College Curriculum Committee Meeting Agenda
Tuesday, June 3, 2014
2:00 p.m. – 3:30 p.m.
President's Conference Room

Item	Action	Attachment	Presenter/Time
1. Minutes: May 20, 2014	Action	#6/3/14-1	Escoto – 3 min
2. Announcements: a. Curriculum Systems Investigation b. Clarification of Lecture & Lab Definitions c. Report Out from Divisions	Information		Escoto - 3 mins Messina - 3 mins Curr Reps - 7 mins
3. Consent Calendar a. Stand Alone Applications b. Transfer Degree Applications	Action	#6/3/14-2 & 3 #6/3/14-4 thru 9	Escoto - 10 mins
4. New Program Approval a. GIST AS and Certificates b. Air Conditioning & Refrigeration Tech AS c. Plumbing Technology AS d. Steamfitting & Pipefitting AS e. Refrigeration & AC Mechanical Service CA f. Residential Plumbing CA g. Plumbing CA h. Steamfitting/Pipefitting CA	 Action 1st Read 1st Read 1st Read 1st Read 1st Read 1st Read 1st Read	 #6/3/14-10 thru 13 #6/3/14-14 #6/3/14-15 #6/3/14-16 #6/3/14-17 #6/3/14-18 #6/3/14-19 #6/3/14-20	Escoto, Lenkeit-Meezan, Reid, Mummert - 3 min
5. Year in Review/Priority List for 2014-15	Discussion		Escoto - 20 mins

Consent Calendar:

Stand Alone Applications: (attachments #2 & 3)

- LINC 57, 67

Transfer Degree Applications: (attachments #4-9)

- Communication Studies, Early Childhood Education, Economics, Political Science, Spanish, Theatre Arts

Attachment List:

#6/3/14-1	Draft Minutes: May 20, 2014
#6/3/14-10	Geographic Information Systems AA State Application
#6/3/14-11	Geographic Information Systems I CA State Application
#6/3/14-12	Geographic Information Systems II CA State Application
#6/3/14-13	Geographic Information Systems III CA State Application
#6/3/14-14	Air Conditioning & Refrigeration Technology AS
#6/3/14-15	Plumbing Technology AS
#6/3/14-16	Steamfitting & Pipefitting AS
#6/3/14-17	Refrigeration & Air Conditioning Mechanical Service CA
#6/3/14-18	Residential Plumbing CA
#6/3/14-19	Plumbing CA
#6/3/14-20	Steamfitting & Pipefitting CA

2013 -2014 Curriculum Committee Meetings

Fall 2013 Quarter:	Winter 2014 Quarter	Spring 2014 Quarter
~~10/1/13~~	~~1/21/14~~	~~4/15/14~~
~~10/15/13~~	~~2/4/14~~	~~5/6/14~~
~~11/5/13~~	~~2/18/14~~	~~5/20/14~~
~~11/19/13~~	~~3/4/14~~	~~6/3/14~~
~~12/3/13~~	~~3/18/14~~	6/17/14

* Standing reminder: items for inclusion on the CCC agenda are due no later than one week before the meeting

2013-2014 Curriculum Deadlines

~~*12/1/13* Deadline to submit courses to CSU for CSU GE approval.~~
~~*12/1/13* Deadline to submit courses to UC/CSU for IGETC approval.~~
~~*12/6/13* COR/Title 5 Updates for Fall 2013.~~
~~*3/3/14* Curriculum Sheet Updates for 2013-14.~~
6/1/14 Deadline to submit new/revised courses to UCOP for UC transferability
Ongoing Submission of courses for C-ID approval and course-to-course articulation with individual colleges and universities.

2013-2014 Professional Development Opportunities & Conferences of Interest

~~7/11-13/13 ASCCC Curriculum Institute, Sheraton Park Hotel, Anaheim.~~
~~11/7-9/13 ASCCC Fall Plenary, Irvine Marriott~~
~~11/25/13 Tips for Writing a Great Program Review - Professional Development workshop, 1:00-3:00, Toyon Rm~~
~~12/3/13 Tips for Writing a Great Program Review - Professional Development workshop, 12:00-1:30, Toyon Rm~~
~~4/10-12-14 ASCCC Spring Plenary, Westin San Francisco Airport~~
~~4/11/14 ACCJC Regional SLO/Assessment Workshop, Ohlone College~~
6/12-14/14 ASCCC Faculty Leadership Institute, Paradise Point Hotel, San Diego
7/10-12/14 ASCCC Curriculum Institute, Hayes Mansion, San Jose Ca

