

**UNIVERSITY OF HAWAI'I**  
**SYSTEM ARTICULATION AGREEMENT**  
**for**  
***the Construction Academy***

**Architectural, Engineering, and CAD Technologies (AEC)**  
**Hawai'i Community College**  
**Honolulu Community College**  
**Maui Community College**  
**Facilities Engineering Technology (FENG) - Kaua'i CC**

**September 2008**

# **UNIVERSITY OF HAWAI'I SYSTEM ARTICULATION AGREEMENT**

**Architectural, Engineering, and CAD Technologies (AEC)  
Hawai'i Community College  
Honolulu Community College  
Maui Community College  
Facilities Engineering Technology (FENG) - Kaua'i CC**

## **INTRODUCTION**

### Construction Academy

The Construction Academy (CNAC) began in 2004 with a \$1.4 million grant from the United States Department of Labor to Honolulu Community College. The purpose of the grant was to develop a construction academy on the island of O'ahu with eight (8) public high schools. The initial results of this federally-funded academy model displayed such great potential that in late 2005 many individuals associated with education and construction in Hawai'i felt it warranted expansion. Thus in 2006, the Hawai'i State Legislature appropriated a total of \$5.4 million to be shared among Hawai'i Community College, Honolulu Community College, Kaua'i Community College, and Maui Community College to expand the CNAC to public high schools throughout the State.

With the expansion of CNAC came an opportunity for students participating in the academy to be able to transition seamlessly from secondary to postsecondary educational institutions as well as from an educational setting to the workforce. To ensure this seamless transition, the alignment of standards, curricula, and assessments across all components of the state's public education systems is needed.

During the course of their education, students may decide to transfer from one campus to another in the University of Hawai'i (UH) system. The development of an articulated program of study supports the transfer of earned academic credits within the UH system.

## **PURPOSE**

The primary purpose of this articulation agreement is to facilitate the matriculation of students and the transfer of credits across the university system. Moreover, it is intended to inform students, whose program of study requires Architectural, Engineering, and CAD Technologies (AEC) courses as part of their degree requirements, of the program opportunities that are available to them throughout the UH system. Through this agreement, students will have the opportunity to transfer credit for equivalent courses taken elsewhere in the UH system, reducing the potential problems of having to retake a similar course or not being credited with work that has been completed.

## AGREEMENTS AND PROCEDURES

1. **Scope of Agreement.** This Articulation Agreement applies among the UH Community Colleges listed in the table below.
2. **Number of Credits to be Awarded.** Transfer credit among University of Hawai'i campuses for the following courses:

Course Alpha & No.	Course Title	Credits	Campuses
AEC 80	Basic Drafting	3	Hawai'i CC
		3	Honolulu CC
		3	Kaua'i CC
		3	Maui CC
AEC 110B	Basic AutoCAD	3	Hawai'i CC
AEC 110		4	Honolulu CC
		4	Maui CC

3. **General Guidelines for the Application and Award of Transfer Credits**
  - A. Student Eligibility: All students within the University of Hawai'i Community Colleges (UHCC) system are eligible for these credits. Those students who successfully completed one or more of these course(s) on a State of Hawai'i Department of Education high school campus as part of the Construction Academy (CNAC) will receive CC credit based on the receiving college's established procedures.
  - B. Transferability: Credits awarded within the guidelines established in this Agreement will transfer between and among designated University of Hawai'i Community College campuses. However, students should be informed by both "sending" and "receiving" campuses that transferred credits may **not** be applicable to programs outside of this Agreement.
  - C. Campus Procedures: Each UH Community College campus which is a party to this Agreement will be responsible for establishing procedures which detail the timeline and deadlines for application, review of requests for award of transfer credit, and the appeals process for such credit.

The Student Learning Outcomes and/or Course Outlines in this document are those for the Construction Academy courses and have been approved by the faculty and administrators of all colleges represented in this signed Agreement. This Articulation Agreement will remain in effect until September 2013. It will be subject to review in September 2012, and may be continued, revised, or discontinued with the consent of all faculty members and administrators of all campuses represented in this agreement. The Articulation Agreement will remain in effect while the review is in progress.

