

## PROGRAM REVIEW Fall 2017

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**Program:** Computer Studies (CIS/CNT/CS)

**Division:** CATSS

**Date:** 10/4/2017

**Writer(s):** Bill Komanetsky, Colin Schatz, Debbie Fields, Don Hester, LaVaughn Hart, Moh Daoud

**SLO/SAO Point-Person:** LaVaughn Hart

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**Audience:** Deans, Vice Presidents of Student Services and Academic Services, All Planning and Allocation Committees. This document will be available to the public.

**Uses:** This Program Review will be used to inform the campus and community about your program. It will also be used in the processes of creating Division Summaries, determining College Planning Priorities and allocating resources. A final use is to document fulfillment of accreditation requirements.

**Time Frame:** This Program Review should reflect on program status during the 2016-17 academic year. It should describe plans starting now and continuing through 2017-18. This document also provides the opportunity to describe more long-term plans (optional).

**Sections:** The first section of this Program Review focuses on general program reflection and planning. The second section is a review of curriculum. Only programs with curriculum need to complete Section 2. The third section is a CTE update, to be completed by CTE programs only.

**Topics:** A list of topics of particular interest to Program Review readers can be found here:

<https://goo.gl/23jrxt>

**Help:** Contact Karin Spirm: [kspirm@laspositascollege.edu](mailto:kspirm@laspositascollege.edu)

### **Instructions:**

- 1) Please respond to each question as completely as possible.
- 2) If the requested information does not apply to your program, write "Not Applicable."
- 3) Optional: Meet with your dean to review this document before October 13.
- 4) Send an electronic copy of this form to Karin Spirm and your Dean by October 16

### **Links:**

Program Review Home Page: <https://goo.gl/XATqjJ>

Fall 2016 Program Review Updates : <https://goo.gl/YV8QOt>

Frequently Asked Questions: <https://goo.gl/ilhRtt>

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## Section One: Program Snapshot

### A. Data Review: Describe any significant changes to your program’s data since last year’s Program Review Update (Fall 2016).

Possible sources of relevant information might include, but are not limited to, the following:

- Data generated by your program
- Data from the Office of Institutional Research (<https://goo.gl/WuR9cQ>)
- CEMC Data
- Labor Market Data
- SLO/SAO Data

- The Computer Studies disciplines engaged in a significant effort to update discipline curriculum during 2016/17. In total, the outlines for 18 courses were updated and 3 new courses were developed. Additionally, a significant number of courses were deactivated.
- Enrollments in CIS have been fluctuating over the last several semester. Course completion and success rates are trending up over the last several semester. The program is in the process of updating curriculum including course outlines, degrees, and certificates to clarify pathways for students.
- Enrollments in CNT courses is returning as the program continues to update curriculum and streamline offerings.
- Enrollment in CS have been constantly increasing over the past years.

### B. Changes to Program and Needs: Describe any significant changes to your program or your program’s needs since the previous Program Review Update (Fall 2016).

<ul style="list-style-type: none"> <li>● With two Computer Studies faculty out on leaves for the fall semester, the program faced significant staffing challenges. Fortunately, we were able to hire a Sabbatical Leave replacement for fall. In addition, we recruited and hired two new CS Part-time Faculty members.</li> <li>● We have an new Full-time CNT faculty member who started Fall 2016.</li> <li>● We have been asked to hold a Computer Science course at a local high school. This may provide opportunities for increasing the connection between the local high school (Dublin) and our program. However, there are staffing and equipment/software challenges that will need to be addressed.</li> <li>● The computer repair workshop has been re-arranged but needs more working space and benches. Workbenches could be used for other CS, CIS, and CNT classes.</li> <li>● Rooms 804, 805, and the back office have been cleaned. The floors have been scraped and rewaxed. The computers and cables have been removed from the floor, where students would inadvertently kick and disconnect the equipment. Still, the rooms are shared with non-information technology classes, and we have a shortage of rooms with computers.</li> </ul>	Mark an X next to each area that is addressed in your response.	
	Definitions of terms: <a href="https://goo.gl/23jrxt">https://goo.gl/23jrxt</a>	
	x	Community Partnerships/Outreach
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<ul style="list-style-type: none"> <li>The CyberPatriots program continues to grow. Throughout the year, competition and competition prep days were held in the 803 computer lab on Saturdays for local high school teams. Faculty worked with high school instructors from several local districts to prepare teams for state competitions. Curriculum is being developed so that students will be able to earn credit for participation in the CyberPatriots program.</li> </ul>	Technology Use
	*Curriculum will also be addressed in Part 2 (Curriculum Review).
	**Facilities will also be addressed in Question H.

