Assessment: Assessment Unit Planning

Program Review 2014-15

YC - Engineering Program Review

Year Under Review : 2014-15
Type of Review:
Program Description : The Engineering Program at Yuba College is an academic transfer program available to the estimated 150 engineering majors enrolled in the college. After completion of core courses in Mathematics, Physics, Chemistry, Computer Science, general education and the available seven courses in Engineering, students in the program transfer to public and private Universities in California and beyond. There they complete their undergraduate degrees in various fields of engineering, typically Civil Engineering, Mechanical Engineering, Electrical Engineering, Computer Engineering or Chemical Engineering.

Executive Summary (Include a list of team members): For the three years, the engineering program at Yuba College has been instructed and strengthened by Dr. Davidson, who is on loan from the Mathematics Department, after he agreed to take on the engineering program as half of his teaching assignment. This situation was to serve as a bridge until a new full-time engineering instructor could be hired after the financial crisis of the District and college had improved. While on sabbatical during the 2014-15 academic year, Dr. Davidson participated in the hiring committee for a full-time engineering instructor, and the program's top goal of hiring a full-time engineering instructor was completed in the summer of 2015.

The engineering program at Yuba College declined during the 2014-2015 academic year due to a lack of leadership. Dr. Davidson was on sabbatical and Dr. Bowley was not yet hired, so all of the courses offered were taught by adjunct faculty members. It is unfortunate that it took so long to hire a full-time faculty member for engineering because this gap had a substantial impact on the health of the program. Additionally, students report that the quality of adjunct faculty teaching engineering courses was very poor.

The Engineering Program Review contains a multitude of references documenting the health of the program (such as the increasing enrollments and curriculum improvements) and the need for and value of engineering degrees (such as the US Census Bureau stating that engineering and computer science graduates earn more in their careers than any other major). For those readers who are data-driven decision makers, there should be no doubt that the Engineering Program at YC deserves and should receive the support from staffing, curriculum, and technology funding that is requested herein to ensure its robust health and continued growth.

01IP. Department Goals (Click '?' for Prompt): The Engineering faculty established 11 goals for its program for the 2011-2012 year using TracDat. Each of these goals has been updated to reflect their linkage of each to multiple Yuba College goals and at least two of the YCCD District Board of Trustees' Vision Statements. For each program goal, the primary Yuba College goal has been noted as the "Goal Type," and the 11 program goals are aligned with six of the nine Yuba College goals (1, 3, 5, 6, 7, & 9) at this level.
In addition, three of the 11 program goals have been completed:
1. Complete a set of SLOs for each Engineering course that is regularly scheduled.
2. Create a new laboratory instructional manual for ENGR-45 (Properties of Materials).
3. Update the Course Outline of Record for each of the regularly scheduled courses in Engineering.

02IP. Access to Support Services (Click '?' for Prompt): -Office Hours, -Supplemental Instruction (In-class peer tutor), -DSPS, -Library Services, -Counseling Services, -Other
03IP. Follow up to question 02IP (Click '?' for Prompt): All students have equitable access to the support services above except where (as in the case of MESA and DSPS) there are specific requirements for support in those student programs.
04IP. Degrees/Certificates (Click '?' for Prompt): There currently is no degree or certificates approved through the Curriculum process for Engineering. Many engineering transfer students do attain an associate degree in mathematics or other STEM discipline, but some students elect to simply transfer rather than apply for those degrees. Since Yuba College does not track

engineering as a major, data is very difficult to obtain. The ELC is currently (Oct 2015) recommending a 'Certificate of Transfer in Engineering' (name to be determined) rather than an AS in Engineering degree.
05IP. Improve Completion (Click '?' for Prompt): As noted in 04IP, data is difficult to obtain. Specifically, there is NO data (as indicated by the prompt to this question) in the Documents tab for this program.
06IP. Course Outlines (Click '?' for Prompt): All CORs for existing courses have been updated at least once in the last 5 years. Some have been updated twice during that period. Dr. Bowley plans to review and update all current CORs for alignment with State C-IDs during the 2015/16 year.
07IP. Collaboration (Click '?' for Prompt): The MESA program has been at Yuba College for over a decade, and many students have benefited from the support that it has provided them. Students have transferred to four-year colleges and universities to major in a STEM discipline, and have won numerous NSF and other scholarships, as well as have attended many leadership workshops and camps. MESA has suffered from a drastic reduction in support by the College and the District. An apparent consequence of this is that MESA lost its State funding two years ago, and has been operating on a shoestring budget. The MESA Director is now part-time, and the direction and the fate of MESA is unclear. Students in MESA populate engineering courses as well as their prerequisites (e.g., Math 1A, 1B, 1C, 2, and 3, PHYS 4A, 4B, and 4C, & CHEM 1A) and, thus, help us to continue to offer those courses. Link to MESA program information: <http://ms.yccd.edu/mesa.aspx>

In addition, the College Success Center (CSC) offers tutoring for upper-level engineering courses (ENGR 17, 35, and 45) if student tutors can be found. Most students who take those courses transfer and are no longer Yuba College students available to lead tutoring. Funding and an option to hire back these students as tutors or teacher's aides would be very helpful.

Additionally, some students enrolled in engineering courses already have a BS degree in Engineering and are taking courses to meet internship requirements. These students are rare but would be great to hire as teacher's aides if funding allowed.
08IP. Catalog Currency (Click '?' for Prompt): Engr-33 needs to be inactivated. This was not done because CurricUNET was not fully operational during 2013-14 (the moratorium), and during 2014-15 there was no full-time engineering faculty member available to monitor the curriculum. This inactivation will likely be done as soon as the new engineering faculty member is up to speed and can find the time for this lower priority item.

Dr. Bowley is planning a major overhaul of all current and new engineering courses to align with State C-IDs. As part of this process, the prerequisite requirements for ENGR 4 need to be dropped so students are not eliminated from enrollment.
09IP. For CTE Programs Only (Click '?' for Prompt): It is unclear (due to historical financial accounting) whether engineering is considered CTE or not. Since engineering has been in the STEM (or MESH) division for over a decade, it is assumed that engineering is NOT considered CTE and therefore does not need to complete this section.
10IP. DE Students (Click '?' for Prompt): There are currently no courses offered in this mode although some are planned in the future, specifically ENGR 6.
11IP.Disproportionate Impact(Click '?' for Prompt): The sample size represented by the current engineering student body is too small to adequately assess disproportionate impact. However, the program is supported by MESA which was formed for exactly this purpose.

Dr. Bowley has noticed that of the few women enrolled in her engineering courses (initially 3), a disproportionate number of women drop out (2 of the 3). Increased support for women in engineering would be very helpful.
12IP. Mapping (Click '?' for Prompt): Yes
13IP. Course SLOs (Click '?' for Prompt): There was no analysis of the course SLOs during the 2014-15 year although data was collected. The new engineering faculty member will likely review both academic years for trends as course SLO data is collected during her first year here.
14IP. Program SLOs (Click '?' for Prompt): No changes are warranted to the Program SLOs at this time. See question 13IP.
15IP. Professional Development (Click '?' for Prompt): Since the prior interim faculty lead was on sabbatical for statistics and computer science and the current faculty lead for the program had not yet been hired. This question is not applicable.
16IP. Reflection (Click '?' for Prompt): The complete set of ALL engineering program reviews going back for more than 5 years has been printed and given to the new engineering program faculty member (Dr. Bowley). She will be reviewing this information as she seeks to improve the engineering program and documenting it's successes.
Are you ready to submit your final program review?:

Program Recommendation: Hire a f/t engineering faculty member (Complete)

YC - Engineering Program Review

Hire a faculty member for the engineering program to replace Veronica Torres.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2013-2014
Request Date: 10/25/2013
Inactive Date: 08/17/2015
Supporting Evidence : H21. Does this program or department have adequate full-time faculty to support a high quality program? Please explain.

No, the program was saved during the summer of 2011 after the prior engineering instructor failed to achieve tenure. At that time Dr. Roger Davidson, of the Mathematics & Statistics Department, agreed to teach the engineering courses and manage the program temporarily. (Dr. Davidson meets the minimum qualifications for Engineering because of his MS and PhD in various engineering disciplines.) The engineering program will be requesting a full-time faculty member to head the engineering program starting Fall 2014 to allow Dr. Davidson to return to his duties in the Mathematics & Statistics Department. Dr. Davidson has made tremendous improvements to the program but has little interest teaching the entire engineering curriculum beyond this year, and he has also announced his intent to apply for a sabbatical for the 2014-15 academic year, so there is the very real possibility that there may not be anyone to teach engineering courses after this year.

Evaluation Plan: This will be considered complete when it happens.

Plan of Action

Staffing - Faculty - H21. Does this program or department have adequate full-time faculty to support a high quality program? Please explain.