Distribution:
Shawna Aced (Instr), Micaela Agyare (LIBR), Kathy Armstrong (PSME), Rachelle Campbell (BH), Bea Cashmore (ALD), Jerry Cellilo (CNSL), Dolores Davison (AS President), Bernie Day (Articulation Officer), Teresa de la Cruz (Articulation), Isaac Escoto (Faculty Co-Chair), Brian Evans (BSS), Marnie Francisco (PSME), Stephanie Franco (Evaluations), Konnilyn Fieg (BSS), Hilary Gomes (FA), Brenda Hanning (BH), Robert Hartwell (FA), Kay Jones (LIBR), Marc Knobel (PSME), Andrew LaManque (AVP, Instruction), Allison Lenkeit Meezan (BSS), Don MacNeil (KA), Kimberlee Messina (VP, Instruction, Administrator co-chair), Peter Murray (Dean, PSME), Simon Pennington (FA), Barbara Shewfelt (P E), Paul Starer (Dean, L A), Kella Svetich (L A)

Updated 5/6/14

COLLEGE CURRICULUM COMMITTEE

Committee Members - 2013-14

Meeting Date: 6/3/14

Co-Chairs (2)

✓	Isaac Escoto	7350	Vice President, Academic Senate (tiebreaker vote only)	escotoisaac@foothill.edu
✓	Kimberlee Messina	7209	Vice President, Instruction	messinakimberlee@foothill.edu

Voting Membership-12 total; 1 vote per division

✓	Micaela Agyare	7086	LIBR	agyaremicaela@foothill.edu
✓	Kathy Armstrong	7487	PSME	armstrongkathy@foothill.edu
✓	Rachelle Campbell	7469	BH	campbellrachelle@foothill.edu
✓	Bea Cashmore	7094	ALD	cashmorebeatrix@foothill.edu
	Jerry Cellilo	7224	CNSL	cellilojerry@fhda.edu
✓	Bernie Day	7225	Articulation	daybernie@foothill.edu
	Brian Evans	7575	BSS CNSL	evansbrian@foothill.edu
✓	Marnie Francisco	7420	PSME	franciscomarnie@foothill.edu
	Konnilyn Fieg	7430	BSS	feigkonnilyn@foothill.edu
✓	Hilary Gomes	7585	FA	gomeshilary@foothill.edu
✓	Brenda Hanning	7466	BH	hanningbrenda@foothill.edU
✓	Robert Hartwell	7016	FA	hartwellrobert@fhda.edu
✓	Kay Jones	7602	LIBR	joneskay@foothill.edu
✓	Marc Knobel	7049	PSME	knobelmarc@foothill.edu
✓	Allison Lenkeit Meezan	7422	BSS	meezankaren@foothill.edu
✓	Don MacNeil	6967	K A	macneildon@foothill.edu
	Simon Pennington	7015	F A	penningtonsimon@fhda.edu
	Barbara Shewfelt	7658	K A	shewfeltbarbara@foothill.edu
✓	Kella Svetich	7924	L A	svetichkella@foothill.edu
✓	Kurt Hueg	7394	Dean	huegjurt@foothill.edu
	Peter Murray	7472	Dean	murraypeter@foothill.edu
	Paul Starer	7227	Dean	starerpaul@foothill.edu

Non-Voting Members (4)

	Teresa de la Cruz	7638	Articulation Assistant	delacruzteresa@foothill.edu
	Stephanie Franco	7231	Evaluations	francostephanie@foothill.edu
	Shawna Aced	7371	Curr/Schedule Asst.	acedshawna@foothill.edu
✓	Cori Nuñez	7439	Curr Coordinator	nunezcori@foothill.edu
	Chris Ju		ASFC	

Visitors: David Ellis (APRT), Mark Pickens (APRT), Andrew La Mangine (AVP)

College Curriculum Committee
Meeting Minutes
Tuesday, May 20, 2014
2:04 p.m. – 3:34 p.m.
President's Conference Room

Item	Discussion
1. Minutes: May 6, 2014	Move to approve minutes with one correction in section 2b, drop off sentence. **M/S** (Cashmore, Knobel) **Approved**, 2 abstentions.
2. Announcements: a. New Course Proposal	**Speaker: Isaac Escoto** a. New course proposal introduced. Please distribute to your constituency groups. Armstrong informed the committee that there is great interest in creating 1 unit seminar "booster-type" courses and they are having difficulty finding examples of these types of courses. Messina reminded the group that this type of seminar is more of a graduate type of activity, so perhaps we need to have more conversation regarding what will be involved in this type of course. Will these courses be passive lectures requiring no outside of class assignments or a lecture that requires assignments and homework?
b. Curriculum Dates	b. Curriculum Dates for this year: 12/5/14 due date for Summer 2015, 6/19/14 due date for Summer 2016. Be aware that this means that we will be working on curriculum for two different catalog years, within the same calendar year.
c. ADT Update	c. ADT Update: we will have the last 6 applications to the FHDA Board on June 16th. With these approvals, we will be 100% compliant with the law.
d. Report Out from Divisions	d. Report Outs: Bea Cashmore is retiring and therefore she is looking for a replacement. Jerry will also be stepping off and Leanne Emmanuel will be filling the Counseling spot. Pennington and Hartwell are trying to find replacements, but until they are able to do so, they will continue to serve.
3. New Program Review	**Speaker: Isaac Escoto, Allison Lenkeit Meezan** Geographic Information Technology is classified as an emerging technology and has nationally vetted curriculum. There was a grant awarded 3 years ago to expand and enrich this growing discipline. These applications are for an AA degree and 3 certificates of achievement. The descriptions for each of the certificates look identical, so perhaps there needs to be some differentiation between them. The suggestion was made that perhaps there should be a new CAD for multiple disciplines course written, rather than using the HORT course.
4. Lecture & Lab Definitions	**Speaker: Isaac Escoto, Kimberlee Messina** These descriptions are a culmination of the faculty negotiation discussions around the elimination of Lecture/Laboratory activity. Be very careful in defining your courses as lecture and laboratory. Our articulation is dependent on how we define our courses. In most instances, 4-year institutions view lec/lab as lab time. Some universities have a required number of laboratory hours for a course to be transferable. Day and Nunez will make themselves available to assist faculty in making the corrections. For 2014-15, all new courses must only use lecture and lab designations. Load conversions will occur