**C. Reflection: What plans from the [2016 Program Review Update](#) or any [previous Program Reviews/Updates](#) have been achieved and how?**

<p>Continue to outreach to the local business community, particularly Sandia and LLNL in the area of cybersecurity.</p> <ul style="list-style-type: none"> <li>Reactivated the Computer Studies Advisory Board. First meeting held in Spring 17. Representatives from LLNL, Sandia, several local business, and high schools attended. Discussion continues on ways to engage industry partners more.</li> </ul> <p>Work with the WBL Specialists to increase internship opportunities for students and to promote our programs to local businesses.</p> <ul style="list-style-type: none"> <li>Worked with WBL Specialist on updating Computer Studies web pages. Anticipating updated pages to be in place by end of Fall 18 semester.</li> </ul> <p>Increase the use of robotic technologies to enhance the learning environment in CS courses based on responses and SLO outcomes from the 2015/2016 academic year</p> <ul style="list-style-type: none"> <li>Educating the student in the use of program loops, the cornerstone of any computer program, has become much easier with the use of robotic technologies. These devices make programming a physical experience instead of just a conceptual one.</li> <li>Program Loop SLO measurements have increased to 90%+ using robotic technologies</li> </ul> <p>Increase the use of portable storage to enhance students' education in multiple operating systems in both the CS and CNT disciplines.</p> <ul style="list-style-type: none"> <li>Purchased 60 external hard drives (SWF)</li> <li>Purchased 15 computer systems for use by CNT student to disassemble and assemble as part of CNT 51 class and also All Academy Day held for the first time at LPC last fall.</li> </ul> <p>Complete the updating for CNT curriculum particularly in the area of cybersecurity. Address the needs of the CNT program for updated equipment (particular Cisco equipment).</p> <ul style="list-style-type: none"> <li>Updated CNT curriculum including CNT 68 Digital Forensics Fundamentals.</li> <li>Hosted the Software/Information Technology FDRG workshop on development of model curriculum for a Software Development/Information Technology degree. Also discussed model curriculum for Cyber</li> </ul>	Mark an X next to each area that is addressed in your response.
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<p>Security model curriculum and Network module curriculum.</p> <ul style="list-style-type: none"> <li>• Needed equipment for the Cisco program and CNT program in general was requested and received through SWF funding.</li> </ul> <p>Develop the CyberPatriots program and explore similar programs for students over 18. Develop curriculum that supports these programs. Develop CyberPatriots brochure and outreach materials.</p> <ul style="list-style-type: none"> <li>• Curriculum developed for CyberPatriots course.</li> </ul> <p>Revised CIS degrees and certificates. Review CIS curriculum and update as needed.</p> <ul style="list-style-type: none"> <li>• 12 CIS course outlines were updated.</li> <li>• Discussions regarding changes to degrees and certificates were held. This work continues with the goal having all degrees/certificates updated in 2017/18.</li> </ul> <p>Begin transitioning courses from Blackboard to Canvas with the goal of having all courses in Canvas by the end of Spring 2018.</p> <ul style="list-style-type: none"> <li>• Computer Studies classes have been (or are being) converted from Blackboard to Canvas.</li> </ul> <p>Revise SLO/PLOs to conform to latest definitions from the SLO Committee</p> <ul style="list-style-type: none"> <li>• SLOs for a significant number of courses were updated last year. This process continues.</li> <li>• Program SLOs were also updated for a number of programs in the Computer Studies disciplines. With the changes in degrees and certificates that will take place in 17/18, there will be a need for review of the program level SLOs again.</li> </ul> <p>Actively engage in campus/district discussions and planning on the Strong Workforce Development initiative.</p> <ul style="list-style-type: none"> <li>• Faculty from the Computer Studies disciplines have been actively engaged with the Strong Workforce Development planning process. We have submitted requests for equipment and funding for training, which have been accepted. As noted above, equipment for the CISCO and CNT program was received from SWF.</li> </ul> <p>Research possible opportunities for non-credit/dual enrollment/adult ed in the CIS and CNT areas.</p> <ul style="list-style-type: none"> <li>• CIS faculty have been engaged in the discussion of the development of non-credit courses particularly in the area of CyberPatriots but also potentially in the development of non-credit courses for some of the entry skills-based courses currently offered in CIS. However, until such time as agreement regarding how non-credit courses will be compensated and other working conditions have been resolved, work in this area is on hold.</li> </ul>	
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**D. Impacts to Students (Optional): Discuss at least one example of how students have been impacted by the work of your program since the last Program Review Update (only if you did not already answer this in Questions A, B or C).**