No, the program was saved during the summer of 2011 after the prior engineering instructor failed to achieve tenure. At that time Dr. Roger Davidson, of the Mathematics & Statistics Department, agreed to teach the engineering courses and manage the program temporarily. (Dr. Davidson meets the minimum qualifications for Engineering because of his MS and PhD in various engineering disciplines.) The engineering program will be requesting a full-time faculty member to head the engineering program starting Fall 2014 to allow Dr. Davidson to return to his duties in the Mathematics & Statistics Department. Dr. Davidson has made tremendous improvements to the program but has little interest teaching the entire engineering curriculum beyond this year, and he has also announced his intent to apply for a sabbatical for the 2014-15 academic year, so there is the very real possibility that there may not be anyone to teach engineering courses after this year.

(Active)
Budgetary Impact: This is a faculty replacement.
Timeline/Responsible Party: Faculty/Staffing Committee in conjunction with the YC administration.

Program Recommendation: Hire qualified and dynamic adjunct faculty

Hire qualified and dynamic adjunct faculty to teach Engineering Courses at YC, particularly ENGR-3 and ENGR-4

Recommendation Priority: 3. High Priority
Year(s) Requested: 2011-2012
Request Date: 08/22/2011
Supporting Evidence : Because community college engineering programs teach the fundamental course for a wide variety of engineering disciplines, it is unlikely that any one instructor is best qualified to teach each course offered at YC. For example, even an instructor with a PhD in electrical engineering is unlikely to have ever even taken a surveying class at any time during their course work. In addition, since the fulltime engineering professor is qualified to teach mathematics at YC, any decrease in his engineering class load enables more sections of mathematics to be taught.
Evaluation Plan: The recommendation will be evaluated by the number of courses taught by adjunct versus f/t faculty and by the number of courses canceled due to insufficient instructors.

YC - Engineering Program Review

Staffing - Faculty - Request a job posting from Human Resources at least 6 months prior to the start of the semester of the next offerings of either ENGR-3 or ENGR-4 (now scheduled for Spring 2013). (Active)

Budgetary Impact: If a qualified and suitable adjunct was able to be located and hired, their would likely be a net IMPROVEMENT in the budget impact based on the relative pay rates of fulltime faculty versus that of the hired adjunct. The engineering professors fulltime load would be shifted to unstaffed mathematics classes or (budgetary worst case) to take over a section previously staffed by a mathematics adjunct.

Timeline/Responsible Party: Engineering Dept.

Status

Reporting Year: 2013-2014 10/21/2013

Recommendation Progress: Recommendation Needs Improvement/Attention

Again this year, there are no engineering adjunct to report. In addition, the current f/t engineering faculty is ending his temporary assignment to return to mathematics so the need for qualified faculty is even more acute.

10/03/2012

Recommendation Progress: Recommendation Needs Improvement/Attention

A subject matter expert (a retired CA surveyor) was hired for Engr-3 in the spring semester to assist with the equipment in the laboratories. After several postings of the adjunct position, no qualified candidates were available to teach or assist in teaching plane surveying thus documenting the difficulty in finding qualified instructors in the demanding and lucrative discipline of engineering.

Related Goals

College - Yuba College Program Review
YC Goal 1 - Foster a culture of evidence-informed decision making, include SLO development/assessment and other measures of student success.
YC Goal 2 - Prioritize and allocate resources based on existing and emerging community and student needs over those of individual projects or programs.
YC Goal 3 - Steward our institutional resources with increasing effectiveness and efficiency.
YC Goal 5 - Design our programs in such a way as to allow students to complete their educational goals in a timely manner.
YC Goal 7 - Improve the quality of the student experience at all our campuses and centers.

Institutional Learning Outcomes
Communication - Effectively use language and non-verbal communication consistent with and appropriate for the audience and purpose.
Scientific Awareness - Understand the purpose of scientific inquiry and the implications and applications of basic scientific principles.
Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

YCCD Board of Trustees Vision Statement
YCCD VS 1 - Providing an innovative, world-class learning environment;
YCCD VS 3 - Developing and maintaining programs and facilities that best meet with needs of our students and communities;
YCCD VS 4 - Stewarding resources strategically to meet the diverse needs of our communities and region;

YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 3 - Appropriately staff the engineering courses at YC, particularly ENGR-3 (Plane Surveying) and ENGR-4 (Engineering Graphics).

YC - Engineering Program Review

Program Recommendation: A.S. Degree in Engineering

Create an Associates of Science degree in Engineering for Yuba College.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2012-2013
Request Date: 10/04/2012
Supporting Evidence : Yuba College is unable to track any significant metrics on engineering students because the college tracks students based on degrees or certificates that are offered for completion at YC, and not based on transfer goals. Since engineering is currently a transfer-only program, its students are invisible to the college and district. A convenience survey of current engineering students found that at least 80% would be interested in obtaining this degree before transferring.

Plan of Action

Curriculum/SLO - Define the A.S. Degree in Engineering and submit it for approval. (Active)
Budgetary Impact: None.
Timeline/Responsible Party: Based on the progress of a similar degree in Biology, it is expected that this will take at least 2 years. The students surveyed were hoping for 6 months to be ready for graduation in 2013, but that is not possible.
Perkins Eligible: No
DE Related: No

Status

Reporting Year: 2013-2014 10/21/2013
Recommendation Progress: Recommendation Needs Improvement/Attention
The degree has been drafted and input into CurricUNET, but the moratorium on using CurricUNET began with no warning in the week that the degree was to be submitted. Hence, all the work that went into creating the new degree has been on hold for a year.

Related Goals

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YC - Engineering Program Review

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YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 9 - Establish an Engineering Technology program to attract students interested in the STEM fields but which may not have the capability or commitment to become full engineers at this time.
YC Goal 9 - Increase the size of the Engineering Program at YC based on FTES.

Program Recommendation: Utilize 3-D Printing Technology

One or two 3D printers should be purchased to revitalized the Engr-4 curriculum and enable not only 3D computer-aided drafting but tie this to engineering design and manufacture. Current introductory-level printers are available for approximately $3000 each or less.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2013-2014
Request Date: 10/21/2013
Supporting Evidence : The technology is one of the fastest growing (in terms of utilization) manufacturing technologies and will lead to further job creation in advanced manufacturing techniques (which have been noted as part of the YCCD Board vision). The same printers could be used for a CTE course in advanced manufacturing, also.
Evaluation Plan: This will be considered complete when the printer(s) are acquired and used in the classroom.

Plan of Action

Equipment - Request technology funding via the program review process. (Active)
Budgetary Impact: $3000 per printer plus estimated on-going expense of $300 in materials which could be funded via laboratory fees.
Timeline/Responsible Party: Technology Committee per their annual review process.
Perkins Eligible: Yes
DE Related: No
HSI Related: No

Related Goals

YC - Engineering Program Review

College - Yuba College Program Review
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YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 7 - Improve the quality of the laboratory experience for YC engineering students.

Program Recommendation: Increased Lab Budget

The department requires a increase in departmental funding (from $800 to $1500 per year) for laboratory expenses to adequately fund the wide variety of laboratory samples that are used each academic year.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2011-2012
Supporting Evidence : As of December 2011, the department has used 80% of its budget for one lab (Properties of Materials) this academic year with two labs scheduled for the Spring semester (Circuits and Surveying). In addition, the metal samples used this semester have not yet been replaced.

Plan of Action

Equipment - Forward this request to acting Dean or, in their absence, the VP of Instruction. (Active)
Budgetary Impact: $700 increase

Status

10/21/2013

Recommendation Progress: Recommendation Needs Improvement/Attention
(10/25/2012) MESH had no Dean for the last budget cycle. The Engineering budget was actually reduced from the prior year although not by as large a percentage (based on hearsay) as other departmental budgets.

(10/21/2013) The engineering budget was increased slightly this year. This will allow purchase of replacement robots for Engr-10.

YC - Engineering Program Review

Related Goals

YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 7 - Improve the quality of the laboratory experience for YC engineering students.
YC Goal 3 - Create an annual replacement list for laboratory samples, materials and equipment maintenance.

Program Recommendation: Plan for engineering expansion

Develop new courses, modalities and structures to allow expansion of the engineering program in incremental ways.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2012-2013
Request Date: 10/04/2012
Supporting Evidence : One of the engineering department's goals is to make the program the best in the region, and certainly the college and district would appreciate increases in the enrollment numbers for the engineering courses. While enrollment is only one aspect of a strong engineering program, it is important, and this will take planning to allow incremental increases to occur because there are systemic limits on some courses based on their current design.

