## I. Team Members

<table>
<thead>
<tr>
<th>Name</th>
<th>Member Type</th>
<th>Email</th>
<th>Contact</th>
<th>Responsible for what part</th>
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<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erik Dunmire</td>
<td>Primary Team Member</td>
<td><a href="mailto:erik.dunmire@marin.edu">erik.dunmire@marin.edu</a></td>
<td>x7536</td>
<td>ENGG P.R.</td>
<td></td>
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</table>

## II. Program Review Committee

<table>
<thead>
<tr>
<th>Name</th>
<th>Committee (Chairs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chris Schultz</td>
<td>Curriculum Committee Chair</td>
</tr>
<tr>
<td>Blaze Woodlief</td>
<td>Educational Planning Committee</td>
</tr>
<tr>
<td>V-Anne Chernock and Erik Dunmire</td>
<td>Facilities Committee Co-Chairs</td>
</tr>
<tr>
<td>Yolanda Bellisimo</td>
<td>Planning and Resource Allocation Committee Co-Chair/Academic Senate President</td>
</tr>
<tr>
<td>Nick Chang</td>
<td>Planning and Resource Allocation Committee Co-Chair/Instructional Equipment Committee Chair</td>
</tr>
<tr>
<td>Sara McKinnon and Becky Brown</td>
<td>Program Review Committee Chair and SLO Coordinators</td>
</tr>
<tr>
<td>Chris Schulz</td>
<td>Student Access and Success Committee Chair</td>
</tr>
<tr>
<td>Michael Irvine</td>
<td>Tech Committee Chair</td>
</tr>
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</table>

## III. Vice President of Academic Affairs

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Nick Chang</td>
<td></td>
<td></td>
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</tbody>
</table>

## IV. Board of Trustees President

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eva Long</td>
<td></td>
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</table>
Program Overview—Introduction
ENGG-2009

**Instructions:** Use this form to quickly outline your program at College of Marin. Briefly answer each of the questions and use bullet points whenever possible. Provide any attachments that substantiate or expand on the questions below.

I. Program Definition
Outline the unique qualities that define the importance of your program.

* The Engineering Transfer Program is a sub-program within the Physical Sciences Transfer Program, and comprises all of the courses needed by other Physical Science majors (MATH, CHEM, PHYS, ENGL, and various GE courses), plus COMP and ENGG courses (see Figure ENGG PO1).
  * Note that courses within the Engineering (ENGG) Discipline represent a small fraction of the Engineering Program. In fact, some engineering students are able to successfully transfer without taking any ENGG courses.

II. Program Purpose
Pathway:
Transfer

Briefly describe how your program fits into the pathways you have chosen.

* The program predominantly serves students who intend to transfer to a university to complete a Bachelor's degree, but occasionally includes students with other objectives (e.g., professional development).
* As with most CC Engineering programs, few students obtain an A.S. degree, since it often requires some additional coursework beyond what is needed for transfer, and since it is of little value professionally for most students.

III. Students Served
Briefly outline what students are served in your program.

Number: Current student data collection at COM makes it impossible to determine with certainty the total number of Engineering Majors. However, surveys conducted by the department in Spring 2005 and Spring 2008 provide an estimate of the number and distribution, as follows (see Figures ENGG PO2a-c for details):

* 95 and 69 total Engineering majors (census unduplicated headcounts) during S05 and S08, respectively.
* 11 and 9 unduplicated students, respectively, in ENGG courses (ENGG 220 & 245).
* 6 and 9 non-ENGG classes, respectively, with more than 25% enrollment from ENGG majors.
* 8 and 5 non-ENGG classes, respectively, that would appear to have single-digit enrollments without ENGG majors.

Demographics: Students enrolled in ENGG courses, when compared to the general COM population, are:

* younger
* similar in ethnic diversity
* more often Asian
* less often African-American
* less often female
IV. Program History

Briefly outline the recent history of your program.

