

**HAWAII COMMUNITY COLLEGE
ARCHITECTURAL, ENGINEERING AND
CAD TECHNOLOGIES
PROGRAM REVIEW REPORT**

November 13, 2006

Assessment Period: July 1, 2003 to June 30, 2006

Initiator: Clyde Kojiro

Writer(s): Gayle Cho

Clyde Kojiro

Program Review at Hawai'i Community College is a shared governance responsibility related to strategic planning and quality assurance. It is an important planning tool for the college budget process. Achievement of Student Learning Outcomes is embedded in this ongoing systematic assessment. Reviewed by a college- wide process, the Program Reviews are available to the college and community at large to enhance communication and public accountability.

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Part I. Report Summary

- **Mission**

Our endeavor is to provide the maximum learning opportunity for students to build proficiency in CAD technology, construction methodology, field and manual dexterity, design and code comprehension, and sound work ethics; in alignment with UHCC's and HawCC's mission to serve all segments of our Hawai'i Island community.

- **History**

In 1949 Hawaii Vocational School initiated a drafting program called "Drafting for Building Trades" which offered a Certificate of Achievement upon completion of 2,600 hours of course work.

Twenty-one years later, in 1970, Hawai'i Technical School became part of the University of Hawai'i Community College (UHCC) system. A major change reduced total hours spent in the specific trade area by approximately 1,000 hours. Emphasis became the "well rounded student" with substantial time allotted to the area of general education. The program was also structured to accept only students who majored in the "Drafting & Engineering Aide Program", and upon successful completion of the program requirements earned an Associate in Science (A.S.) degree. However, with the 1996 UHCC system-wide changes, all trade programs replaced this degree with the current Associate of Applied Science (A.A.S.) degree.

In 2001, the program began major curriculum revisions that included a program name change to "Architectural, Engineering and CAD Technologies". The purpose of this movement was alignment with all UHCC's drafting programs. At this time, Honolulu Community College's "Architectural Drafting Technology" program also adopted the program name change. Courses across both campuses were refined to carry the same alpha numbers, titles, content and credit hours. During this period, our original credit hours per course were split into smaller modules and more engineering courses were added, including three new architecture courses.

Input from the community and our trade Advisory Committee helped to broaden the program's content to increase skills required for both drafting and engineering aide entry-level positions. This new curriculum articulates with other community college programs and expansion of course content better meet the needs of Hawai'i Island employers and improves the employment opportunities for graduates.

Part II. Program

∞ **Credentials Offered:**

Associate in Applied Science (A.A.S.) Degree

• **Program Review Period Goals:**

The foremost objective of the AECTech program is to prepare students for entry-level positions in the Architectural drafting or Engineering Aide field. We also have established contact with the University of Hawaii School of Architecture (UHSoA) and although no formal articulation agreement has been derived, a graduate of our program has been accepted into the UHSoA at the sophomore level.

The top three specific goals of the program are:

- To teach students the basic fundamentals of architectural drafting lettering, line value, use of instruments, geometric construction, axonometric drawings, orthographic projection, and drafting expressions;
- To teach students the introductory level of computer aided drafting (CAD) including appropriate hardware and software, features, functions, operations, and printing or plotting;
- To provide hands-on experience through live projects with community people including the college, service learning, and our capstone project, the Department of Hawaiian Home Lands Model Home Project.

The AEC Tech program also strives to instill field and office procedures with an emphasis on written and oral communication, reading comprehension of building codes and other regulations, design problem solving skills, research and presentation techniques, and to be aware and attentive to the local culture and global environment.

• **Program Entry Requirements:**

- Proficiency levels in both reading and mathematics must be met for entry into the program:

<u>Subject Area</u>	<u>Placement into course</u>
Mathematics	Math 22
Reading	Eng 20R or ESL 9