Plan of Action

Curriculum/SLO - Develop an on-line or television version of Engr-35 (Statics). (Active)
Budgetary Impact: Increased use of DE resources, possible FLEX credit or stipend for course development.
Timeline/Responsible Party: Engineering department
Perkins Eligible: No
DE Related: Yes

Curriculum/SLO - Schedule Engr-45 (Properties of Materials) to support a combined-lecture with dual-lab-time format, then work with Curriculum to determine the effect, if any, on the COR. (Active)
Budgetary Impact: There would be no increased cost for facilities, but there would be a modest increase in instructional costs due to faculty pay for the second lab period and proportional growth in laboratory costs for test samples with student enrollment increases.
Timeline/Responsible Party: Engineering department and MESH Dean
Perkins Eligible: No
DE Related: No

Curriculum/SLO - Develop a course in MATLAB (as offered at Santa Rosa Junior College) and/or engineering numerical methods (as offered at Chabot). (Active)
Budgetary Impact: Possible FLEX for new course development. MATLAB has been purchased by a grant through MESA to provide this industry-standard software for all the computers in Room 603 (with maintenance and software upgrades) for 5 years.
Timeline/Responsible Party: Engineering dept.
Perkins Eligible: No
DE Related: No

Related Goals

Institutional Learning Outcomes
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Program Recommendation: Replace Damaged Rockwell Hardness Tester

Replace the damaged Rockwell Tester for the ENGR-45 Lab

Recommendation Priority: 3. High Priority
Year(s) Requested: 2013-2014
Request Date: 12/13/2011
Supporting Evidence : One of the two ancient Rockwell testers has finally sustained enough wear that it can no longer be calibrated and is unusable for the Engr-45 lab. This tester is used for half of the lab experiments in the course and so is critical to student learning. The current tester is over 50 years old and so is well beyond its expected life.
Evaluation Plan: This will be considered complete when the damaged Rockwell tester is replaced.

Plan of Action

Equipment - Replace the broken hardness tester by requesting Technology Funds via this program review. (Active)
Budgetary Impact: $5,000-$10,000
Timeline/Responsible Party: Technology Committee
Perkins Eligible: No

Related Goals

College - Yuba College Program Review
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Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

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Program Recommendation: Purchase 4-5 Replacement Oscilloscopes

Replace the oscilloscopes used for engineering and computer science courses with new oscilloscopes at a rate of 1-2 per year.

Recommendation Priority: 3. High Priority

YC - Engineering Program Review

Year(s) Requested: 2013-2014
Request Date: 10/25/2013
Supporting Evidence : The oscilloscopes used for Engineering Circuits (Engr-17), the hardware-based computer science courses, and the new digital electronics course in computer science must be replaced. They are decades old and have slowly been declining in number due to failure and cannibalization to replace parts in others. We have lost 1 per year for the last 2 years. Ultimately all the oscilloscopes need to be replaced, but a purchase rate of 1-2 scopes per year will allow the courses to continue with the current set of laboratory work.
Evaluation Plan: This will be considered satisfactory when students in all lab groups have newer model oscilloscopes in their courses.

Plan of Action

Equipment - Request Technology funds to purchase 1-2 new oscilloscopes per year to replace the failing equipment. (Active)
Budgetary Impact: $3000 to $12,000 per year depending on the model and number purchased.
Timeline/Responsible Party: Technology Committee in conjunction with the computer science and engineering faculty.
Perkins Eligible: No
DE Related: No
HSI Related: No

Related Goals

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YC Goal 1 - How do program or department goals align with stated Yuba College goals?

The Engineering faculty established 11 goals for its program for the 2011-2012 year using TracDat. Each of these goals has been updated to reflect their linkage of each to multiple Yuba College goals and at least two of the YCCD District Board of Trustees' Vision Statements. For each program goal, the primary Yuba College goal has been noted as the "Goal Type," and the 11 program goals are aligned with six of the nine Yuba College goals (1, 3, 5, 6, 7, & 9) at this level.
In addition, three of the 11 program goals have been completed:
1. Complete a set of SLOs for each Engineering course that is regularly scheduled.
2. Create a new laboratory instructional manual for ENGR-45 (Properties of Materials).
3. Update the Course Outline of Record for each of the regularly scheduled courses in Engineering.

And two others are on-going and currently have evidence of success:
1. Assess the SLOs in all Engineering courses offered each semester beginning in Fall 2011.
2. Increase the size of the Engineering Program at YC based on FTES.

YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.

YC Goal 7 - Improve the quality of the laboratory experience for YC engineering students.

YC Goal 3 - Create an annual replacement list for laboratory samples, materials and equipment maintenance.

Program Recommendation: Engineering Laboratory Manuals

Create laboratory instructional manuals for ENGR-45 and ENGR-3.

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2012-2013
Request Date: 08/01/2011
Supporting Evidence : Any laboratory instruction manuals (including equipment documentation and safety instructions) were lost with the prior engineering instructor. As a consequence the laboratory experiments and student instructions must be recreated from scratch for both ENGR-45 and ENGR-3.

Plan of Action

Curriculum/SLO - Create laboratory experiments and corresponding student instructions for these course based on available equipment and supplies. (Active)

Budgetary Impact: Minimal, since this work is being accomplished mainly on nights and weekends by the instructor. Possible FLEX time credit for the new multidisciplinary experiments such as the recrystallization of brass experiment.
Timeline/Responsible Party: Engineering Dept.

Status

Reporting Year: 2013-2014 10/21/2013
Recommendation Progress: Recommendation Needs Improvement/Attention
The first edition of the Engr-45 lab manual is complete and being used in Fall 2013. The lab manual also moves printing costs from the MESH division to the students who purchase the manual at the bookstore for less than $20/student. The Engr-3 lab manual has had no progress to date.

09/25/2012
Recommendation Progress: Recommendation Needs Improvement/Attention
A draft laboratory manual has been created for Engr-45 (Properties of Materials), and this is being refined during the Fall 2012 semester. In future years, it is hoped this could be printed and bound by the Print Shop to be an additional required reference for the course. Some experiments were created for Engr-3 (Plane Surveying) during the Spring 2012 semester, but malfunctions in the GTS equipment hindered development of experiments involving that technology.

YC - Engineering Program Review

Related Goals

Institutional Learning Outcomes
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Critical Thinking - Analyze data/information in addressing and evaluating problems and issues in making decisions.
Information Competency - Conduct, present, and use research necessary to achieve educational, professional, and personal objectives.
Personal and Social Responsibility - Interact with others by demonstrating respect for opinions, feelings, and values.
Scientific Awareness - Understand the purpose of scientific inquiry and the implications and applications of basic scientific principles.
Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

YCCD Board of Trustees Vision Statement
YCCD VS 1 - Providing an innovative, world-class learning environment;

YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 7 - Improve the quality of the laboratory experience for YC engineering students.
YC Goal 6 - Create a new laboratory instructional manual for ENGR-3 (Plane Surveying)
YC Goal 3 - Create an annual replacement list for laboratory samples, materials and equipment maintenance.
YC Goal 6 - Create a new laboratory instructional manual for ENGR-45 (Properties of Materials)

Program Recommendation: Replace Impact Tester

Replace the damaged Impact Tester for the ENGR-45 Lab

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Supporting Evidence : The Impact Tester in the Engineering Lab (Room 713) was broken at some point in the past 4 years. A consultation with the welding faculty indicated that while the broken parts might be able to be welded back into place, any subsequent breakage could present a safety and potential liability issue. As a result impact tension tests can no longer be performed for ENGR-45, reducing the usefulness of this testing equipment (and associated laboratory experiment) by 1/3.

Plan of Action

Equipment - Request a new Impact Tester when institutional equipment funds become available again. (Active)
Budgetary Impact: $10000 to $25000 depending on availability of used/new equipment
Timeline/Responsible Party: Engineering Dept

Status

10/03/2012

Recommendation Progress: Recommendation Needs Improvement/Attention
No progress. Perhaps at some point the department will find time to write a grant proposal in hopes of getting funding to replace the equipment, but that time is not this year given the other institutional responsibilities that the engineering faculty have had to take on with accreditation, the 4-month advance in the program review process, increased committee responsibilities due to shrinking numbers of faculty, etc.

YC - Engineering Program Review

Related Goals

Institutional Learning Outcomes
Information Competency - Conduct, present, and use research necessary to achieve educational, professional, and personal objectives.
Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

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YC Goal 6 - Create a new laboratory instructional manual for ENGR-45 (Properties of Materials)

Program Recommendation: Improve Internet Access in 713

Improve the speed of internet connection to the instructional computer in 713, and install an internet connection to the laboratory microscope computer in 713A.

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Supporting Evidence : The Engineering Department lacks sufficient funding at the moment to supply the newest technologies to its students. To compensate in some areas, videos are available on the Web to demonstrate technology, techniques and processes that could never be duplicated here. However, the current instructional computer or the computer's internet connection lacks sufficient speed so that these videos can be effectively played in the classroom. In addition, the laboratory computer connected to the new metallurgical microscope in 713A has no internet connection at all, preventing software updates and complicating the sharing of laboratory results.

