New Program Proposal

Advanced Professional Certificate in Information Technology

Kapiʻolani Community College

Date of Proposal: Spring 2010
Proposed Date of Program Implementation: Fall 2010
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1. Objectives of the Program

Kapi`olani Community College (KapCC) proposes to develop an Advanced Professional Certificate (APC) in Information Technology (IT) that will articulate to a Bachelor’s of Applied Science (BAS) with a Concentration in Information Technology at the University of Hawai’i West O’ahu. This program will provide students with career-laddered opportunities in the multifaceted field of Information Technology.

While the University of Hawai’i system provides the state with entry-level workers in the IT field through its many Associate in Science (AS) in IT and Computing, Electronics and Network Technology (CENT) programs, there is a serious shortfall in providing qualified, diversified IT workers with baccalaureate degrees and appropriate hands-on training. By 2012, it is projected the state will need approximately 400 IT workers with baccalaureate degrees while only producing 139 using existing higher education resources (See Section 2 below and Appendix A: State Data).

The proposed APC in IT will provide the 3rd year IT technical training following the Association for Computing Machinery (ACM) guidelines for IT baccalaureate programs. The proposed certificate will build on the existing two-year degree’s foundation in three major IT pillars (programming, networking, and databases infused with elements of the human-computer interaction pillar) by pushing out programming and networking and establishing a strong Web systems pillar, all infused with elements of the human-computer interaction pillar.
Figure 1—From ACM IT Curriculum 2008
(http://www.acm.org//education/curricula/IT2008%20Curriculum.pdf)

The major objectives of this program are:

- To provide additional diversified technical training for Hawaii’s IT workforce
- To add another rung in an educational/career ladder for IT students
  - Certificate of Completion in Database Administration (in place)
  - Certificate of Completion in Programming (in place)
  - Certificate of Completion in Help Desk Services (in place)
  - Certificate of Achievement in Information Technology (in place)
  - Associate of Science in Information Technology (in place)
  - **Advanced Professional Certificate in Information Technology (proposed)**
  - Bachelors of Applied Science with a Concentration in Information Technology (under negotiation)
- To provide an alternative to current theoretical based computer science and hardware based electronics educational programs
2. Relationship of Objectives to Appropriate Functions of the College and University

The proposed APC is consistent with the following campus mission statements: Kapi‘olani Community College

- prepares students to meet rigorous employment and career standards by offering 21st century career programs.
- uses human, physical, technological and financial resources effectively and efficiently to achieve ambitious educational goals.
- builds partnerships within the University and with other educational, governmental, business, and non-profit organizations to support improved learning from preschool through college and lifelong.

Furthermore, this APC is consistent with statements in the College’s Strategic Plan that describe both the current and future directions of the College relevant to the IT program. From the “Functional Statement” on page 2 (emphasis added):

The College offers 21st century career programs in business and information technology, culinary arts, hospitality, legal education, nursing and health sciences, including emergency medical services. The college is developing emerging technology programs in new media arts, exercise and sports science, biotechnology, eBusiness and information technology. New synergies bridging P-12 and college, including educational assisting, teacher preparation, Teaching English as a Second Language, and Service-Learning also hold promise for training tomorrow’s teachers, locally, nationally, and internationally.

The proposed program also aligns with Goal 3 and two specific objectives in the College’s 2007-2015 Strategic Plan:

Goal 3 To Build A Learning, Partnering, and Service Network for Workforce and Economic Development

Relevant Objectives

3. Develop new degree programs (Associate, 3 year, and Baccalaureate) to meet the changing educational needs of our communities.
4. Partner with other UH campuses to plan and develop four year degree programs, with initial emphasis on the health sciences and technology.
From the Action Strategies of Goal 3 detailed further in the document (page 18ff):

Action Strategy for Objective 3:

- *Develop new degrees based on relevant, exemplary models at other institutions.*

Action Strategy for Objective 4:

- *Identify demand for four-year programs in health and technology.*
- *Establish a working relationship with UHM, UHWO, and UH Hilo to explore 2+2 degree partnerships.*

