

# UNIVERSITY OF HAWAI'I SYSTEM ANNUAL REPORT



REPORT TO THE 2009 LEGISLATURE

Annual Report on  
The Construction Academy Curriculum

HRS 304A-1144  
Act 234, SLH 2006

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# THE CONSTRUCTION INITIATIVE BACKGROUND

The Construction Academy began in 2004 with a \$1.4 million grant from the U.S. Department of Labor. This grant started a pilot program whereby the University of Hawai'i's Honolulu Community College (HCC) partnered with eight Department of Education high schools on O'ahu—Kahuku, Kailua, McKinley, Mililani, Pearl City, Radford, Waipahu, and Waialua—to prepare high school students with the technical, academic, and employability skills necessary to pursue a career in the construction industry. The initial results of this federally-funded academy model displayed such great potential that in late 2005 many associated with education and construction felt it warranted expansion.

By late 2005, the construction and building industry found itself in a dire situation. Construction projects and developments could move no faster unless there were more qualified workers for the job sites. In late 2005, the industry approached HCC to request its assistance in educating and training a greater number of qualified construction workers. In a true industry-education partnership, HCC, with its experience in the pilot Construction Academy as well as its long history in Apprenticeship Training, developed a comprehensive proposal (the "Construction Initiative") that encompassed both high school education (Construction Academy) and post-high school career training (Apprenticeship).

In session 2006, the Hawai'i State Legislature passed Senate Bill 2980 SD2, HD1, CD1, which appropriated \$5.4 million to expand the Construction Academy to other public high schools on O'ahu as well as on the islands of Kaua'i, Maui, and Hawai'i, and to increase Apprenticeship Training at Honolulu, Hawai'i, Kaua'i, and Maui Community Colleges.

# THE CONSTRUCTION ACADEMY

*Our mission is to prepare high school students with the technical, academic, and employability skills necessary to pursue a career in the construction industry.*

From servicing over 200 students at 8 pilot schools during the 2005–2006 school year, the Construction Academy has grown to a capacity of over 2220 students in 35 high schools statewide in the Fall 2008. In this pre-apprenticeship program, students actively participate in an integrated classroom setting that promotes the use of math, reading, and writing skills as they engage in building and construction activities. At the end of the course, students build real world projects such as children’s playhouses and storage sheds to test the skills they have learned throughout the year. This hands-on approach to learning requires students to apply skills in math, communication, construction technology, problem solving, and most importantly, teamwork.

## CONSTRUCTION ACADEMY STATEWIDE ENROLLMENT SUMMARY

SCHOOL YEAR 06-07 through 08-09

Community College	Hawaii			Honolulu			Kauai			Maui			Total		
School Year	06-07	07-08	08-09	06-07	07-08	08-09	06-07	07-08	08-09	06-07	07-08	08-09	06-07	07-08	08-09
Participating High Schools	3	9	9	14	15	16	0	3	3	7	7	7	27	34	35
Building & Construction 1	31	214	251	415	477	614	n/a	142	130	82	153	213	528	995	1208
Building & Construction 2	n/a	46	52	54	119	163	n/a	15	35	2	25	86	56	195	336
Mechanical Drawing	n/a	n/a	n/a	87	110	209	n/a	n/a	n/a	0	n/a	n/a	87	110	319
Drafting Technology 1	11	45	50	97	96	112	n/a	n/a	n/a	85	98	78	193	236	240
Electricity and Electronics	n/a	n/a	n/a	111	157	117	n/a	n/a	n/a	n/a	n/a	n/a	111	157	117
<b>Total</b>	<b>42</b>	<b>305</b>	<b>353</b>	<b>764</b>	<b>959</b>	<b>1215</b>	<b>0</b>	<b>157</b>	<b>165</b>	<b>169</b>	<b>276</b>	<b>377</b>	<b>975</b>	<b>1697</b>	<b>2220</b>

\*08-09 enrollment counts reflect Fall 2008 semester registration only.