Plan of Action

Equipment - Request the improvements in internet access in 713 from Media Services. (Active)
Budgetary Impact: Unknown -- depends on issues and decisions on implementation.
Timeline/Responsible Party: Engineering Dept and Media Services

Status

Reporting Year: 2013-2014 10/21/2013
Recommendation Progress: Recommendation Needs Improvement/Attention
The instructional computer was replaced in Spring 2013. This has improved speed of internet-related tasks at the podium.

10/03/2012
Recommendation Progress: Recommendation Needs Improvement/Attention
No improvement for this item. The age of the computer equipment in the room may be some of the issue for the teaching computer's slowness, and the outdated computer (2006) is listed in Media Services program recommendations.

Related Goals

Institutional Learning Outcomes
Communication - Effectively use language and non-verbal communication consistent with and appropriate for the audience and purpose.

Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 7 - Improve the quality of the laboratory experience for YC engineering students.

Program Recommendation: Install padlocks on the Universal Testing Machines

Request keyed padlocks for the new knife switches on the Universal Testing Machines from Facilities.

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Supporting Evidence : The new "knife" electrical cutoff switches were installed on 2 of the 3 Universal Testing Machines in 713 for student safety. However, they were never supplied with padlocks so there is the potential that any student in 713 for any class or any reason could activate these powerful and expensive machines and damage themselves, other students or the machines.

Related Goals

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YC Goal 6 - Create a new laboratory instructional manual for ENGR-45 (Properties of Materials)

Program Recommendation: Update surveying technologies

Purchase at least one global navigation satellite system (GNSS) surveying instrument set for Plane Surveying.

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2012-2013
Request Date: 10/05/2012
Supporting Evidence : At least 80% of all surveying work is now accomplished with GNSS technologies over the prior generation technology of total station measurements. Plane surveying (Engr-3) is offered in the Spring semester of even-numbered years, and students majoring in civil engineering and those interested in surveying as a profession need to be trained in technologies that are current.

Plan of Action

Equipment - Secure funding for the purchase of the recommended equipment. (Active)
Budgetary Impact: $10000-15000
Timeline/Responsible Party: Engineering department, the MESH Dean and the Facilities and Equipment committee.
Perkins Eligible: Yes
DE Related: No

Related Goals

YC - Engineering Program Review

Institutional Learning Outcomes
Computation - Use appropriate mathematical concepts and methods to understand, analyze, and communicate issues in quantitative terms.
Critical Thinking - Analyze data/information in addressing and evaluating problems and issues in making decisions.
Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 6 - Create a new laboratory instructional manual for ENGR-3 (Plane Surveying)
YC Goal 9 - Establish an Engineering Technology program to attract students interested in the STEM fields but which may not have the capability or commitment to become full engineers at this time.
YC Goal 9 - Increase the size of the Engineering Program at YC based on FTES.

Program Recommendation: Define a YC Engineering Technology Program

Work with CTE, Computer Science and other MESH faculty to define a viable Engineering Technology Program for Yuba College.

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Supporting Evidence : Engineering Technicians have relatively high starting salaries and are in demand in many different fields. There is considerable interest among the affected YC faculty to establish a program that would provide such certification here in Northern CA. Given the established Engineering Program and the wide range of disciplines in MESH, this is a reasonable goal for an exciting interdisciplinary program that could be of great value to our students and community.

Plan of Action

Curriculum/SLO - Partner with CTE and Computer Science faculty to define such a program then seek support of MESH and then the Academic Senate. (Active)
Budgetary Impact: None at this time.
Timeline/Responsible Party: Engineering, CTE and Computer Science Departments

Status

10/03/2012

Recommendation Progress: Recommendation Needs Improvement/Attention
Some discussions are occurring between Computer Science and Engineering. We believe this degree option would be easier after the A.S. Degree in Engineering is in place, but development can proceed.

Related Goals

Institutional Learning Outcomes
Communication - Effectively use language and non-verbal communication consistent with and appropriate for the audience and purpose.
Computation - Use appropriate mathematical concepts and methods to understand, analyze, and communicate issues in quantitative terms.
Critical Thinking - Analyze data/information in addressing and evaluating problems and issues in making decisions.
Information Competency - Conduct, present, and use research necessary to achieve educational, professional, and personal objectives.

Scientific Awareness - Understand the purpose of scientific inquiry and the implications and applications of basic scientific principles.
Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

YC - Engineering Program Review
YC Goal 9 - Establish an Engineering Technology program to attract students interested in the STEM fields but which may not have the capability or commitment to become full engineers at this time.
YC Goal 9 - Increase the size of the Engineering Program at YC based on FTES.

Program Recommendation: Initial SLO assessments

Complete initial SLO assessments for all engineering courses by Spring 2013.

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2012-2013
Request Date: 10/04/2012
Supporting Evidence : This conforms to district, college and program goals. Only one engineering course (Engr-10) remains to have its SLOs assessed for the first time, and this course will be offered for the first time in Spring 2013.
Evaluation Plan: On-going

Related Goals

Institutional Learning Outcomes
Communication - Effectively use language and non-verbal communication consistent with and appropriate for the audience and purpose.

YC - Engineering Program Review
YC Goal 1 - Assess the SLOs in all Engineering courses offered each semester beginning in Fall 2011.
YC Goal 1 - Complete a set of SLOs for each Engineering course that is regularly scheduled.

Program Recommendation: Clean 713 Floor Drains

Hire a "Roto-Rooter" or equivalent to clear the floor drains in Room 713.

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Supporting Evidence : Several experiments in ENR-45 involve the use of water, including but not limited to the Concrete Design and Testing Lab and the Recrystallization of Brass Lab. The floor drain in the concrete mixing area is very slow and water seeps under the door into the main classroom near the instructors podium with all the AV equipment. The resulting situation presents a safety hazard.

Plan of Action

Facilities - Request a cleaning/clearing of the floor drains in 713. (Active)
Budgetary Impact: Unknown, but likely minimal since this should be part of regular building maintenance.
Timeline/Responsible Party: Facilities

Status

10/03/2012

Recommendation Progress: Recommendation Needs Improvement/Attention
The drain is still blocked. This room is used every fall for the concrete laboratory, and there is a tank in the room used to cure the concrete for 28-days in water. Draining the tank must be done by bailing out the water and walking it outside to the grass.

Related Goals

YCCD Board of Trustees Vision Statement
YCCD VS 1 - Providing an innovative, world-class learning environment;

YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 7 - Improve the quality of the laboratory experience for YC engineering students.

Program Recommendation: Program cost model

Develop a cost model for the engineering program including maintenance costs for engineering equipment and samples & supplies needed for engineering laboratory and design work.

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2012-2013
Request Date: 10/05/2012
Supporting Evidence : The model will provide more quantitative justification for the engineering budget and will roll up to tie in with the college and district cost models.

Plan of Action

Equipment - Use MS Excel to create a simple cost model for the engineering program. (Active)
Budgetary Impact: None. Possible FLEX credit since this is currently considered beyond the typical duties of faculty or department heads.
Timeline/Responsible Party: Engineering Department
Perkins Eligible: No
DE Related: No

Related Goals

Institutional Learning Outcomes
Information Competency - Conduct, present, and use research necessary to achieve educational, professional, and personal objectives.

YC - Engineering Program Review
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YC Goal 7 - Improve the quality of the laboratory experience for YC engineering students.
YC Goal 3 - Create an annual replacement list for laboratory samples, materials and equipment maintenance.
YC Goal 9 - Increase the size of the Engineering Program at YC based on FTES.

Program Recommendation: Professional training

Secure training for the engineering faculty in new technologies in engineering.

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2012-2013
Request Date: 10/05/2012
Supporting Evidence : The engineering field is filled with many tools and technologies that are specific to particular engineering disciplines (such as GTS and GNSS technologies for surveying and civil engineering). Additional training is needed for the engineering faculty to be proficient in these technologies and reduce the need for subject-matter experts to support the laboratory work in some courses.

Professional Development/Training - Attend training in Computer-Aided Design using an industry-standard software tool (such as Solid Works). (Active)
Budgetary Impact: $800-2500 depending on format of the training and the level of certification desired.
Timeline/Responsible Party: Engineering department with the MESH Dean to secure training funding
Perkins Eligible: Yes
DE Related: No

Professional Development/Training - Attend training in Topcon-GTS total station technology (Active)
Budgetary Impact: Approximately $1000
Timeline/Responsible Party: Engineering department with MESH Dean
Perkins Eligible: Yes
DE Related: No

Related Goals

Institutional Learning Outcomes
Communication - Effectively use language and non-verbal communication consistent with and appropriate for the audience and purpose.
Critical Thinking - Analyze data/information in addressing and evaluating problems and issues in making decisions.
Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

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YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 6 - Create a new laboratory instructional manual for ENGR-3 (Plane Surveying)
YC Goal 3 - Appropriately staff the engineering courses at YC, particularly ENGR-3 (Plane Surveying) and ENGR-4 (Engineering Graphics).
YC Goal 9 - Increase the size of the Engineering Program at YC based on FTES.