<p>The enrollment has increased in the CIS/CNT/CS areas, while maintaining the previous resources; staffing and facilities. The instructors are able to accommodate larger classes with the same equipment and working space. No adverse impact noticed on student retention or participation.</p>	<p>Mark an X next to each area that is addressed in your response.</p>																												
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**E. Obstacles: What obstacles has your program faced in achieving plans and goals?**

<ul style="list-style-type: none"> <li>Over the last two years, we have experienced increasing issues with IT support for our labs. This includes repeated requests for specific software/hardware to be installed, issues with non-functional equipment, and issues with the installation of software. These issues are impacting students' ability to perform work during class time and also to complete lab assignments.</li> <li>The program continues to struggle with a shortage of computer lab space. At this point, it is very difficult to add classes to meet student demand as lab space is extremely limited at core times. With both the CS and CNT programs growing, and CIS holding steady, this shortage of lab space will becoming a limiting factor on the number of classes that we can add to meet student need.</li> </ul>	<p>Mark an X next to each area that is addressed in your response.</p>												
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<ul style="list-style-type: none"> <li>We continue to face issues with other disciplines needing lab space and wanting to use our labs. The 1 hour labs that several disciplines have added to their curriculum are often scheduled in the middle of a block of time effectively eliminating the use of the lab for our courses, which are typically 3 hours or more in length. While we work with the scheduler to accommodate these non-Computer Studies labs, this will continue to be an issue until more labs become available.</li> <li>In the Computer Studies fields, the need for constant upgrading for skills and retraining adds to the time commitment needed to be effective in our jobs. This requires significant additional time commitments by faculty. Some CNT classes require faculty to have specific industry certifications, which require time and funding—both of which in short supply.</li> <li>Several of our long-time CIS Part-time faculty are planning to retire over the next 3-12 months. Finding replacements will be challenging.</li> <li>While we have hired two new Part-time faculty members for CS, we will continue to need additional Part-time faculty for this program as we add more classes. Finding qualified, available, and skilled Part-time faculty for this program is always challenging.</li> <li>Each discipline in the Computer Studies area has only two faculty members, who are responsible for the curriculum updates, program updates, equipment requests, etc. There simply isn't enough time to complete all this work plus the additional requirements that have been added, e.g., yearly program review, constant SLOs/PLOs tracking/updating/reporting, etc.</li> </ul>	x	Human Resources
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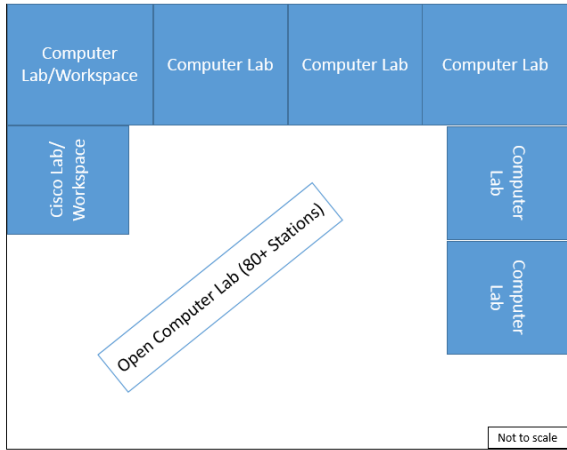
**F. Short Term Planning: What are your most important plans (either new or continuing) for next year?**