### Participating High Schools SY 2008-2009

Hawai'i Community College	Honolulu Community College	Kaua'i Community College	Maui Community College
Hilo      Konawaena	Campbell    Nanakuli	Kapaa	Baldwin
Kau      Laupahoehoe	Farrington   Pearl City	Kaua'i	Lahainaluna
Keaau      Paho	Kailua      Radford	Waimea	Lana'i
Kealahou    Waiakea	Kaimuki      Roosevelt		Hana
Kohala	Kalaheo      Waialua		Maui
	Kahuku      Waianae		Moloka'i
	Leilehua      Waipahu		King Kekaulike
	Mililani		

The statewide implementation of the Construction Academy model continues to make progress. The four participating community colleges have completed the University of Hawai'i System Articulation Agreement for its carpentry programs. Remaining flexible to the individual needs of each high school and its surrounding communities remains an essential element of implementation. A brief description of the progress being made by each community college campus is provided in the appendices of this report.

## APPRENTICESHIP

The second component of the Construction Initiative is to improve and expand apprenticeship training. The University of Hawaii Community Colleges currently administer the related instruction portion of apprenticeship training for most of the non-union and union construction industry apprenticeship programs. Substantial increases in apprenticeship enrollments in recent years have strained the campuses' personnel resources, facilities and equipment, and continued significant increases are anticipated in the coming years. Additional funding was needed to more adequately meet current and future industry demands for training. The general fund appropriations include allocations for support staff, lectureship costs and supplies and equipment.

Since enrollments during this past academic year increased by over 670 from the previous year, an additional staff position was needed in the Records office to assist the Registrar with attendance and grades and in generating reports such as cumulative earned hours which are used by apprenticeship coordinators to track their students. An Assistant Registrar was recently hired and her primary responsibility is record keeping for the apprenticeship programs. She has assisted with registration and explored ways to streamline and improve data gathering and reporting processes. She is currently involved in planning revisions to our record keeping system that will need to be implemented if the University moves toward not requiring social security numbers for admissions and registration and is also assisting in the conversion of our attendance record keeping system from daily logs to one in which only class total hours are collected and retained. As reported earlier, the other campuses have much fewer apprentices so their appropriations did not include funds for additional positions. The Apprenticeship Offices at these other colleges have had to obtain support from other departments on their campuses.

### Position:

	FTE Position Allocated	FTE Position Filled
Administrative Profession Technical	1	1

Apprenticeship enrollments increased significantly on all campuses in the past year and continued increases are anticipated in the next academic year. At Honolulu Community College, the Hawaii Laborers Training program began offering their classes through the College for the first time last

semester, so in addition to the ever increasing enrollments in our current programs, apprentices from this program will also be adding to our numbers in the coming semesters. The funds earmarked for lectureship costs helped the College retain our current staff of instructors and hire new qualified instructors to teach the additional classes that were needed. Wages for approximately 17,300 instructor hours (300 apprenticeship classes) were paid with these funds. Maui Community College also received an allotment for lectureship with which they hired over 15 instructors to staff new classes that were requested by their different training programs. The other campuses did not receive allocations for lectureship so any additional instructors had to be funded from existing sources.

Due to the almost unprecedented numbers of apprentices on the campuses in recent semesters, shop equipment was over taxed and materials and supplies depleted. The Colleges used their supplies and equipment budgets to replace old equipment, purchase new equipment and replenish shop supplies and materials. This funding enabled the colleges to replace equipment which were outdated and/or unsafe and purchase different types of equipment that programs are utilizing to expand the scope of their training. For example, new welding machines were purchased by the Welding and Refrigeration programs to replace worn out older models, electric conduit benders were bought by the Electrical and Refrigeration programs to help them teach an alternative method to manual pipe bending, and a scissors lift was purchased by the Painters to expand their training to include the safe and proper use of this type of equipment. Funds from the supplies budget were used to purchase materials such as sand for the Masons, electrodes for the Welding shop, and oxygen, argon and acetylene gases for the Boilermakers and Ironworkers. In addition to these construction-related equipment and supplies, laptop computers were also purchased because of the limited number of computer labs on campus and the increasing numbers of apprenticeship instructors requesting computers and web access to deliver their curricula. These computers are configured as two mobile computer labs and can be wheeled from room to room so now virtually every classroom can be transformed into computer lab when needed.