The program was well respected and highly enrolled until the late 1980's or early 1990's, at which point, due to unclear reasons, the program was essentially (though not officially) discontinued via the retirement of all full-time ENGG faculty. Although some attempt was made to offer ENGG courses with part-time faculty, these courses were frequently cancelled due to "low" enrollment (~15-20), creating a reputation among the community that the college was no longer committed to offering an Engineering Program. In 2000, a new full-time faculty member was hired, split between engineering and chemistry, in an attempt to resurrect the program. However, due to numerous retirements among Physical Science faculty (85% of dept. faculty retired from 2000-2004, with delayed and only partial replacement), changes in transfer requirements at the state level, and a persistent belief among the community that the program has been discontinued, enrollment in the program (especially in ENGG courses) has never fully recovered.

Attachments:
List and briefly describe any attachments
Five Pathways
A description of how you serve students in the five pathways as described in the
Educational Master Plan.
ENGG-2009

I. Please refer to the table of estimates of how many students are in each
pathway for your program/discipline over the past four years.

1. Basic Skills
Students on the Basic Skills pathway seek to improve day-to-day functioning, enhance job
performance, enter new careers, and/or acquire pre-collegiate fundamental skills in order
to successfully complete college level courses. The Basic Skills pathway includes English
as a Second Language courses offered in both credit and non-credit divisions as well as
courses in developmental mathematics and English as well as basic skills courses in
computers and Library.

Our program serves students in this pathway: None

2. Career and Technical Education
Students on the Career and Technical Education pathway pursue knowledge, technical and
skill training necessary for career placement, career advancement and career changes or
for creative endeavors that require technical skills. Their educational goals are either
an associate degree or certificate. For some degrees/ certificates, such as Nursing, the
course of study is defined by external professional regulations or licensing criteria.

Our program serves students in this pathway: Some students

3. Cultural Enrichment
Students on the Cultural Enrichment pathway focus on acquiring and expanding aesthetic
abilities. Students broaden their intellectual and artistic skills through participation
in creative opportunities including exhibitions, performances, or publishing work.

Our program serves students in this pathway: None

4. Lifelong Learning
Students on the Lifelong Learning pathway focus on intellectual and physical enrichment.
Some Lifelong students may have already completed degrees and/or may be in significantly
advanced positions in their careers.

Our program serves students in this pathway: None

5. Transfer
Students on the Transfer pathway seek successful matriculation from College of Marin to
four-year institutions, universities, colleges or specialized educational institutions by
completing courses that fulfill requirements for the baccalaureate degree or admission to
specialized programs such as nursing. In the process of completing transfer requirements,
these students may also earn an associate degree.

Our program serves students in this pathway:
Transfer GE: None
Transfer Major: Exclusively/ primarily

II. What are your program’s goals for each pathway?
Transfer Goal:
Allow students to meet the requirements for transfer into a wide variety of
Engineering programs at as many UC and CSU campuses as is feasible, and to help
students develop the foundational knowledge, skills, and abilities that they will need
in order to succeed after transfer from COM.

III. How does your program/discipline help students meet these goals?
1. We try to offer a complete and well-coordinated set of Math, Chemistry, Physics, and Engineering courses that are required for transfer to a broad array of UC and CSU Engineering programs.

2. We design the curriculum so as to gradually build requisite knowledge and skills through the various course sequences (which typically span multiple disciplines).

3. We incorporate fundamental Engineering concepts and practices into all of the ENGG courses, so that students learn the "Engineering Problem-Solving Method" regardless of the specific discipline of emphasis (i.e., even if they only complete 1 or 2 of the ENGG courses offered), and so that most Engineering majors will successfully address all of the program-level SLO's by completing their transfer requirements.

4. We ensure the highest quality teaching environment by staffing classes with well-qualified instructors, who are knowledgeable practitioners of both engineering and teaching, and who are actively engaged in the engineering education and/or professional community.

IV. How do you measure your success?

1. Ability to maintain the necessary curricular offerings (which depends in turn upon maintaining adequate enrollment, as low-enrolled classes are often cancelled).

2. Avoidance of interdisciplinary scheduling conflicts that would prevent students from completing necessary course requirements (e.g., zero to minimal student complaints).

3. Reasonable success and persistence rates throughout the various course sequences.

4. Evaluation by the instructors of upper-level courses as to whether students are receiving adequate preparation in pre-requisite coursework.