## **AEC 80 Basic Drafting - Hawai'i CC, Honolulu CC, Maui CC**

### **Course Descriptions**

#### **Hawai'i CC - AEC 80: Basic Drafting (3)** (6 lec/lab hrs. per week)

Designed for students interested in technical drawing. This course is an introduction to the very basic manual drafting practices, procedures, equipment use, lettering, and architectural symbols. Orthographic projection, pictorial drawings, sectional views, dimensioning, screw threads, and weld symbols will also be covered.

*Recommended: High school mechanical drawing.*

#### **Honolulu CC - AEC 80: Basic Drafting (3)** (2 lecture hrs, 3 lab hrs. per week)

A first course in drafting. Manual drafting procedures and practices, plus a 5-week glimpse at computer drafting. Designed primarily for students planning to enroll in regular-program Architectural, Engineering and CAD Technologies courses upon completion of this course. Also serves students preparing to be public school industrial arts teachers and those interested in a general "feel" for the subject of technical drawing.

##### **Student Learning Outcomes**

Upon completion of the course, the student will be able to:

- Identify, select, and use the basic manual drafting tools to complete assigned tasks.
- Demonstrate proper linework, lettering, dimensioning, and symbolizing in creating drawings of industry standard quality.
- Demonstrate the ability to center drawings, scale views, and draw neatly and accurately with the common drafting tools.
- Create correct single, orthographic, auxiliary, isometric, sectional, perspective, and developed views of simple objects from different types of views or differently oriented views of the objects.
- Create correct welded object, thread, and architectural floor plan drawings appropriate to the level of the course.
- Using descriptive geometry techniques, find the true length, point, and true shape views of simple lines and planes from given skewed views.
- Explain a few of the advantages of computer drafting over manual drafting, and explain the basic AutoCAD line drawing procedure and coordinate system for locating points on the computer screen.
- Roughly define the terms, concepts, and standards associated with the topics of the course.
- Demonstrate the ability to communicate electronically, seek help when needed, work from written instructions, and meet production deadlines.

#### **Maui CC - AEC 80: Basic Drafting (3)** (1 lecture hr, 4 lab hrs per week)

Provides basic instruction in blueprint reading and drafting. Covers manual drafting procedures and practices with an introduction to computer-aided drawing. Designed as a prerequisite for the Drafting program. Serves students preparing to be public school industrial arts teachers and those interested in a background in technical drawing.

*Recommended: ICS 101 or BUSN 150, and placement in ENG 100, or consent.*



**Program Content:**

- ✓ Career Path
- ✓ Communication Skills

- ✓ Math
- ✓ AutoCAD Commands

These Student Learning Outcomes (SLOs) were developed for the Construction Academy Program. They encompass the participating University of Hawai'i Community Colleges' SLOs as well as the Department of Education's CTE standards.

<b>Student Learning Outcomes</b>	<b>Knowledge, Skills, and Abilities</b>	<b>National Occupational Skills Standards</b>	<b>Possible Assessments</b>
1. Demonstrate knowledge of personal and professional career opportunities in the AEC industry with an outline of a personal career path.	a) Conduct an online research project to identify the levels of education, training, and certification requirements, employment opportunities, workplace environments, career growth potential, and impact of current and future technologies for an occupation within the AEC industry. b) Assess personal knowledge, skills and interests to determine which careers would be appropriate, and the financial and social implications of the career choice on self and family. c) Choose a career and completes a 4-year and 5-year professional plan. d) Demonstrate the skills needed to prepare for, seek, obtain, maintain, and advance in the chosen career path.	ES-7 ES-8	Prepare a written or oral presentation on career research.
2. Identify, select, and use the basic manual drafting tools to complete assigned tasks.	a) Demonstrate knowledge of specific tools (purpose and uses). b) Performs proper use of tools and equipment according to industry standards. c) Define and demonstrate understanding of the basic terminology and concepts as used in the industry. c) Define the industry standards associated with the topics of the course.		Continual observation using a tool use rubric with quarterly objective assessments.
3. Produce various drawings to industry standard.	a) Demonstrate proper linework, lettering, dimensioning, and symbolizing in creating drawings of industry standard quality. b) Demonstrate the ability to center drawings, scale views, and draw neatly and accurately with the common drafting tools. c) Create correct single, orthographic, auxiliary, isometric, sectional, perspective, and developed views of simple objects from different types of views or differently oriented views of the objects. d) Create correct welded object, thread, and architectural floor plan drawings appropriate to the level of the course. e) Using descriptive geometry techniques, find the true length, point, and true shape views of simple lines and planes from		Quarterly drawing assignments using drawing rubric