• **Faculty and Staff listing:**

- Clyde S. Kojiro, Professor, AEC Tech
- Gayle H. Cho, Professor, AEC Tech

- **Description of Facilities: Building 380, Manono Campus**
 - Level I CAD Lab Rm. 30, 896sf + 384sf alcove (28x32 & 16x24)
16 student workstations (CAD computer system w/desk + drafting desk)
1 instructor workstation (CAD computer system w/desk + layout table)
1 laser printer, 1 ink jet full size plotter, 1 blueprint machine
1 portable computer projector and wall-mounted screen
1 chalk board, 1 white board, and bulletin boards
general storage closet (6x4)
 - Blueprinting in Rm. 30, 384 sf (16x24)
1 Diazo BlueRay copy machine
layout table and general storage area with closets cabinets/drawers
 - Reference Library/Material Sample Room 31, 400sf (20x20)
Library shelving, material sample display area
Small table with seating
Engineering copier and faculty work/prep area
 - Faculty Office – Rm. 31, 240sf (12x20)
3 instructor desks with 3 computer work stations
1 laser printer
1 color ink jet desk top printer
1 phone line
 - Level II CAD Lab-Rm. 33, 768sf (24x32)
12 student workstations (CAD computer system w/desk + drafting desk)
1 instructor workstation (CAD computer system w/desk + layout table)
1 desk top ink jet 11x17 printer, 1 ink jet full size plotter
4 chalk boards, and bulletin boards
 - Level II Lecture/Studio Project Workshop Rm. 32, 896sf(28x32)
1 Theodolite Surveying station w/tripod and accessories
1 wall mounted projection screen
2 chalk boards, 1 white board, and bulletin boards
general storage closet
sink closet

Since the curriculum revisions, the Program has improved to maximum entering student enrollment in each Fall semester. Our facility, however, is woefully antiquated. We endure power fluctuations and unsightly hanging electrical outlets. Student projects are piled on each other and the student work areas are cramped and confined.

Reflective glare from our windows on to computer screens generate complaints from our students close to the windows and the window mounted air conditioning units are distractingly loud, sadly under rated for the area, and in constant need of maintenance or repair.

Through Perkins funding we procured new computer hardware, CAD software, and plotters but our copying/reproduction and printers require constant maintenance. In fact our reproduction Diazo machine uses a caustic and corrosive hazardous waste developer ammonium hydroxide.

- Advisory Board:
 - 4 members:
 - Expert in survey & drafting equipment
 - License Land Surveyor
 - Licensed Architect
 - HawCC Graduate – knowledgeable in GIS/GPS
 - Meeting Dates: 5/03, 2/04, 4/05
 - Next meeting date: 05/06

The AEC Tech Program Advisory Committee has been invaluable to the students and instructors. A practicing Architect, keeps us informed and up-to-date on the latest Code changes and requirements, construction trends, and computer hardware and software innovations.

A practicing Licensed Land Surveyor, enlightens the Committee on cost cutting surveying techniques and instruction on the latest surveying equipment.

We have an individual who is well connected in the field of surveying and drafting equipment with expertise in the survey quality Global Positioning Systems and Total Station survey equipment. His vast knowledgeable of the latest technology in the engineering aide field has been very beneficial to the AEC Program for supplies and equipment updates.

A graduate of HawCC, this member is knowledgeable in the latest data gathering information system Geographic Information System (GIS) and Global Positioning System (GPS).

Functioning together as a strong advisory team, these groups of professionals contribute to the mix with their varied field area backgrounds. They have guided our decision making process with regards to delivery of lectures and presentations, lesson planning, topic area procedures, and curriculum direction. They have also contributed as guest lecturers and shared new ideas and suggestions that have been implemented successfully in our courses. Their insightful feedback has been of immeasurable assistance to the program.

Part III. Quantitative Trend Data Table

QUANTITATIVE TREND DATA CHART(as of 10-19-06)

	Fall 2003	Spring 2004	AY	Fall 2004	Spring 2005	AY	Fall 2005	Spring 2006	AY
#1 Number of Unduplicated Majors	36	25	36	42	29	43	59	55	70
#2 Total Student Semester Hours	377	299	676	479	316	795	542	483	1025
#3 FTE Student Majors	25.13	19.93	22.53	31.93	21.07	26.50	36.13	32.20	34.17
#4 Number of Graduates			3			8			11
#5 Number of classes	11	9	20	11	9	20	11	9	20
#6 Avg Class size	11.18	9.67	10.50	14.09	10.56	12.50	14.55	11.44	13.15
#7 Avg Class fit	69.9%	60.4%	65.6%	88.1%	66.0%	78.1%	90.9%	71.5%	82.2%
#8 FTE of BOR Appointed Program Faculty			2			2			2
#9 Number of FTE Faculty based on contact hours (FTE = 21)			2.14			2.14			2.14
#10 Student semester hours for all PPC class enrollments	270	199	469	325	223	548	293	226	519
#11 Student-Faculty Ratio			4.86			5.68			5.38
#12 PPC Credits Earned Ratio	.96	.95	.95	.94	1.00	.97	.82	.92	.87
#13 Non-PPC Credits Earned Ratio	.86	.94	.90	.79	.88	.83	.65	.61	.63
#14 PPC Avg GPA	2.85	2.69	2.77	3.21	3.54	3.37	3.18	3.51	3.35
#15 Non-PPC Avg GPA	2.38	2.53	2.46	2.55	2.57	2.56	2.70	2.21	2.45
#16 Budget			\$5,641.89			\$4,750.13			\$7,039.29
#17 College Cost per SSH			\$128.28			\$114.38			\$86.31
#18 Grant Cost per SSH			\$14.71			\$14.80			\$0.00