5. Quality of work on final exams and projects in 'terminal' (200-level) ENGG courses.

6. Number of annual engineering transfers.

7. Anecdotal reports from past students regarding their post-transfer success.

V. How do you make sure your students are able to get through your program in a timely fashion?

1. The small size of the program and college, coupled with current budget constraints, places severe limits on the diversity and frequency of offerings. Nevertheless, we attempt to offer a complete set of courses required for transfer to most UC and CSU engineering programs, sequenced such that a full-time student who successfully completes all attempted courses, can transfer in 2 years if 'college ready' (or, in other words, in 3 years for most students).

2. We coordinate extensively with other disciplines and departments to schedule courses in a manner that provides the greatest opportunity for students to complete their objectives in a timely fashion.

3. We try to communicate regularly with counselors and students to inform them of anticipated changes in offerings, and to solicit information that will aid us in planning.

4. We lobby the administration vociferously on behalf of our students to maintain critical offerings, wherever feasible, in the face of budgetary and enrollment pressures.
Student Access and Success
ENGG-2009

I. Access
Based on the enrollment numbers and demographic breakdown for your courses, what significant factors or barriers are influencing student access to your courses or program?

Insufficient sample size to draw any reasonable conclusions for ENGG alone.

A detailed description of the general issues regarding access and success for engineering students was provided in the Access section of the 07-08 Program Review.

II. Student Success
Based on the student success and retention rates breakdown for your courses, what significant factors or barriers are influencing student success in your courses or program measured by completion of course and grade earned?

Note: Success Rate is the percentage of students who received a passing grade of A, B, C, or P at the end of the semester.

Note: Retention Rate is the percentage of students retained in a class at the end of the semester. In Progress and Report Delayed grades are excluded. Cancelled classes and classes with no grades shown are excluded.

Insufficient sample size to draw any reasonable conclusions for ENGG alone.

III. Student Retention
Based on the student success and retention rates breakdown for your courses, what significant factors or barriers are influencing the ability for the student to succeed at more advanced courses for which your course is a prerequisite.

N/A (terminal courses)

IV. Improving Student Success and Retention
What key factors would further improve your student success and retention or support your current level of success? Please check any applicable statements below and then provide additional details/explanation on your choices below.

- Access to student support services (counseling, tutoring, etc.)
- Curriculum change
- Course scheduling for students needs
- New offerings/additional sections
- Articulation for transfer or COM GE
- Recruitment/outreach
- Student/job market demand change
- Faculty availability
- Facilities & technology
- Professional development
- Other:

V. Please explain and provide additional details regarding your choices above:
Facilities Questionnaire
ENGG-2009

What are the existing facilities issues that impact student access and success, or health and safety? (address any of the following: Size, location, conditions, maintenance, features, a/c, lighting, adjacencies, other.)

None--new bldg on the way...
Curriculum
ENGG-2009

1. Course Outlines of Record must be updated every 5 years to remain current for content, texts, student learning outcomes as well as for articulation purposes. Are you aware of the dates on your course outlines? If not, contact OIM to check. If you have courses that are over 5 years old, are you planning on updating them? Please list.

All ENGG COR's have been either revised or deleted, with the exception of ENGG 125, which is in the process of revision at the current time, and ENGG 126 and 210, both of which are in the process of being deleted.

2. Are you planning on changing, updating or revising and degree or certificate requirements? If so, please explain how it will improve student learning, student success and/or access.

The AS degree for Engineering Majors will be revised this semester to reflect updates to course offerings.

3. Are you collaborating (or thinking about collaborating) with other departments to develop joint curriculum for learning communities? If so, please describe briefly and explain how it will improve student learning, student success and/or access.

4. Do you plan to develop any new curriculum? If so, please describe briefly and explain how it will improve student learning, student success and/or access.

5. Do you plan to develop any new Distance Ed courses or develop Distance Ed versions of existing courses? If so, please describe briefly and explain how it will improve student learning, student success and/or access.

Yes, I would like to develop 'simultaneous dual-mode delivery' (simultaneous face-to-face and online) for a number of the ENGG courses. This mode has been tested by Engineering programs at other CC's and shown to be even more effective than traditional face-to-face instruction alone. It improves access by allowing students to 'attend' live interactive lectures remotely, and improves success by providing archived lecture material for repeated and asynchronous viewing.

