Annual Instructional Program Review Template for 2011-2012

Introduction to The Program Review Process for Instructional Programs

Program Review at Foothill College

Purpose

An effective program review supports continuous quality improvement to enhance student learning outcomes and, ultimately, increase student achievement rates. Program review aims to be a sustainable process that reviews, discusses, and analyzes current practices. The purpose is to encourage program reflection, and to ensure that program planning is related to goals at the institutional and course levels.

Process

Foothill College academic programs that lead to an A.A./A.S. or Certificate(s), or are part of a specialized pathway, such as ESL, Developmental English, Math My Way are reviewed annually using this template, with an in-depth review occurring on a three-year cycle. The specialized pathways may be included as part of the program review for the department, or may be done as a separate document if they are not part of a department that offers a degree or certificate. Faculty and staff in contributing departments will participate in the process. Deans provide feedback upon completion of the template and will forward the program review on to the next stage of the process, including prioritization at the Vice Presidential level, and at OPC and PaRC.

Annual review will address five core areas, and include a place for comments for the faculty and the dean or director.

1. Data and trend analysis
2. Outcomes assessment
3. Program goals and rationale
4. Program resources and support
5. Program strengths/opportunities for improvement
6. Administrator's comments/reflection/next steps

Foothill College Program Review Cycle:

2011-2012 All academic programs participate in an annual program review

2012-2013 1/3 of academic programs participate in comprehensive review, remaining 2/3 of programs update their annual program review

Contact: Office of Instruction and Institutional Research, 650-949-7240

Instructions: Complete this template with data on any degree, certificate, or pathway your department offers. Return the completed form to your Dean on the last day of Fall quarter.

Website: http://foothill.edu/staff/irs/programplans/index.php

2011-2012 Submission Deadline:

All program review documents are due to Deans by December 16

Basic Program Information

Department Name: Computer Science

Program Mission(s): The computer science department was conceived in recognition of the fact that a BS degree is a minimum requirement for most of the jobs in the computing industry (as noted by almost any study over the past 10 years). This makes the transfer component of the CS curriculum of paramount importance. Before 2007, certificates - even without a Bachelor degree - had real value in the lively job market. This is no longer the case, and so Foothill computer science education now emphasizes the transfer student as the centerpiece of the program.

Despite this recognition, we cannot abandon professional development students, as they constitute a large percentage of our classroom seats. The Enterprise Networking program in particular has had great success in preparing students for entry level positions in information technology as well as getting people retrained for specific jobs in the local workforce. Many of these mature students already have BS or BA degrees and all of them add to the quality of the experience for the less experienced student. Therefore, we intend to continue to make the transfer courses relevant to this sector as well. In addition, as resources stabilize and advisory data comes in, we must grow new programs, or revive new versions of retired programs, designed for the non-transfer student.

Program review team:

Name	Department	Position
Elaine Haight	CS	Faculty
Michael Loceff	CS	Faculty
Mike Murphy	CS	Faculty

Programs* covered by this review

Program Name	Program Type (A.S., C.A., Pathway, etc.)	Units**
Computer Science	AS	90
(we are in the process of getting state approval for the AS in CS)		
Enterprise Networking	AS	90

*If you have a supporting program or pathway in your area for which you will be making resource requests, please analyze it within this program review. For example, ESLL, Math My Way, etc. You will only need to address those data elements that apply.

**Certificates of 27 or more units must be state approved. If you have certificates that are 27 or more units that are not state approved, please indicate your progress on gaining state approval, with the tentative timeline for approval, or your plan for phasing out the certificate.

Section 1. Data and Trend Analysis

NOTE: Since computer science is a new program (as of Fall 2012), we have no historical data to analyze.

1.1. Program Data will be posted on: http://foothill.edu/staff/irs/programplans/programreviewdata.php for all measures except non-transcriptable completion. Please attach all applicable data sheets to the final Program Review document submitted to your Dean. You may use the boxes below to manually copy data if desired.

Transcriptable Program	2008-2009	2009-2010	2010-2011	% Change
N/A				

Please provide any non-transcriptable completion data you have available.