Part IV. Quantitative Data Analysis:

The above data chart indicates the AEC Tech Program has made significant gains in the in the areas of essence including items #1, Number of Unduplicated Majors, #2, Total Student Semester Hours, and #3, FTE Student Majors.

Item #4, Number of Graduates is a major concern and has been discussed at length on how to improve in this area. Although the numbers are rising each year in this review period, we are looking into this dilemma and seeking suggestions from our counselors.

Items # 6, Average Class Size, and item #7, Average Class Fit, have improved considerably for this review period and hopefully continue to rise.

Items #5, Number of Classes, #8, FTE of BOR Appointed Program Faculty, and #9, Number of FTE Faculty Based on contact hours (21), are a constant and should not change in the near future.

Items #10, Student Semester Hours for all PPC class Enrollments, have improved while item #11, Student-Faculty Ratio will hopefully rise before the next review. Item #12, PPC Credits Earned Ratio and #14, PPC Average GPA, will maintain a higher average as the Professors improve, modify, and deliver the new curriculum further. Items # 16, Budget; #17 College cost per SSH, and #18, Grant Cost per SSH illustrate a thriving and healthy program with room to grow and develop.

In addressing the budget, the data chart shows an increasing budget but a decreasing college cost per SSH indicating monies well spent.

Part V. Other Data

The AEC Tech Program uses the Applied Technical Education Division standard evaluation forms for course evaluation. We have discussed various ways to initiate student satisfaction surveys for the program and are now carefully determining questions and outcomes of the survey.

We have sent out students for employment to various firms within the community and have required them to register with the Corporative Vocational Education program. The CVE program has a student evaluation form the employer/supervisor fills out and returns to the CVE coordinator.

All Career and Technical Education (CTE) programs are required to submit Program Health Indicator reports to the system level because of Perkins monies received. The report includes data and narratives to justify monies or equipment procured including:

Program Demand/Centrality- Student enrollment, SSH, and classes taught.

Program Efficiency- Average class size, SSH per Faculty, class size.

Program Outcomes- Credits earned ratio, Graduation, Employment.

Plan of Action- Ideas, changes, for the next PHI.

For this Program Review period, the AEC Tech Program was rated a healthy program in all aspects of the indicators and a notable factor for all CTE programs are the employment rate. We have had employment offers from various Engineering, Architectural, Surveying, Structural/Mechanical firms, and construction companies asking for graduates to apply to respective firms. Any student wanting to work had an opportunity. The program could not fill all the employment offers.