	for labs beginning with the Fall 2014 quarter. The Curriculum Team is working on a streamlined solution to make changes to the current courses. More to come.
5. Academic Senate & CCC Interconnection	**Speaker: Isaac Escoto** We want to remind the committee that we are a sub-committee of the Academic Senate and we will continue to support each other in what we would like to accomplish. The "10 + 1" is the list of things the Academic Senate has been charged to oversee: • Curriculum, including establishing prerequisites. • Degree and certificate requirements. • Grading policies. • Educational program development. • Standards or policies regarding student preparation and success. • College governance structures, as related to faculty roles. • Faculty roles and involvement in accreditation processes. • Policies for faculty professional development activities. • Processes for program review. • Processes for institutional planning and budget development. • Other academic and professional matters as mutually agreed upon. Please think about the things we would like to accomplish. "Multiple measures" is one topic that might be relevant for us to consider. Credit by Exam: what would we like to approve, to see as tools. Some faculty felt that the experience of being in a classroom vs. taking a test is not the same depth of experience of learning. It can differ from department to department.
6. Content Review Form	**Speaker: Isaac Escoto** Content Review form: this is the last version that we have prepared. Highlighted section is just to indicate the changes. Question: If there is a requirement based on the 4-yr institution, do we need 2 faculty participants? Through discussion, the committee concluded that should this be the case, it's not necessary to have two and therefore, we should change the wording to indicate such. Nuñez will attempt to correct the wording.
7. Course Outline Review	**Speaker: Cori Nuñez, Bernie Day** Review of a course currently in Edit using the "Reviewing CORs" instruction sheet.

Attendees:
Minutes Recorded by: C. Nuñez

FOOTHILL COLLEGE

Stand-Alone Credit Course Approval Request

If a Foothill credit course is **NOT** part of a State approved associate's degree, certificate of achievement or the Foothill College GE Pattern, it is considered by the State to be a "Stand Alone Course." Per Title 5, local curriculum committees must review and approve proposed stand-alone courses to ensure that they are consistent with credit course standards (§55002), the community college mission and there is sufficient need and resources for the course.

In short, the State wants us to deliberate carefully before adding a course that does not help students complete a degree or certificate. If it doesn't help them complete a State approved program of study, why are we offering the course?

Stand Alone Course Approval Requests should be completed and forwarded to your Division Curriculum Committee to begin the approval process. To be compliant with State regulations, there must be a completed, approved Stand Alone Form on file in the Office of Instruction.

Course #: LINC 57

Course Title: **DESIGNING LEARNER-CENTERED INSTRUCTION**

Catalog Description:

Educators will examine the learner-centered approach to teaching in order to create transformative experiences for students. Educators develop the skills and conceptual knowledge for instructional design and creating student-centered learning activities that meet Common Core and content standards. Topics addressed include how learning happens, the role of educational technologies in student engagement, and effective modifications to existing instructional material. Following the learner-centered classroom guidelines, educators will create a multidisciplinary unit of instruction that is aligned to teaching standards and include both formative and summative assessments.

Are you requesting Stand Alone Approval for the course on a <u>temporary,</u> or <u>permanent</u> basis?

_____ The course will be **permanently** Stand Alone; there are no plans to add it to a State approved degree or certificate of achievement, nor to the Foothill GE pattern

<u>XX</u> The course will only be Stand Alone **temporarily**, and it will be incorporated into a new degree or certificate of achievement that is not yet State approved. In this case, identify which degree/certificate to which the course will be added:

Instructional Design and Technology

- What is the specific timeline for program application/approval? (e.g. is your program application complete and submitted to the State, or is it still in development and if so, what is your anticipated submission date?)

  in development, June 2015

NOTE: *If you have not submitted your program application to the State by the end of the current academic year, you must reapply for permanent Stand Alone approval.*

The Curriculum Committee must evaluate this application based on the following five criteria:

Criteria A. -- Appropriateness to Mission

California Education Code 66010.4 identifies the two primary missions for California Community Colleges, and one secondary mission that pertains to credit coursework:

1. <u>Primary</u>: offer academic and vocational instruction at the lower division level; and
2. <u>Primary</u>: to advance California's economic growth and global competitiveness through education, training, and services that contribute to continuous work force improvement

3. Secondary: provision of remedial instruction for those in need of it and, in conjunction with the school districts, instruction in English as a second language, and support services which help students succeed at the postsecondary level

Briefly explain how this course is consistent with one (or more) of these missions:

2. Advances California's economic growth and global competitiveness by improving occupational skills through education and training for teachers, all educational professionals, students, and community members on common computer software skills for communication, namely word processing and media creation, but also cloud computing and online collaboration via shared documents.