Non-Transcriptable Program	2008-2009	2009-2010	2010-2011	% Change
N/A				

1.2 Department Data

Dimension	2008-2009	2009-2010	2010-2011	% Change
Enrollment				
Productivity (Goal: 546)				
Success				
Full-time FTEF				
Part-time FTEF				
Full-time Staff				
Part-time Staff				

Department Course Data

	2008-2009			2009-2010			2010-2011		
Course	Enroll.	Prod.	Success	Enroll.	Prod.	Success	Enroll.	Prod.	Success
Ex. ART 1									
Ex. ART 2									

1.3 Using the data and prompts, provide a short narrative analysis of the following indicators.

1. Enrollment trends over the last three years: Is the enrollment in your program holding steady, or is there a noticeable increase or decline? Please comment on the data and analyze the trends.
2. Completion Rates (Has the number of degrees/certificates held steady, or increased or declined in the last three years? Please comment on the data and analyze the trends.
    a. AA, AS, transcriptable certificates
    b. Local, non-State approved certificates
    c. Certificates less than 27 units: All certificates less than 27 units should be reviewed carefully to determine if the certificate provides a tangible occupational benefit to the student, such as a job or promotion or higher salary, and documentation should be attached.
3. Productivity: The college productivity goal is 546. (Please analyze the productivity trends in your program and explain factors that affect your productivity, i.e. GE students, size restrictions)
4. Course Offerings (Comment on the frequency, variety, demand, pre-requisites.) Review the enrollment trends by course. Are there particular courses that are not getting the enrollment or are regularly cancelled due to low enrollment?)
5. Curriculum and SLOs
    a. Comment on the currency of your curriculum, i.e. are all CORs reviewed for Title 5 compliance at least every three years and do all prerequisites, co-requisites and advisories undergo content review at that time? If not, what is your action plan for bringing your curriculum into compliance?
    b. Comment on program mapping and how it ties to the college Mission(s).
    c. Identify any other programs with which your program has overlap, and comment on the purpose of the overlap.
    d. Comment on any recent developments in your discipline which might require modification of existing curriculum and/or the development of new curriculum?
    e. Do all of the courses in your program have SLOs identified? Do all programs have program-level student learning outcomes? If not, what is your plan for completing these?
6. Basic Skills Programs (Please describe your Program's connection to this core mission, if applicable):
7. Transfer Programs: Articulation (Please describe your Program's connection to this core mission, if applicable)
8. CTE Programs: Labor/Industry Alignment (Please describe your Program's connection to this core mission, if applicable)

Section 2. Learning Outcomes Assessment Summary

NOTE: Since computer science is a new program (as of Fall 2012), we have no assessments to summarize.

2.1. Attach 2010-2011 Program Level – Four Column Report for PL-SLO Assessment from TracDat, please contact the Office of Instruction to assist you with this step if needed.

(In Progress)

2.2 Attach 2010-2011 Course-Level – Four Column Report for CL-SLO Assessment from TracDat

(See Attachment)

Section 2 Continued: SLO Assessment and Reflection

2.3 Please provide observations and reflection below.

2.3.a Course-Level SLO

What findings can be gathered from the Course Level Assessments?

What curricular changes or review do the data suggest in order for students to be more successful in completing the program?

How well do the CL-SLOs reflect the knowledge, skills, and abilities students need in order to succeed in this program?

How has assessment of course-level student learning outcomes led to improvement in student learning in the program?

2.3.b Program-Level SLO

What summative findings can be gathered from the Program Level Assessments?

How has assessment of program-level student learning outcomes led to certificate/degree program improvements?

2.4 Annual Action Plan and Summary: Using the information above, list the program's action steps, the related Core Mission objective, SLO assessment data and the expected impact on student success.

Action Step	Related SLO assessment (Note applicable data)	Related ESMP Core Mission Goals (Basic Skills, Transfer, Work Force, Stewardship of Resources)	How will this action improve student learning/success?
1			
2			
3			

Section 3: Program Goals and Rationale

Program goals should be broad issues and concerns that incorporate some sort of measurable action and should connect to Foothill's core missions, Educational & Strategic Master Plan (ESMP), the division plan, and SLOs.

3.1 Program relation to college mission/core missions

Prepare students for transfer to university with a CS major. Prepare students to enter into the ICT workforce. Prepare students to be promoted in the ICT workforce.

