College Mission Statement

Honolulu Community College’s mission is to:

- Serve the community as an affordable, flexible, learning centered, open-door comprehensive Community College that meets the post-secondary educational needs of individuals, businesses, and the community.
- Serve the Pacific Rim as the primary technical training center in areas such as transportation, information technology, education, communications, construction, and public and personal services.

Program Mission Statement

The mission of the Computing, Electronics, and Networking Technology program at Honolulu Community College is to serve the community as a learning-centered, open door program which provides technical training to meet the demands of the Information and Communications Technology (ICT) industry and the needs of the individual. The program is designed to provide the student with a mixture of knowledge and hands-on training with an emphasis on preparing students for entry level employment in the Information and Communications Technology industry.

EXECUTIVE SUMMARY OF PROGRAM STATUS

The CENT program has recently submitted curriculum proposals to support a comprehensive update of the CENT Associate of Science (AS) and Advanced Professional Certificate (APC) programs. The purpose of these program modifications, and new course proposals, was to bring the CENT programs up to current technology standards and to improve support for the first three years of an articulated Bachelors of Applied Science Degree in CENT at the University of Hawai’i at West O’ahu. A key objective of the curriculum proposals was provide more options for advanced technical training in Information and Communication Technology (ICT) and to ensure that courses in the CENT AS and APC programs have the rigor and complexity that support a bachelor's program.

The CENT program is building solid relationships with the ICT industry as shown by our partnerships with the system-integrator startup company SNR Systems, the Armed Forces Communications and Electronics Association (AFCEA), Verizon Business, and the Defense Information Systems Agency (DISA). In 2012 the CENT program received a large donation of telecommunications workstation and data center racks from DISA and is proceeding forward in designing and building an innovative network operation center (NOC) classroom and data center. This NOC classroom and data center will be used to teach advanced technical courses in Networking and Telecommunications, Information Assurance, and Virtualization. Partnerships which various industry partners are planned to support this project.

The CENT program has recently submitted mappings of three CENT courses for certification to standards NSTISSI 4011 and 4012 of the National Information Assurance Education and Training Program (NIETP). These standards have been developed by the Committee on National Systems Security (CNSS) which is supported by the National Security Agency (NSA). In addition to the course mappings which have been reviewed and approved as of October 31, 2012, the CENT program in partnership with the Pacific Center for Advanced Technical Training (PCATT) is now exploring the possibility of applying to become a National Center of Academic Excellence for Information Assurance Education and Training for 2 year institutions (CAE/2Y).

The overall program health indicators listed the CENT program as healthy and cautionary. The CENT program was strong in the “Number of Majors” (198), “New and Replacement Positions” (79), “Fill Rate” (89%), “Successful Completion” (78%) and “Persistence (77%). “Unduplicated Degrees/Certificates Awarded” showed growth from (16) in 2010-2011 to (21) in 2011-2012 and “Transfers to a UH 4-yr” showed a large gain from (10) in 2010-2011 to (21) in 2011-2012. This large increase clearly reflects our articulation agreement with the University of West O’ahu leading to the Bachelor of Applied Science. We are currently developing four Certificates of Completion in CENT which will also help to provide students more options for completing a CENT degree or certificate.

A significant area of weakness shows up in the CENT program health indicators when a comparison is done between the numbers of “FTE BOR Appointed Faculty” (3) to “Majors to FTE BOR Appointed Faculty” of 7.9. This clearly demonstrates
a shortage of full-time faculty for the CENT program. About four years ago the CENT program lost two faculty members; one to retirement and another who accepted a position at UH West O`ahu. These two faculty positions have not been replaced.

**PROGRAM OVERVIEW**

**Program Description**

The CENT program offers an Associate in Science (AS) Degree and an Advanced Professional Certificate (APC) in Computing, Electronics, and Networking Technology.

The Associate in Science (AS) Degree in the Computing, Electronics, and Networking Technology program is a two-year course of study that prepares the student for entry-level employment in the field of Information and Communications Technology (ICT). Core classes are designed to give students a firm foundation in the basics of computers, networking and information systems. Elective courses allow students to further specialize in a field of study in Information and Communications Technology. Students are required to participate in an internship or cooperative education experience before completing the program. Certain courses may also prepare the student to take the following Information and Communications Technology industry certification exams: Computer Technician A+, Cisco Certified Network Associate, and Microsoft Certified Professional. The CENT program, in partnership with the Pacific Center for Advanced Technology Training (PCATT) at Honolulu Community College, is a Cisco Authorized Regional Academy, CompTIA Training Center, and a Microsoft Regional Academy.

The Advanced Professional Certificate (APC) in CENT is designed to provide the student with advanced technical training in the field of Information and Communications Technology with a core emphasis on Information Assurance (IA). This program also features training in the soft technical skills required to become an ICT professional. The student will have the opportunity to pursue advanced industry certifications.

The Honolulu Community College CENT program has established an articulation agreement leading to a Bachelor of Applied Science Degree in CENT with the University of Hawai`i at West O`ahu. There is also an articulation agreement leading to a Bachelor of Arts in System Administration with Hawai`i Pacific University. Students who complete the Associate of Science degree may apply to transfer to these institutions to complete a baccalaureate degree in either of these programs. Students may be concurrently enrolled in the Bachelor of Applied Science program at UH West O`ahu and the CENT AS or APC program at HCC.

**Program History**

The Computing, Electronics and Networking Technologies(CENT) program is the former Electronics Technology Program at HCC. About 15 years ago in response to changes in technology, the Electronics Program underwent a program change to place a stronger emphasis on computer hardware, computer networking and computing systems. The name of the program was changed to Computing, Electronics, and Networking Technology to emphasize the change. In 2003 the CENT program added a third year Advanced Professional Certificate (APC) to provide advanced training in areas such as information systems security, system administration and network administration.

In 2007 we extensively modified the CENT AS and APC programs to reflect changes in technology and current industry needs.

In 2008 the CENT Program established an articulation agreement with the University of Hawai`i at West O`ahu (UHWO), for a Bachelor of Applied Science degree program in CENT. This degree builds upon the CENT AS and APC programs and includes ICT professional courses offered at UHWO. Students have the option of dual-enrollment at both campuses.

In 2012 the CENT program has again modified the CENT AS and APC programs to reflect changes in technology and to bring the program up to date with current industry standards. These changes were also needed to provide a basis for establishing four Certificates of Completion which are currently in development.

In 2012 we submitted three CENT Courses (CENT 231 Telecommunications, CENT 275 Security Essentials, CENT 310 Network Security) for evaluation of our program as conforming to the NIETP/CNSS training standards for Information
Assurance. As of October 31, 2012, the courses we submitted for review have been approved as meeting these national standards for training in Information Assurance. Our next step will be to apply to become designated as a National Center of Academic Excellence for Information Assurance Education and Training Program for 2 Year Institutions (CAE/2Y).

Admission Requirements

As of Fall 2012, the prerequisites for admission into the CENT program are:

- Completion of ENG 22/60 or ESL 23, OR placement in ENG 100.
- Completion of Math 25 with a C or higher, or placement in MATH 103 or MATH 135 or higher.
- Completion of ICS 100 or ICS 101.

Credentials / Licensures Offered

There are no city, state, or national level licenses or credentials offered or required in any of the fields for which the CENT program provides training.