NOTE: *Courses must address a valid transfer, occupational or basic skills purpose rather than primarily a vocational or recreational purpose. Courses must not provide only an activity or service without instructional content (e.g., assistive or therapeutic activity, use of college facilities or resources without specific instructional objectives, or assessment testing).*

Criteria B. – Need

A course may only be granted Stand Alone Approval if there is demonstrable need for the course in the college service area.

If you identified your course as intending to meet the CCC mission of preparation for **transfer**, we must demonstrate that the course is transferable. **Please attach the ASSIST documentation** to this application. (Ask the Articulation Officer for assistance if necessary.)

Occupational need for this course is primarily demonstrated by the need for educators to learn technology in order to apply the new Common Core State Standards in the classroom, school sites, and district wide. See the attached document stating the central role of technology for Common Core implementation.

For courses that are **primarily occupational**, or that respond to economic development interests, need must be demonstrated within the service area of the college. Examples of the types of evidence of occupational need that may be submitted include:

- Statistical projections of growth in specific jobs by county (or labor market area) from the Employment Development Department's Labor Market Information system,
- Employer surveys
- Industry studies
- Regional economic studies
- Letters from employers
- Minutes of industry advisory committee meetings
- Job advertisements, from newspapers or the Internet
- Newspaper or magazine articles on industry or employment trends
- Studies or data from licensing agencies or professional associations

Please attach appropriate evidence to this application form.

Criteria C. -- Curriculum Standards (please initial as appropriate)

SJM___ The outline of record for this course has been approved the Division Curriculum Committee and meets the requirements of Title 5.

_____ This is a non-degree applicable credit course (specify which one, below)

_____ non-degree applicable basic skills course.

_____ course to enable students to succeed in degree-applicable credit courses (e.g. college orientation and guidance courses, discipline-specific preparatory courses)

_____ pre-collegiate career technical preparation course to provide foundation skills for students preparing for entry into degree-applicable credit courses.

Criteria D. -- Adequate Resources (please initial as appropriate)

SJM___ This course will be administered in the same manner as existing courses in terms of funding, faculty, facilities and equipment.

FOOTHILL COLLEGE

Criteria E. – Compliance (please initial as appropriate)

SJM___ The design of the course is not in conflict with any law particularly in regard to enrollment restrictions and licensing or accreditation standards.

Faculty Requestor: **Steven McGriff** **Date:** **5/13/14**

Division Curriculum Representative: **Simon Pennington** **Date:** **5/14/14**

College Curriculum Co-Chairperson: _____ **Date:** ____

FOOTHILL COLLEGE

State of California Employment Development Department
Labor Market Information Division

Given the primary audience for LINC classes is comprised of teachers in elementary, middle, and secondary classrooms, the labor market analysis data focuses on this occupational sector. The data in the tables below shows projected growth change of 21.2% and 15.4% in teacher employment in the San Jose (1) and San Mateo (2) Metropolitan Divisions (MDs) by 2020. The annual need for new jobs and replacement jobs to meet the projected change is 3,244 and 2,737 for San Jose and San Mateo MDs, respectively. Each year until 2020, it is projected that nearly 6000 new or reclassified teachers will enter the profession in the two counties surrounding the KCI. The new teachers are joining an existing workforce of 12,745 teachers in Santa Clara County and 4,912 in San Mateo County (3). New teachers will need the educational technology knowledge and skills the KCI offers through LINC classes and existing teachers will need to refresh or upgrade as technological advances occur regularly.

2010-2020 Occupational Employment Projections
San Jose-Sunnyvale-Santa Clara
(San Benito and Santa Clara Counties)

Annual Average Employment		Employment Change		Average Annual Job Openings		
2010	2020	Numerical [1]	Percent	New Jobs [2]	Replace-ment Needs [3]	Total Jobs [4]
72,920	**88,380**	**15,460**	**21.2**	**1,545**	**1,699**	**3,244**

2010-2020 Occupational Employment Projections
San Francisco-San Mateo-Redwood City Metropolitan Division
(Marin, San Francisco, and San Mateo Counties)

Annual Average Employment		Employment Change		Average Annual Job Openings		
2010	2020	Numerical [1]	Percent	New Jobs [2]	Replace-ment Needs [3]	Total Jobs [4]
71,380	**82,340**	**10,960**	**15.4**	**1,095**	**1,642**	**2,737**

Data Sources:
1. http://www.calmis.ca.gov/htmlfile/msa/sjose.htm, Report Date: 1/7/2013, 12:00:00 AM
2. http://www.calmis.ca.gov/htmlfile/msa/sf.htm, Report Date: 10/24/2012, 12:00:00 AM
3. Ed-Data: http://www.ed-data.k12.ca.us/App_Resx/EdDataClassic/fsTwoPanel.aspx?#!bottom=/_layouts/EdDataClassic/profile.asp?level=05), 2011-12 data report year

Common Core State Standards (CCSS) are new requirements for California teachers to use in the classroom CCSS, which requires a higher level of technology ability than previous standards. LINC Classes offered by the KCI use and address CCSS.