3.2 Previous Program Goals from last academic year

Goal	Original Timeline	Actions Taken	Status/Modifications
1 N/A			
2			
3			

3.3 New Goals: Goals can be multi-year

Goal	Timeline (long/short-term)	Supporting Action Steps from section 2.4 (if applicable)	How will this goal improve student success or respond to other key college initiatives
1 Transfer students as juniors into programs that award a bachelors degree in computer science and Networking	2 years		
2 Enable workers to develop professionally in their careers.	1 year		
3 Train students for new technician level jobs	1 year		

Section 4: Program Resources and Support

4.1 Using the tables below, summarize your program's resource requests.

Full Time Faculty and/or Staff Positions

Position	$ Amount	Related Goal from Table in section 3.3	Possible funding sources (Lottery, Measure C, Basic Skills, Perkins, etc.)
N/A			

Reassigned Time

Position	$ Amount	Related Goal from Table in section 3.3	Possible funding sources (Lottery, Measure C, Basic Skills, Perkins, etc.)
N/A			

B Budget Augmentation

B Budget FOAP	$ Amount	Related Goal from Table in section 3.3	Possible funding sources (Lottery, Measure C, Basic Skills, Perkins, etc.)
Teaching assistance	10,000	Goal 1	

Facilities and Equipment

Facilities/Equipment Description	$ Amount	Related Goal from Table in section 3.3	Possible funding sources (Lottery, Measure C, Basic Skills, Perkins, etc.)
Room 4211 lab for mobile computing	15,000	Goals 2, 3	Grants and Measure C
Student Open Education Resources repository	5,000	Goals 1, 2, 3	Lottery, Perkins
Refresh of Cisco lab equipment	75,000	Goals 2, 3	Grant and Measure C

One-time/Other: (Release time, training, etc.?

Description	$ Amount	Related Goal from Table in section 3.3	Possible funding sources (Lottery, Measure C, Basic Skills, Perkins, etc.)
Certification of adjunct Cisco instructors	2,000	Goal 3	B Budget
Certification of adjunct VMWare instructors	2,000	Goal 3	B Budget
Course development, instructional design	135,000	Goal 3	B Budget or grant or foundation

Section 5: Program Strengths/Opportunities for Improvement

5.1 Use the matrix provided below and, reflect on the program relative to students' needs, briefly analyze the program's strengths and weaknesses and identify opportunities and challenges to the program. Consider external and internal factors, such as demographic, economic, educational, and societal trends. Some considerations may include current and future demand for the program, similar programs at other comparable institutions, and potential auxiliary funding.

	INTERNAL FACTORS	EXTERNAL FACTORS
Strengths	We have a brand new curriculum that articulates with virtually all public California universities that award a bachelors degree in computer science. The Enterprise Networking Program has an establish reputation in the community. It has been recognized as an authorized Cisco Networking Academy, a VMware Academy, and and EMC Academic Partner. The program has recognized by Cisco in the Workforce America initiative and was chosen to host a meeting with the US Secretary of the Treasary and the Chairman of the Board of Cisco. Foothill College was the first VMware Academy.	The local industry is hiring again, so successful students have a very good chance of becoming employed. We also have a strong advisory board to assure that we grow in ways that are relevant to the community.
Weaknesses	1) Foothill is not going to offer a class in HTML in 2012-2013. This is a basic tech job skill and a prerequisite for one of our electives (CS 22A). It is not clear how we will prepare students for the workforce if no department on campus offers this course next year. 2) Foothill is not going to offer a course in database management in 2012-2013. There are virtually no practical software applications in business nor science that don't require a database. It is not clear how we will prepare students for the workforce if no department on	Some other division on campus (e.g. Business and Social Studies Division or the Fine Arts Division) will need to offer HTML and/or database management. The courses could be offered as not-for-credit cash-carry contract base to support the needs of students who need the skills and not the course credits.

	campus offers this course next year. 3) Foothill is not able to offer a full complement of Enterprise Networking classes because of a shortage of part-time instructors.	
Opportunities	Our new course outlines of record are so much more detailed, and require a more highly qualified staff. Therefore, we should have consistently higher quality courses to offer students.	The active job market and the new requirement for CS minimum qualifications will make it more difficult for us to find qualified adjunct faculty. However, the inapplicability of past "rehire preferences" will allow us to select the best adjuncts we can find.
Threats	If no division on campus decides to offer a class in HTML, we will not be able to train students for technical office jobs and some of our higher level classes may not have enough students with the required prerequisites. If no division on campus decides to offer a class in database management, we will not be able to train students for technician level jobs in database administration and the projects in our higher level classes will not be very realistic.	Some other division on campus (e.g. Business and Social Studies Division or the Fine Arts Division) will need to offer HTML and/or database management.

5.2 Are there any critical issues you expect to face in the coming year? How will you address those challenges?

The computer lab has not been available on a consistent nor reliable basis. Students have no way of knowing if they are doing something wrong or if the lab is simply down. This has caused many students to become very frustrated with Foothill. In the future, unless there are major changes made to the systems governing the lab, we will advise faculty and students to find a different webserver to store their work on instead of trying to use the Foothill lab.