The CENT program supports many different vendor-specific and vendor-neutral certifications. Supported ICT industry certifications include: CompTIA A+ and Security +, Cisco Certified Networking Associate (CCNA), Cisco Certified Network Professional (CCNP), Microsoft Certified Professional (MCP) and VMware Certified Professional (VCP).

Faculty and Staff

CENT program faculty and staff include:

- Bill Becker, M.S. University of Hawai‘i. Bill is full-time faculty in ITS and teaches (CENT 315) Network Management for the CENT program as part of his load.

- Michael Castell, M.S., Information Systems, Hawai‘i Pacific University. Mike's current areas of responsibility in the CENT program include: Computer Hardware, Computer Networking, and Telecommunications. Mike is A+ certified and is a Cisco Certified Academy Instructor (CCAI/CCNA). Mike also teaches the CENT Electronic Fundamentals course for the MELE Program at HCC.

- Gerald Chen, M.S., Information Systems, Hawai‘i Pacific University. Gerald provides full-time academic support to the CENT program. Gerald is certified as a Microsoft Certified Systems Engineer (MCSE), Microsoft Certified Professional (MCP), Microsoft Certified Professional + Internet, and Cisco Certified Academy Instructor (CCAI/CCNA). He has also completed training for Certified Information System Security Professional (CISSP), Advanced Troubleshooting, Maintaining and Upgrading PCs, and Unix System Administration.

- Michael Cress, M.A., Hawai‘i Pacific University; Ph.D., Communications and Information Sciences (CIS), University of Hawai‘i. Michael is full-time faculty for the ICS program and teaches Introduction to Information Systems and Database Systems I for the CENT program as part of his full-time teaching load.

- Sally Dunan, M.S., Information and Computing Sciences, University of Hawai‘i. Sally is the CENT Program Coordinator with overall responsibility for the CENT AS, APC, and the developmental Certificate of Completion in Information Assurance. Her current areas of responsibility for courses in the CENT program include: Cisco networking CCNA and CCNP, information systems security, and Linux system administration. Sally has the following certifications: Certified Information Systems Security Professional (CISSP), Cisco Certified Network Associate (CCNA) and is a Cisco Certified Academy Instructor (CCAI/CCNA).

- Vern Takebayashi, M.S., University of Hawai‘i. Vern is full-time faculty for the ICS program and teaches Introduction to Internet/Web Applications for the CENT program as part of his full-time teaching load.

- Aaron Tanaka, M.S., Electrical Engineering, University of Hawai‘i. Aaron is the CENT Program Technical Coordinator and his current areas of responsibility in the CENT program include: network operating systems, telecommunications, Cisco networking CCNA and CCNP, and network security. Aaron has the following certifications: Certified Information Systems Security Professional (CISSP), Microsoft Certified Trainer (MCT), Cisco Certified Network Associate (CCNA), Cisco Certified Network Associate Security (CCNA Security), Cisco Certified Academy Instructor (CCAI), VMware Certified Professional (VCP), Comptia Security + and A+.
Resources

- The CENT program presently occupies Building 13 and Building 20 at the HCC campus, which are small buildings that provide computer lab classrooms and lab space suitable for the courses we teach. ICS faculty who teach on our behalf use ICS computer lab classrooms located in Building 2 at the HCC Campus.
- We have three computer lab classrooms used for teaching a variety of courses including networking, operating systems, system administration, and information systems security.
- One of our computer lab classrooms is configured to be used as a networking lab and also includes a variety of networking devices including Cisco routers, switches, and wide area networking simulators used as part of the Cisco networking curriculum.
- In 2012 the CENT program received a large donation of telecommunications workstations and data center racks from DISA and is proceeding forward in designing and building an innovative network operation center (NOC) classroom and data center in an old electronics laboratory in Building 20 room 11. We are enlisting the help of various industry professionals to help with this project.
- We also maintain a lab with a variety of computers and printers to support a computer hardware course. This equipment allows students the opportunity to work with a range of equipment including older computers and some newer computers.
- We also have a variety of electronics test equipment, such as oscilloscopes, which are used in the fundamental electronics course we teach to support the Music & Entertainment Learning Experience (MELE) program. This is all older equipment, but still satisfactory for use in this class.

Articulation Agreements

- In 2008 we established an articulation with UH West O‘ahu (UHWO) that provides students in our CENT AS and APC programs the opportunity to complete a 4 year Bachelor of Applied Science degree in Computing, Electronics, and Networking Technology at UHWO. This program supports dual enrollment with the first three years of course work taken at HCC and the senior year of course work taken at UH West O‘ahu.
- We also have an existing articulation with Hawai‘i Pacific University that allows graduates of our AS and APC programs to complete a Bachelor of Arts degree in System Administration at HPU.

Community Connections / Advisory Committees / Internships / Coops / DOE

The technology in our program changes so quickly and the scope of our program has become so broad that we have found that no single advisory committee is able to provide consistent input regarding program directions and goals. Consequently we use employer surveys or special advisory committees, targeted to explore particular program objectives, as the basis for obtaining input regarding industry needs in particular areas. Recently, we have been focusing on developing our program in the Information and Communications Technology and have been working closely with industry representatives in this area.

We met with our Advisory Committee this summer (July 2012) related to our proposed development of a Certificate of Completion in Networking and Telecommunications. The focus of this meeting was to solicit input regarding the development of a Telecommunications II course to anchor this certificate. The major topics that will be included in this course, SONET, ATM, MPLS and Carrier Ethernet are not taught in depth at any other academic institution in the state of Hawai‘i.

For three years the CENT program, hosted in one of its labs in building 20, a systems integrator startup company, SNR Systems. The local SNR Systems branch is managed by former CENT student Daren Presbitero and is linked to the SNR Systems headquarters located in Washington DC. To date, SNR Systems has accepted 10 CENT students as interns. Daren has been able to place most of these interns in Department of Defense ICT positions. In the spring of 2012 SNR systems moved off campus to a private location about 1/2 mile away from campus, however SNR Systems still continues to partner with the CENT program.

We enroll approximately 30 students per year in Cooperative Education (Cent 293V) and Internship (Cent 290V). Employers include Honolulu CC, UH Manoa, Kapiolani CC, UH Research Corporation, Blackbird, Camber
Corporation, Computer Doctor, DMBGI Consultants, Ke Ola Mamo, Lawrence Livermore National Laboratory, Net Enterprise, Oceanic Time Warner, Tahiti Imports, and WKF, Inc.

The CENT program also partners with the Akamai Internship program which has selected at least two CENT students each summer for the past five years for their paid internship program on the Big Island and Maui.

The CENT program has an articulation agreement with the Hawai’i Department of Education. This articulation agreement grants high school students who complete the Cisco Networking Academy CCNA 1 and CCNA 2 courses, credit for CENT 140 (Computer Networking 1) at HCC.

**Distance Delivered / Off Campus Program**

We do not currently offer any courses off campus or through distance education.