I hope to attend a summer workshop this July/August to receive training in the technologies and approaches.

6. Do you plan to add or increase your material fees for any of your classes? If so, please list the classes and the proposed new or revised material fees for the respective classes.

N/A
Student Learning Outcomes
ENGG-2009

Five College Learning Outcomes:

1. **Written, Oral and Visual Communication:** Communicate effectively in writing, orally and/or visually using traditional and/or modern information resources and supporting technology.

2. **Scientific and Quantitative Reasoning:** Locate, identify, collect, and organize data in order to then analyze, interpret or evaluate it using mathematical skills and/or the scientific method.

3. **Critical Thinking:** Differentiate between facts, influences, opinions, and assumptions to reach reasoned and supportable conclusions.

4. **Problem Solving:** Recognize and identify the components of a problem or issue, look at it from multiple perspectives and investigate ways to resolve it.

5. **Information Literacy:** Formulate strategies to locate, evaluate and apply information from a variety of sources - print and/or electronic.

I. Degrees and Certificates

1. What degrees and certificates does your discipline offer?

   Engineering Major for AS Degree

2. Keeping in mind the five College Learning Outcomes above as well as what your discipline specifically requires of your graduating students, what should students be able to do when they have completed your discipline’s requirements for each degree or certificate?

   Upon completion of the A.S. Engineering Major, students will be able to:

   A. apply their knowledge of math, science, and engineering to identify, formulate, and solve engineering problems.
   B. design and perform experiments, as well as to analyze and interpret data.
   C. design a system, component, or process to meet desired needs.
   D. demonstrate professional ethical responsibility.
   E. communicate effectively and perform on multi-disciplinary teams.
   F. judge the effects of engineering projects on society and the environment.
   G. engage in life-long learning and explain contemporary issues.
   H. use the techniques, skills, and modern engineering tools necessary for engineering practice.

3. How do students in your program demonstrate that they meet each of the college-wide learning outcomes? What courses, activities, and/or projects are students required to complete that relate to each outcome?

   i. Written, Oral and Visual Communication

   All ENGG courses address communication skills to varying extents and in varying ways.

   Written communication:

   a. Written research, project, and laboratory reports (110, 111, 150, 220L, 235, 245)
   b. Problem solutions on homework assignments and exams (all courses)
Oral communication:

a. Oral presentations (110, 125)

b. In-class discussions (110)

c. Team projects/lab experiments (110B, 125, 150, 220L, 235, 245)

Visual communication

a. Diagrammatic problem-solving (all courses)

b. Creation and interpretation of graphs (all courses)

ii. Scientific and Quantitative Reasoning

All ENGG courses address scientific and quantitative reasoning extensively throughout most assignments and exams. Experimental data collection and analysis skills are particularly addressed in lab courses such as 110B, 220L, and 245.

iii. Critical Thinking

All ENGG courses address critical thinking skills to some extent in most assignments and exams.

a. For every analytical problem, students must judge the most appropriate solution technique for a particular problem, identify relevant data, formulate and defend simplifying assumptions, and evaluate the reasonableness of results.

b. For all design-oriented problems, students must evaluate the relative merit of competing design choices to satisfy multiple performance requirements and objectives, in order to finally arrive at a non-unique, but defensible 'best design' solution. Design skills are emphasized in 110B, 150, and 245.

c. Critical thinking skills are also addressed through discussions and assignments involving social aspects of engineering, including professional ethics and the interaction of engineering with society and the environment. These topics are primarily addressed in 110A, but to a lesser extent in other courses.

iv. Problem Solving

Virtually all assignments and exams in all ENGG courses address problem solving skills.

v. Information Literacy

All ENGG courses require students to collect information from a variety of sources for use in problem solving and design. The types of sources include textbooks, handouts, data tables and graphs, reference handbooks, and internet sources.

II. General Education:

1. Does your discipline offer any classes which count for general education requirements?

2. Which General Education courses in your discipline address the each of the five College Learning Outcomes? Please list courses for each of the following:

i. Written, Oral and Visual Communication

ii. Scientific and Quantitative Reasoning

iii. Critical Thinking

iv. Problem Solving

v. Information Literacy
III. Course Level Outcomes:

1. Do all of your Course Outlines of Record include Student Learning Outcomes? If not, are you revising them?

Yes, all current ENGG COR's include SLO's.