5.3 What statements of concern have been raised in the course of conducting the program review by faculty, administrators, students, or by any member of the program review team regarding overall program viability?

There is no question that this new program is viable.

5.4 Address the concerns or recommendations that were made in prior program review cycles.

There has been no prior program review cycle because this is a brand new program (as of Fall 2012.)

5.5 After reviewing the data, what strengths or positive trends would you like to highlight about your program?

Section 6: Feedback and Follow Up

This section is for the Dean to provide feedback.

6.1 Strengths and successes of the program as evidenced by the data and analysis: The new Computer Science (CS) program has morphed from the original organization. The core courses focus on the transfer pattern to the CSUs. The new courses will be based on more in depth knowledge of computer science and compatible if the CSU transfer degrees are implemented.

The Enterprise Networking program has been enhanced with new courses that offer in depth instruction.

The strength of the new programs will be a blended offering of both online and in class courses.

CS and Enterprise Networking are expanding rapidly and there is a wide range of growth opportunities. This is both for transfer as well as workforce. The program could expand in both for credit and "for profit".

The core CS faculty are well positioned to maintain the CSU Transfer and Enterprise Networking courses.

6.2 Areas of concern, if any:
There are quite a few areas for concern:

1) There are a number of potential courses that were not transferred from the CIS and CNET courses to the CS because of time and other issues. The current FT cannot meet the needs below. This will require domain experts from industry to be paid to develop the new curriculum. This is estimated at $ 4K per course and total estimate of $135,000. There are large opportunities in:
    a. Databases
    b. Gaming
    c. Mobile computing
    d. Computer Architecture
    e. Client-Server services
    f. Systems Architecture
    g. Program Management
    h. Cloud Computing
    i. Network Security
    j. Smart Grid

2) The server systems used for the CS and Enterprise Networking classes are very old and many were donated to the college. They are not part of ETS support. The server room needs to be updated with current and reliable technology. Estimated cost for Computer Scirence $22,000 and $75,000 for Enterprise Networking. This was NOT budgeted by the prior Deans for Measure C refresh.
3) In a fast moving technology area to address workforce needs, a "for profit" (not WSCH based) organization is required to permit new courses to be created and offered. FH needs to set up a parallel workforce course that is cash-carry with no college credit, just a certificate. This will permit PSME to offer a full range of courses from web development, human-computer interaction (HCI), mobile computing, unique languages such as C#, Atlas, etc. This needs to occur ASAP to have revenue (not WSCH) starting in summer 2012.
4) A new group of Part-Time Faculty need to be hired. They will also need to be able to use and/or develop online materials.

Within the Network Enterprise courses there are a number of concerns:

5) The enrollment has been on a decline as well as the course-to-course persistence.
6) There is only one faculty member who has been doing the core teaching and the sequence is fragile.
7) The courses are expensive from the resources required; rooms and unique systems.
8) The sequence has never been developed into a transfer sequence at any level even though there were discussions with UCSC.

6.3 Recommendations for improvement:

All of the above needs to be accomplished. The expected outcome is the current CIS WSCH could double in one year.

If the catalog date does not change for new courses in 2012 fall, there will be zero WSCH from CS in summer. Even with fall quarter without an alternate path for offering courses, CS revenue will be 50% of CIS this year.

Additional recommendations map to 6.2 items 5-8 items above:

1. 6.2.5 The delivery and style of the instruction may need to be revamped to create a pathway that students persist within the course as well as into the next course. I have no formal recommendation on how this should occur.
2. 6.2.6 Additional Adjunct Faculty need to be included who may have experience in different areas of network/communications technology.
3. 6.2.7 The number and type of classes needs to be expanded to make the resource usage viable.
4. 6.2.8 Working with CSU and UC for a transfer pattern as well as a way to encourage students in networks in their 2 or 3 yeas at FH.

6.4 Recommended Next steps:

__X_ Proceed as planned on program review schedule
___ Further review/Out of cycle in-depth review

Unit Course Assessment Report - Four Column

Foothill College

Department - Computer Science (C S)

