Assessment Plan

Yuba Community College District

YC - Engineering Program Recommendations

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Program Description: The Engineering Program at Yuba College is an academic transfer program available to the approximately 40 engineering majors enrolled in the college. (It should be noted, however, that many students who transfer for engineering degrees do not self-identify as engineering majors at Yuba College. For example, of the 28 unique students who took engineering courses in the 2010-2011 academic year, only one had engineering as their major or program.) After completion of core courses in mathematics, physics, chemistry, computer science, general education and the available seven course in engineering, students in the program transfer to public and private universities and colleges, both within California and beyond. There they complete undergraduate degrees in one of the over 200 fields of engineering, but typically chemical, civil, computer, electrical, or mechanical engineering.

The majority of YC engineering students transfer to CSU Sacramento, CSU Chico, American River College or UC Davis, in that order. Transfer from the Yuba College program is enhanced by the availability of many Transfer Agreements, the active participation of the MESA Program at Yuba College, and the demand for engineers in the workplace.

Enrollments in the program are stable and healthy for an institution the size of Yuba College. While enrollment in some engineering classes could be increased, others classes (such as Properties of Materials and Plane Surveying) are limited by the availability of equipment and size of the laboratory.

Year of Review: 2011-2012

Type of Review: Annual Update

Executive Summary: The Engineering Program at Yuba College is now in a transitional phase as the leadership for the department passes to Dr. Roger Davidson following the non-renewal of the prior instructor's teaching assignment coupled with the lack of district funding to secure a new engineering instructor. Due to the nature of the transition, there was no hand off of information to the new leadership, and numerous challenges have been discovered related to maintenance, supplies and documentation on top of the expected curriculum responsibilities for the engineering courses.

After the Fall 2011 semester, the program has gone from a single SLO assessment to three, with one course now having year-to-year SLO results for comparison. The status of SLO development has increased from one course having a documented SLO to all courses having SLOs except one (ENGR-33, which has not been offered in two years). In addition, all course outlines (except ENGR-33) have been updated (at a minimum) with their newly established SLOs.

The Engineering Program participated in the 8th Grade Career Fair at Yuba College on January 12, 2012 to speak about Engineering to nearly 100 8th grade students. It is hoped this type of outreach will increase engineering majors in the future. That same day, the Appeal-Democrat newspaper published a story on our Yuba College engineering student, Gagneet Singh, who was selected as a finalist from over 20,000 entries for NASA's National Community Aerospace Scholarship program. The Engineering Department was pleased to support Gagneet with a recommendation and is proud of this national accomplishment.

Future Goals and Program Direction: Moving forward, the department is focused primarily on preserving the current engineering program and ensuring that it is on a solid foundation of curriculum, processes, and equipment on which to build. The department would like to see the Engineering Program at Yuba College increase, not only in the number of students, but also in its breadth, quality and reputation.

The Engineering Program has developed a new course ENGR-10: Introduction to Engineering and Science which is currently under review by the Curriculum Committee. The goal of the new course is to engage more students in considering and pursuing a career in engineering or other STEM (Science, Technology, Engineering and Mathematics) field. The course will be offered at least once per year and will have only a beginning algebra prerequisite.

Finally, the Engineering Program is looking forward to a deeper partnership with the Computer Science Program and the CTE programs to develop an Engineering Technology Program. This field is a broad and exciting opportunity for students who are interested in STEM careers but who may not have the academic skills to obtain a Bachelor of Science degree in engineering. Engineering Technology was one of the top 15 degrees in 2011 based on starting salary.

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.

Year(s) Requested: 2011-2012
Recommendation Priority: 3. High Priority
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.

Plans of Action

Plan of Action	Budgetary Impact	Timeline/Responsible Party	Active
Forward this request to acting Dean or, in their absence, the VP of Instruction. **Type:** Curriculum/SLO	$700 increase		Yes

Recommendation: Engineering Laboratory Manuals

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

Year(s) Requested: 2011-2012
Request Date: 08/01/2011
Recommendation Priority: 3. High Priority
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.