2. What percentage of faculty members in your discipline include SLOs in their course syllabi?

100% (1 of 1)

3. Assessment:
   i. How often do you assess these SLOs?

   SLO's are implicitly assessed for individual students in each course every semester, since they form the basis for each student's grade in the course.

   Explicit assessment of aggregate measures of SLO's will begin this year; however, since each course is only offered once per year (at best), and most ENGG courses have enrollments of under 10, it may be many years before any statistically meaningful conclusions can be drawn.

3. Assessment:
   ii. In the last two years every discipline developed SLOs specifically related to College Learning Outcome #3: Critical Thinking. Have you assessed this or any of the stated Student Learning Outcomes in your course outlines over the last year? If so, please summarize the results.

   No

3. Assessment:
   iii. What improvements have you made or do you plan to make in the future?

   Regarding SLO's, primary improvements thus far have been to include course-level SLO's in each course outline, and to link them to program-level and college-level SLO's. Additionally, the course-level SLO's are now included in all course syllabi.

3. Assessment:
   iv. What do you plan to assess this year? Who will you assess? How will you assess?

   This semester, I will assess the only ENGG course offered--ENGG 245 Materials Science. All students in the course will be assessed. SLO's will be assessed using Final Exam questions and several laboratory reports.

   For the Fall semester, ENGG 235 Statics will be assessed.
This section will be filled out by faculty and reviewed by the Department Chair, the Area Dean, the Instructional Equipment Committee, IFC and Budget.

Please enter items that will be used over a period of semesters BY STUDENTS. (Note: These should be NEW items that you are requesting one time only - not ongoing or consumable. Ongoing and consumable requests go under "Other Instructional Equipment". Technology-related requests should go under "Technology Requests". Select whether the item is less than or more than $200 each. If you are a large discipline with several areas, please include which area this item is for. Include Tax, Shipping and Handling in the total cost for each item.

I. Instructional Equipment/Materials Requirements

<table>
<thead>
<tr>
<th>Priority</th>
<th>To Support:</th>
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<tbody>
<tr>
<td>02</td>
<td>2 Classes</td>
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Category: Discipline Area
Engr

Description and part number for ordering:

M 22601 698100 11100 64600 Historical/ongoing instructional equipment budget

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<th>Unit Cost:</th>
<th>Tax:</th>
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One-time expenses: (e.g. construction, electrical, installation)

On-going Expenses: (e.g. maintenance, repairs, staffing, and/or upgrades)

Item to be shared with the following Department/Program: (Include any shared expenses)

Do you have space for this equipment? Yes

Justification for Item (See Rating Rubric)

1. Indicate how important this item is to the life of your discipline.
   • 'A' means that your discipline cannot teach your course(s) without the requested equipment.
   • 'B' means that your course(s) would be greatly enhanced with the requested equipment.
   • 'C' means that you would like this piece of equipment for your course(s) but can wait for a future academic year.

B
This is a request for continuation of an existing equipment budget which allows some minor upgrading and replacement of equipment in absence of major equipment modernization funding.

2. Is this equipment required to meet Title 5 and/or Ed Code? If so, how? (Cite code)
Is this equipment required to meet any local, state or federal Health and Safety Code? If so, how? (Cite code)

3. How will the quality of instruction be improved for student learning and success? Is it necessary for students to succeed in a series of courses?
These funds are used to repair/replace/upgrade small pieces of older equipment that are routinely used by students in the engineering courses, particularly the Materials lab course, and which are critical to being able to offer the course. Because of the age of much of the engineering lab equipment (circa 1950s), it is in almost constant need of repair and upgrade.

4. How will access for students be improved? How many students (annually) will benefit from this request? Is it required to accommodate existing students? Would it be vital to attracting new students?
It is required for existing students and may help attract new students as equipment upgrades/modifications improve the quality of the laboratory experience.