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Department - Computer Science (C S) - C S 10 - COMPUTER ARCHITECTURE & ORGANIZATION - Microprocessor Architecture - The student will demonstrate knowledge of the architecture of a microprocessor including the use of registers, the program counter, and the arithmetic logic unit. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 10 - COMPUTER ARCHITECTURE & ORGANIZATION - Compilation of C++ or Java to assembly language - The student will demonstrate the ability to analyze the assembly language instructions generate by C++ or Java programs. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 50A - NETWORK FUNDAMENTALS (CCNA) - OSI Model - The student demonstrate understanding of the role of the OSI Model in Networking (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 50A - NETWORK FUNDAMENTALS (CCNA) - Network Communications - The student will demonstrate an understanding of communications between two hosts on an IP network connected by an arbitrary collection of routers and switches. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
50B - IP ROUTING PROTOCOL FUNDAMENTALS (CCNA) - Routing Protocols - The student will demonstrate the ability to configure the interior gateway routing protocols RIP, RIPv2, OSPF, and EIGRP. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 50B - IP ROUTING PROTOCOL FUNDAMENTALS (CCNA) - Selection of Interior Gateway Routing Protocols - The student will demonstrate the process of selecting the appropriate routing protocol for specific netwok requirements. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 50C - THE LOCAL AREA NETWORK: ETHERNET & WIRELESS NETWORKS - LAN Design - The student will demonstrate knowledge of the Composite LAN Design Model. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 50C - THE LOCAL AREA NETWORK: ETHERNET & WIRELESS NETWORKS - Spanning Tree Protocol - The student will demonstrate knowledge of the Spanning Tree and Rapid Spanning Tree protocols. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 50D - INTRODUCTION TO WIDE AREA NETWORKS, NETWORK SECURITY & IP ADDRESSING SERVICES - WAN Design - The student will demonstrate knowledge of the design and configuratio of Wide Area Networks utilizing point-to-point (PPP) and			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
point-to-multipoint (Frame Relay) topologies. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 50D - INTRODUCTION TO WIDE AREA NETWORKS, NETWORK SECURITY & IP ADDRESSING SERVICES - Network Security - The student will demonstrate the ability to secure a local area and wide area network. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 50E - INTRODUCTION TO IP NETWORK SECURITY - Firewalls - The student will demonstrate the ability to configure and use firewalls to provide security for a campus network. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 50E - INTRODUCTION TO IP NETWORK SECURITY - Intrusion Prevention - The student will demonstrate the configuration use of Intrusion Prevention Systems to incresae the security of a campus network (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 52A - ADVANCED IP ROUTING PROTOCOLS & SERVICES (CCNP) - BGP - The student will demonstrate knowledge of the Border Gateway Protocol (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 52A - ADVANCED IP ROUTING PROTOCOLS & SERVICES (CCNP) - Route Maps - The student will demonstrate the use			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
of route maps. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 52B - ADVANCED SWITCHING & CAMPUS LAN DESIGN (CCNP) - Private VLANs - The student will demonstrate the application and configuration of private VLANs. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 52B - ADVANCED SWITCHING & CAMPUS LAN DESIGN (CCNP) - First Hop Redundancy Protocols - The student will demonstrate the knowledge of three first hop redundancy protocols (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 52C - ADVANCED NETWORK TROUBLESHOOTING (CCNP) - Troubleshooting connectivity problems in a campus LAN - The student will demonstrate the ability to describe the methodology of troubleshooting and correcting connectivity problems in a campus LAN. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 52C - ADVANCED NETWORK TROUBLESHOOTING (CCNP) - BGP Attributes - The student will demonstrate the use of BGP attributes to influence the BGP route selection decision. (Created By Department - Computer Science (C S)) **Start Date:** 01/02/2012			
Department - Computer Science (C S) - C S 54A - STORAGE AREA NETWORKS -			

Course-Level SLOs	Means of Assessment & Targets for Success / Tasks	Assessment Findings	Reflection/Action Plan & Follow-Up
Network Attached Storage - The student will demonstrate the use of Network Attached Storage in a data center environment (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 54A - STORAGE AREA NETWORKS - Data Backup and Recovery - The student will demonstrate the knowledge of recovery time option (RTO) and recovery point option (RPO) in backup and recovery. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 54B - VMWARE VSPHERE INSTALL, CONFIGURE, MANAGE - vMotion - The student will demonstrate the use of vMotion in a virtual infrastructure environment. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 54B - VMWARE VSPHERE INSTALL, CONFIGURE, MANAGE - Distributed Virtual Switches - The student will demonstrate knowledge of the configuration and use of Virtual Distributed switches in a virtual infrastructure. (Created By Department - Computer Science (C S))			
Department - Computer Science (C S) - C S 56A - ENTERPRISE WIRELESS LOCAL AREA NETWORKS - Autonomous Access Points and Wireless Lan Controllers - The student will demonstrate knowledge of the application and use of autonomous access points and thin access points in a wireless LAN controller environment. (Created By Department - Computer Science (C S))			