Common Core State Standards

Selected summary of key points regarding the standards and technology.

http://www.corestandards.org/about-the-standards
The standards are informed by the highest, most effective models from states across the country and countries around the world, and provide teachers and parents with a common understanding of what students are expected to learn. Consistent standards will provide appropriate benchmarks for all students, regardless of where they live.

These standards define the knowledge and skills students should have within their K-12 education careers so that they will graduate high school able to succeed in entry-level, credit-bearing academic college courses and in workforce training programs. The standards:

- Are aligned with college and work expectations;
- Are clear, understandable and consistent;
- Include rigorous content and application of knowledge through high-order skills;
- Build upon strengths and lessons of current state standards;
- Are informed by other top performing countries, so that all students are prepared to succeed in our global economy and society; and
- Are evidence-based.

http://www.corestandards.org/resources/key-points-in-english-language-arts
Key Points In English Language Arts
Media and Technology

- Just as media and technology are integrated in school and life in the twenty-first century, skills related to media use (both critical analysis and production of media) are integrated throughout the standards.

Authors: National Governors Association Center for Best Practices, Council of Chief State School Officers
Title: Common Core State Standards (insert specific content area if you are using only one)
Publisher: National Governors Association Center for Best Practices, Council of Chief State School Officers, Washington D.C.
Copyright Date: 2010

ISTE Position Statement on the
Common Core State Standards

ISTE believes digital learning plays a central and substantive role in ensuring all students graduate college and career ready. Technology, used effectively, can help all students meet and exceed the rigorous learning goals embedded in the Common Core State Standards by providing access to tools and resources that personalize instruction and creating rich, engaging and relevant learning environments.

As U.S. states and school districts implement the new Common Core State Standards, they have an unprecedented opportunity to collaborate and share best practices across geographic borders to ensure their students attain these new rigorous learning goals. With the advent of the 2014–2015 Common Core Online Assessments it is imperative that students' learning takes place in a robust digital learning environment in order for them to be successful on these new higher-order thinking assessments. Schools will have to make significant investments in infrastructure and hardware which will provide an extraordinary opportunity for extending and leveraging the use of technology to transform teaching and learning.

ISTE's Standards for learning, teaching and leading in the digital age set the standard for excellence and best practices. The ISTE Standards help educators build a firm foundation for teaching with technology and further the development of many of the same 21st century skills set forth by the Common Core State Standards, such as problem solving, critical thinking, creativity and collaboration skills. In addition, the ISTE Standards focus on the development of the digital skills that are requisite for success in workplace. Rather than being a set of content standards requiring stand-alone learning activities, the ISTE Standards include knowledge and skills that span the curriculum providing a firm foundation for the effective use of technology in any content area and, particularly, in support of the Common Core.

As the premier association for educators engaged in leveraging technology to improve teaching and learning, ISTE is poised to provide the professional development, resources and advocacy needed to support district leaders, principals and teachers as they infuse technology across the curriculum to increase student engagement, personalize learning, improve student achievement and, ultimately, help students master the Common Core State Standards. ISTE is committed to serving as a clearinghouse for the resources, tools and support that school leaders need to realize the synergy between the Common Core and the ISTE Standards, and to continuing to develop the practical resources that states, districts, schools and teachers need to make effective use of technology to improve student achieve ment.

Foothill College
Program Application
Associate in Arts in Communication Studies for Transfer

Item 1. Statement of Program Goals and Objectives

Communication Studies examines how people use messages to generate meanings within and across various contexts, cultures, channels and media. As an interdisciplinary field, coursework in communication also includes contributions in the social sciences, humanities, philosophy and cultural studies. Some of the topics explored in this field include rhetoric and public address, debate, gender differences, interpersonal and cross-cultural communication, the art of effective persuasion, leadership and professional skills, group interaction and decision-making and forensic speech.

The Associate in Arts in Communication Studies for Transfer degree meets the requirements set forth by Education Code section 66746 to prepare students to transfer to local California State Universities (CSUs). Students who complete the Associate in Arts in Communication Studies for Transfer degree will be ensured preferential and seamless transfer status to local CSUs for X majors and majors in related disciplines. The Associate in Arts in Communication Studies for Transfer degree requirements will fulfill the lower division major requirements at many local CSUs. Students are advised, however, to meet with a counselor to assess the course requirements for specific local CSUs and to validate which CSUs are considered local.