5. What student learning or other outcomes are expected? Is it important to the achievement of student goals?

6. How will these outcomes be measured for future planning? What data or evidence supports your request?

Additional Justification for this item:
Instructional Operating Supplies

ENGG-2009

I. Consumable Instructional Operating Supplies
This section will be filled out by faculty and reviewed by the Department Chair, the Area Dean, the Technology Committee, IPC and Budget.
Note: Please group requests into broad categories of items required to teach a class.
Make ONE entry for each category.
Note: These are generally ongoing costs. One-time items go under Instructional Equipment.

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<th>Priority:</th>
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<th>Discipline Area</th>
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<tbody>
<tr>
<td>01</td>
<td>3 Classes</td>
<td>Engg</td>
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Broad Category (for example in Chemistry - "Chemicals")
Engineering supplies and parts.

<table>
<thead>
<tr>
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<th>Amount of Increase</th>
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<tr>
<th>Type</th>
<th>How Long?</th>
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<tbody>
<tr>
<td>Increasing Cost</td>
<td>Ongoing/Recurring</td>
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</table>

Item to be shared with the following Department/Program: (Include any shared expenses)

Justification for Item (See Rating Rubric)
1. Indicate how important this item is to the life of your discipline.
   • 'A' means that your discipline cannot teach your course(s) without the requested equipment.
   • 'B' means that your course(s) would be greatly enhanced with the requested equipment.
   • 'C' means that you would like this piece of equipment for your course(s) but can wait for a future academic year.
In addition, how many times have you requested this item, but you have not received it?
   A
   Engineering lab classes use destructive testing so supplies are consumed. Some courses cannot be taught without this budget line.
   22601  090100  11100  43000

2. Is it necessary for students to succeed in a series of courses?
   Students cannot succeed in upper division courses if we can't offer them the prerequisite.

3. How will access for students be improved? How many students (annually) will benefit from this request? Is it required to accommodate existing students? Would it be vital to attracting new students?
   36 engineering students will benefit from this request.
   It is required to accommodate existing students.
   If we are unable to offer classes, we can't attract new students.

4. What student learning or other outcomes are expected? Is it important to the achievement of student goals?
   Students cannot meet their goals if we don't offer the classes.

5. How will these outcomes be measured for future planning? What data or evidence supports your request?
Faculty Members
ENGG-2009

I. Program Faculty
List of Faculty Members and Total faculty Units separately for Fall, Spring and Summer

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>MI</th>
<th>Year Retired:</th>
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<tbody>
<tr>
<td>Banos</td>
<td>Robert</td>
<td></td>
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</tbody>
</table>

Status: Adjunct, ETCUM No

Shared W/other program(s):

Summer 2009 TU | Fall 2009 TU | Spring 2010 TU | Reassigned (Total)
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<tr>
<td>6.2</td>
<td>00.000</td>
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</table>

Years of Service: 3
Specialty: Graphics

Leadership: List involvement in committees or other service

- Currently Academic Senator and Facilities Planning Committee (previously served as Interim Dean, Chair, Budget Committee, Data Acquisition Group).

List of Faculty Members and Total faculty Units separately for Fall, Spring and Summer

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>MI</th>
<th>Year Retired:</th>
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<tbody>
<tr>
<td>Dunmire</td>
<td>Erik</td>
<td>N</td>
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</table>

Status: Full-time, tenured Yes

Shared W/other program(s):

Summer 2009 TU | Fall 2009 TU | Spring 2010 TU | Reassigned (Total)
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>13.98</td>
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Years of Service: 8

Leadership: List involvement in committees or other service

Additional Teaching Unit Requests

III. FT Faculty Needs (Please fill this out ONLY if you are stating a need for new full time faculty in your area.)

1. Please indicate if there are NO FT faculty in your discipline. Please provide data regarding the length of time this discipline has been without a full time instructor.

2. Non-availability of part-time instructors in a subject area. Please provide evidence demonstrating the difficulty in finding part-time instructors to teach in the subject area.

3. RETCUM Faculty: How many FT faculty have retired in the past ten years. How many units are now taught by RETCUM faculty each year?

4. New FT Faculty: How many NEW FT faculty have been hired in past 10 years? Please list each faculty name and the year of employment. If this instructor is shared with another department, please
list the equivalent FTE% for your department. Please list instructional equivalencies as necessary and if faculty member was the result of retreat rights.