Part VI. Program SLO's

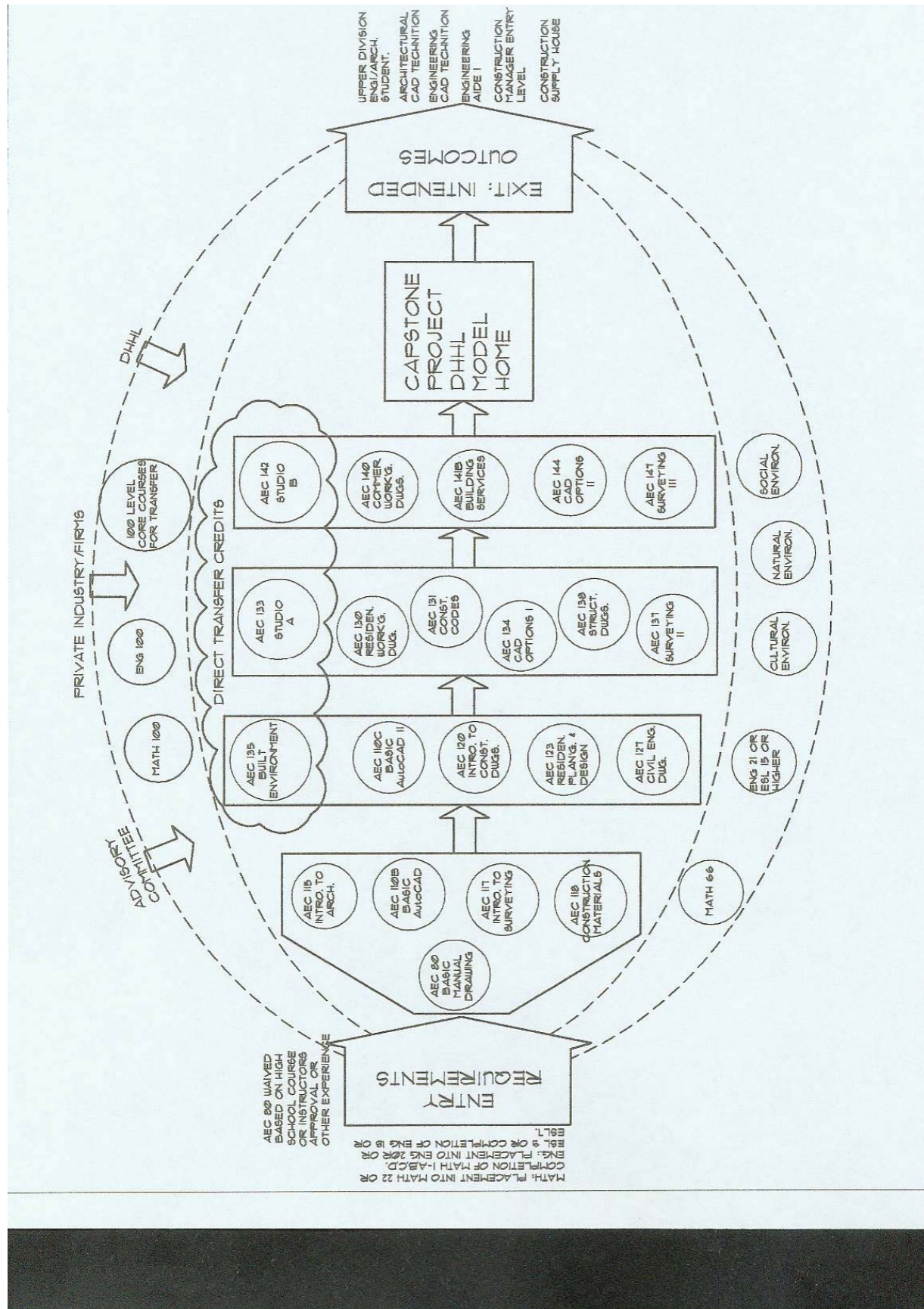
Program SLO's

- Demonstrates entry-level skills for accuracy in drawing geometric shapes, axonometric pictorials, orthographic projections, and identify the relationship of features to demonstrate visualization proficiency.
- Identify or describe the characteristics and uses of construction materials, building products and systems, and research these materials for use based on a prescribed design project requirement.
- Use with reasonable competence our two-dimensional and three-dimensional CAD programs to create architectural and engineering drawing documents for use in the Construction Technology Capstone DHHL Model Home Project.
- Use with reasonable competence our surveying hand tools/equipment, theodolite, total stations, and GPS Garmins safely on campus and at the DHHL Model Home Project site.
- Formulate, design, revise, and construct projects of knowledge and comprehension based on design criteria requiring recall of past courses/experiences and be able to defend, explain, and discuss designs.
- Demonstrate computation, communication, critical thinking, research, and problem-solving skills as well as an appreciation for the diversity of cultures, community, and the environment.

Take pride in the quality of projects and performance, possess responsible work ethics and standards, and model attitudes of professionalism and appearance.

The AEC Tech Program is part of the Construction Trades Department in the Applied Technical Education Division. The Construction Trades Department has a unique and exceptional capstone project that is used as an assessment tool. This project is the collaboration of State and County Agencies, Community Partners, Hawai'i Community College, and the Department of Hawaiian Home Lands. This forty-year old partnership for a four bedroom residential dwelling involves the planning, designing, drawing of construction documents and obtaining professional stamps for County of Hawaii construction permits. Our drawings are perused by practicing Architects and Engineers as to its relevance to code requirements, structure, and appearance.