Kapiʻolani’s APC in IT is also in alignment with the University’s strategic outcomes to grow the educational capital of the state. The APC provides a pathway for students in Kapiʻolani’s IT program to expand their IT skill sets, thereby making them more competitive in the labor force, as well as provide a pathway to a Bachelor’s of Applied Science degree at UH West O’ahu. According to data presented in the 2nd Decade Project, East and Ewa O’ahu will have the two largest increases in population in the state, projected at 54,315 and 72,721 respectively through 2020. In addition, each area is identified as having either a very high or high need for post secondary education. Offering the propose APC will address both of these needs. In addition, while the demand for entry-level workers in computer-related jobs would seem to be met through 2012 by graduates of two-year IT programs (projected vacancies=96/projected annual UH graduates=93), there is a serious projected shortfall of graduates in computer-related positions requiring a bachelor’s degree (projected vacancies=395/projected annual UH graduates=139) (Appendix A: State Data). Additionally, the APC and BAS will support the State’s workforce needs as noted by research documents from the University of Hawai’i System (VP for Planning Office) as well as US Bureau of Labor, and Hawai’i Workforce Informer (HIWI). See Section 4 below.

### 3. Organization of the Program

Students who complete either Kapiʻolani’s A.S. in Information Technology degree or a comparable degree at another community college will qualify for entrance to this Advanced Professional Certificate in Information Technology. In addition, industry workers with adequate experience will be able to apply through a process whereby their prior life experiences are assessed for verification of skill attainment for entrance to the APC equivalency (LEAP, Life Experience Assessment Program).
The Advanced professional Certificate curriculum consists of six three-credit courses covering topics that relate to advanced skills and expertise in networking, web development and server administration:

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITS 324 PC &amp; Network Security and Safeguards</td>
<td>3</td>
</tr>
<tr>
<td>ITS 327 Dynamic Hyper Text Markup Language (DHTML)</td>
<td>3</td>
</tr>
<tr>
<td>ITS 328 Advanced Database Programming with VB.Net</td>
<td>3</td>
</tr>
</tbody>
</table>

**Semester Credits** 9

**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITS 344 Small Business Windows Server Administration</td>
<td>3</td>
</tr>
<tr>
<td>ITS 347 Active Server Pages--Web Development</td>
<td>3</td>
</tr>
<tr>
<td>ITS 381 (alpha) Topics in Information Technology</td>
<td>3</td>
</tr>
</tbody>
</table>

**Semester Credits** 9

**Total Credits** 18

**Program Learning Outcomes**

The APC program learning outcomes were developed in collaboration with the IT advisory board and as a result of an examination of the IT Curriculum Guidelines put forth by the ACM (Association of Computing Machinery). Graduates of the proposed program will be able to:

- Design and implement an application in VB.Net that connects to and draws from a contemporary database.
- Design, implement, and schedule reasonable personal computer and network security measures.
- Setup and Administer Windows Computer Server to provide business support services as needed.
- Code Web pages that are interactive, responsive to user input and environmental variables, and provide information and services in an attractive and timely manner.
- Code Web pages whose content and design are determined by database data.
4. Enrollment Projections

The Information Technology field is always changing. New technology after new technology is developed, pushing both the economy and the field of study forward. Unfortunately, most of what is newly developed does not simply supplant that which was. Instead, it adds to it. The new technologies developed are based on older technologies.

Given the existing total credits required for an Associate in Science degree (approximately 60 credits), the options for increasing the skill sets of students are either to add additional credits to the existing AS degree or to create a pathway for further study in the field that would lead to other credentialing (e.g., APC, 3+1, BAS). Option 2 is the more beneficial option for students. By setting their academic goal to a BAS, students not only acquire valuable additional IT skill sets, they also develop an enhanced understanding of the business environment. Kapi’olani’s decision to develop this pathway was informed by the recommendation of the IT advisory Board for additional skills and enhanced business background.