### Part I. Quantitative Indicators for Program Health Review

**Overall Program Health:** Cautionary  
**Majors Included:** CENT

<table>
<thead>
<tr>
<th>Demand Indicators</th>
<th>Program Year</th>
<th>Demand Health Call</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>09-10</td>
<td>10-11</td>
</tr>
<tr>
<td>1 New &amp; Replacement Positions (State)</td>
<td>33</td>
<td>30</td>
</tr>
<tr>
<td>2 *New &amp; Replacement Positions (County Prorated)</td>
<td>30</td>
<td>24</td>
</tr>
<tr>
<td>3 *Number of Majors</td>
<td>179</td>
<td>188</td>
</tr>
<tr>
<td>4 SSH Program Majors in Program Classes</td>
<td>1,692</td>
<td>1,930</td>
</tr>
<tr>
<td>5 SSH Non-Majors in Program Classes</td>
<td>2,347</td>
<td>2,369</td>
</tr>
<tr>
<td>6 SSH in All Program Classes</td>
<td>4,039</td>
<td>4,299</td>
</tr>
<tr>
<td>7 FTE Enrollment in Program Classes</td>
<td>135</td>
<td>143</td>
</tr>
<tr>
<td>8 Total Number of Classes Taught</td>
<td>61</td>
<td>64</td>
</tr>
</tbody>
</table>

**Efficiency Indicators**

<table>
<thead>
<tr>
<th>Efficiency Indicators</th>
<th>Program Year</th>
<th>Efficiency Health Call</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>09-10</td>
<td>10-11</td>
</tr>
<tr>
<td>9 Average Class Size</td>
<td>19.8</td>
<td>19.8</td>
</tr>
<tr>
<td>10 *Fill Rate</td>
<td>86%</td>
<td>89%</td>
</tr>
<tr>
<td>11 FTE BOR Appointed Faculty</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>12 *Majors to FTE BOR Appointed Faculty</td>
<td>59.5</td>
<td>62.7</td>
</tr>
<tr>
<td>13 Majors to Analytic FTE Faculty</td>
<td>23.7</td>
<td>23.5</td>
</tr>
<tr>
<td>13 a Analytic FTE Faculty</td>
<td>7.5</td>
<td>8</td>
</tr>
<tr>
<td>14 Overall Program Budget Allocation</td>
<td>$381,813</td>
<td>$284,429</td>
</tr>
<tr>
<td>14 a General Funded Budget Allocation</td>
<td>$279,429</td>
<td>$284,429</td>
</tr>
<tr>
<td>14 b Special/Federal Budget Allocation</td>
<td>$7,097</td>
<td>$0</td>
</tr>
<tr>
<td>14 c Tuition and Fees</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>15 Cost per SSH</td>
<td>$95</td>
<td>$66</td>
</tr>
<tr>
<td>16 Number of Low-Enrolled (&lt;10) Classes</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>
Effectiveness Indicators

<table>
<thead>
<tr>
<th>Effectiveness Indicators</th>
<th>Program Year</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>09-10</td>
<td>10-11</td>
<td>11-12</td>
<td></td>
</tr>
<tr>
<td>Successful Completion (Equivalent C or Higher)</td>
<td>75%</td>
<td>77%</td>
<td>78%</td>
<td></td>
</tr>
<tr>
<td>Withdrawals (Grade = W)</td>
<td>55</td>
<td>53</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>*Persistence (Fall to Spring)</td>
<td>68%</td>
<td>69%</td>
<td>77%</td>
<td></td>
</tr>
<tr>
<td>*Unduplicated Degrees/Certificates Awarded</td>
<td>16</td>
<td>16</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Degrees Awarded</td>
<td>16</td>
<td>15</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Certificates of Achievement Awarded</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Advanced Professional Certificates Awarded</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Other Certificates Awarded</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>External Licensing Exams Passed</td>
<td>Not Reported</td>
<td>Not Reported</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Transfers to UH 4-yr</td>
<td>11</td>
<td>10</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Transfers with credential from program</td>
<td>2</td>
<td>2</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Transfers without credential from program</td>
<td>9</td>
<td>8</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Distance Education:

<table>
<thead>
<tr>
<th>Distance Education: Completely On-line Classes</th>
<th>Program Year</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>09-10</td>
<td>10-11</td>
<td>11-12</td>
<td></td>
</tr>
<tr>
<td>Number of Distance Education Classes Taught</td>
<td>1</td>
<td>3</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Enrollment Distance Education Classes</td>
<td>20</td>
<td>58</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Fill Rate</td>
<td>83%</td>
<td>92%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Successful Completion (Equivalent C or Higher)</td>
<td>85%</td>
<td>74%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Withdrawals (Grade = W)</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Persistence (Fall to Spring Not Limited to Distance Education)</td>
<td>0%</td>
<td>44%</td>
<td>0%</td>
<td></td>
</tr>
</tbody>
</table>

Perkins IV Core Indicators 2010-2011

<table>
<thead>
<tr>
<th>Perkins IV Core Indicators</th>
<th>Goal</th>
<th>Actual</th>
<th>Met</th>
</tr>
</thead>
<tbody>
<tr>
<td>1P1 Technical Skills Attainment</td>
<td>90.10</td>
<td>94.34</td>
<td>Met</td>
</tr>
<tr>
<td>2P1 Completion</td>
<td>45.00</td>
<td>24.53</td>
<td>Not Met</td>
</tr>
<tr>
<td>3P1 Student Retention or Transfer</td>
<td>56.00</td>
<td>70.43</td>
<td>Met</td>
</tr>
<tr>
<td>4P1 Student Placement</td>
<td>51.00</td>
<td>62.22</td>
<td>Met</td>
</tr>
<tr>
<td>5P1 Nontraditional Participation</td>
<td>16.25</td>
<td>13.27</td>
<td>Not Met</td>
</tr>
<tr>
<td>5P2 Nontraditional Completion</td>
<td>15.15</td>
<td>23.08</td>
<td>Met</td>
</tr>
</tbody>
</table>

Last Updated: August 6th, 2012

Part II: Analysis of Program

CENT SOC codes and CIP codes:
Network and Computer Administrators: SOC: 15-1071 (old) 15-1142 (new); CIP: 11.0901/11.1001
Computer Support Specialists: SOC: 15-1041 (old), 15-1150 (new); CIP: 11.1006
Telecommunications Equipment Installers and Repairers: SOC: 49-2022; CIP: 47.0103 Communications Systems Installation and Repair Technology

The CENT program overall performance was satisfactory (Cautionary).
The “Demand Indicators” listed the CENT program as “Healthy”, reflecting solid numbers in majors (198) and in “New and Replacement Positions” in the state of Hawai‘i (140).

The “Efficiency Indicators” listed the CENT program as “Cautionary”. Although the program showed a solid class fill rate of 89%, the program earned a “Cautionary” score because of the lack of lack of full-time CENT faculty. The ratio of “Majors to FTE BOR Appointed Faculty” was listed at 66 with the ratio of “Majors to Analytic FTE Faculty” as 7.9. The CENT program currently has 3 FTE BOR appointed faculty members.

The “Effectiveness Indicators” also listed the CENT program as “Cautionary”. The program showed growth in “Unduplicated Degrees/Certificates Awarded” from 16 to 21, although this ratio of Degrees/Certificates awarded compared to Number of Majors was 10.6%, which resulted in an “unhealthy” call for this metric. Also, the ratio of the number of Degrees and Certificates awarded compared to New and Replacement Positions (County) was 26.6%, which was “cautionary” for this metric. The Persistence from fall to spring was 77%, which is rated as “healthy.” Beyond the measures the CENT course completion rate was solid at 78%. Also strong was the number of “Transfers to UH 4-yr” at 21. This reflects the CENT program’s articulation agreement with the University of Hawai‘i at West O‘ahu into the Bachelors of Applied Science Degree in CENT.