The Program SLO's were developed last Spring '05 and are being implemented this Fall '06. We have introduced them to the second year students and have revised our syllabuses for the incoming first year students. We are now working on assessment ideas and methods to assist and support the capstone project.



Part VII. Course SLO's

The AEC Tech Program has twenty-one courses ranging from one credit hour to four credit hours per semester. The two-year program includes three courses that have been accepted by Manoa School of Architecture and we added and upgraded engineering aide courses.

We do plan on including the Advisory Committee in the development of course SLO's and also a Math and English representative.

As a CTE Program, our assessment strategies will be SLO based and "hands-on learn by doing". Our capstone project, DHHL Model Home, deals with our plans being approved by licensed engineers and inspected by County and State agencies for Building Permit Approval at every phase of the design and construction of the project. These approvals by professionals are a major part of assessment tools. Other methods of assessment will be established in the individual course SLO development.

Instructor participation in the completion of each course SLO will be accomplished as a team consisting of both full-time faculty members-Clyde Kojiro and Gayle Cho. The proposed timeline is as scheduled below.

Spring 2007 = Level I, Fall 2007 courses with implementation in Fall `07

Fall 2007 = Level I, Spring 2008 courses with implementation in Spring `08

Spring 2008 = Level I, Fall 2008 courses with implementation in Fall `08

Fall 2008 = Level I, Spring 2009 courses with implementation in Spring `09

Currently, we have course objectives that were newly developed with the curriculum accepted and approved by the college in 2002. These will be utilized in the above process.

HAWAII COMMUNITY COLLEGE

ARCHITECTURAL, ENGINEERING & CAD TECHNOLOGIES

FORMERLY DRAFTING AND ENGINEERING AIDE (DRENG)

Program Requirements (Overall [64 credits, cumulative GPA 2.0 required from all courses & 2.0 GPA required in all major courses])

Course	Course Name	Sm/Yr& Gr	AAS
FALL:			
AEC 80	Basic Drafting (3 cr.)		X
AEC 110B	Basic AutoCAD (3 cr.)		X
AEC 115	Introduction to Architecture (2 cr.)		X
AEC 117	Introduction to Surveying (1 cr.)		X
AEC 118	Construction Materials (3 cr.)		X
SPRING:			
AEC 110C	Basic AutoCAD II (1 cr.)		X
AEC 120	Introduction to Construction Drawings (3 cr.)		X
AEC 123	Residential Planning and Design (3 cr.)		X
AEC 127	Civil Engineering Drawing (3 cr.)		X
AEC 135	Introduction to the Built Environment (3 cr.)		X
FALL:			
AEC 130	Residential Working Drawings (3 cr.)		X
AEC 131	Construction Codes (2 cr.)		X
AEC 133	Basic Architectural Studio A (4 cr.)		X
AEC 134	CAD Options I (1 cr.)		X
AEC 138	Structural Drawing (1 cr.)		X
AEC 137	Surveying II (1 cr.)		X
SPRING:			
AEC 140	Commercial Working Drawings (3 cr.)		X
AEC 141B	Building Services (1 cr.)		X
AEC 142	Basic Architectural Studio B (4 cr.)		X
AEC 144	CAD Options II (1 cr.)		X
AEC 147	Surveying III (2 cr.)		X
Eng 21 or higher OR Eng 22 (or ESL 15) or higher	Developmental Reading (3 cr.)		X
	Introduction to Expository Writing (3 cr.)		
MATH 66	Trig & Algebraic Topics (4 cr.)		X
AEC 93V (optional)	Cooperative Vocational Education		
1. Cultural Environment Elective [1 COURSE REQUIRED – 3 cr.] ART 101, 105B, 105C, 107, 108, 111, 113, 114, 115, 123, 207, 211, 217, 223, 227, 230, 238, 239, 243, 244, ASAN 120, 121, DANCE 153, 185, 285, ENG 103, 204, 255, 256, 257A, 257E, HAW 101, 102, 103, 201, 202, HAWST 123, 124, 125, 126, 128, 129, 130, 131, 160, 161, 205, 221, 224, 231, 232, 235, 241, 250, 251, 260, 261, HIST 123, 151, 152, 241, 242, 281, 282, 284, 288, HUM 100, JPNS 101, 102, 121, 122, LING 102, PHIL 100, 101, 102, 120, PSY 275, REL 150, 151, 152, 153, 297, SPCO 231, 251			X