Program Learning Outcomes

- Identify patterns of communication in a variety of contexts.
- Utilize appropriate methods of communication in critical thinking and/or communication situations.

Item 2. Catalog Description

Communication Studies examines how people use messages to generate meanings within and across various contexts, cultures, channels and media. As an interdisciplinary field, coursework in communication also includes contributions of the social sciences, humanities, philosophy and cultural studies. Some of the topics explored in this field include rhetoric and public address, debate, gender differences, interpersonal and cross-cultural communication, the art of effective persuasion, leadership and professional skills, group interaction and decision-making and forensic speech. This degree provides excellent preparation for careers in the fields of mass media, human resources, business, government, social services, and/or education in such areas as teaching, consulting, law, broadcast announcing, public relations or any field in which communication skills are highly relevant.

The Associate in Arts in Communication Studies for Transfer degree prepares students for transfer to California State Universities (CSUs). Students who complete the Associate in Arts in Communication Studies for Transfer degree will be ensured preferential transfer status to CSUs for communication studies majors and majors in related disciplines. The Associate in Arts in Communication Studies for Transfer degree requirements will fulfill the lower division major requirements at many CSUs. Students are advised, however, to meet with a counselor to assess the course requirements for specific CSUs.

In addition, the student must complete the following:

(1) Completion of 90 quarter units that are eligible for transfer to the California State University, including both of the following:
    (A) The Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education – Breadth Requirements.
    (B) A minimum of 27 quarter units in a major or area of emphasis, as determined by the community college district.
(2) Obtainment of a minimum grade point average of 2.0.

Foothill College
Program Application
Associate in Science in Early Childhood Education for Transfer

Item 1. Statement of Program Goals and Objectives

The mission of Child Development Department is to prepare students with the knowledge, theory and practical experience necessary to plan, implement and evaluate developmentally appropriate experiences for young children and their families in a variety of settings. The well-rounded curriculum leads to educated individuals who are responsible lifelong learners and take an active interest in the world around them.

The Associate in Science in Early Childhood Education for Transfer degree meets the requirements set forth by Education Code section 66746 to prepare students to transfer to local California State Universities (CSUs). Students who complete the Associate in Science in Early Childhood Education for Transfer degree will be ensured preferential and seamless transfer status to local CSUs for early childhood education majors and majors in related disciplines. The Associate in Science in Early Childhood Education for Transfer degree requirements will fulfill the lower division major requirements at many local CSUs. Students are advised, however, to meet with a counselor to assess the course requirements for specific local CSUs and to validate which CSUs are considered local.

Graduates will be able to:

- Demonstrate understanding of the needs and characteristics of children birth through middle childhood and the multiple influences on their development as related to the high quality care and education of young children.
- Demonstrate ethical standards and professional behaviors that deepen knowledge and commitment to the field of early care and education as related to NAEYC Code of Ethical Conduct.

Item 2. Catalog Description

The Associate in Science in Early Childhood Education for Transfer degree prepares students for transfer to California State Universities (CSUs). Students who complete the Associate in Science in Early Childhood Education for Transfer degree will be ensured preferential transfer status to CSUs for early childhood education majors and majors in related disciplines. The Associate in Science in Early Childhood Education for Transfer degree requirements will fulfill the lower division major requirements at many CSUs. Students are advised, however, to meet with a counselor to assess the course requirements for specific CSUs.

The Child Development Program deepens the student's understanding of children, their families and developmentally appropriate practices while preparing students for careers in early childhood education. In addition to ensuring preferential transfer status to CSUs for Early Childhood Education majors and majors in related disciplines, the program offers a strong foundation in child development that allows students to immediately take classroom and lab learning into the workplace to create quality developmentally appropriate learning environments.

In addition, the student must complete the following:

(1) Completion of 90 quarter units that are eligible for transfer to the California State University, including both of the following:
    (A) The Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education – Breadth Requirements.
    (B) A minimum of 27 quarter units in a major or area of emphasis, as determined by the community college district.
(2) Obtainment of a minimum grade point average of 2.0.

Foothill College
Program Application
Associate in Arts in Economics for Transfer

Item 1. Statement of Program Goals and Objectives

The Economics program provides students with the theoretical and practical knowledge to help prepare them for transfer to four-year institutions. The primary objective is to teach economic principles and core concepts, help students develop critical thinking and analytical skills and elevate awareness of the importance of economics in their everyday lives.

The Associate in Arts in Economics for Transfer degree meets the requirements set forth by Education Code section 66746 to prepare students to transfer to local California State Universities (CSUs). Students who complete the Associate in Arts in Economics for Transfer degree will be ensured preferential and seamless transfer status to local CSUs for economics majors and majors in related disciplines. The Associate in Arts in Economics for Transfer degree requirements will fulfill the lower division major requirements at many local CSUs. Students are advised, however, to meet with a counselor to assess the course requirements for specific local CSUs and to validate which CSUs are considered local.