Program Recommendation: Equipment maintenance schedule

Create and implement an equipment maintenance schedule for the engineering equipment in the department.

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2012-2013
Request Date: 10/07/2012
Supporting Evidence : None of the equipment (either it is too old or there are no affordable maintenance plans available to our location) has professional maintenance performed. Therefore, the department must perform this maintenance on an on-going basis.

Plan of Action

Equipment - Collect the available equipment manuals for the engineering equipment and document maintenance that is recommended for each and the necessary timeline. Then implement the maintenance plan. (Active)
Budgetary Impact: None. Possible reduction in equipment failures.
Timeline/Responsible Party: Engineering dept.
Perkins Eligible: No
DE Related: No

YC - Engineering Program Review

Related Goals

Institutional Learning Outcomes
Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

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YC Goal 3 - Create an annual replacement list for laboratory samples, materials and equipment maintenance.

Program Recommendation: Engineering Travel Budget

A modest travel budget should be obtained for the Engineering Department for planning purposes.

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2012-2013
Request Date: 10/09/2012
Supporting Evidence : Engineering is a rapidly changing field with new advancements in theory and technology occurring each year. The full-time engineering faculty have used personal funds to attend at least two engineering conferences and/or training sessions each year, but this is not a sustainable way of keeping the department up to date. Although YCFA/FLEX funding has helped offset some costs, more than $1000 in additional travel and conference expenses were incurred in 2011-12.

Plan of Action

Professional Development/Training - Request that the MESH Dean establish a small travel budget of $500-1000 annually for travel needed for the engineering program. (Active)
Budgetary Impact: $500-1000 annually
Timeline/Responsible Party: MESH Dean
Perkins Eligible: No
DE Related: No

Related Goals

Institutional Learning Outcomes
Communication - Effectively use language and non-verbal communication consistent with and appropriate for the audience and purpose.
Critical Thinking - Analyze data/information in addressing and evaluating problems and issues in making decisions.
Scientific Awareness - Understand the purpose of scientific inquiry and the implications and applications of basic scientific principles.
Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

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YC Goal 9 - Increase the size of the Engineering Program at YC based on FTES.
YC Goal 6 - Update the Course Outline of Record for each of the regularly scheduled courses in Engineering.

Program Recommendation: Repaint Room 713

Paint the interior walls of 713 to a consistent, lighter color

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2013-2014
Request Date: 10/25/2013
Supporting Evidence : To what degree does your program or department have adequate facilities to support effective instruction? Please explain.
The current facilities are satisfactory given that the main engineering laboratory is located in an aged building in room 713 and the adjoining storage/work rooms. The leak in the ceiling near the main compression test machine was fixed in late 2012. There are minor issues such as the plugged floor drain in the side room off the southeast corner of room 713 where the students mix concrete and test buoyancy, and the lack of Wi-Fi or other internet connectivity for the computer that is connected to the metallurgical microscope in the side room north of room 713. Overall, however, the facilities are dated and rather dingy, but adequate. A brighter paint color (other than pink or the current orange) would probably be an easy improvement.

Evaluation Plan: This will be considered complete when the room has been painted a better color.

Plan of Action

Facilities - Request updated interior paint on room 713. Please use a better and consistent color throughout. (Active)
Budgetary Impact: Unknown. No method provided to estimate.

Program Recommendation: New Math and Engineering Building

Replace or renovate Building 700

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2013-2014
Request Date: 10/25/2013
Supporting Evidence : There is an acute need for modern classrooms. Presently many mathematics classes are taught in temporary classrooms (the "swing space": M-3003 and M-3004) because there are not enough available permanent classrooms for mathematics. Mathematics classes are also taught in classrooms (M-607 and M-713) that do not allow the classes to enroll to cap. Many mathematics courses are now taught in classrooms that do not include at least better (larger) student desks that would provide students with a greater working area, as well as provide instructors the flexibility to present lectures, conduct small group activities, &c.; wide writing spaces for instruction (several blackboards or whiteboards, or both); flexible projection systems; and Internet access.

In addition, the temporary classrooms will be removed by Spring 2014 and will no longer be available. Space now needs to be found for the mathematics classes that were scheduled to be held there in Spring 2014. This space shortage may result in more use of Room 713 by non-engineering students which would increase the risk of equipment misuse and harm.

The minimal solution would be for the College to upgrade existing classrooms or make available existing classrooms or construct new classrooms that would be suitable for our teaching mathematics today. The optimal solution would be to construct a new building that would house the Mathematics, Engineering and Drafting, and Computer Science programs. The building should be two stories, with classrooms and engineering laboratories on the first floor; and computer labs, MESA, the Hard Math Cafe, student and

staff lounges, a meeting or conference room, and faculty offices on the second floor. See Brian Birgen's article, "How to design a mathematics building," _Focus_, May/June 2005; URL below.

<http://www.maa.org/sites/default/files/pdf/pubs/june%2005web.pdf>

There is a huge push at all levels of the State and CCC to encourage students to enter a STEM (Science, Technology, Engineering, and Mathematics) field. A new building for the Mathematics, Engineering and Drafting, and Computer Science programs would go a very long way towards making Yuba College a premier college for STEM in the North State.

Evaluation Plan: This will be considered complete when the new facility is in operation.

Plan of Action

Facilities - There is an acute need for modern classrooms. Presently many mathematics classes are taught in temporary classrooms (the "swing space": M-3003 and M-3004) because there are not enough available permanent classrooms for mathematics. Mathematics classes are also taught in classrooms (M-607 and M-713) that do not allow the classes to enroll to cap. Many mathematics courses are now taught in classrooms that do not include at least better (larger) student desks that would provide students with a greater working area, as well as provide instructors the flexibility to present lectures, conduct small group activities, &c.; wide writing spaces for instruction (several blackboards or whiteboards, or both); flexible projection systems; and Internet access.

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<http://www.maa.org/sites/default/files/pdf/pubs/june%2005web.pdf>

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Budgetary Impact: Unknown

Program Recommendation: Cross-list DRAFT-30 with Engineering

Link DRAFT-30 (Technical Drawing with CAD) with the Engineering Program

Recommendation Priority: 1. Low Priority
Year(s) Requested: 2012-2013
Request Date: 10/05/2012
Supporting Evidence : DRAFT-30 is a pre-requisite to Engr-4 (Engineering Graphics and Design). Cross-listing the course would reflect the interdisciplinary nature of the course, fit well with the plans of an AS Engineering & Cert. Engineering Tech. and allow greater influence of engineering on the CAD software to be used in the course.

Plan of Action

Curriculum/SLO - Work with Drafting adjunct to appropriately cross-link the course with the Engineering curriculum. (Active)

Budgetary Impact: None.

YC - Engineering Program Review

Timeline/Responsible Party: Engineering department
Perkins Eligible: No

Related Goals

Institutional Learning Outcomes
Communication - Effectively use language and non-verbal communication consistent with and appropriate for the audience and purpose.
Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 9 - Establish an Engineering Technology program to attract students interested in the STEM fields but which may not have the capability or commitment to become full engineers at this time.
YC Goal 9 - Increase the size of the Engineering Program at YC based on FTES.
YC Goal 1 - Complete a set of SLOs for each Engineering course that is regularly scheduled.
YC Goal 6 - Update the Course Outline of Record for each of the regularly scheduled courses in Engineering.

Program Recommendation: Engineering Club

Encourage the formation of an Engineering Club

Recommendation Priority: 1. Low Priority
Year(s) Requested: 2012-2013
Request Date: 10/05/2012
Supporting Evidence : The former engineering club has dwindled and died over the past 2 years. It had weak goals that did not benefit all members, and its affiliation with SHPE (Society for Hispanic Professional Engineers) alienated some students who were not Hispanic. A new club could be formed to generate funds for conferences, shared textbooks (for the reserve desk of the library), for new engineering equipment, etc. that would benefit all students. Affiliation with the ASEE would provide a broad umbrella to introduce students to professional engineering societies.

Plan of Action

Staffing - Technical/Clerical - Identify students willing to restart an engineering club and encourage them to form and align with ASEE. (Active)
Budgetary Impact: None.
Timeline/Responsible Party: Engineering department
Perkins Eligible: No
DE Related: No

Related Goals

Institutional Learning Outcomes
Communication - Effectively use language and non-verbal communication consistent with and appropriate for the audience and purpose.
Global Awareness - Articulate similarities and differences among cultures, times, and environments, demonstrating an understanding of cultural pluralism and knowledge of global issues.
Personal and Social Responsibility - Interact with others by demonstrating respect for opinions, feelings, and values.
Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

YC - Engineering Program Review

YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 9 - Increase the size of the Engineering Program at YC based on FTES.