	<p>given skewed views.</p> <p>f) Explain a few of the advantages of computer drafting over manual drafting, and explain the basic AutoCAD line drawing procedure and coordinate system for locating points on the computer screen.</p>		
4. Demonstrate oral and written communication skills appropriate to the level of the coursework.	<p>a) Demonstrate the ability to understand information and instructions that are presented in both written and verbal form.</p> <p>b) Communicate effectively in on-the-job situations using written and verbal skills.</p>	C1 – C11 C15 – C18 C23	Continual observation with quarterly assessment using personal attribute rubric.
5. Demonstrate math skills appropriate to the level of the coursework.	<p>a) Add, subtract, multiply, and divide whole numbers, with and without the use of a calculator.</p> <p>b) Use a standard ruler and a metric ruler to measure.</p> <p>c) Add, subtract, multiply, and divide fractions.</p> <p>d) Add, subtract, multiply, and divide decimals, with and without a calculator.</p> <p>e) Convert decimals to percents and percents to decimals.</p> <p>f) Convert fractions to decimals and decimals to fractions.</p> <p>g) Explain what the metric system is and how it is important in the construction industry.</p> <p>h) Recognize and use metric units of length, weight, volume, and temperature.</p> <p>i) Recognize some of the basic shapes used in the construction industry and apply basic geometry to measure them.</p>	M1 – M9 M12 M13	Quarterly fact sheets and quizzes—objective assessment.
6. Demonstrate employability skills desirable for a Draftsperson	<p>a) Demonstrate critical thinking skills and the ability to solve problems using those skills.</p> <p>b) Demonstrate effective relationship skills with teammates and supervisors, exhibit the ability to work on a team, and demonstrate appropriate leadership skills.</p> <p>a) Demonstrate appropriate personal attributes sought by employers.</p>	ES1 ES2 ES4 – ES6	Continual observation with quarterly assessment using personal attribute rubric

**AEC 110B Basic AutoCAD (Hawai'i CC)**  
**AEC 110 Basic AutoCAD (Honolulu CC and Maui CC)**

**Course Descriptions**

**Hawai'i CC- AEC 110B: Basic AutoCAD (3)** (6 lec/lab hrs.)

Designed for students interested in Computer Aided Drafting (CAD). This course is designed for the student with no CAD experience. Introduction to AutoCAD's basic drawing commands will be the focus including features, functions, and operations such as lines, arcs, circles, symbols, text, dimensions, and editing/modifying objects will be explored.

*PreReq: Placement in Eng 20R or placement in ESL 9.*

*CoReq: AEC 80, and AEC 115, and AEC 118 (or prior completion of any).*

*Recommended: mechanical drawing and computer keyboarding experience.*

**Honolulu CC- AEC 110: Basic AutoCAD (4)** (2 lecture hrs., 6 lab hrs. per week)

The foundation AutoCAD course in the Architectural, Engineering and CAD Technologies program. Basic commands and operations from 2D drawing and editing tools to creating solid models and rendering. 2D drawing, text, dimensions, blocks, hatching, reference files, sharing data, 3D drawing, plotting, and more. Designed to qualify students for Autodesk certification.

*PreReq: AEC 80, or AEC 81, or instructor approval*

**Student Learning Outcomes**

Upon completion of the course, the student will be able to:

- Use the AutoCAD® software program to create drawings from scratch and to modify, manipulate, copy, delete, save, and plot drawings.
- Use the full range of AutoCAD® commands and options, use the keyboard, toolbar, and menu interfaces, and employ shortcuts and time-saving strategies to operate the program at a level of efficiency acceptable for employment as a CAD technician.
- Create, render, and manipulate 3D AutoCAD® drawings and convert 2D drawings to 3D drawings.
- Roughly define the terms, concepts, and standards associated with the topics of the course.
- Report to a workplace regularly and punctually, engage effectively and congenially with peers and supervisors, work from written as well as oral instructions, use assigned time efficiently for productive work, and meet production deadlines.
- Demonstrate oral and written communication, computation, and problem-solving skills appropriate to the level of the coursework.