The Perkins IV Core indicators show that as a campus overall Honolulu Community College did not meet the Perkins IV Core Indicator 2P1 Completion. The overall campus completion rate was 24.53% with a system-wide goal of 45%. Perkins goals are set as system level goals for two year programs, not as goals for individual programs. The goal amount of 45% does not take into account unique program characteristics, such as the fact that the CENT program includes students participating in four year degree programs, as well as those students who are seeking only the AS degree. The fact that many students in the CENT Program are participating in an overall 4 year degree program may adversely affect the overall campus completion rate for this Perkins core indicator metric. The campus also did not meet Perkins IV Core Indicator 5P1 Nontraditional Participation with a score of (13.27) compared to a goal of (16.25). The CENT program has seen increases in the number of nontraditional students enrolled. CENT will work with the CTE Dean to regarding ways to increase nontraditional participation in our program.

Additional data for comprehensive 5 year program review.

<table>
<thead>
<tr>
<th>2012 Comprehensive Program Review Data - 5 years</th>
<th>Fall 2007 - Spring 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Number of Majors Enrolled In At Least One Program Course (Fall only)</strong></td>
<td>Fall 2007 / Spring 2008</td>
</tr>
<tr>
<td><em>Majors who completely withdrew but counted for Census removed from tally</em> Source: ODS, IRO_BASE_UH, IRO_REGS_UH, Census freeze</td>
<td>133</td>
</tr>
<tr>
<td><strong>2.A. Number of Classes Fall 2007 - Fall 2011</strong></td>
<td>Source: ODS, IRO_SOCEX_UH, Census Freeze</td>
</tr>
<tr>
<td><strong>2.B. Number of Classes Spring 2008 - Spring 2012</strong></td>
<td><em>Excluding Co-op and Directed Studies courses</em> Source: ODS, IRO_SOCEX_UH, Census Freeze</td>
</tr>
<tr>
<td><strong>3.A. Average Class Size Fall 2007 - Fall 2011</strong></td>
<td><em>Excluding Co-op and Directed Studies courses, ‘W’ grades removed</em> Source: ODS, IRO_SOCEX_UH, IRO_REGS_UH Census Freeze</td>
</tr>
<tr>
<td><strong>3.B. Average Class Size Spring 2008 - Spring 2012</strong></td>
<td><em>Excluding Co-op and Directed Studies courses, ‘W’ grades removed</em> Source: ODS, IRO_SOCEX_UH, IRO_REGS_UH Census Freeze</td>
</tr>
<tr>
<td><strong>4.A. Fill Rate Fall 2007 - Fall 2011</strong></td>
<td><em>Excluding Co-op and Directed Studies courses, ‘W’ grades removed</em> Source: ODS, IRO_SOCEX_UH, IRO_REGS_UH, IRO_SOCAD_UH Census Freeze</td>
</tr>
<tr>
<td><strong>4.B. Fill Rate Spring 2008 - Spring 2012</strong></td>
<td><em>Excluding Co-op and Directed Studies courses, ‘W’ grades removed</em> Source: ODS, IRO_SOCEX_UH, IRO_REGS_UH, IRO_SOCAD_UH Census Freeze</td>
</tr>
<tr>
<td><strong>5. Persistence Fall to Spring</strong></td>
<td><em>Using majors as defined in Item 1, accounting for completers in Fall term</em></td>
</tr>
</tbody>
</table>
The additional data for the 5 year comprehensive review clearly reflect the dip in enrollment that the CENT program went through in the Academic Year 2008-2009 and the steady increases in enrollment starting in Academic Year 2009-2010. Our enrollment currently exceeds the enrollments from Academic Year 2008-2009 when we had 5 full-time faculty. Our average class sizes have consistently increased and our fill rates are higher. Our persistence rates from fall to spring have dropped, which may be reflective of numerous factors such as larger class sizes, personal or work-related conflicts, or other economic issues. We can also see a drop in degrees awarded in Academic Year 2008-2009 and increasing degrees awarded during the past three years. The student semester hours have also had sustained increases during the past three years.

Part IIB: Program Review

Program SLOs

Upon successful completion of the CENT program, students will be able to:

- Apply current industry standards, protocols, and techniques; and keep up with evolving technology to maintain professional proficiency.
- Identify, analyze and improvise solutions to resolve problems using a systematic method.
- Use appropriate industry tools and testing equipment to analyze, troubleshoot, and install systems.
- Install, configure, operate, and maintain systems.
- Apply current standards for safety and security.
- Communicate clearly and effectively through written reports and oral presentations.
- Work effectively, independently, and interdependently, in diverse situations involving stress, teams, co-workers, customers, vendors, organizational partners and supervisors.
- Demonstrate professionalism and integrity in supporting the mission of the organization.

A) Evidence of Industry Validation

The CENT program is building solid relationships with the ICT industry as shown by our partnerships with the system-integrator startup company SNR Systems, the Armed Forces Communications and Electronics Association (AFCEA), Verizon Business, and the Defense Information Systems Agency (DISA). In 2012 the CENT program received a large donation of telecommunications workstation and data center racks from DISA and is proceeding forward in designing and building an innovative network operation center (NOC) classroom and data center. This NOC classroom and data center will be used to teach advanced technical courses in Networking and Telecommunications, Information Assurance, and Virtualization. Partnerships which various industry partners are planned to support this project.

The CENT program supports many different vendor-specific and vendor-neutral certifications. Supported ICT industry certifications include: CompTIA A+ and Security +, Cisco Certified Networking Associate (CCNA), Cisco Certified Network Professional (CCNP), Microsoft Certified Professional (MCP) and VMware Certified Professional (VCP).

We met with our Advisory Committee this summer (July 2012) related to our proposed development of a Certificate of Completion in Networking and Telecommunications. The focus of this meeting was to solicit input regarding the development of a Telecommunications II course to anchor this certificate. The major topics that will be included in this
course, SONET, ATM, MPLS and Carrier Ethernet are not taught in depth at any other academic institution in the state of Hawai`i.

For three years the CENT program, hosted in one of its labs in building 20, a systems integrator startup company, SNR Systems. The local SNR Systems branch is managed by former CENT student Daren Presbitero and is linked to the SNR Systems headquarters located in Washington DC. To date, SNR Systems has accepted 10 CENT students as interns. Daren has been able to place most of these interns in Department of Defense ICT positions. In the spring of 2012 SNR systems moved off campus to a private location about 1/2 mile away from campus, however SNR Systems still continues to partner with the CENT program.

All CENT students are required to successfully complete a Cooperative Education or Internship course as part of the CENT AS degree. Approximately 30 students per year enroll in Coop(Cent 293V) and Internship (Cent 290V) courses. Employers include Honolulu CC, UH Manoa, Kapiolani CC, UH Research Corporation, Blackbird, Camber Corporation, Computer Doctor, DMBGI Consultants, Ke Ola Mamo, Lawrence Livermore National Laboratory, Net Enterprise, Oceanic Time Warner, Tahiti Imports, and WKF, Inc. Based upon the results of the employer evaluations of CENT students in cooperative education/internship courses, our students are performing satisfactorily or better in their internship assignments.

The CENT program also partners with the Akamai Internship program which has selected at least two CENT students each summer for the past five years to participate in their paid internship program on the Big Island and Maui.