Item 2. Catalog Description

Economics is the study of how society allocates scarce resources such as land, labor and capital, in an attempt to satisfy unlimited wants. It is broadly divided into two branches: macroeconomics and microeconomics. Macroeconomics is concerned with the workings of the economy as a whole. It is the study of broad measures of economic performance: Gross Domestic Product, unemployment, and inflation. Microeconomics focuses on the role of individual decision-makers - consumers and firms – and analyzes the efficiencies and failures of a market system. The two branches approach the fundamental questions of resource allocation from opposite sides: one from the perspective of the economy as a whole and one from the perspective of the individual agents in the economy.

Program Learning Outcomes:

- Have a working understanding of the role of prices in a market economy, the benefits of trade, economic growth and stability, market structures and competition, market failures and the economic role of government.
- Employ economic reasoning to explain the world around them and make objective decisions based on assessments of costs and benefits.

The Associate in Arts in Economics for Transfer degree prepares students for transfer to California State Universities (CSUs). Students who complete the Associate in Arts in Economics for Transfer degree will be ensured preferential transfer status to CSUs for economics majors and majors in related disciplines. The Associate in Arts in Economics for Transfer degree requirements will fulfill the lower division major requirements at many CSUs. Students are advised, however, to meet with a counselor to assess the course requirements for specific CSUs.

In addition, the student must complete the following:

(1) Completion of 90 quarter units that are eligible for transfer to the California State University, including both of the following:
    (A) The Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education – Breadth Requirements.
    (B) A minimum of 27 quarter units in a major or area of emphasis, as determined by the community college district.
(2) Obtainment of a minimum grade point average of 2.0.

Foothill College
Program Application
Associate in Arts in Political Science for Transfer

Item 1. Statement of Program Goals and Objectives

The Associate in Arts in Political Science for Transfer degree prepares students for transfer as an upper division student in the Political Science major to the California State University system. The political science curriculum fully analyzes the political behavior of human beings. The major is mainly concerned with exploring the systematic analysis of governmental institutions and processes, the development of power and its use in the maintenance of order and the promotion of equality and justice. Areas of specialization within this major include the international arena, comparative government, political theory, political economy, public administration, political parties and elections, constitutional law and regional political studies.

The Associate in Arts in Political Science for Transfer degree meets the requirements set forth by Education Code section 66746 to prepare students to transfer to local California State Universities (CSUs). Students who complete the Associate in Arts in Political Science for Transfer degree will be ensured preferential and seamless transfer status to local CSUs for X majors and majors in related disciplines. The Associate in Arts in Political Science for Transfer degree requirements will fulfill the lower division major requirements at many local CSUs. Students are advised, however, to meet with a counselor to assess the course requirements for specific local CSUs and to validate which CSUs are considered local.

Graduates will be able to:

- demonstrate critical, analytical, research and writing skills in political science and its sub-fields using basic scientific tools underlying modern social science.
- analyze the major theoretical formulations and concepts of political science and its sub-fields and the philosophical basis of those formulations.

Item 2. Catalog Description

The Associate in Arts in Political Science for Transfer degree prepares students for transfer to California State Universities (CSUs). Students who complete the Associate in Arts in Political Science for Transfer degree will be ensured preferential transfer status to CSUs for political science majors and majors in related disciplines. The Associate in Arts in Political Science for Transfer degree requirements will fulfill the lower division major requirements at many CSUs. Students are advised, however, to meet with a counselor to assess the course requirements for specific CSUs. This degree may also provide excellent preparation for other majors.

Political Science as a social science is mainly concerned with the systematic analysis of governmental institutions and processes and the development of power. It fully analyzes the political behavior of human beings. Specific areas of specialization within the major include the international arena, comparative government, political theory, political economy, public administration, political parties and elections, constitutional law and regional political studies.

In addition, the student must complete the following:

(1) Completion of 90 quarter units that are eligible for transfer to the California State University, including both of the following:
   (A) The Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education – Breadth Requirements.
   (B) A minimum of 27 quarter units in a major or area of emphasis, as determined by the community college district.
(2) Obtainment of a minimum grade point average of 2.0.

Foothill College
Program Application
Associate of Arts Degree in Spanish for Transfer

Item 1. Statement of Program Goals and Objectives

The Associate of Arts in Spanish for Transfer degree provides transfer students with a strong foundation in the four basic language skills: listening comprehension, reading comprehension, speaking and writing. It also provides students with in-depth knowledge of the civilizations and cultures of the hispanic world. This degree emphasizes the acquisition of communicative competence as well as the development of intercultural awareness, appreciation and understanding. Additionally, the spanish courses align well with lower division major preparation for transfer in related fields such as liberal arts, language arts and linguistics and other areas of study at CSU, UC and independent colleges and universities.

The Associate in Arts in Spanish for Transfer degree meets the requirements set forth by Education Code section 66746 to prepare students to transfer to local California State Universities (CSUs). Students who complete the Associate in Arts in Spanish for Transfer degree will be ensured preferential and seamless transfer status to local CSUs for Spanish majors and majors in related disciplines. The Associate in Arts in Spanish for Transfer degree requirements will fulfill the lower division major requirements at many local CSUs. Students are advised, however, to meet with a counselor to assess the course requirements for specific local CSUs and to validate which CSUs are considered local.