5. Reduction in department TUs as a result of FT Faculty retirements or other significant causes? Please provide data that illustrates a change in teaching unit allocation as a direct result of FT faculty retirements within your department and how this may change in the coming year(s).

6. Other reasons: Have there been other causes for a reduction in units in your discipline? If so, please explain and provide evidence.

7. Changes in Student Demand: Recent or forthcoming growth as a result of added sections due to enrollment demands. Provide evidence that illustrates the need for additional faculty due to increased student demand such as numbers of sections added and/or courses with waitlist totals showing a need for additional sections. What is the % of FTEF for this increase in units? If there has been a decline in student growth, please explain why.

8. Current of forthcoming changes that illustrate the immediate need of additional FT faculty within this department. Please outline all relevant circumstances that justify the priority of a FT hire in addition to those already outlined above. Consider changes in the field, changes in the job market and population shifts.

9. Program Review Findings: Indicate what trends you identified in your last program review that support the need for full time faculty hires. Tie these to the department and college mission.

10. Other considerations: Include such information as matriculation needs, changes in student demand or community and job market needs, response to legislation, or rapid growth of the discipline.

11. Shared Resources: If you have requested FT faculty that will be used by more than one department, please indicate here. Please indicate which disciplines and/or departments and the number of combined students/faculty or classes he/she would serve. Please indicate how it will improve access or outcomes and if it is needed for health and safety concerns or required by law.
**Program Summary**

**ENGG-2009**

**Instructions:** after reviewing your data and reports from all other sections of your program review, use this form to briefly summarize all of the information you have provided by closing with your concluding remarks (e.g. an executive one-page summary) for your entire program review.

**I. Program Excellence (Best Practices)**

Please address any of the following areas:

Overall Program structure, contextualized learning/learning communities, reputation of faculty, faculty collaboration, staff, retention and success, how you maintain a supportive environment, how you address issues of diversity, any specific student learning outcomes.

The current Engineering Transfer Program successfully:

* maintains an appropriate (albeit minimum), well scheduled, and completely articulated set of course offerings that allows students to complete engineering transfer requirements.
* achieves high levels of retention and success within the ENGG discipline courses.
* appears to achieve relatively high transfer rates and post-transfer student success.

**II. Program Resources (Responsiveness)**

Briefly summarize examples of key resources required for your program to meet or exceed the college goals (as cited in this review).

Despite apparent success in preparing students academically for transfer, the Engineering Program, especially the upper level ENGG courses, have been plagued by low enrollments for some time. While these enrollments are low in absolute terms, they are actually about average for CCC’s in relation to overall college size, reflecting statewide systemic problems associated with engineering transfer education in CA. Nevertheless, any success in increasing these enrollments would bring considerable benefits to the ENGG program, to other math and science programs, and to the college as a whole (and, in a more indirect sense, to the county, state, and nation by increasing the number of domestically trained engineers).

OUTREACH--One obvious strategy, which is being pursued by colleges and universities around the U.S., is to enhance our K-12 outreach activities in order to promote both the engineering profession generally, and COM's Engineering Program specifically. An effective outreach program will require planning and a sustained commitment to provide adequate institutional support.

MATRICULATION--Additionally, since there appears to already be a substantial number of self-declared Engineering majors at COM, better identification, advising, tracking, and support of students could help to increase the percentage of those students who appear in ENGG courses, as well as help to clarify the academic pathways and existing barriers that may explain this apparent discrepancy.

INSTRUCTIONAL EQUIPMENT--As professions and as academic fields of study, the physical sciences and engineering are equipment intensive; consequently, adequate and predictable funding is essential to maintaining modern equipment inventories for both laboratory and "lecture" purposes. Modernizing equipment in all of the physical science disciplines will not only improve our ability to achieve learning outcomes, but will also likely lead to higher enrollments as a result of the improved student perception of our programs.