According to the US Bureau of Labor Statistics (See Appendix B: National Data), Computer Systems Analysts, Database and Network Administrators, as well as Computer Programmers, are occupations that 1) require a Bachelor’s degree, 2) have a Very High Median Annual Earning, and 3) are expected to grow between 8,000 to 63,000 positions between 2006 and 2016. This portends well for the IT industry as a whole. Further data from the USBL guide to Software Publishing suggest upwards to a 41% growth in these positions (See Appendix B: National Data).

Statistics from Hawai’i’s own Department of Labor and Industrial Relations (2007) suggest a similar, though less robust, trend here; Computer Systems Analysts and Network and Data System Analysts are both listed as requiring a bachelor’s degree, having high pay ($62K+), and having a strong percentage growth (2–5%). When ranked by growth rate, these positions rank at the very top of careers requiring at least a bachelor’s degree (See Appendix A: State Data). Network Systems and Data Analysts are in fact listed in Hawai’i’s Hot 50 Demand Occupations (See Appendix A: State Data). The Hawai’i Workforce Informer (HI-WI) lists each of these positions as needing a bachelor’s degree and having both very strong growth (8%—46%) and high pay ($53K–$79K).

The APC thus supports the UH community colleges’ goals of graduating more students for high demand, high wage employment.
As noted above, both the Second Decade and government studies have shown the workforce need for IT workers with baccalaureate degrees. The University of Hawai‘i system is already addressing the need for IT workers with AS degrees. At this time, UH offers a number of four-year degree options for Hawai‘i’s students. Honolulu Community College’s CENT program has created a pathway to a baccalaureate at UHWO for its students. However, HCC’s CENT program emphasizes hardware/network more than does KapCC’s program. A second option is provided by Maui College, with its ABIT (Applied Business and Information Technology) Program; however, this program is primarily a business program with a minor emphasis in IT. KapCC’s IT APC will differ from both these existing options. The proposed APC be more software-centric, offering six IT courses of additional advanced content in web applications, programming with database connectivity, and server installation and network security in a business environment. Kapi‘olani’s APC curriculum differs also from a third option, offered by UH Manoa. As is the case with all Kapi‘olani IT courses, the APC IT courses are practical, hands-on education coupled with industry standards, making the knowledge, skills and attitudes acquired more immediately usable in the workforce than either the Management and Information Systems or Information and Computer Sciences programs at the University of Hawai‘i at Manoa, which are more theoretical in nature. Federal workforce studies (See Appendix B: National Data) confirm that IT workers with a broader skill set, including programming, web and database development and administration, and system integration in a business environment will better meet current and future IT workforce needs. In addition, Kapi‘olani’s APC in IT will be an excellent fit for UHWO’s BAS program. Prof. Pai at UHWO is so convinced of this alignment that he has suggested the creation of a third option for IT students seeking a BAS: a hybrid of the HCC and KCC BAS programs, allowing students to take IT classes at either community college to fulfill a third curriculum BAS option.

KapCC’s IT advisory board has been very supportive (See Appendix C: Advisory Board) and student interest in this BAS pathway is very high. Both current and former students are eager to continue their studies in IT. The pathway alignment of the APC and UHWO’s BAS optimizes degree completion. UHWO’s BAS degree will accept all IT credits towards the bachelor’s degree, accelerating the timeline to graduation. In addition, because the UHWO four-year degree is a BAS rather than a BA or BS, students completing this program will have more applied experience. This shortened time to the completion of a baccalaureate degree is a great incentive for IT students. The proposed APC, and pathway to UHWO’s BAS, will save students both time and money in their efforts to further their professional development in information technology.

