Health and safety impacts of the project
5. Ongoing maintenance that will be necessary

Geographic Information Systems Computer Lab
- Addition of GIS computer lab that is currently not part of the general plan.
- Location is to be near or in newly refurbished SME building.
- No Health and Safety issues at this time.
- Ongoing maintenance must be planned for.
- 25 computer stations
- Instructor station
- LCD/VHS/DVD projector and player
- ArcIMS Server
- Color printer
- 42 inch plotter/scanner

Justification
The project supports institutional and departmental SLOs and objectives

Cost estimates will be provided for priority projects only.

Submitted by: ____________________________ Approved by: ____________________________
Budget Center Manager President/Vice President

APRIL 2006
PROFESSIONAL DEVELOPMENT NEEDS

Accreditation reference: The institution provides all personnel with appropriate opportunities for continued professional development, consistent with the institutional mission and based on identified teaching and learning needs.

Please identify the professional development needs required for faculty and staff to stay current in the discipline, office technology, diversity, safety, instructional methods, and other areas. Specific training and estimated number of attendees are requested.

1. What training needs have been identified from your program review?
   - Technology training
   - Economic and Workforce Development training

2. What pedagogical training needs have been identified in your program review?
   Incorporation of GIS lab into all Geology, Earth Science, and Geography classes.

3. What types of technology does your program use? What technology training needs have you identified?
   GIS/GPS technology is constantly evolving and our staff needs training in all areas in order to have a professional program for the public. Necessary training courses include the following:
   - Advanced Techniques for Labels and Annotation
   - Analyzing School Safety Using ArcGIS
   - Aprender ArcGIS 9
   - Aprender ArcGIS 9 Spatial Analyst
   - Arc Hydro: GIS for Water Resources
   - ArcGIS Annotation: Tips and Tricks
   - ArcGIS Enterprise Systems: Performance and Scalability

4. What are the leading publications specific to your discipline and/or program?
   - Journal of the Association of Engineering Geology
   - Journal of the Geological Society of America
   - Journal of Geography
   - Journal of Geographic Information and Decision Analysis
   - Journal of Environmental Science

Submitted by: Budget Center Manager
Approved by: President/Vice President

APRIL 2006
LEARNING RESOURCES/MEDIA MATERIALS REQUEST

Books including Reference:
Number of titles to add: 10

Areas to consider for maintaining and developing a collection that supports this course and corresponding assignments:

Titles that provide: a multi-cultural perspective to the topics covered in the course; gender perspectives on subjects; a literary, dramatic, or fictional perspectives for students to explore; or titles that provide biographical information on innovators, leaders, or historic figures in the discipline.

Recommendations/ comments: Books like the following:

Estimated cost for new materials: $1000

Periodical Titles: (Newspapers, Journals, Magazines)
Number of titles to add: 5
Recommendations/comments: *Journal of Geographic Information Systems*
Estimated cost for new materials: $1000

Electronic Databases and Indexes:
Number of databases to add: 1
Recommendations/comments: *InfoUSA Demographic Database*
Estimated cost for new materials: $5000

Media Collection (closed captioned or DVD):
Number of titles to add: 10
Recommendations/comments: Subscription to lynda.com for geography staff
Estimated cost for new materials: $5000

Yes ✓ No ___ Are library/learning resource service hours adequate for this course/program?
Yes ✓ No ___ Is the quantity of materials sufficient for students within needed time frame?
Yes ✓ No ___ Will library/learning resources assignments be used in your course?
Yes ✓ No ___ Will this course/program require the assistance of library faculty for orientations or other information competency instruction?

✓ I would like to meet with a Librarian for developing a plan for selecting and adding materials to the Library or Media Center.
✓ To keep the collection reflecting current knowledge, I will alert the librarians of new developments in my field and send suggestions of books and other materials to be ordered.

APRIL 2006