The CENT program has recently submitted mappings of three CENT courses for certification to standards NSTISSI 4011 and 4012 of the National Information Assurance Education and Training Program (NIETP). These standards have been developed by the Committee on National Systems Security (CNSS) which is supported by the National Security Agency (NSA). In addition to the course mappings which have been reviewed and approved as of October 31, 2012, the CENT program in partnership with the Pacific Center for Advanced Technical Training (PCATT) is now exploring the possibility of applying to become a National Center of Academic Excellence for Information Assurance Education and Training for 2 year institutions (CAE/2Y).

B) Expected Level Achievement

This summer we completed the mappings of CENT courses to the CENT Program SLOs. All courses showed strong support for program SLOs, with all program SLOs addressed by multiple courses.

We formally assess and collect evidence of student achievement of program learning outcomes using a variety of methods including hands-on student laboratories, work habits evaluation, student written projects, student oral reports, student group projects, written exams, and hands-on (skills) exams.

Informally, we observe on an ongoing basis that our students demonstrate increased proficiency and knowledge of Information and Communication Technology as they progress through the program.

By the time they graduate from CENT programs, and in particular the AS, all students visibly demonstrate satisfactory performance and growth with respect to all of the Program SLOs. Clearly, we take pride in our superstars, but we are also very aware and proud that even those students who are not superstars demonstrate visible growth in the program.

C) Courses Assessed

As part of the ongoing discussion regarding modifications to the CENT AP and APC over the past three years, we carefully reviewed all courses in our curriculum, including course SLOs, to ensure the course SLOs continue to reflect the learning outcomes students are expected to achieve and to update the SLOs when the current expectations for the course have changed.

In most CENT courses students are required to complete thorough written and hands-on examinations as well as submit written reports. Written examinations demonstrate that students have met the knowledge outcomes for courses. Hands-on
examinations demonstrate that students have acquired the skills indicated in student learning outcomes. Additionally, every Cisco networking course in the curriculum requires that students complete comprehensive Cisco online examinations that demonstrate their knowledge of networking topics and skills exams to demonstrate their skills proficiency.

In some classes students are required to do group projects as well as group presentations. These assignments allow students to demonstrate their knowledge and comprehension of course material and to develop and reinforce skills for working in groups.

Mike Castell uses pre-tests and post-tests in his courses to assess student achievement of course SLOs.

We expect all students to demonstrate satisfactory achievement of course SLOs as a prerequisite for receiving a passing grade for each course. Consequently, we construct our course assignments and methods of examination to ensure that students demonstrate an overall satisfactory level of accomplishment for all course SLOs every semester.

D) Assessment Strategy/Instrument

Evidence of student learning is demonstrated by various assessment methods deployed throughout the program.

This summer we completed mapping CENT course SLOs to the CENT Program SLOs. All courses showed strong support for program SLOs, with all program SLOs addressed by multiple courses. The CENT Program Curriculum Maps are posted online at http://programs.honolulu.hawaii.edu/intranet/sites/programs.honolulu.hawaii.edu.intranet/files/CENT2%20Program%20Map.pdf

We formally assess and collect evidence of student achievement of program learning outcomes using a variety of methods including hands-on student laboratories, work habits evaluation, student written projects, student oral reports, student group projects, written exams, and hands-on (skills) exams.

CENT students are also required to complete an Internship (CENT 290V) or Cooperative Education (CENT 293V) course as part of the CENT AS degree. A review of the employer feedback for the past five years reflects that CENT students participating in Internship or Cooperative Education met or exceeded employer expectations with respect to achievement of CENT Program SLOs. The results of this analysis provided by the Cooperative Education coordinator are provided below.

Informally, we observe on an ongoing basis that our students demonstrate increased proficiency and knowledge of Information and Communication Technology as they progress through the program.

E) Results of Program Assessment

Based on an ongoing comprehensive review of the CENT program courses over the past three years, the CENT program has recently submitted curriculum proposals to implement a comprehensive update of the CENT Associate of Science (AS) and Advanced Professional Certificate (APC) programs. The purpose of these program modifications, and new course proposals, was to bring the CENT programs up to current technology standards and to improve support for the first three years of an articulated Bachelors of Applied Science Degree in CENT at the University of Hawai`i at West O`ahu. A key objective of the curriculum proposals was provide more options for advanced technical training in Information and Communication Technology (ICT) and to ensure that courses in the CENT AS and APC programs have the rigor and complexity that support a bachelor's program.

We met with industry partners and examined available information regarding bachelors programs in ICT across the country to formulate our plan. Through organizations such as the Mid-Pacific Information and Technology Center and the Center for Systems Security and Information Assurance, we were able to learn about the content of ICT courses being offered around the country. Being one of the few ICT programs in the country which offers three years of an articulated bachelors program in ICT, made this task challenging as there is no existing model to follow.
The conclusion of our three year study of the CENT program and feedback from the ICT industry was to streamline the courses in the CENT AS and APC programs and to provide additional advanced technical courses in ICT.

The first package of program and course modifications for the CENT AS program was submitted in Fall 2012. Courses CENT 130 Microcomputer Operating Systems and CENT 131 Microcomputer Hardware were combined into a single course CENT 132 ICT Support. Other courses were trimmed in credits from 4 to 3 to provide room for a new course CENT 275 Security Essentials and provide CENT AS students with the ability to take additional elective courses.

The second package of program and course modifications for the CENT APC program was also submitted in the Fall 2012. All 300 level courses within the CENT APC program were trimmed from four credits to three credits to give CENT students the opportunity to take more 300 level elective courses. The SLOs and content of each 300-level course were reviewed and updated for relevancy. The new three credit structure better aligns these courses to baccalaureate course offerings at other ICT programs. In addition, four new courses were developed based on industry recommendations for Telecommunications (SONET, ATM, MPLS, Carrier Ethernet), Junos Routing, Cloud Services and Virtualization.

F) Other Comments

Resource Concerns

- We currently have to share networking equipment (routers, switches, firewalls, and test equipment) between classrooms to support multiple courses.
  - As mentioned elsewhere we are in the process of converting an old Electronics classroom into a modern classroom which will be able to support networking, telecommunications, information assurance, and virtualization courses.
  - In 2012 we were able to secure a Perkins grant of $26,100 to purchase some equipment to support the new lab. In the future we will still need to purchase additional routers, switches and power-edge servers to support our technical courses and to keep our laboratories current with industry.

- While we have computers in all of our labs, we need one new classroom of computers that can run virtualization environments to support newer courses being developed. This will allow us to reuse the computers from one classroom to update computers in our networking lab/classroom that are now borderline with respect to meeting the needs of our networking courses. The older computers from the networking lab would then be reused to support needs for newer hardware for students taking our introductory computer hardware course.

G) Next Steps

In order to improve systematic assessment of CENT program SLOs, the CENT program intends to:

- Develop a systematic method for obtaining information about CENT program graduates, as well as students who do not complete a CENT program. We believe this effort will require assistance and support from the Tech II Dean as part of a campus-wide initiative to track outcomes for students completing programs, or leaving programs. In particular, the results of campus-wide tracking methods will need to be systematically reported to programs, for use in program-level assessments.
- Develop a systematic method for assessing and reporting on student achievement of course SLOs that can easily be applied to all courses. Again, we solicit assistance from the Tech II Dean and Division Chair with respect to developing standard templates/strategies for assessing course outcomes.