2. Natural Environment Elective [1 COURSE REQUIRED – 3 cr.] AG 175-175L, ASTRO 110, BIOC 241, BIOL 100-100L, 101-101L, 141-141L, 142-142L, 156-156L, BOT 101-101L, 130-130L, CHEM 100-100L, 151-151L, FSHN 185, GEOG 101-101L, 122, 170-170L, 180-180L, GG 101-101L, ICS 100, MICRO 130-130L, OCN 201, 205, PHRM 203, PHYS 25, 50, 55, 56, 100-100L, SCI 20, 51, 124-124L, 222, ZOOL 101-101L		X
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3. Social Environment Elective [1 COURSE REQUIRED - 3 cr.] AJ 101, ANTH 150, 200, ASAN 120, BUS 71, ECON 20, 50, 120, 130, 131, ED 105, 131, FAMR 230, GEOG 102, HAWST 221, HD 234, HSER 110, LAW 30, MGT 20, 24, POLS 110, PSY 100, 170, 230, SOC 100, 208, 218, 251, 289, 290, SPCO 51, 130, 151, 260, SSCI 25, 45, 60, 111, 150, 160, WS 151		X
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Total Credits: 64

Courses completed that do not apply to major

Course	Sem., Yr. & Grade	Course	Sem., Yr. & Grade

Entry Requirements

- Proficiency levels in both reading and mathematics must be met for entry into the program:

Subject Area

Mathematics

Reading

Placement into course

MATH 22

ENG 20R or ESL 9

REV: 10/02
1/03

Part VIII. Program Summary

The AEC Technology Program developed our mission statement, as stated on page 2 of this report, after Hawaii Community College mission, vision, and imperatives were developed. We tried to align with the UHCC's mission and Hawaii C.C.'s mission as much as possible but realized that our mission statement might have to be changed or tweaked the first two years to closer align with the college.

The college's ADP was developed some years ago and much of the contents are outdated and unusable. Technology, curriculum, and equipment are the focus of the Program now.

The AEC Technology Program has not completed a Program Review since 1985 therefore, goals and missions will have to begin now and be analyzed annually.

All CTE Programs, AEC Tech. included, are required to submit Program Health Indicator (PHI) reports to the Federal Perkins Administrator on Oahu as to the "health" of the program. For the past three years the AEC Tech. Program has been rated as healthy and thriving.

New curriculum, equipment, and technology, I believe, changed the AEC Tech. Program for the better. Technology is the driving force for our program. Architects, Engineers, Surveyors, Community Partners, and construction firms are demanding that our students be entry level ready for them. This means a variety of knowledge of the latest equipment they use including the computer hardware, software, and CAD programs. Our program acquired through Perkins funding in 2004, a two dimensional CAD program (AutoCAD 2005lt) and we are reasonable for now. However, AutoCAD 2008lt is already available and if we cannot replace this universally used drawing program on a reasonable schedule, our students will be left behind because the progressive Architectural/Engineering firms update their systems annually or every two years.

The "theodolite" survey instrument that we use in our engineering aide course work is an obsolete instrument. Luckily, the Forest Team Program has a Nikon Top Gun Total Station survey instrument that we borrow when needed for our advanced engineering aide course. The Forest Team also has a Trimble GPS instrument that they generously share with our program on an as needed basis.

Facilities are surely not the enticement that attracts students to our program. We deal with termite droppings, peeling paint, inadequate/leaking AC units, leaking gutters, obsolete surveying equipment, hazardous material reproduction machine, cramped and confined work-stations, and unsightly lecture/resource/model building areas. Space to research and build mock-up of designs to analyze, examine, and observe would undoubtedly enhance the students learning.

The top three program strengths during this review period are:

- New restructured curriculum articulated with Honolulu C.C. and three courses transferable (not formalized but accepted) to Manoa School of Architecture.
- Various employment opportunities for any graduate that is willing to work in the field of Architectural/Engineering drafting and surveying.
- Caring, compassionate, knowledgeable professors with community links locally and state wide.

The three main program weaknesses during this review period are:

- No rigid schedule for replacement of computer hardware, software, and equipment that are time sensitive.
- The graduation rate of the program needs serious reflection.
- The facilities are old, falling apart, and depressing.

Action Plan	Year	Responsible Part
• A rigid schedule for upgrading/replacing of computer hardware and software and surveying equipment needs to be established because the program is technology driven and easily outmoded.	Audited yearly	Clyde Kojiro Gayle Cho
• Examine to improve the graduation rate.	2007	Clyde Kojiro Gayle Cho

We plan to develop a leaver survey to determine the “employment entry level” satisfaction of our graduates and as suggested, include a survey of our current students to determine “what support services they may want/need”, “course scheduling times preferences (nights/weekends)”, “access to lab hours they would benefit from”.