Program Recommendation: Roof Repair for Room 713

Fix the leak in the roof above the Universal Testing Machines in 713.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Inactive Date: 10/21/2013
Supporting Evidence : There is a leak (likely in the roof) in room 713 near the center Universal Testing Machine that results in a large puddle next to or touching that expensive piece of equipment. Replacement of that piece of equipment (which is the only machine capable of compressing concrete to failure in the ENGR-45 laboratory) would likely result in replacement costs in the neighborhood of $50,000-$75,000, perhaps more. The machines are so expensive, that a reliable price quote could not be obtained via the web.
Evaluation Plan: The roof is no longer leaking.

Plan of Action

Facilities - Follow up on ticket that was submitted after the most recent rain storm. (Active)
Budgetary Impact: Minimal if adequate maintenance of the roof is done. VERY large if either testing machine near the leak is damaged.
Timeline/Responsible Party: Facilities

Status

Reporting Year: 2013-2014 10/21/2013
Recommendation Progress: Recommendation Addressed/Satisfactory Progress
This was fixed last winter, and the missing ceiling tile was replaced during the summer 2013.

10/24/2012
Recommendation Progress: Recommendation Needs Improvement/Attention
Another ticket was submitted today (10/24/2012) after noting the puddle on the lab floor following yesterday's rains. The current maintenance ticket system does not allow tracking (via ticket number or online status) so it is not clear if anything is being done about this safety issue.

09/25/2012
Recommendation Progress: Recommendation Needs Improvement/Attention
A ceiling tile was removed from the lab during the Spring 2012 semester and remains missing. It is not clear whether the roof leak was repaired or not since it has not rained so far this semester. There is also not a way of checking status on maintenance tickets other than opening up a new ticket electronically.

Program Recommendation: Elmo Projector for Room 713 (Complete)

Purchase and install an Elmo document projector for Room 713.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Inactive Date: 10/21/2013
Supporting Evidence : Room 713 is home to a number of engineering courses that require the use of complex diagrams and charts, such as phase diagrams, engineering stress/strain graphs, etc. These are impossible to draw accurately by hand even if one had the time during a lecture to do so. An Elmo document projector would allow sharing such diagrams to the class and demonstrate the use of these engineering graphics.
Evaluation Plan: Complete.

YC - Engineering Program Review

Equipment - Request institutional purchase and installation of the document projector from Media Services. (Active)
Budgetary Impact: According to the spreadsheet provided by Media Services, the cost is $2350.
Timeline/Responsible Party: Media Services

Status

Reporting Year: 2013-2014 10/21/2013
Recommendation Progress: Recommendation Addressed/Satisfactory Progress
This was funded via the institutional technology funds in Spring 2013. The installation has greatly improved instruction in Room 713.

09/25/2012
Recommendation Progress: Recommendation Needs Improvement/Attention
No change in status. The lack of a document cam and the age of the other AV equipment in 713 has been documented by Media Services in its program recommendations. Apparently the price has dropped to $1925 this year, though. At this rate it will be free by the next program review!

Related Goals

Institutional Learning Outcomes
Information Competency - Conduct, present, and use research necessary to achieve educational, professional, and personal objectives.
Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 7 - Improve the quality of the laboratory experience for YC engineering students.

Program Recommendation: Revise ENGR-10 COR

Revise the Course Outline of Record (COR) for ENGR-10 to expand its applicability to STEM fields and excite and engage new students in these fields of study.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2011-2012
Request Date: 11/01/2011
Inactive Date: 10/21/2013
Supporting Evidence : The ENGR-10 course should be revised to help introduce more students into the STEM fields, not only engineering. Nationally, it has been found that many students do not consider engineering or STEM fields simply because they do not know what jobs/activities these disciplines encompass. Engineering continues to have among the highest starting salaries for bachelors degrees and the among the lowest unemployment rates.
Evaluation Plan: This is complete.

Plan of Action

Curriculum/SLO - Submit a revised COR for ENGR-10 and support it through approval in the curriculum review process. (Active)
Budgetary Impact: Increased FTES would be a budgetary improvement
Timeline/Responsible Party: Engineering Dept. and Curriculum

Status

Reporting Year: 2013-2014 10/21/2013
Recommendation Progress: Recommendation Addressed/Satisfactory Progress
The course is being offered for the second time in Fall 2013. It is now the largest enrolled course in the engineering program with an average of 19 students per class for the last two semesters.

09/25/2012

Recommendation Progress: Recommendation Addressed/Satisfactory Progress
This was approved in Spring 2012 and the revised course uploaded to CurricUNET prior to the start of Fall 2012. There was one minor glitch in that the title of the course was not changed in CurricUNET, but this was corrected by the Curriculum Chair. This item is complete.

Related Goals

Institutional Learning Outcomes
Communication - Effectively use language and non-verbal communication consistent with and appropriate for the audience and purpose.
Computation - Use appropriate mathematical concepts and methods to understand, analyze, and communicate issues in quantitative terms.
Critical Thinking - Analyze data/information in addressing and evaluating problems and issues in making decisions.
Information Competency - Conduct, present, and use research necessary to achieve educational, professional, and personal objectives.
Personal and Social Responsibility - Interact with others by demonstrating respect for opinions, feelings, and values.
Scientific Awareness - Understand the purpose of scientific inquiry and the implications and applications of basic scientific principles.
Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 9 - Increase the size of the Engineering Program at YC based on FTES.
YC Goal 1 - Complete a set of SLOs for each Engineering course that is regularly scheduled.

Program Recommendation: Make ENGR-10 a GE Course

Get the new ENGR-10 (Introduction to Engineering and Science) listed as a General Education course at Yuba College to attract new students into the STEM fields.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Inactive Date: 10/21/2013
Supporting Evidence : Nationally, it has been found that many students do not consider engineering or STEM fields simply because they do not know what jobs/activities these disciplines encompass. Engineering continues to have among the highest starting salaries for bachelors degrees and the among the lowest unemployment rates. We must find a way to attract new students into this field, and fulfilling a GE requirement could be a means of introduction for YC students to these exciting fields.
Evaluation Plan: This is complete.

Plan of Action

Curriculum/SLO - Once the new ENGR-10 COR is approved, a request will be made to consider making ENGR-10 a GE course for Yuba College. (Active)
Budgetary Impact: An increase in Engineering FTES would be a budgetary improvement. However, there is a lab component with this course, so there could be a slight increase in the engineering departmental expenses.
Timeline/Responsible Party: Engineering Dept.

Status

Reporting Year: 2013-2014 10/21/2013

YC - Engineering Program Review

Recommendation Progress: Recommendation Addressed/Satisfactory Progress
Engr-10 is now part of the GE list for Yuba College in area D-2.

09/25/2012

Recommendation Progress: Recommendation Needs Improvement/Attention
After the Curriculum Committee and Board approved the revised Engr-10 COR, somehow the GE petition that was submitted at the same time as the revised COR got "lost in translation" to CurricUNET, or the summer semester, or other unknown reason. The GE petition was re-submitted in CurricUNET early in the Fall 2012 with the understanding that the petition would be expedited. The new Engr-10 course is to be offered in Spring 2013, but without an approved and advertised GE status, the department is concerned about the course effectively meeting the population of students that it is designed for. This item is on the agenda for the Curriculum Committee on October 16th (the day after this program review is due).

Related Goals

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Communication - Effectively use language and non-verbal communication consistent with and appropriate for the audience and purpose.
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YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
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YC Goal 9 - Establish an Engineering Technology program to attract students interested in the STEM fields but which may not have the capability or commitment to become full engineers at this time.
YC Goal 9 - Increase the size of the Engineering Program at YC based on FTES.

Program Recommendation: Replace Whiteboard

Replace Left Whiteboard in Room 713.

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2011-2012
Request Date: 01/25/2012
Inactive Date: 10/21/2013
Supporting Evidence : The left whiteboard in 713 has degraded such that it can no longer be erased using the supplied eraser or towel. Although the right whiteboard works well, for some reason erasing the left whiteboard requires spraying with water or a cleaner (also supplied) and wiping vigorously with a paper towel. This takes at least 3 minutes of precious lecture time whenever the board needs to be erased. It may be that the left board gets more use because the projector screen covers most of the right board when the overhead projector is used.
Evaluation Plan: Complete.

Equipment - Request that Media Services replace the whiteboard in 713. (Active)
Budgetary Impact: Approximately $200 (based on an internet search of prices, although I would expect that Media Services has negotiated better pricing deals for their standard model)
Timeline/Responsible Party: Media Services

Status

Reporting Year: 2013-2014 10/21/2013
Recommendation Progress: Recommendation Addressed/Satisfactory Progress
Completed in Spring 2013 thanks to funding by the Mathematics Dept.