**Maui CC - AEC 110: Basic AutoCAD (4)** (2 lecture hrs., 4 lab hrs. per week)

Introduces the foundation AutoCAD course in the Drafting Technology program. Covers basic commands and operations from 2D drawing and editing to creating solid block models and rendering. Teaches 2D drawing, text, dimensions, blocks, hatching, reference files, sharing data, 3D drawing, and plotting. Prepares student for Autodesk certification.

*PreReq: AEC 80, BLPR 22 or equivalent training/experience with consent.*

*Recommended: ICS 101 or BUSN 150, and placement at least ENG 100.*

**Program Content:**

- ✓ Career Path
- ✓ Communication Skills
- ✓ Math
- ✓ AutoCAD Commands

These Student Learning Outcomes (SLOs) were developed for the Construction Academy Program. They encompass the participating University of Hawai'i Community Colleges' SLOs as well as the Department of Education's CTE standards.

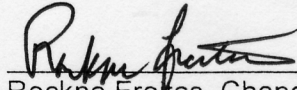
Student Learning Outcomes	Knowledge, Skills and Abilities	National Occupational Skills Standards	Possible Assessments
1. Demonstrate knowledge of personal and professional career opportunities in the AEC industry with an outline of a personal career path.	a) Conduct an online research project to identify the levels of education, training, and certification requirements, employment opportunities, workplace environments, career growth potential, and impact of current and future technologies for an occupation within the AEC industry. b) Assess personal knowledge, skills and interests to determine which careers would be appropriate, and the financial and social implications of the career choice on self and family. c) Choose a career and completes a 4-year and 5-year professional plan. d) Demonstrate the skills needed to prepare for, seek, obtain, maintain, and advance in the chosen career path.	ES-8	Prepare a written or oral presentation on career research.
2. Demonstrate the ability to perform the basic commands necessary for professional 2D drawings using AutoCad.	a) Demonstrate the ability to perform basic Windows navigation operations to open and save files, and properly display objects. b) Demonstrate the ability to create basic drawings by using Draw commands, setting units, and using object snaps, polar and object snap tracking. c) Demonstrate the ability to manipulate objects in the drawing using grips, and move, copy, mirror commands. d) Demonstrate the ability to organize your drawings and utilize the inquiry commands thru the use of layers, properties, line types, and inquiry commands. e) Demonstrate the ability to modify objects using trim, extend, boundaries, parallel and offset geometry, join, break, chamfer, and fillet commands. f) Demonstrate the ability to annotate drawings using multi-line text, single line text, setting up and editing text styles. g) Demonstrate the ability to hatch objects using the hatch command. h) Demonstrate the ability to set up a dimension style and properly place dimensions in a drawing.	1.1.2 1.1.4 1.1.6 1.1.7 1.1.9 1.2.1 1.2.3 1.2.3 1.3.1 1.4.1 3.1.3 3.1.4 3.1.6 3.1.5 3.1.5 3.2.1 3.2.2 3.3.1 3.3.1 3.3.2 3.3.3 3.3.4 3.3.6 3.3.7 3.4.1	Summative assessment at the end of course