<ul style="list-style-type: none"> <li>Review/revision of existing degrees and certificates in all Computer Studies disciplines needs to be completed during the 17/18 academic year. The disciplines have been working on this for the last two years, updating courses, deactivating courses, etc. With the majority of our courses updated, we can now concentrate on our degrees and certificates.</li> <li>Determine whether career certificates should be converted to Certificates of Achievement so that we can get "credit" from the state for our completers.</li> <li>Continue to update course offerings to keep up with new industry demands.</li> <li>Work with IT to address software/hardware issues in our labs.</li> <li>Work with the Business discipline to develop a Data Analytics program. (SWF)</li> </ul>	Mark an X next to each area that is addressed in your response.	
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<ul style="list-style-type: none"> <li>Continue with the development of CyberPatriots program (credit and possibly non-credit).</li> <li>Continue to outreach to the local business community and the labs to increase participation in advisory board and to ensure that our programs address the workplace training needs of our local community.</li> <li>Finalize updates to Computer Studies web page to accurately reflect our programs and provide information to our current student and to potential students.</li> <li>The Cisco/Networking Lab has been renovated, but needs a larger space and more equipment to accommodate the larger student enrollment.</li> </ul>		<a href="https://goo.gl/LU99m1">https://goo.gl/LU99m1</a>
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**G. Long Term Planning (Optional): Please detail any long-term plans for the next 3-5 years. (Only if you have significant plans, such as implementation of a grant project, creation of long-term initiatives including those using restricted funds such as Equity or SSSP, construction and outfitting of a new building).**

<p>As new buildings are constructed, the Computer Studies disciplines would like a new Computer Studies area that would provide a space for labs for all of the programs as well as a large open lab for Computer Studies students and students from all other disciplines to work on assignments and develop their computer skills. This new area would replace the large open computer lab in room 803 as well as 804, 805, 714, and 2416. In addition, a computer workroom would be created to support the A+ program and working Cisco lab would be created.</p> <p>Currently our computer labs are spread across the campus. Our goal is to consolidate all the labs (plus 1-2 new labs) into one space. The space would also have a large open computer lab area similar to the 803 computer lab, which provides computer access for all Computer Studies students as well as students from all other disciplines. We envision a large open lab area with labs located around the perimeter. One possible configuration is shown below.</p> 	Mark an X next to each area that is addressed in your response.	
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<p>Ideally, offices for Computer Studies faculty would be located near the new Computer Studies Lab to facilitate greater interaction between Computer Studies faculty and increased accessibility for our students. Also, we would like to display area for computer equipment from a historical perspective.</p> <p>CNT classes need to have a separate network for student labs that will not interfere with campus network. Like a sandbox environment.</p>	
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**H. Do you have any facilities needs that are currently unmet? If yes, please describe.**

- See G. Long Term Planning for description of needed facilities
- The program continues to struggle with a shortage of computer lab space. At this point, it is very difficult to add classes to meet student demand as lab space is extremely limited at core times. With both the CS and CNT programs growing, and CIS holding steady, this shortage of lab space will become a limiting factor on the number of classes that we can add to meet student need.
- Cisco Lab should be modernized.
- PC Repair lab should be larger. Currently we can only host 25% of the class at a time in the current area.

**I. Mission: Explain how your program’s plans and accomplishments support the mission of Las Positas College:**

*Las Positas College is an inclusive learning-centered institution providing educational opportunities and support for completion of students’ transfer, degree, basic skills, career-technical, and retraining goals.*

Courses in the Computer Studies disciplines provide educational opportunities for students to transfer to 4-year institutions, complete local degrees and certifications, address the career goals and retraining needs, and obtain computer skills at all levels from basic keyboarding to advanced networking, programming, system analysis, and database design and administration. Our programs are open to all students and we seek to address the learning needs of all the students who take our classes.

**J. Program-Set Standard (Instructional Programs Only): Did your program meet its program-set standard for successful course completion? yes no**

(This data can be found here: <https://goo.gl/b59nCy>)

**If your program did not meet your program-set standard, discuss possible reasons and how this may affect program planning or resource requests.**



**K. SLO/SAO Reflection: Describe an example of how your program used course SLO data (CSLOs), Student Service Area Outcome (SAO) data or Program SLO data (PSLOs) from last year (2016-17) to impact student learning or achievement. Focus on PSLOs or CSLOs where you have multiple semesters of data to analyze. (Copy the box below if you would like to discuss multiple examples.)**