In summary with the additional funding, the University of Hawaii Community College Apprenticeship Offices have been able to more satisfactorily serve their rapidly expanding training programs. The Assistant Registrar at Honolulu Community College is working to ensure the accuracy and integrity of apprenticeship records and improve data gathering and dissemination

capabilities. The funding for lectureship costs has helped the College meet the steadily increasing number of requests for courses from the training programs and will offset the added costs of instructor wage increases which are scheduled over the next two years. Allocations for supplies and materials have enabled the Colleges to at least partially restock shop consumables which constitute huge and growing expenses as enrollments rise. Perhaps the most significant beneficial outcome of this funding is that the Colleges are now able to purchase much needed equipment. Departments have bought or are in the process of purchasing equipment to replace old, outdated and/or unsafe models and types of equipment that were earlier not available for training. Therefore, in several significant ways, the Colleges have and will be able to more completely meet the training needs of the construction industry.

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## **HAWAI'I COMMUNITY COLLEGE**

Enrollment in Construction Academy classes on the island of Hawai'i continues to grow. Classes are being offered in nine of the ten identified public high schools on the island. Enrollment has increased to 353 students for the current academic year (2008-09) with 33 class sections offered, an increase of 27% over the classes offered the previous year. Average class size has remained about the same. Over half of the students taking courses during academic year 2007-08, earned a grade of "B" or better and thus, qualified for college credit.

In May 2008 the Construction Academy in cooperation with the Hawai'i Community College Carpentry Program hosted the 1st Annual Safety-First Hand Tools Face-Off. Big Island high school students taking Construction Academy Classes gathered at Hawai'i Community College to participate in a series of challenges. The competitive events tested the students' use of hand tools and safe practices in the areas of joint construction, stud framing, nailing, and measurement calculations. Ka'u High School took top honors with Konawaena High coming in second. Faculty are already planning for the spring 2009 event, spending extra time prepping students on teamwork and mathematic calculations.

All eleven positions allocated to the Construction Academy are currently filled: one clerk and five non-tenure track, full-time temporary, 11-month faculty have been hired, one tenured faculty transferred into the Academy to serve as coordinator, and four positions currently filled with casual hires are scheduled for recruitment. Two of the four casual positions were filled with personnel leaving at the end of the academic year.

	<b>FTE Position Allocated</b>	<b>FTE Position Filled</b>
Home-Based Instructors:	6	4 FTE/3 Casual Hires
Traveling Instructors	2	1 FTE/1 Casual Hire
Counselor	1	(funds used for Instructors)
Clerical	1	1
Coordinator	1	1
(Allocated as a 7 <sup>th</sup> home-based instructor)		
	11.00	11.00

### HONOLULU COMMUNITY COLLEGE

Honolulu Community College continues to increase school participation with the addition of Roosevelt High School in SY 2008-2009. Student interest is on the rise with an increased enrollment of over 250 students.

Pre- and post-testing with the ACT<sup>®</sup> ASSET numerical skills test continues to be used to track Construction Academy student performance in math. Honolulu Community College determined that a scale score of 42 is needed for students to place into *Math 24, 50, and 53*— the entrance mathematics courses required by most HCC building and construction-related degree programs; and the level students will be tested at for acceptance into HCC's apprenticeship programs.

Students who score at a 42 or better are considered to have passed the test. Initial results from school year 2006-2007 showed little change in student performance over the first year. ACT<sup>®</sup> ASSET numerical skills test results for school year 2007-2008 continues to show a small improvement in test scores. Thirty-three percent (33.2%) of those students taking the pre-test passed the test, thirty-five percent (35%) of those students taking the post-test scored at the passing level. While this is a minimal gain in test scores, the trend is promising and is improving. Forty-four percent (44.6%) of the students taking both the pre- and post-test showed gains in their test scores. A total sixty-six percent (66.1%) of the students have either shown improvement in test schools or have passed the test.

To improve student math performance, academy instructors will continue to integrate math problems within the construction academy's curriculum. Instructors will also use a computer-based math-tutoring program designed to supplement the math instruction in the classroom. Honolulu Community College has received a federal grant under Carl D. Perkins to focus on the math achievement. The grant focuses on the development of integrated math instructional units and formative assessment tools to help improve math instruction in the classroom.