FACULTY--Any future expansion of ENGG offerings would necessitate additional full-time faculty hiring, at least within the department (to shift loads) if not the discipline. There is currently only one FT faculty member (Erik Dunmire) who is assigned less than half his teaching load to engineering, and who is often called upon to serve in other non-instructional capacities (e.g., Interim Dean, Department Chair, etc.). Because of the complexity of curricular requirements, instructional equipment, course scheduling, etc., maintaining a functional Engineering program requires considerable non-instructional work that can only be carried out by a FT faculty member. While it is not uncommon in CC’s to share Engineering faculty with other Physical Science disciplines (e.g., Physics, Computer Science, Chemistry), the current dearth of faculty in the Physical Science Dept (less than 40% of units taught by FT instructors)
tends to pull faculty away from, rather than toward, service to the Engineering program.

III. Moving Forward Objectives (Planning)
Please summarize any data-driven coordinated planning has your department done to improve enrollment, student learning, access and success?

Strategy 1: Increase "self-awareness" via improved data gathering, in order to support decision making.
   a) Improve student data collection, management, and documentation practices within ENGG courses so as to enhance and streamline assessment of course-level and program-level SLOs.
   b) Work with the college to improve student data collection practices and matriculation processes to enhance the identification and tracking of prospective engineering students.
   c) Seek access to post-transfer performance data in order to evaluate overall success of entire Engineering Transfer Program.

Strategy 2: Continually re-evaluate and update curriculum in response to a dynamic educational and occupational environment.
   a) Update course outlines to ensure ongoing articulation.
   b) Update A.S. degrees to reflect current course offerings.
   c) Continue to attend annual ELC meetings in order to anticipate upcoming changes in transfer requirements and share best practices with other Engineering faculty.
   d) Consider opportunities to incorporate current societal trends (e.g., sustainability, energy issues, etc.) into curriculum.

Strategy 3: Improve student access to Engineering transfer
   a) Plan and seek institutional support for a K-12 Engineering outreach program to promote interest in, and preparation for, Engineering study.
   b) Contingent upon availability of data, attempt to analyze streams of prospective Engineering students to identify potential barriers to persistence in the program or other reasons for low appearance of students in ENGG courses.
   c) Investigate the establishment of a MESA program at COM to provide support to students from under-represented groups in Science and Engineering.

IV. Assessment of 2008 Program Reviews:
1. What resources have you been granted from your previous program reviews?
2. Please assess how these resources have been used to improve access, learning outcomes and student success in your program?
3. What changes have you implemented based on previous program reviews?
4. What results have you found?
   A. Increased TU to allow offering of new lab course for Electric Circuits. Unfortunately, due to low enrollment, this course (both lab and lecture) were cancelled.
   B. Approval of IE funds to purchase a laptop computer to be used by students as a digital interface with equipment for data collection and analysis in some of Engineering lab courses. This computer has been ordered, and should be put to use sometime this semester in the Engineering Materials course.
   C. Revised (or deleted) course outlines for all of the ENGG courses, with the exception of one course (ENG 125) that is still in the process of revision. The AS degrees for Engineering and for Engineering Technology are also in the process of revision or deletion (draft proposals were submitted to Curriculum Committee in November 2009).

V. Fall 2009 Requests Summary:
1. Please summarize the main requests you have made in this program review in order of your priority starting with the most important one.
2. Summarize briefly why you want each one.
3. Summarize your overall rationale.

Maintenance of historical unit offerings and supply/equipment budgets will allow us to continue to offer the 'bare-bones' Engineering transfer program that we have historically offered. In light of the current economic/budget environment, we have
not requested any additional funds or units for 2010-11.

VI. Other concluding remarks.
Area Directors and Deans Comments
ENGG-2009

1. Please make any comments on the Five Pathways, Student Access and Success, Facilities, Curriculum and SLO sections.

2. Please comment on the instructional equipment requests, technology requests and other instructional materials requests sections. Please comment especially on any specific priorities without which this program cannot function.

3. Please comment on the faculty and staff sections.

4. Please itemize expenses currently covered by external funds that may revert back to general funds.

5. Other comments

I support the Engineering discipline's suggestions to undertake such activities as enhancing their "self-awareness" through better identification of engineering majors on campus and other data-collecting efforts. Implementing some form of outreach program to area high schools would likely assist with the enrollment issues that continue to plague the engineering discipline here.