Course Name, Program Name or Student Service Area: CS1
Text of the CSLO, SAO, or PSLO: Demonstrate understanding of fundamental syntax and control structures - including variables, arithmetic statements, if statements and loops
Describe the quantitative or qualitative results: Increase in the student success rate using for and while loops when programming robotic devices. Measurements have shown an increase from the lower 80 to mid 90 percentile
Discuss and reflect upon student achievement for this CSLO/PSLO/SAO. Discuss any actions taken so far (and results, if known) and your action plan for the future:  By adding the use of robotic technologies, learning the for and while loop control structures within a C/C++ program has become more fun than tedious. Students find the interaction with a device much more satisfying than learning these concepts in the virtual environment of the computer screen
What changes in student achievement are evident across the semesters you analyzed? What are some possible explanations for these changes in student achievement?  The 2015-2016 beginning use of robotics in the course showed a smaller increase in student performance than the 2016-2017 academic year. Reasons for the increase in student performance is because of the repeated use of robotic devices and repetitive exercises instead of the single exposure in 2015.

**L. Plans for Analysis of SLO/SAO Data: Identify the PSLOs, CSLOs, or SAOs that your program plans on focusing on the upcoming year with subsequent analysis. (Copy the box below as needed.)**

Circle One: <b><u>CSLO</u></b> PSLO   SAO
Course, Program Name, or Student Service Area: CS2
Text of CSLO/PSLO/SAO: Create and use overloaded functions and operators in C++, including friend functions.
If you plan on analyzing a PSLO, identify the CSLOs that feed into the PSLO that will need to be assessed.

**Section Two: Curriculum Review  
(Programs with Courses Only)**

The following questions ask you to review your program’s curriculum. To see the last outline revision date and revision due date:

1. Log in to CurricUNET
2. Select “Course Outline Report” under "Reports/Interfaces"
3. Select the report as an Excel file or as HTML

**Curriculum Updates**

**A. Title V Updates: Are any of your courses requiring an update to stay within the 5 year cycle? List courses needing updates below.**

Yes	CIS 46 (in process) CIS 55B (in process) CIS 71A (in process) CIS 71B (in process) CIS 71C (in process) CIS 72A (in process) CIS 72B (in process) CIS 73A (in process) CIS 75 (in process) CIS 9010 (to be deactivated) CIS 9101 (to be deactivated) CIS 9102 (to be deactivated) CIS 9103 (to be deactivated) CIS 9103 (to be deactivated)	CNT 72 (in process) CNT 7501 (in process) CNT 7502	CS 32 (being deactivated) CS 36 (being deactivated) CS 37 (being deactivated) CS 44 (being deactivated) CS 45 CS 46 (in process)
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**B. Degree/Certificate Updates: Are any degrees/certificates requiring an update to do changes to courses (title, units) or addition/deactivation of courses? List needed changes below.**

Yes. We are currently in the process of updating all of our degrees and certificates due to the significant number of courses that have been updated or in the process of being updated.

**C. DE Courses/Degrees/Certificates: Detail your department’s plans, if any, for adding DE courses, degrees, and/or certificates. For new DE degrees and/or certificates (those offered completely online), please include a brief rationale as to why the degree/certificate will be offered online.**

The majority of CIS and CNT courses are already approved for DE and/or Hybrid deliver. CS continues to review their curriculum for possible DE/Hybrid delivery as appropriate. We currently have no plans to create degrees/certificates that can only be completed via DE.

### Section Three: CTE Updates (CTE Programs Only)

**A. Labor Market Conditions: Examine your most recent labor market data. Does your program continue to meet a documented labor market demand? Does this program not represent unnecessary duplication of other training programs in the college's service area? (Please note: your labor market data should be current within two years. Contact [Vicki Shipman](#) or the current CTE Project Manager for access to data).**

**TOP Codes:** 070810 - Cisco Network Associate; 070210 - Computer Applications Software (Microcomputers); 070200 - Computer Information Systems; 070200 - Computer Information Technologist; 070810 - Computer Networking Technology: Network Security & Admin; 070710 - Computer Programming ; 070710 - Computer Programming for the Web; 070600 - Computer Science; 070100 - Liberal arts and Sciences: Computer Studies.

**SOC Codes:** 113021 - Computer and Information Systems Managers; 151111 - Computer and Information Research Scientists; 151111 - Computer and Information Research Scientists; 151121 - Computer Systems Analysts; 151122 - Information Security Analysts; 151131 - Computer Programmers; 151132 - Software Developers, Applications; 151133 - Software Developers, Systems Software; 151141 - Database Administrators; 151142 - Network and Computer Systems Administrators; 151143 - Computer Network Architects; 151143 - Computer Network Architects; 151199 - Computer Occupations, All Other; 439021 - Data Entry Keyers.