A full-time academy counselor has joined the Construction Academy staff. The Construction Academy counselor provides direct services to academy students at the high school. Services include classroom presentations and one-on-one counseling in completion of college and employment applications, financial aid, resume writing, and preparing for job interviews. Soft skills

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training in time management, stress management, communication, note taking and test taking are also part of the services package provided by the Construction Academy counselor.

Honolulu Community College continues to seek to fill its positions. The two vacant positions are currently posted and are expected to be filled by the end of December 2008.

### Positions:

	FTE Position Allocated	FTE Position Filled
Home-Based Instructors:	16	15
Traveling Instructors	4	3
Administrative Profession Technical	1	1
Clerical	1	1
Counselor	1	1
	23.00	21.00

Honolulu Community College hosted the 2<sup>nd</sup> Annual Hawaii Construction Career Day's event. The partnership included the Hawaii Department of Transportation, Hawaii Local Technical Assistance Program, Department of Labor and Industrial Relations, the Federal Highway Administration, Union Apprenticeship programs and more than a hundred volunteers. In total, there were over 1100 students who were bused to the event from public and private high schools. There were many hands-on activities to engage the students. One student reported on the evaluation form, "What made this event different from the rest was the hands-on activity and getting a chance to talk to the pros about their trade." Students were able to experience heavy equipment, visit educational displays, and see and experience demonstrations of the various trades available in the construction industry.

Honolulu Community College Construction Academy hosted its first summer school program for graduating seniors and high school juniors. The program offered community college credit in CARP 20 Carpentry Basics, for three (3) credits and IS 103 Introduction to College, for one (1) credit. Part of the student experience during the summer program included exposure to the various trade areas on the HCC campus such as welding, sheet metal, and electricity. Twelve (12) students began the six-week program with nine (9) students completing the program and earning credit. Of the nine students completing the program, four students are currently enrolled at Honolulu Community College in construction-related fields of study; two are currently high school seniors.

Honolulu Community College was able to complete a follow-up survey of high school senior participants who graduated in June 2007. Students were asked to provide contact information at the end of the school year and were then called by their Construction Academy instructors in October 2007. A total of one-hundred twenty-two (122) students provided contact information. Of these students, instructors were able to contact eighty-two (82) students or sixty-two percent (62%) of the 2007 graduates who had participated in the Construction Academy program on O`ahu. Of the students contacted, thirty (30) graduates or thirty-six percent (36%) reported that they were involved in construction-related activities through apprenticeship, education, or direct employment. Details of the survey results are provided in the following tables. Construction Academy will continue to pursue these students and other graduates from the program to assist in its program improvement efforts.

## **Post-High School Graduate Survey Results**

### **Honolulu Community College**

Participating Seniors Class of 2007

#### **Summary Table**

\* Construction Related Fields

<b>Post-high school plans</b>	<b>#</b>	<b>%</b>
Apprenticeships	6	5%
College	45	37%
* Construction-related majors	16	13%
Military	2	2%
Moved	3	4%
No response	40	33%
Uncertain	2	2%
Working	24	20%
* Working in Construction	8	7%

#### **Apprenticeship Breakdown**

Beachside Construction	2
Carpenters Union	2
Carpentry (unspecified)	1
Coastal Construction	1
Infinity Electric	1
Laborers Union	1
Pearl Harbor Apprenticeship Program	1
Plumbing Union	1

(note: some apprenticeships are listed concurrently with work)

**College Breakdown**

Arizona Community College	1
Brigham Young University	1
Heald College	1
<b>Honolulu Community College</b>	<b>12</b>
Leeward Community College	10
Maramount Junior College	1
Montana Western University	1
Oregon State University	1
Portland State University	1
Universal Technical Institute	2
University of Hawaii at Manoa	8
University of Portland	1
University of Southern California	1
Unspecified	3
Washington State University	1