10/03/2012
Recommendation Progress: Recommendation Needs Improvement/Attention
No progress. The left whiteboard is still difficult to erase/reuse during lectures. I don't know if this properly belongs with Media Services or Maintenance. I had hoped to purchase a new one with the last of the engineering budget last year, but battery replacements for the surveying instruments (Engr-3) and restocking of lab samples for Properties of Materials (Engr-45) wiped out the entire budget and then some last year.

Related Goals

Institutional Learning Outcomes
Communication - Effectively use language and non-verbal communication consistent with and appropriate for the audience and purpose.

YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 7 - Improve the quality of the laboratory experience for YC engineering students.

Program Recommendation: ABET accreditation

Complete ABET accreditation for the engineering program.

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2012-2013
Request Date: 10/05/2012
Supporting Evidence : ABET is a nonprofit, non-governmental organization that accredits college and university programs in the disciplines of applied science, computing, engineering, and engineering technology. ABET accredits over 3,100 programs at more than 670 colleges and universities in 24 countries. Accreditation by ABET would greatly increase the status of the engineering program at Yuba College, although it is unlikely to occur until YC offers an A.S. Engineering degree option.

Plan of Action

Curriculum/SLO - Begin preliminary study of the accreditation standards and document the gaps. (Active)
Budgetary Impact: None. Possible FLEX credit.
Timeline/Responsible Party: Engineering department.
Perkins Eligible: No
DE Related: No

Status

Reporting Year: 2013-2014 10/21/2013
Recommendation Progress: Recommendation Addressed/Satisfactory Progress
ABET accreditation is not offered for 2-year programs EXCEPT for engineering technology programs. This recommendation will need to wait until the Engineering Technology degree is approved.

YC - Engineering Program Review

Related Goals

Institutional Learning Outcomes
Communication - Effectively use language and non-verbal communication consistent with and appropriate for the audience and purpose.
Critical Thinking - Analyze data/information in addressing and evaluating problems and issues in making decisions.
Information Competency - Conduct, present, and use research necessary to achieve educational, professional, and personal objectives.
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Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

YCCD Board of Trustees Vision Statement
YCCD VS 1 - Providing an innovative, world-class learning environment;

YC - Engineering Program Review
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YC Goal 9 - Establish an Engineering Technology program to attract students interested in the STEM fields but which may not have the capability or commitment to become full engineers at this time.
YC Goal 9 - Increase the size of the Engineering Program at YC based on FTES.

Program Recommendation: Speakers for Room 713

Fix or purchase and install speakers for the instructional computer in Room 713.

Recommendation Priority: 1. Low Priority
Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Inactive Date: 10/21/2013
Supporting Evidence : The Engineering Department lacks sufficient funding at the moment to supply the newest technologies to its students. To compensate in some areas, videos are available on the Web to demonstrate technology, techniques and processes that could never be duplicated here. However, the current instructional computer lacks any speakers so that these videos can be effectively played in the classroom.
Evaluation Plan: Complete.

Plan of Action

Equipment - Request speakers for the instructional computer in Room 713. (Active)
Budgetary Impact: Per the Media Services estimation spreadsheet, wall speakers would cost $258.
Timeline/Responsible Party: Media Services

Status

Reporting Year: 2013-2014 10/21/2013
Recommendation Progress: Recommendation Addressed/Satisfactory Progress
Complete

09/25/2012
Recommendation Progress: Recommendation Addressed/Satisfactory Progress
It was found via experimentation that the speakers work only when the overhead projector is in use.

Related Goals

YC - Engineering Program Review

Institutional Learning Outcomes
Communication - Effectively use language and non-verbal communication consistent with and appropriate for the audience and purpose.
Critical Thinking - Analyze data/information in addressing and evaluating problems and issues in making decisions.
Global Awareness - Articulate similarities and differences among cultures, times, and environments, demonstrating an understanding of cultural pluralism and knowledge of global issues.
Information Competency - Conduct, present, and use research necessary to achieve educational, professional, and personal objectives.
Scientific Awareness - Understand the purpose of scientific inquiry and the implications and applications of basic scientific principles.
Technological Awareness - Select and use appropriate technological tools for personal, academic, and career tasks.

YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 7 - Improve the quality of the laboratory experience for YC engineering students.

Program Recommendation: Staffing

I22. Does this program have adequate technical/clerical staff to support a high quality program?

The program is supported in an excellent manner by the MESH division staff with regard to clerical needs. However, the program has not been able to attract even a single adjunct faculty member to teach any engineering course in over two years. In addition, the funds for student graders had to be redirected for the past two years to pay for supplies needed for the laboratories. The department would also like to see greater investment in student work-study or a part-time instructional assistant to help prepare laboratory spaces for the various engineering lab activities. This would free up limited instructor time to focus on lecture, curriculum and grant-writing for the department.

Recommendation Priority: 2. Medium Priority
Request Date: 10/25/2013
Supporting Evidence : I22. Does this program have adequate technical/clerical staff to support a high quality program?

The program is supported in an excellent manner by the MESH division staff with regard to clerical needs. However, the program has not been able to attract even a single adjunct faculty member to teach any engineering course in over two years. In addition, the funds for student graders had to be redirected for the past two years to pay for supplies needed for the laboratories. The department would also like to see greater investment in student work-study or a part-time instructional assistant to help prepare laboratory spaces for the various engineering lab activities. This would free up limited instructor time to focus on lecture, curriculum and grant-writing for the department.

Evaluation Plan: This will be considered complete when it's done.

Plan of Action

Staffing - Technical/Clerical - I22. Does this program have adequate technical/clerical staff to support a high quality program?

The program is supported in an excellent manner by the MESH division staff with regard to clerical needs. However, the program has not been able to attract even a single adjunct faculty member to teach any engineering course in over two years. In addition, the funds for student graders had to be redirected for the past two years to pay for supplies needed for

the laboratories. The department would also like to see greater investment in student work-study or a part-time instructional assistant to help prepare laboratory spaces for the various engineering lab activities. This would free up limited instructor time to focus on lecture, curriculum and grant-writing for the department.
(Active)
Budgetary Impact: Unknown

Program Recommendation: Training/Professional Development - Other

Answers to PR template questions

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2013-2014
Request Date: 10/25/2013
Supporting Evidence : See plan of action
Evaluation Plan: See plan of action

Plan of Action

Professional Development/Training - J23. In the last year, what professional development or networking has faculty and/or staff participated in?
For the past two years the YC engineering faculty member has participated in the Summer Engineering Teaching Institute (SETI) which is hosted by Cañada College. This past year was as a speaker relating the experience of using new technologies of Piazza and Mastering Engineering software in the classroom. The faculty member is also a member of the state-wide Engineering Liaison Council (ELC) that has meetings in the spring and fall to discuss curriculum matters across the entire CCC, UC and CSU system. The YC engineering faculty member attended the April ELC meeting in East LA. The YC engineering faculty member has also been selected as a C-ID reviewer by the CCC system to evaluate engineering course outlines of record (COR) state-wide that are proposed to align with the new engineering C-IDs. In the past, the YC engineering faculty member has attended the annual American Society of Engineering Educators (ASEE) conference which is held in June at his own personal expense. The YC engineering faculty member is also a member of ASEE and in the past year has served as a reviewer for proposed papers to their annual conference. In October 2012, the YC engineering faculty member attended the STEMTech Conference which was partially paid for by FLEX funds and the remainder paid at personal expense. Finally, the YC engineering faculty member exchanges periodic emails with colleagues at UC Davis, the California State University, Chico and many community colleges that are part of the ELC.

J24. How did these activities contribute to student success? (include supportive data)
In preparation for the SETI conference, the use of Piazza with Mastering Engineering software was introduced to the Engineering Circuits (Engr-17) class in Spring 2013. The success was evaluated by student feedback solicited at the end of the course. The feedback was overwhelmingly positive regarding Piazza in helping students to collaborate to solve engineering problems and diagnose software issues in Mastering Engineering. In fact, several students lamented the fact that Piazza had not been available to them for Statics (Engr-35), so Piazza is now being piloted in Engr-35 for the Fall 2013 semester. In addition for the Fall 2013 semester, Piazza “forums” have been created for Properties of Materials (Engr-45) and for Statistics (Stat-1) which use traditional homework assignments and submissions. Piazza is a free online site that allows instructors to answer questions from students in an asynchronous manner in a forum setting so that all students can benefit from the questions and answers. Piazza also allows for easier announcements and distribution of classroom materials than the YCCD Portal. Mastering Engineering is an online homework and reference site available to courses using Pearson engineering textbooks, and requires an additional cost to the students.

From the ASEE conferences, the lectures of Engr-45 have been improved by the addition of concept maps, developed at Arizona State University, as a review methodology. Also, numerous small ideas for improving instruction on material science and engineering have been implemented such as hands-on demonstrations, lecture advice from colleagues, etc.