The Centers of Excellence Community College Consortia (COECCC) data projects **13,748 annual job openings** between 2015-2018. The COECCC data reports a total of **1,181 Computer Studies Program completers per year** from 2012 to 2016, **yielding a demand of 12,567 openings per year of the combined occupations** (SOC Codes). Geographic area: SF Bay Area Counties.

(Source: Data compiled by and used with the permission of the Centers of Excellence Community College Consortia. More information available at [www.COECCC.net](http://www.COECCC.net).)

**B. Advisory Boards: Has your program complied with advisory board recommendations? If not, please explain.**

The Computer Studies Advisory Board met on April 24, 2017. This is the first meeting of the advisory board in a number of years. The meeting included representatives from local businesses including Sandia and Lawrence Livermore National Labs, high school instructors, and LPC faculty.

While there were no specific recommendations from the advisory board, some key ideas did emerged:

- Employers see issues with soft skills with new employees—discussion of ways to address in our curriculum.
- Employer assume that new employees have basic/intermediate skills with office applications, however, they find this is an issue—discussion on ways to better inform students of the need for these skills (we have the curriculum in place but students may not realize the value of these skills)
- Increasing need for data security, particularly cyber security skills—LPC is updating curriculum in this area including CyberPatriots program.

**C. Strong Workforce Program Metrics: Utilizing LaunchBoard, review the Strong Workforce Program Metrics. Review the data and then answer the following questions.**

(Contact [Vicki Shipman](#) or the current CTE Project Manager for help accessing the data).

C1. Does your program meet or exceed the regional and state medians **for increased enrollments, completions, and/or transfer since your last program review**? If not, what program improvements may be made to increase this metric?

**Base Year: 2015-2016**

**Enrollments:** LPC 4,551; EastBay 4,784; Entire Bay Area 4,060; State 4,882. LPC's enrollments exceed the Entire Bay Area however not the EastBay and State. To increase enrollments, all Computer Studies programs are updating courses, degrees, and certificates to clarify pathways. In addition, the Computer Studies department has taken steps promote our programs by engaging with our local high schools in a number of ways including:

- Offering Computer Science classes at Dublin High School
- Hosting CyberPatriot teams from local high schools for competition prep and competition events
- Hosting an All Academy day for local high schools to participate in a day of computer networking/CyberPatriots competitions
- Attending career day events at local high schools

**Completions:** LPC 100; EastBay 110; Entire Bay Area 117; State 151. LPC's completions do not exceed the EastBay, Entire Bay Area and State. To increase completions, faculty will encourage students to complete paperwork to earn their certification/degree; faculty will encourage Student Services to effectively implement DegreeWorks; and complete the updating of our certificates and degrees so that students will be able to complete degrees and certificates in a timely manner.

**Transfers:** LPC 166; EastBay 112; Entire Bay Area 109; State 117. LPC's transfer rates exceed the EastBay, Entire Bay Area, and State.

C2. Does your program meet or exceed the regional and state medians **for students gaining employment in their field of study**? If not, what program improvements may be made to increase this metric?

Data is not available via Launchboard at this time.

C3. Does your program meet or exceed the regional and state medians **for student employment rates after leaving the college**? If not, what program improvements may be made to increase this metric?

**Base Year: 2014-2015**

**Students Employed in the Fourth Fiscal Quarter:** LPC 68; EastBay 63; Entire Bay Area 62; State 61. LPC's employment rates exceed the EastBay, Entire Bay Area, and State.

C4. Does your program meet or exceed the regional and state medians **for increased student earnings and median change in earnings**? If not, what program improvements may be made to increase this metric?

**Base Year: 2014-2015**

**Increased Earnings:** LPC \$7,808; EastBay \$7,588; Entire Bay Area \$7,808; State \$6,602. LPC's increase in student earnings exceeds or meets the EastBay, Entire Bay Area and State metrics.

**Median Change in Earnings:** LPC 30%; EastBay 41%; Entire Bay Area 33%; State 36%. LPC's median change in students' earnings do not exceed or meet the EastBay, Entire Bay Area, and State. Program improvements that may be made including recruiting higher paying employers for the LPC student population.