The survey will be accomplished as a team of both faculty members with possible input from current lecturers, and advisors. Timeline as follows:

Leaver survey development: Fall 2007
 Survey administered and analyzed: Spring 2008
 Analytical information incorporated: Fall 2008

The AEC Tech program did go through a period where the enrollment numbers dwindled down during the early 2000 years, which prompted the revamping of our curriculum. The program’s new curriculum was launched in the Fall of 2002. In the years since, the data reflects a continually increasing number of majors.

In closer examination of our program’s data figures with regard to the graduation rate, there are two points we would like to explain. On page 6, the data states there were 70 unduplicated majors for the academic year of 2005-2006. Keeping in mind that our class cap is 16 due to the limited number of CAD/manual drafting workstations in the classroom, up to 16 majors are registered into the program every Fall. Due to the consecutive nature of course offerings, new students do not enter into the program in the Spring semesters. In evaluating a cohort group that enters in the Fall and proceeds through four semesters to graduation, see the below example:

Academic year 2004-2005= unduplicated majors = 43 (from data table, pg. 6)
 Actual number of students accepted into the courses in the Fall = 16
 These 16 students proceed through 4 semesters.
 Number of students in this cohort graduated in AY 2005-2006 = 11(data table)
 Attrition in this specific cohort group = 5

A loss of 5 students over a time span of 4 semesters in the program’s view is not alarmingly high.

Also, while the data indicates an increasing part time student population and granted, we currently do have approximately four students, our class roster of first year and second year students does not validate the 50% full-time data. Perhaps the other 50% half-time data reflects students waiting to enter the program and enrolling in one or two courses to keep an active student representation for early registration.

Regarding the data on pg. 6 stating 70 unduplicated majors for the AY 2005-2006, we will search out specific information reflecting the current situation of these 35+- part-time individuals and may consider this a separate group for the survey. As mentioned in the scenario stated above we suspect these may be students who have declared AEC Tech as their major and may currently be enrolled in Math, English, and general education courses required for graduation. Or, part of this group of 35+- individuals may be in the reversed situation, who may have already taken all of the AEC courses but are currently taking the required general education courses. Or, may also consist of students who have taken both, but did not complete all, and have changed academic or career paths and will not be graduating with an AEC Tech program degree. None-the-less, we will initiate the survey.

- Continue developing course SLO's and Assessment strategies 2007 -09 Clyde Kojiro
Gayle Cho
See defined schedule in PART VII. COURSE SLOs, pg. 11
- Explore possible Engineering course articulation w/ OSU/Manoa 2008 Clyde Kojiro
Gayle Cho

We, Gayle Cho and myself, are discussing and researching the possibility of some kind of articulation with UHM and OSU. First, Math and Eng levels of possible transfer students should be considered and a course-by-course analysis of their curriculum to our course work shall be done to find any applicable matches. Contact with UHM's College of Engineering has been initiated and after the curriculum review is completed in the Fall of 2007, we expect to seek possible articulation in the Spring of 2008, for any courses identified as potentially equivalent and transferable. The final assessment will be complete upon successful transfer of a student.

- A rigid schedule for upgrading/replacing of computer hardware and software and surveying equipment needs to be established because the Program is technology driven.
- In coordination with the above schedule, upgrading in training for the instructors and lecturers should coincide.
- Specifics for augmentation to improve the student workstation layout in the CAD Labs for proper circulation and egress and for more efficiency and organization in classroom spaces to shall be developed. See Chart 1: Facilities Assigned to Program, pg. 18 and Chart 3: Budget Requests, pg. 20.
- See Budget Implications Priorities, on pg. 17 and Chart 3: Budget Requests, pg. 20.