Plans of Action

Plan of Action	Budgetary Impact	Timeline/Responsible Party	Active
Create laboratory experiments and corresponding student instructions for these course based on available equipment and supplies. **Type:** Curriculum/SLO	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.	Engineering Dept.	Yes

Recommendation: Roof Repair for Room 713

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

Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Recommendation Priority: 3. High Priority
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.

Plans of Action

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

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.

Year(s) Requested: 2011-2012
Request Date: 11/01/2011
Recommendation Priority: 3. High Priority
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.

Plans of Action

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

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.

Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Recommendation Priority: 3. High Priority
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.

Plans of Action

Plan of Action	Budgetary Impact	Timeline/Responsible Party	Active
Once the new ENGR-10 COR is approved, a request will be made to consider making ENGR-10 a GE course for Yuba College. **Type:** Curriculum/SLO	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.	Engineering Dept.	Yes

Recommendation: Elmo Projector for Room 713

Purchase and install an Elmo document projector for Room 713.

Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Recommendation Priority: 3. High Priority
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.

Plans of Action

Plan of Action	Budgetary Impact	Timeline/Responsible Party	Active
Request institutional purchase and installation of the document projector from Media Services. **Type:** Equipment/Technology	According to the spreadsheet provided by Media Services, the cost is $2350.	Media Services	Yes

Plans of Action			
Plan of Action	**Budgetary Impact**	**Timeline/Responsible Party**	**Active**

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

Year(s) Requested: 2011-2012
Request Date: 08/22/2011
Recommendation Priority: 2. Medium Priority
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.

Plans of Action			
Plan of Action	**Budgetary Impact**	**Timeline/Responsible Party**	**Active**
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). **Type:** Staffing - Other	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.	Engineering Dept.	Yes

Recommendation: Clean 713 Floor Drains

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

Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Recommendation Priority: 2. Medium Priority
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.

Plans of Action			
Plan of Action	**Budgetary Impact**	**Timeline/Responsible Party**	**Active**
Request a cleaning/clearing of the floor drains in 713. **Type:** Facilities	Unknown, but likely minimal since this should be part of regular building maintenance.	Facilities	Yes

Recommendation: Install padlocks on the Universal Testing Machines

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

Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Recommendation Priority: 2. Medium Priority
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.

Plans of Action

Plan of Action	Budgetary Impact	Timeline/Responsible Party	Active
This request was expedited in January 2012, and the new locks are now installed. **Type:** Facilities	Trivial -- the locks match those used by Facilities for all campus electrical fuse boxes.	Complete.	Yes

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.

Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Recommendation Priority: 2. Medium Priority
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.

Plans of Action

Plan of Action	Budgetary Impact	Timeline/Responsible Party	Active
Request the improvements in internet access in 713 from Media Services. **Type:** Equipment/Technology	Unknown -- depends on issues and decisions on implementation.	Engineering Dept and Media Services	Yes

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.

Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Recommendation Priority: 2. Medium Priority
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.

Plans of Action

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

Recommendation: Replace Impact Tester

Replace the damaged Impact Tester for the ENGR-45 Lab

Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Recommendation Priority: 2. Medium Priority
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.

Plans of Action

Plan of Action	Budgetary Impact	Timeline/Responsible Party	Active
Request a new Impact Tester when institutional equipment funds become available again. **Type:** Equipment/Technology	$10000 to $25000 depending on availability of used/new equipment	Engineering Dept	Yes

Recommendation: Replace Whiteboard

Replace Left Whiteboard in Room 713.

Year(s) Requested: 2011-2012
Request Date: 01/25/2012
Recommendation Priority: 2. Medium Priority
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.

Plans of Action

Plan of Action	Budgetary Impact	Timeline/Responsible Party	Active
Request that Media Services replace the whiteboard in 713. **Type:** Equipment/Technology	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)	Media Services	Yes

Recommendation: Speakers for Room 713

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

Year(s) Requested: 2011-2012
Request Date: 12/13/2011
Recommendation Priority: 1. Low Priority
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.

Plans of Action

Plan of Action	Budgetary Impact	Timeline/Responsible Party	Active
Request speakers for the instructional computer in Room 713. **Type:** Equipment/Technology	Per the Media Services estimation spreadsheet, wall speakers would cost $258.	Media Services	Yes