Student Learning Outcomes	Knowledge, Skills and Abilities	National Occupational Skills Standards	Possible Assessments
	<ul style="list-style-type: none"> <li>i) Demonstrate the ability to work with reusable content thru the use of blocks, design center, and tool palettes.</li> <li>j) Demonstrate the ability to create additional drawing objects using polylines, splines, and ellipses.</li> <li>k) Demonstrate the ability to prepare drawings for plotting using layouts, viewports, &amp; page setups.</li> <li>l) Demonstrate the ability to use and create templates.</li> </ul>		
3. Demonstrate the ability to perform advanced CAD skills within the AutoCAD environment.	<ul style="list-style-type: none"> <li>a) Demonstrate the ability to draw objects using revision clouds, wipeouts, boundaries, and regions.</li> <li>b) Demonstrate the ability to manipulate objects and data using quick select, purging objects, point objects, dividing and measuring, and geometry calculator.</li> <li>c) Demonstrate the ability to use annotation scaling.</li> <li>d) Demonstrate the ability to create and use dynamic blocks.</li> <li>e) Demonstrate the ability to create tables.</li> <li>f) Demonstrate the ability to create and modify basic 3D objects</li> </ul>	4.1.1 – 4.1.4 4.1.6 – 4.1.8 4.1.10  4.2.1 – 4.2.4 4.2.6  4.3.2 & 4.3.3  4.4.1 – 4.4.4  4.5.1 & 4.5.3	Summative assessment at the end of course
4. Demonstrate oral and written communication skills appropriate to the level of the coursework.	<ul style="list-style-type: none"> <li>a) Demonstrate the ability to understand information and instructions that are presented in both written and verbal form.</li> <li>b) Demonstrate the ability to communicate effectively in on-the-job situations using written and verbal skills.</li> </ul>	C1 – C11 C15 – C18 C23	Continual observation with quarterly assessment using personal attribute rubric.
5. Demonstrate math skills appropriate to the Level of the coursework.	<ul style="list-style-type: none"> <li>a) Add, subtract, multiply, and divide whole numbers, with and without the use of a calculator.</li> <li>b) Use a standard ruler and a metric ruler to measure.</li> <li>c) Add, subtract, multiply, and divide fractions.</li> <li>d) Add, subtract, multiply, and divide decimals, with and without a calculator.</li> <li>e) Convert decimals to percents and percents to decimals.</li> <li>f) Convert fractions to decimals and decimals to fractions.</li> <li>g) Explain what the metric system is and how it is important in the construction industry.</li> <li>h) Recognize and use metric units of length, weight, volume, and temperature.</li> <li>i) Recognize some of the basic shapes used in the construction industry and apply basic geometry to measure them.</li> </ul>	M1 M2 M4 – M9 M12 M13	Quarterly fact sheets and quizzes—objective assessment.

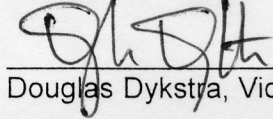
Student Learning Outcomes	Knowledge, Skills and Abilities	National Occupational Skills Standards	Possible Assessments
6. Demonstrate employability skills desirable for a CAD operator.	a) Demonstrate critical thinking skills and the ability to solve problems using those skills. b) Demonstrate effective relationship skills with teammates and supervisors, exhibit the ability to work on a team, and demonstrate appropriate leadership skills. c) Demonstrate appropriate personal attributes sought by employers.		Continual observation with quarterly assessment using personal attribute rubric.

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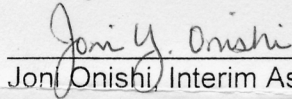
Hawaii Community College



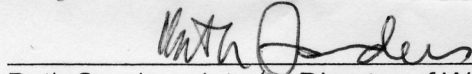
Rockne Freitas, Chancellor



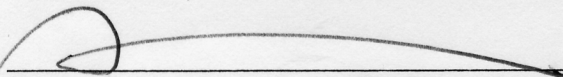
Douglas Dykstra, Vice Chancellor for Academic Affairs



Joni Onishi, Interim Assistant Dean, Career and Technical Education



Beth Sanders, Interim Director of West Hawaii Campus



Gordon Nekoba, Assistant Professor and Construction Academy Coordinator



Rex Ribao, Construction Academy Instructor

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10/23/2008

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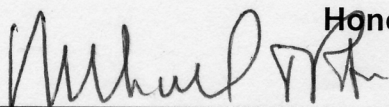
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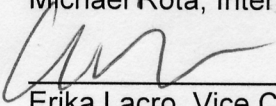


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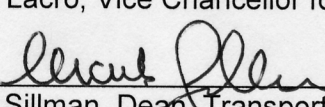
Honolulu Community College

  
Michael Rota, Interim Chancellor

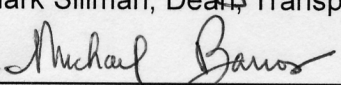
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Erika Lacro, Vice Chancellor for Academic Affairs