Finally, the ELC and associated efforts surrounding the draft engineering C-IDs hold the promise of allowing all engineering courses at YC to transfer to any CSU. Information in the draft C-IDs was being used to update YC engineering CORs until

the CurricUNET moratorium paralyzed curriculum revisions. The ELC exhibited a positive response to the new Introduction to Engineering & Science (Engr-10) course that was approved in Curriculum Committee in Fall 2012 and offered in Spring 2013 for the first time. The inclusion of this critical thinking course in the YC graduation requirements was seen as positive and appropriate.

J25. How does professional development in your program or department support basic skills students and foster inclusive classroom environments that value diversity?

Engineering courses are well above the BSI level. In Engr-10, we study scientists and engineers from many cultures and backgrounds. The main engineering faculty was part of the Diversity Committee for over a year and has presented or organized seminars under Crossing Borders-Building Bridges on three separate occasions. The latest was in February 2013 on women in STEM fields.

J26. What Staff Development activities would you suggest be offered in the next year that would enhance your program?

It would be helpful to have more outside speakers in STEM fields give seminars to educate our students and staff on the variety of STEM careers and the diverse backgrounds of its practitioners.

(Active)

Budgetary Impact: J23. In the last year, what professional development or networking has faculty and/or staff participated in?
For the past two years the YC engineering faculty member has participated in the Summer Engineering Teaching Institute (SETI) which is hosted by Cañada College. This past year was as a speaker relating the experience of using new technologies of Piazza and Mastering Engineering software in the classroom. The faculty member is also a member of the state-wide Engineering Liaison Council (ELC) that has meetings in the spring and fall to discuss curriculum matters across the entire CCC, UC and CSU system. The YC engineering faculty member attended the April ELC meeting in East LA. The YC engineering faculty member has also been selected as a C-ID reviewer by the CCC system to evaluate engineering course outlines of record (COR) state-wide that are proposed to align with the new engineering C-IDs. In the past, the YC engineering faculty member has attended the annual American Society of Engineering Educators (ASEE) conference which is held in June at his own personal expense. The YC engineering faculty member is also a member of ASEE and in the past year has served as a reviewer for proposed papers to their annual conference. In October 2012, the YC engineering faculty member attended the STEMTech Conference which was partially paid for by FLEX funds and the remainder paid at personal expense. Finally, the YC engineering faculty member exchanges periodic emails with

Program Recommendation: Modern technology access

Provide priority and increased annual budget for creating a modern learning environment for students access to technology necessary for currency of their engineering education.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2015-2016
Request Date: 10/25/2015
Supporting Evidence : The current budget allocated for engineering is completely inadequate for a program that almost died. A large and significant incremental funding is needed to update and modernize all equipment needed to teach engineering labs. After the equipment is updated to support the courses, then an ongoing annual budget will be adequate. However, equipment and software annual maintenance costs are significant and should be budgeted for appropriately. Additionally, a modern classroom and laboratory space dedicated to engineering is sorely needed. Currently most engineering courses are held in room 713, which is a laboratory space without any modern technology.

Plan of Action

Technology - Submit request to IT for installation of wireless router and at least 7 current computer systems in room 713 . (Active)

Budgetary Impact: Depending on current equipment in IT stores, this cost may vary from $100-$15,000

YC - Engineering Program Review

Timeline/Responsible Party: An email will be sent to IT prior to December 1, 2015 to request these updates.
Perkins Eligible: No
DE Related: No
HSI Related: No
YC - Location: Yuba College - All

Related Goals

YC - Engineering Program Review
YC Goal 5 - Save the Engineering Program at Yuba College, and then make it the best such program in the region.
YC Goal 7 - Improve the quality of the laboratory experience for YC engineering students.
YC Goal 9 - Increase the size of the Engineering Program at YC based on FTES.
YC Goal 6 - Budget adequate annual funds to continuously improve and keep pace with technology necessary for engineering.

Program Recommendation: Engineering Aides

Budget annually for Engineering Aides to assist the full-time engineering faculty member. These positions can be filled by individuals who do not meet minimum qualifications to teach engineering classes. The Engineering Aides will be hired to assist with laboratory classes only (not lectures). The positions can be filled by 1) former students who have left YC and previously taken an engineering course, 2) current students or working professionals who hold B.S. degrees in an Engineering discipline, or 3) Licensed Professional Land Surveyors (PLS) without engineering degrees.

Recommendation Priority: 2. Medium Priority
Year(s) Requested: 2015-2016
Request Date: 10/25/2015
Supporting Evidence : Students enrolled in engineering courses with a lab would benefit enormously by exposure to the Engineering Aides who would help the lead instructor with lab exercises. This would also serve to connect engineering students with former students and working professionals in the engineering field.

Plan of Action

Staffing - Technical/Clerical - Discuss with Division Dean since this model is similar to current use of Lab Techs in Biology and Chemistry. Modeling similar to 'embedded tutor' may also be useful. (Active)

Budgetary Impact: These positions could be part-time or student work study. Pay scale depends on qualifications.
Perkins Eligible: No
DE Related: No
HSI Related: No
YC - Location: Yuba College - All

Related Goals

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YC Goal 9 - Establish an Engineering Technology program to attract students interested in the STEM fields but which may not have the capability or commitment to become full engineers at this time.
YC Goal 3 - Appropriately staff the engineering courses at YC, particularly ENGR-3 (Plane Surveying) and ENGR-4 (Engineering Graphics).

Program Recommendation: Annual budget to support access for at least 25 students to SolidWorks in ENGR 4 class

YC - Engineering Program Review

Provide budget to support annual access for 25 students to SolidWorks CAD software for learning in ENGR 4. At the end of the class, provide financial access for all students to take entry level proficiency exam for SolidWorks and add to their resume.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2015-2016
Request Date: 10/25/2015
Supporting Evidence : SolidWorks is the industry standard CAD and Design software and is the most recommended CAD software for articulation to 4-year universities for engineering students. YC engineering students should be able to pass the SolidWorks entry level proficiency exam at the end of their training in ENGR 4. Providing this opportunity will make our engineering students highly marketable to industry.

Plan of Action

Technology - Explore funding options including server license, per seat license and student educational license. Investigate computer lab space that will support SolidWorks software. This course could possibly be offered as an online course (via DE). (Active)

Budgetary Impact: Budget for licenses could be offset by a student course fee. Computer hardware may be supportable via Perkins.
Perkins Eligible: Yes
DE Related: Yes
HSI Related: No
YC - Location: Yuba College - All

Related Goals

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YC Goal 6 - Budget adequate annual funds to continuously improve and keep pace with technology necessary for engineering.

Program Recommendation: Maker Space

Budget for creation of a Maker Space on the YC campus or in Marysville or Yuba City area. This Maker Space would be open to both YC and the local community on a fee-based usage model. All individuals using the space would be required to attend safety and instructional workshops (fee-based) prior to using any equipment. Current YC students would receive severely discounted rates. The Maker Space should also be staffed by at least 2 full-time engineers. This space would allow for cross-over between engineering and manufacturing.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2015-2016
Request Date: 10/25/2015
Supporting Evidence : Currently both the YC campus and the local community have no access to a Maker Space. This limits the exposure of young people interested in engineering. Providing access to this type of Do-It-Yourself (DIY) space in such an economically depressed area would provide enormous long-term benefits to attracting new students to the engineering program at YC.

Plan of Action

Other - Research options available both on and off campus, including teaming up with local industry. (Active)

Budgetary Impact: Evaluate mechanisms for start-up (via grants) and ongoing funding support (through on-going industry partnerships and user fees)
Perkins Eligible: No

YC - Engineering Program Review

DE Related: No
HSI Related: No
YC - Location: Yuba College - All

Related Goals

YC - Engineering Program Review
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YC Goal 9 - Increase the size of the Engineering Program at YC based on FTES.

Program Recommendation: Offer YC Engineering courses at Woodland College

Start offering Yuba College Engineering courses at Woodland College. Courses without a lab component, or where the lab can be portable, are the best choices for these offerings. The best impact to attract students would be to offer classes in person and on the Woodland campus.

Recommendation Priority: 3. High Priority
Year(s) Requested: 2015-2016
Request Date: 10/25/2015
Supporting Evidence : Currently, there are students intending to pursue engineering who are enrolled at Woodland. These students are not coming to Yuba to take engineering classes due to the travel burden. Instead YC is losing these students to the community colleges located closer to the Woodland campus.

Plan of Action

Curriculum/SLO - Test options available (such as video conferencing) and only offer Yuba course on Woodland campus. Evaluate student enrollment in terms of FTES. (Active)
Budgetary Impact: Minimal FTEF impact and potential FTES improvement.
Perkins Eligible: No
DE Related: Yes
HSI Related: No
YC - Location: Yuba College - All

Related Goals

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