**College Major Breakdown**

\* Construction-related major

<b>* Architecture</b>	<b>3</b>
<b>* Architecture, Engineering and CAD Technology</b>	<b>2</b>
Auto Body	1
Automotive Technology	2
Biochemistry and Physiology	1
<b>* Carpentry</b>	<b>2</b>
<b>* Civil Engineering</b>	<b>3</b>
Computer Electronics	1
Diesel Automotive Technology	1
<b>* Electrical Technology</b>	<b>1</b>
Electrical Engineering	3
<b>* Electrical Installation</b>	<b>2</b>
<b>* Electricity/Pre-engineering</b>	<b>1</b>
<b>* Engineering</b>	<b>1</b>
Health and Human Performance	1
Liberal arts	5
Mechanical Engineering	2
Undeclared	8
<b>* Welding</b>	<b>1</b>

## Work Breakdown

\* Construction-related employment

Bank of Hawaii	1
<b>* Beachside Roofing</b>	<b>2</b>
<b>* Carpenters Union</b>	<b>1</b>
Cutter-Ford	1
<b>* Father Construction</b>	<b>1</b>
<b>* Father Drywall</b>	<b>1</b>
Hawaii Logistic Services	1
<b>* Infinity Electric</b>	<b>1</b>
<b>* Jayar Construction</b>	<b>1</b>
McDonald's	1
Safeway	1
<b>* Sheet Metal Union</b>	<b>1</b>
Unspecified	10
Unspecified construction	2
Wendy's	1
Zippy's	2

(note: some graduates worked while attending school/apprenticeships/a second job)

### MAUI COMMUNITY COLLEGE

Now in its third year, the Maui Community College Construction Academy (CA) program serving the seven high schools located on Maui, Molokai, and Lanai is continuing to flourish. The following are some of the accomplishments of the past year made possible by legislative funding of the program:

- The number of Maui County high school students enrolled in the Construction Academy program has increased from 276 in school year 2007-2008 to 377 in 2008-09.
- Recruitment in all seven high schools and at high school and college career fairs continues; the CA counselor makes regularly scheduled presentations to students, passing out information on educational and workforce possibilities.
- Students in all seven Maui County high schools completed final projects in their classes according to professional guidelines and Construction Academy curriculum requirements; professionally detailed playhouses constructed for donation to children's organizations, sturdy benches constructed for county parks, and a number of other structures completed for various worthwhile purposes gave students hands-on practice in professional construction skills as well as in reading, writing, mathematics, communication, and teamwork.
- Maui CC Construction Academy faculty worked with faculty from Honolulu, Hawai'i, and Kauai CC's to complete articulation agreements across the system that are aligned with professional standards; the Carpentry articulation agreements are now posted on the web.
- Regularly scheduled informational and planning meetings have been held with Maui County DOE teachers, principals, and CTE coordinators; during the articulation meetings, DOE teachers were kept informed and asked for input.
- Maui CC Construction Academy faculty have worked with high school teachers to consistently implement the completed articulation agreements.
- Over 125 Maui County high school students and their teachers attended a presentation by construction industry and union professionals on the Maui CC campus and toured the facilities.

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- Additional computers capable of running CAD software were purchased and delivered to high schools; CAD software has also been made available to high school classes.
- CA faculty members received training and conducted workshops on architectural CAD software, safety, green design, and sustainability in the construction industry.
- CA high school students were escorted on tours of sustainable wind and solar installations on Maui, Lanai, and Molokai, where professionals conducted demonstrations and answered questions.
- The Construction Academy counselor has regularly visited high schools, assisting students with academic planning and goal setting. The counselor also makes presentations in individual high school CA classes, answering questions about such things as financial aid, skills testing, and student housing.
- Official counts, names, and grades of students taking part in Construction Academy classes have been obtained from high schools. Any high school student earning a B or better in a CA class that articulates with a Maui CC class will receive college credit for that class.
- Three hundred seventy-seven portfolios were printed, assembled, and distributed to participating high school students. The portfolios are being used as part of the assessment practices for the program's student learning outcomes.
- All Maui Community College Construction Academy positions funded by the State Legislature in 2006 were filled by qualified personnel for most of the year. As the following chart shows, one position is temporarily vacant:

Positions:

	<u>FTE Position Allocated</u>	<u>FTE Position Filled</u>
Home-based Instructors	4	3*
Traveling teacher	1	1
Clerical	1	1
Counselor	1	1

\*In August 2008, one Construction Academy teacher was hired as a full time tenure track Sustainable Construction Technology instructor at Maui CC. The college is currently interviewing candidates for the CA position. In the meantime, the other four CA teachers are working together

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to cover the seven high schools on three islands. This is especially challenging, since three of the high schools are located far from the main Maui CC Kahului campus and must be reached by plane (Molokai), boat (Lanai), or a long automobile trip over a winding road (Hana). Nevertheless, all of these programs are thriving, and classes are being taught according to the professional standards in the articulation agreement.