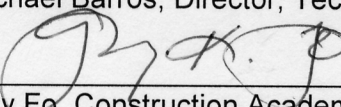
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Mark Sillman, Dean, Transportation and Trades

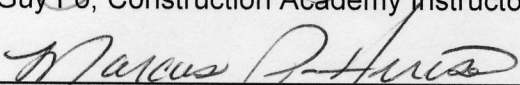
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Michael Barros, Director, Technology Academy

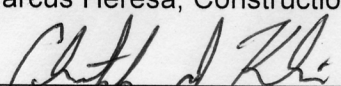
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Guy Fo, Construction Academy Instructor

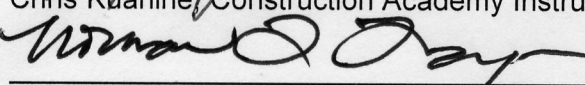
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Marcus Heresa, Construction Academy Instructor

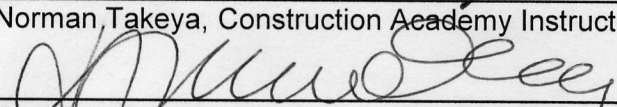
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Chris Kuahine, Construction Academy Instructor

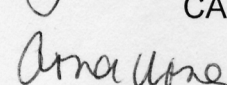
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Norman Takeya, Construction Academy Instructor

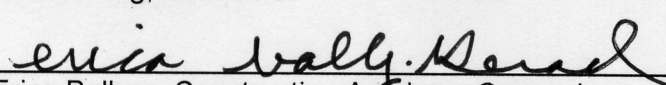
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Douglas Madden, Professor, Architectural, Engineering &  
CAD Technologies

11/17/08  
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Rona Wong, Counselor

12/8/08  
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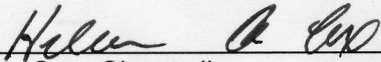
  
Erica Balbag, Construction Academy Counselor

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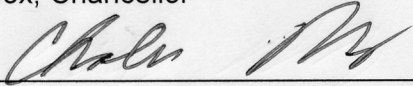


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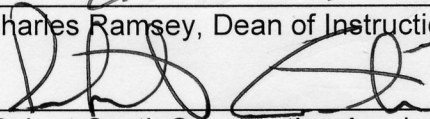
Kaua'i Community College

  
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Helen Cox, Chancellor

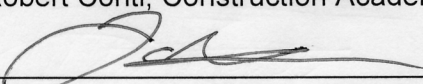
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Charles Ramsey, Dean of Instruction

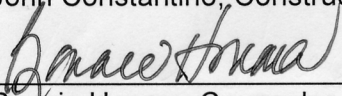
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Robert Conti, Construction Academy Coordinator

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John Constantino, Construction Academy Counselor

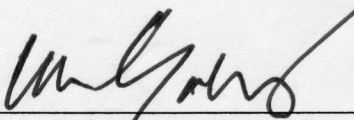
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Bonnie Honma, Counselor

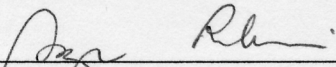
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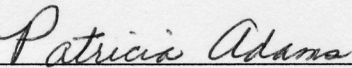
Maui Community College

  
Clyde Sakamoto, Chancellor

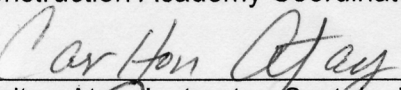
11/12/08  
Date

  
Suzette Robinson, Vice Chancellor of Academic Affairs


10/20/08  
Date

  
Patricia Adams, Interim Assist Dean of Instruction and  
Construction Academy Coordinator

10/20/08  
Date

  
Carlton Atay, Instructor, Sustainable Construction Technology


10/22/08  
Date

  
Andrew Carson, Construction Academy Instructor


11/07/08  
Date

  
Larry Janik, Construction Academy Instructor


10-22-08  
Date

  
Steve Johnson, Construction Academy Instructor

10/22/08  
Date

  
David Techau, Construction Academy Instructor

10/20/08  
Date

  
Linda Fujitani, Construction Academy Counselor

11/07/08  
Date