Part III: Action Plan

The following action plan items can be tied to the HCC Specific Additional Outcomes and Measures accessible online at http://programs.honolulu.hawaii.edu/intranet/sites/programs.honolulu.hawaii.edu.intranet/files/2009-strategic-outcomes-statements.pdf

1. Hire additional faculty. (Outcome #2). The CENT Program previously had five full-time faculty positions, of which two positions were vacated in June 2008. We were able to operate with reduced faculty because we had low enrollments at that time, and we had not yet implemented our articulation with UHWO for the BAS degree. For the past four years we have supplemented our three full-time faculty members with lecturers and faculty from ICS to teach existing
Our articulation with UHWO is now in place and our enrollments have been steadily increasing as a result. We have reached the point that we very much need additional full-time staffing to maintain existing courses and assist in developing new courses for the CENT programs.

We submitted a request to hire an additional FTE BOR faculty member during spring 2012. Hiring an additional faculty would help for developing and teaching new and existing CENT courses, and would also help to improve the Program Health Indicator “Majors to FTE ratio”. We need to follow up on this request. (item carried over from previous year)

The ramifications of not having additional full-time faculty would be increasing reliance on lecturers and ICS faculty to teach courses on behalf of the CENT program and the inability of current CENT faculty to develop needed new courses, and to adequately maintain our current courses up-to-date. This would adversely affect our ability to satisfactorily meet our Program SLOs and ensure that our students are receiving training that conforms to the needs of industry.

2. Develop proposals for Certificates of Completion in Basic Networking, Basic Information Assurance, Networking and Telecommunications and System Administration. We have submitted the Authorization to Plan (ATP) request to proceed with this development this year and are within the formal planning period for developing the proposed certificates. (Outcome #2). (item carried over from previous year)

We used Perkins grant funding during the summer 2012 to work on this project, which enabled us to define changes needed to our CENT AS and APC programs, to support the development of the proposed certificates.

3. Ensure CENT faculty will have sufficient time to develop and prepare courses for the newly modified CENT AS and APC programs. Ensure these courses meet industry standards and support the BAS in CENT at the University of West O‘ahu. (Outcome #2 and outcome #7)

4. Ensure that courses taught as part of industry established certification programs (CCNA, CCNP, MCP, VMware, Junos, A+, Security +) are up-to-date and conform to industry standards, including equipment. (Outcome #2 and outcome #7)

Provide opportunities for faculty to learn new material and to become or remain certified in the areas they teach. This is especially important for courses which require instructor certification. (Outcome #2, outcome #5, and outcome #7)

Meet with our industry/advisory committees regularly to ensure program/courses are current with industry standards. (Outcome #7)

Continue to develop industry partnerships with organizations such as AFCEA, DISA, and TechNet. (Outcome #7)

5. Continue developing the NOC classroom and data center. (Outcome #2 and outcome #7)

Partner with industry to support and develop various parts of the NOC classroom and data center. (Outcome #7)

6. Apply for designation as a National Center of Academic Excellence for Information Assurance Education and Training for two year Institutions (CAE/2Y). This is a follow up to the NSA/NIETP course mappings for standards 4011 and 4012 that we submitted this year. Our course mappings were approved as of November 2, 2012, and applying for the CAE/2Y designation is our next step toward establishing HCC as a recognized provider for Information Assurance training and education that conforms with national standards. (Outcome #2 and Outcome #7)

7. Update and streamline our articulation agreement with the University of West O‘ahu for the BAS in CENT to reflect program changes both at HCC and UHWO since the Memorandum of Agreement was first signed in 2008. (Outcome #2)

8. Contract professional services to help recruit non-traditional students into the program. (Outcome #4) This is anticipated to help to improve participation in and completion of CENT programs by non-traditional students to improve outcomes for Perkins Core Indicators 5P1 and 5P2. Support from the CTE Dean for accomplishment of this objective is needed. (item carried over from previous year)

9. Purchase and upgrade one computer lab to be able to offer industry current curriculum. (Outcome #2) (item carried over from previous year)

We teach courses supporting the Microsoft Academy program that require students to perform in-lab work that involves the use of three or more computers at one time. We do not have either the space or funding to provide physical computers to meet this requirement. We need to upgrade the computers in one of our existing computer lab
classrooms to support the use of computer virtualization with sufficient hard drive space and memory to permit the creation of up to 5 computer images that can run concurrently on one computer. This will enable us to greatly improve the effectiveness of the types of system administration courses we currently teach. Upgrading the computer equipment in one classroom will allow us to reuse the computers from the upgraded classroom to subsequently upgrade computers in other classrooms that are currently using older, less capable computers. So, buying new computers for one classroom allows us to also upgrade one to two other classrooms and computer lab areas where students need to have access to physical computers.

The proposed upgrade of this computer lab will also support the development of new courses for Virtualization and Cloud Infrastructure.

10. Additionally, with increasing utilization of physical classroom/lab space during the academic day because we are now offering more sections of courses and will also need to offer more courses as a result of our recent curriculum changes, the opportunities for students to work in the classroom outside of normal class times have become more limited. With the support of the proposed reorganization of ITC at HCC, we would like to develop a virtualized environment that provides all CENT students the ability to remotely access a virtual lab environment in which they can work and complete course assignments. This will improve accessibility to the resources students need to have to perform required course work and alleviate the conflicts between courses that are using the physical lab/classrooms and students who need to work on lab activities for courses outside their scheduled class time. We have the campus CIO on a preliminary basis. (item carried over from previous year)

11. Purchase additional Cisco routers and switches to support existing networking and telecommunications courses to be able to offer industry current curriculum. (Outcome #2)

We currently have sufficient routers and switches to support our courses, if offered during separate time slots. However, we have begun to use our routers and switches more extensively to support additional courses, such as the Data Telecommunications course (CENT 231), and have become uncomfortably aware that we don't really have enough equipment to support two courses being offered at the same time. It has become clear that we need to procure additional equipment so that we can support multiple courses using the same equipment at the same time. We currently need to procure approximately 10 additional routers, which will upgrade the supply of routers we currently have, as well as provide additional routers to support classroom needs for both the networking courses and the data communications course. (item carried over from previous year)

12. Maintain/update equipment required to offer industry current curriculum. (Outcome #2)

In addition to the computer upgrades and networking equipment specified above, we must also maintain sufficient, up-to-date equipment to support the courses we teach across the board. Specific equipment items we have identified to date that we would like to procure contingent on availability of funds include:

- 2 VIC2-2FXS Router Voice Interface cards, 2 VIC2-2FXO Router Voice Interface Cards, and 2 Adtran Atlas 550 T1/PRI Network Cards for CENT 231. This equipment will be used to improve coverage of voice over IP for the CENT 231 Data Communications course. We were able to procure one set of cards last year, but 2 additional sets of cards will provide a total of three sets of network cards to support a class of 18-20 students. (item carried over from previous year)
- Fiber optic installation kits to support training related to termination and splicing of fiberoptic cabling to our existing CENT 231 Data Communications course and a possible new course focused on cabling. (item carried over from previous years)
- Voice over IP Phones to improve support for teaching VoIP in CENT 231 Data Communications and other advanced networking courses. (item carried over from previous years)
- HWIC-2T network cards for use in Cisco 2800 series routers. Cisco is no longer manufacturing the older WIC-2T cards that we are currently using in our routers. Procuring upgraded HWIC-2T cards would enable us to reserve older WIC-2T cards for use as spare networking cards for our older Cisco 2600 series routers. Having spare WIC-2T cards to support the 2600 series routers will extend the usable lifetime of the 2600 series routers. (item carried over from previous years)
- Spirent Test Center to provide support for advanced labs in CENT 231 Data Communications and other networking courses. (item carried over from previous years)
• Printers for three classroom computer labs and one Data Communication Lab. (carried over from previous years). This equipment would replace older equipment that was received as donations.