In a survey of over 700 students that Business Education serviced in 2007, 59 identified themselves as IT majors; 24 of the 59 (41%) stated that their academic goal was to receive a bachelor’s degree. In addition, in a more recent survey of 99 current and recent IT graduates
this August 2009, when asked if they would be interested in pursuing a bachelor’s degree in IT, 76/99 responded affirmatively (58—definitely, 28—possibly). In addition, 91/99 liked the 2+1+1 format proposed (50—definitely, 41—possibly). Students, however, expressed some concerns:

- *The classes would have to be in the afternoon or on the internet. If the classes are offered during these times then I would enroll in the program.*
- *It would be a great way to continue in the UH system for my 4 year degree. I am somewhat concerned that UHWO is so far from KapCC, but I would still be willing to transfer there.*
- *This step would help people not wanting to go in to ICS but want to stay in the computer world while coming out of college with a 4 year degree.*

Initially, the 300-level IT courses will be offered in the evenings and weekends, providing a schedule to accommodate already employed IT workers. Later, the College will study the feasibility of offering some of the courses online. While we cannot change the distance students will need to travel to UHWO to take required courses there, we are in discussions with UHWO to assure many of their required courses are offered online, thereby obviating the commuting issue.

Based on need and perceived interest the College proposes an initial enrollment of 15–20 students per semester. Given the number of students who have expressed interest and could immediately qualify for the program once it starts (70+) and the need as detailed in HI-WI (Hawai’i Workforce Informer) publications (200+), the program is projected to continually reach that enrollment. That, coupled with additional students qualifying over the years and increased need for IT workers in the state (See item #2 above), should sustain the program well into the future.

### 5. Resources Required for Program Implementation

As this program merely pushes out our existing IT AS program, the additional resources required to implement the program are nominal. The College already has the administrative personnel to oversee the program; classrooms, lab, hardware, and software resources are available to deliver the courses.

**Faculty:** Existing faculty are available to teach the courses required for the APC. Because the program emphasizes “hands-on” learning, people currently using the technology will be invited
to teach courses whenever possible, convenient, and appropriate. In either case, the minimal additional human resource cost is the same.

**Physical Resources:** The College has obtained a US Department of Education Title III Renovation grant ($890,000) starting in October 2010, which will transform the Business Education computer lab into a state-of-the-art Business/Computing Resource Learning Center. This renovated learning space will provide IT, Accounting and Marketing students with improved access to faculty, academic advisors, community partners, and technology resources. In addition, it will create a sense of place for students looking to join the local business community (Some preliminary drawings are included in Appendix D: Renovation Sketches).

The scheduling of five additional IT courses into the College’s existing and projected physical resources will not impact current offerings as the APC courses will be scheduled in late afternoon, evening, and weekends, when classrooms are available. The program courses will also be offered in online modalities to accommodate students already in the workforce. These times and modalities will not interfere with existing Business Education courses.

**6. Measures of Program Efficiency**

The template below details the projected program costs.

In the first semester, only two of the 300-level courses will be offered to monitor the implementation of the program and to optimize student success. In subsequent semesters, three courses will be offered each semester, thereby allowing students to complete the certificate in one year. Thus **personnel costs** will cover salary for a .40 FTE faculty member in the first year and .60 FTE in the second, drawn from existing Business Education faculty. The standard UHCC **tuition** rate will be applied to APC courses. Projections show that enrollments of approximately 20 students are possible, and this number of students paying current and projected UH community college tuition rates will cover the direct costs of instruction. In addition, Honolulu Community College currently charges community college tuition for its APC in CENT. Charging a higher per credit tuition fee would create an inequity in the UHCC system.
7. Measures of Program Effectiveness

All programs at Kapi‘olani Community College are subject to annual program reviews, which include an analysis of data on program demand, efficiency, and effectiveness. All programs and certificates also complete three-year comprehensive program reviews, which, in addition to three years of annual program data, also include an assessment of program learning outcomes. Program effectiveness will be measured by data points such as course completion rates, number of certificate completers, the placement of graduates into industry positions, the performance of graduates in related industry positions and the persistence of graduates in
related industry positions. In addition, APC program learning outcomes will be assessed on a semester-by-semester rotational basis. That is, selected outcomes will be assessed each semester so that at the conclusion of three years, all PLO will be assessed as part of the College’s established comprehensive program review cycle.

Appendixes

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Appendix B: National Data
Appendix C: Advisory Board
Appendix D: Renovation Sketches
Appendix E: Authorization to Plan (ATP)
Appendix F: MOA with UHWO (Draft)