Part IX. Budget Implications

- The following are required for the program to continue maintaining, improving and meeting its goals through the next review period:
 - Equipment:
 - One large format copier
To replace outdated/old technology ammonia blueprint machine.
 - Two permanent computer projection systems, for Level I & II
For student presentations, and PowerPoint instruction.
 - One Nikon Total Station w/ Data collector
In addition to borrowed equipment, supporting two teams of 8 students.
 - Rigid schedule of hardware upgrades, per Biennium Request, pg. 20.
To replace current hardware, students and instructors' stations.
 - Trimble GPS Surveying Equipment
To gather geographical information for input into GIS software, AEC 144.
 - Drawing plotters, for Level I & Level II
To replace & upgrade existing equipment.
 - Furnishings, for Level I and Level II
To replace the old original, and present 'home-made' drafting tables; and hand me down computer desks and chairs reassigned from stopped out programs or labs whose furnishings were upgraded.
 - Rigid schedule of software upgrades, per Biennium Request, pg. 20.
- The program utilizes its current resources to sustain the program's daily needs throughout the academic year. The program promotes recycling of materials and conservation of consumable supplies that students access, therefore the below items are used efficiently and with necessity.
 - paper: vellum, bond, transbond, blueprint
 - plotter ink jet cartridges
 - printer laser toner cartridges
 - general drafting tools and equipment: triangles, lead, scales, technical pens, sharpeners, templates, drafting desk surfaces (Borco) & parallel bars
 - general computer supplies: CDs, portable drives, replacement parts
 - general office supplies: file folders, tape, binders, note books,
 - general surveying supplies and equipment: tape, hubs, cones, replacement parts, compasses, communication radios, batteries
 - model building supplies: Tacky glue, Exacto replacement blades, balsa wood
 - presentation project supplies and equipment:
illustration boards, Fome-cor, glue sticks, hot melt glue & guns

CHART 1: FACILITIES ASSIGNED TO PROGRAM

List Bdnng/Rm/Lab/Shop	Describe Renovation/Repair Needed	Estimated Cost
Building 380/30 Level I CAD Lab	-increase square footage to provide efficient working space for student workstations -increase square footage to provide lecture area -replace light fixtures -improve electrical & internet layout -install computer projection system -repair exhaust fan in printing room -improve lighting in printing room -provide student project display space -upgrade air-conditioning system	\$ 508,000.00
Building 380/31 Faculty Office	-divide into 2 separate offices -install separate phone lines -replace all light fixtures, upgrade electrical outlets -upgrade air-conditioning system	\$ 90,000.00
Building 380/32 Level II Lecture Room	-install window coverings -install computer projection system -provide internet access -provide student project display space -upgrade air conditioning system	\$58,000.00
Building 380/33 Level II CAD Lab	-increase square footage for more workstations -improve electrical and internet layout -upgrade air-conditioning system	\$ 300,000.00

CHART 2: INVENTORY LIST: EQUIPMENT and CONTROLLED PROPERTY

Program Assigned Equipment (E) and Controlled Property (CP) (List in order of chronological depreciation date)	Category: E =item value > than \$5K CP =item value \$1K - \$5K	Expected Depreciation Date	Estimated Replacement Cost
(1989) Bluera y 454 Blueprinter	E	2006	\$15,000.00
(1995) HP Laser Jet 4si Printer	CP	2006	\$3,000.00
(1989) Theodolite Surveying Instrument	E	2007	\$25,000.00
(2000) HP Color Pro 11x17 Printer	CP	2007	\$5,000.00
(2001) Dell Desk top system-faculty I	CP	2008	\$2,000.00
(2001) Dell Desk top system-faculty II	CP	2008	\$2,000.00
(2001) Dell Desk top system-Lecturer	CP	2008	\$2,000.00
(2001) Dell Desk top system classrm. 30,33	E	2008	\$80,000.00
(2002) Toshiba Laptop system - faculty	CP	2008	\$2,500.00
(2005)Software CAD Programs	E	2008	\$40,000.00
(1999) HP DesignJet 755cm ink jet plotter	E	2008	\$15,000.00
(2005) HP DesignJet 1055cm ink jet plotter	E	2009	\$18,000.00

CHART 3: BUDGET REQUESTS

Describe Item	Biennium Request – 1 st Yr.	Biennium Request – 2 nd Yr.	Reallocation of Funds and/or Positions	X Amt. Line Item
Large format copier	1 st . yr			\$20,000.00
Permanent Computer Projection Systems	1 st yr			\$6,000.00
Nikon Total Station w/ Data Collector	1 st . yr.			\$25,000.00
Computer hardware & Software upgrade		2 nd yr.		\$100,000.00
Trimble GPS Surveying Equipment		2 nd yr.		\$50,000.00
E Size Laser Plotters		2 nd yr.		\$33,000.00
Furnishings		2 nd yr.		\$20,000.00