**Part IV: Resource Implications**

There are resource implications our action items, as delineated below. We will work with the Tech II Dean to obtain necessary resources.

1. Hire additional faculty. (Outcome #2). This action item will require funding approval. We will submit a budget request to request funding for hiring additional faculty. This is the CENT program’s second (#2) priority for funding. We consider this item to be high priority because of program impact, since we will not be able to continue to develop and maintain our courses to meet industry standards with out additional full-time faculty.

2. Develop proposals for Certificates of Completion in Basic Networking, Basic Information Assurance, Networking and Telecommunications and System Administration. (Outcome #2). We used Perkins grant funding during the summer 2012 to work on this project, which enabled us to define changes needed to our CENT AS and APC programs, to support the development of the proposed certificates. We have also used assigned time during the academic year to provide the time needed to develop curriculum proposals. We may need additional assigned time in the future for developing curriculum actions to support additional certificates.

3. Ensure CENT faculty will have sufficient time to develop and prepare courses for the newly modified CENT AS and APC programs. Ensure these courses meet industry standards and support the BAS in CENT at the University of West O‘ahu. (Outcome #2 and outcome #7). Assigned time would be needed to provide faculty time to develop new courses and update existing courses.

4. Ensure that courses taught as part of industry established certification programs (CCNA, CCNP, MCP, VMware, Junos, A+, Security +) are up-to-date and conform to industry standards, including equipment. (Outcome #2 and outcome #7). Provide opportunities for faculty to learn new material and to become or remain certified in the areas they teach. This is especially important for courses which require instructor certification. (Outcome #2, outcome #5, and outcome #7). Meet with our industry/advisory committees regularly to ensure program/courses are current with industry standards. (Outcome #7) Continue to develop industry partnerships with organizations such as AFCEA, DISA, and TechNet. (Outcome #7). Assigned time would be needed to provide faculty time to develop new courses and update existing courses.

5. Continue developing the NOC classroom and data center. (Outcome #2 and outcome #7). Partner with industry to support and develop various parts of the NOC classroom and data center. (Outcome #7). Assigned time may be needed to provide faculty time to coordinate with industry partners for completion of this initiative.

6. Apply for designation as a National Center of Academic Excellence for Information Assurance Education and Training for two year Institutions (CAE/2Y). This is a follow up to the NSA/NIETP course mappings for standards 4011 and 4012 that we submitted this year. Our course mappings were approved as of November 2, 2012, and applying for the CAE/2Y designation is our next step toward establishing HCC as a recognized provider for Information Assurance training and education that conforms with national standards. (Outcome #2 and Outcome #7). This application is expected to be completed this year with no additional need for assigned time.

7. Update and streamline our articulation agreement with the University of West O‘ahu for the BAS in CENT to reflect program changes both at HCC and UHWO since the Memorandum of Agreement was first signed in 2008. (Outcome #2). Updating the articulation with UHWO for the BAS in CENT is expected to be completed this year with no additional need for assigned time.

8. Contract professional services to help recruit non-traditional students into the program. (Outcome #4) This is anticipated to help to improve participation in and completion of CENT programs by non-traditional students to improve outcomes for Perkins Core Indicators 5P1 and 5P2. Support from the CTE Dean for accomplishment of this objective is needed. Resource requirements are unknown.

9. Purchase and upgrade one computer lab to be able to offer industry current curriculum. (Outcome #2) (item carried over from previous year). This action item will require funding approval. We will prepare and submit a budget request for funding. This request will be coordinated with ITS. This is the CENT program’s first (#1) priority for funding. We consider this item to be high priority because of program impact, since we will not be able to continue to provide training that meets industry standards without upgrading classroom computers.
10. Additionally, with increasing utilization of physical classroom/lab space during the academic day because we are now offering more sections of courses and will also need to offer more courses as a result of our recent curriculum changes, the opportunities for students to work in the classroom outside of normal class times have become more limited. With the support of the proposed reorganization of ITC at HCC, we would like to develop a virtualized environment that provides all CENT students the ability to remotely access a virtual lab environment in which they can work and complete course assignments. This will improve accessibility to the resources students need to have to perform required course work and alleviate the conflicts between courses that are using the physical lab/classrooms and students who need to work on lab activities for courses outside their scheduled class time. We have already discussed this idea with Mike Meyer on a preliminary basis. (item carried over from previous year). This action item will require funding. We will coordinate this request with ITS. This is the CENT program’s 7th (#7) priority for funding. We consider this item to be medium priority to improve support for students to be able to perform labs remotely.

11. Purchase additional Cisco routers and switches to support existing networking and telecommunications courses to be able to offer industry current curriculum. (Outcome #2). This action item will require funding approval. We will prepare and submit a budget request for funding. This is the CENT program’s third (#3) priority for funding. We consider this item to be medium priority to improve support for existing courses.

12. Maintain/update equipment required to offer industry current curriculum. (Outcome #2). In addition to the computer upgrades and networking equipment specified above, we must also maintain sufficient, up-to-date equipment to support the courses we teach across the board. Specific equipment items we have identified to date that we would like to procure contingent on availability of funds include:

- 2 VIC2-2FXS Router Voice Interface cards, 2 VIC2-2FXO Router Voice Interface Cards, and 2 Adtran Atlas 550 T1/PRI Network Cards for CENT 231. This equipment will be used to improve coverage of voice over IP for the CENT 231 Data Communications course. We were able to procure one set of cards last year, but 2 additional sets of cards will provide a total of three sets of network cards to support a class of 18-20 students. (item carried over from previous year). This action item will require funding approval. We will prepare and submit a budget request for funding. This is the CENT program’s fourth (#4) priority for funding. We consider this item to be medium priority to improve support for VoIP.

- Fiber optic installation kits to support training related to termination and splicing of fiber optic cabling to our existing CENT 231 Data Communications course and a possible new course focused on cabling. (item carried over from previous years). This action item will require funding approval. We will prepare and submit a budget request for funding. This is the CENT program’s fifth (#5) priority for funding. We consider this item to be medium priority to import support for training.

- Voice over IP Phones to improve support for teaching VoIP in CENT 231 Data Communications and other advanced networking courses. (item carried over from previous years). This action item will require funding approval. We will prepare and submit a budget request for funding. This is the CENT program’s sixth (#6) priority for funding. We consider this item to be medium priority to improve support for teaching VoIP.

- HWIC-2T network cards for use in Cisco 2800 series routers. Cisco is no longer manufacturing the older WIC-2T cards that we are currently using in our routers. Procuring upgraded HWIC-2T cards would enable us to reserve older WIC-2T cards for use as spare networking cards for our older Cisco 2600 series routers. Having spare WIC-2T cards to support the 2600 series routers will extend the usable lifetime of the 2600 series routers. (item carried over from previous years). This action item will require funding approval. We will prepare and submit a budget request for funding. This is the CENT program’s eighth (#8) priority for funding. We consider this item to be low priority.

- Spirent Test Center to provide support for advanced labs in CENT 231 Data Communications and other networking courses. (item carried over from previous years). This action item will require funding approval. We will prepare and submit a budget request for funding. This is the CENT program’s ninth (#9) priority for funding. We consider this item to be low priority.