Maui County High School 2008 Fall Registration:

	TIU 5800 B&C 1	TIU 5810 B&C 2	TIN 5310 Drafting	Females (B&C)	Females (Drafting)	Special Education
Baldwin	76	18	0	6	0	8
Hana	10	3	0	0	0	4
King Kekaulike	21	5	14	0	4	8
Lahainaluna	30	22	48	14	21	11
Lanai	19	10	15	3	0	7
Maui	48	24	0	8	0	--
Molokai	9	4	1	1	1	--
Totals	213	86	78	32	26	38
Total CA students	377					

### KAUAI COMMUNITY COLLEGE

#### Participation:

The student enrollment for the 3 high schools on Kauai totals 165 students and all students in the program are seeking college credit in both the BC1 course as well as the BC2 course. Kapaa High School enrollment in Construction Academy classes has increased from a total enrollment of 25 students last year to a total enrollment of 50 students. We have 46 students in two classes of BC1 and 4 students in BC2. Kauai High School has increased total enrollment from 35 students last year to a total enrollment of 48 students. We have two BC1 classes with a total enrollment of 42 students. In BC2 class there are 6 students. Waimea High School enrollment has leveled out this year due to graduation and a high number of seniors in the program. This year we have 42 students in BC1 in two classes from last year's count of 103 students. In the BC2 class this year we have 25 students enrolled and last year we did not offer the BC2 class.

#### Equipment:

The distribution of equipment to the schools has been completed along with an evaluation of the condition of the equipment after completing our first year. Part of the instruction is to include the care and maintenance of the equipment along with noting any safety or performance issues. This part of the program has been very successful as we had no equipment that failed or presented a safety concern. The continuing process of acquiring the additional equipment to suit the needs of the individual high schools, along with meeting our new revised curriculum, and maintaining a safe work environment has been a challenge. Materials and equipment are being ordered and staged at KCC, and we are distributing them as needed to each school. In addition, we have started to conduct our training for the DOE Industrial Arts teachers from the three schools at KCC along with conducting general coordination and informational meetings.

We have made purchases to allow for the introduction of AutoCAD into the high school classrooms. Along with the instructors' course on AutoCAD last year, we are able to introduce this as part of our program offering.

#### Special Projects:

The Construction Academy Program last year took on the set construction for the KCC production of the 'Man of La Mancha' performance, working with the carpentry classes at KCC and having the

students from the high schools come out to KCC to meet the producer, director, and performers as well as seeing the stage that would be used. The involvement of the students in the set construction for the KCC production of the 'Man of La Mancha' performance at our Performing Arts Center was a huge success. Not only were the students invited to attend the performance but were recognized at the start of each performance as well as in the Garden Isle Newspaper.

We are maintaining a strong relationship with the local Carpenters Union. We are setting up community service projects that will involve students from each high school working alongside members of the Carpenters Union. Last year students cut and pre-prepared the lumber necessary to construct picnic tables, and then working with Journeyman Carpenters on the day of the event, assembled and completed them. This was a community service project as we had no financial gain in this project. The students learned to give back to the community. People attending our annual ACF Culinary Arts Breakfast at KCC had a chance at receiving the tables made by the students of the three high schools. A student from each high school selected a winner. The breakfast event hosted over 2500 people at the campus.

We are seeking an additional instructor at this time to assist at the schools with carpentry. Our plan is to bring that individual on board during the spring term and be prepared for the upcoming enrollments that the schools are communicating to us.

We are currently involved with the Kauai Marines Veterans Association, and in conjunction with the DARE and GREAT programs, are assisting in providing additional instructor resources to help the students at the high schools meet their community service obligations. The students will be building benches and tables using donated materials that the high school seniors will prepare for the middle school students to do the final assembly within their limits of skills, abilities, and acceptable tasks.