- Printers for three classroom computer labs and one Data Communication Lab. (carried over from previous years). This equipment would replace older equipment that was received as donations. This action item will require funding approval. We will prepare and submit a budget request for funding. This is the CENT program’s tenth (#10) priority for funding. We consider this item to be low priority.
APPENDIX 1
Minutes of CENT Program Advisory Committee Meeting
July 18th, 2012

Attendance: CENT Faculty: Aaron Tanaka, Sally Dunan
Committee Members: Thomas Lau (DISA), Adrian Nomura (Hawaiian Telecom), Tommy Yoshida (SNR-Systems),
Daren Presbitero (SNR-Systems)

Note: Daren Presbitero was not present but submitted documents for review:

Meeting Started at 12:00
- Introductions
- CENT faculty provided an overview of the CENT Program.
- CENT faculty introduced the planned Certificate of Completion in Networking and Telecommunications.
- Aaron introduced the planned new course Telecommunications II course.
- Aaron presented documents submitted by Daren Presbitero for this course. (Labs, suggested topics)
- Adrian Nomura provided the following topic suggestions:
  - Layer 2 and 3 MPLS
  - Application of MPLS services
  - Functions, security, enterprise
  - Monitoring of MPLS systems
  - Tseudo wire for migration from ATM – MPLS
  - Traffic Engineering
  - Have students understand the why of MPLS, etc
  - IPv6 is in the future
  - SLA
  - Private VLANs
- Thomas Lau provided the following topic suggestions.
  - ATM is important.
  - Quality of service.
  - DISA is currently towardmigrating from ATM to MPLS.
  - Cisco and Juniper equipment is used in DISA.
  - Documentation is important.
- Tommy Yoshida
  - Spoke on the training he received since starting the job at DISA.
  - Needed a solid understanding of ATM and of SONET.
  - Especially the different alarms in SONET and how they can be used to locate a fault.

Meeting adjourned at 1:15

Summary of meeting provided by Aaron Tanaka, Technical Coordinator CENT
APPENDIX 2
5 Year Statistics for Employer Feedback for CENT Internship and Cooperative Education Students

### CENT 290v

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APPENDIX 3
Email Notification of Approval of Review Status for NSTISSI 4011 Standard

Subject: 4011 Approved for Honolulu Community College
From: NIETP Office askIACE@nsa.gov
Date: 10/31/2012 8:42 AM
To: sdunan@hawaii.edu

Asst Prof Sally Dunan,

Since you are the IACE POC for Honolulu Community College, you are being notified of the submission review status.

Institution: Honolulu Community College
Submitted by: Ms Lynn Hathaway
Submitted on: 10/31/2012 at 02:42 PM
Standard: NSTISSI 4011
Regarding: Submission Approved

Comments:
You will receive an official certificate, signed by the CNSS Chair, at the 17th Colloquium for Information Systems Security Education (CISSE). The Colloquium will be held June 10-12, 2013 at The Battle House Renaissance Mobile Hotel & Spa in Mobile, Alabama. Information on past colloquiums can be found on the CISSE website at http://www.cisse.info.
Honolulu Community College (4011): There is sufficient evidence that the College has done a thorough job in mapping their courseware justifications with the required CNSS standards and elements. Multiple courses, topics, lectures and labs were utilized to reinforce key principles and concepts. The College provided the necessary references which assisted the reviewers in their validation process. Thank you, that information greatly assists. The courseware provides the students with an introduction of basic networking, telecommunications and information security principles, followed with a more in-depth course on network security. The latter course provides the students access to various network threats and vulnerabilities along with exposure to strategies and methods to minimize those threats. The students in this curriculum are exposed to industry certification, standards and processes such as CCNA, Security+, ISO and CoBIT.

Noticed the Information Technology Services website of the University of Hawaii System provided information for the students on strong password selection, tips and warnings about "phishing scams", setting up and encrypting their windows or mac based systems, along with additional links to external sources such as DHS Stay Safe Online, STOP, THINK. CONNECT, an Anti-Phishing Working Group report such as the latest “Phishing Activity Trends Report – 1st Qtr 2012", Security Tips of the Week and more. It appears to be a great resource with very useful information for the faculty and students who use this system campus-wide.

Nicely Done, Keep up the good work. Congratulations to the College for earning this level of certification and for promoting cybersecurity practices among their students. You will receive an official certificate, signed by the CNSS Chair, at the 17th Colloquium for Information Systems Security Education (CISSE). The Colloquium will be held June 10-12, 2013 at The Battle House Renaissance Mobile Hotel & Spa in Mobile, Alabama. Information on past colloquiums can be found on the CISSE website at http://www.cisse.info.

Attached are:

- A notification letter which you may use until you receive your certificate in June. Your CNSS courseware certification is valid through June 2018. Please keep in mind that this certifies your courseware only. Institutions may [and are encouraged to] issue certificates* to students completing their education and training against the specific CNSS standards.
- The CNSS Logo so you can place it on your website and student certificates

To respond to this message, DO NOT REPLY TO THIS EMAIL. Instead, login to https://www.iad.gov/NIETP website and go to 'IACE Message Center' on the left-side of the page, click the associated message and respond using that form.

Thank you,
IACE PM
Subject: 4012 Approved for Honolulu Community College
From: NIETP Office askIACE@nsa.gov
Date: 10/31/2012 8:45 AM
To: sdunan@hawaii.edu

Asst Prof Sally Dunan,

Since you are the IACE POC for Honolulu Community College, you are being notified of the submission review status.

Institution: Honolulu Community College
Submitted by: Ms Lynn Hathaway
Submitted on: 10/31/2012 at 02:45 PM
Standard: CNSSI 4012
Regarding: Submission Approved

Comments:

a thorough job in mapping their courseware justifications with the required CNSS standards and elements. Similar to the prior 4011 submission, many of the elements were covered in multiple courses, topics or lectures, which help reinforce key concepts. This submission utilized the same courseware, so it would be fair to say that those comments apply equally to this submission. The objectives of the courseware include providing the students the opportunity to learn about defending a network, understanding the Defense-in-Depth perspective, understanding various threats and methods to mitigate those threats and vulnerabilities. There were also supplemental readings on WPA2 configuration, VOIP basics and Best Practices in VOIP, and more. The students also obtain some hands-on experience with software programs such as Ophcrack, Cain & Abel, Wireshark, Nmap, etc. Within the courseware the students are expected to explain, analyze and implement various security practices and tools. There is some very good foundational material within these courses and the College is well positioned to expand on these concepts.

One item to note, although it does not impact this review - The risk management information that I reviewed did not yet have the NIST Risk Management Framework referenced and that would be useful to the students since the U.S. Government and DoD is transitioning and emphasizing this process. The reviewer would recommend that this be considered when updating the curriculum or at least provide the information as a reference resource. http://csrc.nist.gov/groups/SMA/fisma/framework.html

Overall this was a good submission and the curriculum is recommended for approval. Congratulations to the College for achieving this level of recognition for their program.

You will receive an official certificate, signed by the CNSS Chair, at the 17th Colloquium for Information Systems Security Education (CISSE). The Colloquium will be held June 10 - 12, 2013 at The Battle House Renaissance Mobile Hotel & Spa in Mobile, Alabama. Information on past colloquiums can be found on the CISSE website at http://www.cisse.info.

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