Graduates will be able to:

- Communicate with native speakers of Spanish, using the appropriate language for any given situation.
- Conduct research and demonstrate knowledge of Hispanic society, culture, and politics.

Item 2. Catalog Description

Spanish is the national language of the majority of the countries of the western hemisphere. It is also the fastest growing language in California. Students completing this degree will have a foundation for the field of Spanish through the study of Spanish language, culture and literature and will acquire the abilities to engage in conversation, understand the essential points of a narrative or explanation, read and comprehend literature, write summaries and engage in correspondence.

The Associate in Arts in Spanish for Transfer degree prepares students for transfer to California State Universities (CSUs). Students who complete the Associate in Arts in Spanish for Transfer degree will be ensured preferential transfer status to CSUs for Spanish majors and majors in related disciplines. The Associate in Arts in Spanish for Transfer degree requirements will fulfill the lower division major requirements at many CSUs. Students are advised, however, to meet with a counselor to assess the course requirements for specific CSUs. This degree may also provide excellent preparation for other majors.

In addition, the student must complete the following:

(1) Completion of 90 quarter units that are eligible for transfer to the California State University, including both of the following:
    (A) The Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education – Breadth Requirements.
    (B) A minimum of 27 quarter units in a major or area of emphasis, as determined by the community college district.
(2) Obtainment of a minimum grade point average of 2.0.

Foothill College
Program Application
Associate in Arts in Theatre Arts for Transfer

Item 1. Statement of Program Goals and Objectives

The Associate in Arts in Theatre Arts for Transfer degree prepares students to apply their perception and skills as well-rounded theatre artists versed in multiple aspects of production and performance aligned with industry standards. Students will analyze dramatic literature from a historical and modern perspective and develop a broad–based understanding of the application of this analysis to contemporary theatrical practice.

The Associate in Arts in Theatre Arts for Transfer Degree meets the requirements set forth by Education Code section 66746 to prepare students to transfer to local California State Universities (CSUs). Students who complete the Associate in Arts in Theatre Arts for Transfer degree will be ensured preferential and seamless transfer status to local CSUs for theatre arts majors and majors in related disciplines. The Associate in Arts in Theatre Arts for Transfer degree requirements will fulfill the lower division major requirements at many local CSUs. Students are advised, however, to meet with a counselor to assess the course requirements for specific local CSUs and to validate which CSUs are considered local.

2. Catalog Description

The Associate in Arts in Theatre Arts for Transfer degree prepares students for transfer to California State Universities (CSUs). Students who complete the Associate in Arts in Theatre Arts for Transfer degree will be ensured preferential transfer status to CSUs for theatre arts majors and majors in related disciplines. The Associate in Arts in Theatre Arts for Transfer degree requirements will fulfill the lower division major requirements at many CSUs. Students are advised, however, to meet with a counselor to assess the course requirements for specific CSUs.

The Associate in Arts in Theatre Arts for Transfer degree provides an introduction to theatre history, play analysis, acting and theatre production. Students will develop their abilities to analyze dramatic literature and their theatrical skills in a variety of disciplines both onstage and backstage. They will be able to apply their perceptions as multi-faceted theatre artists to contemporary theatrical practice through their classwork and participation in departmental productions.

In addition, the student must complete the following:

(1) Completion of 90 quarter units that are eligible for transfer to the California State University, including both of the following:
   (A) The Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education – Breadth Requirements.
   (B) A minimum of 27 quarter units in a major or area of emphasis, as determined by the community college district.

(2) Obtainment of a minimum grade point average of 2.0.

FOOTHILL COLLEGE
Credit Program Narrative
Associate in Arts in Geographic Information Systems Technology

Item 1. Program Goals and Objectives

The goals of this program are to graduate students who are competent users and creators of geospatial technology and ready to enter the workforce. The general education coursework required by the associate degree provides the broad skill set of computational and communications skills necessary to succeed in the workplace. This program will prepare students to apply for the Geographic Information Systems Professional certification (GISP) through the Geographic Information Systems Certification Institute, administered through the Urban and Regional Information Systems Association.

Graduates will have achieved the following competencies:

- Apply cartographic principles of scale, resolution, projection, data management and spatial analysis to a geographic nature using a geographic information system.
- Plan, evaluate and execute an original geographic information systems project.
- Demonstrate the ability to communicate orally, in writing and graphically, the outcome of geographic information systems analysis.
- Demonstrate an awareness of professional obligations to society, employers and funders and individuals as outlined in the Geographic Information Systems Professional Certification Institute Code of Ethics.

Item 2. Catalog Description

Geospatial technology is the unifying tool with which spatial phenomena is explored. Geospatial technology consists of Geographic Information Systems, Global Positioning Systems and Remote Sensing. The Geographic Information Systems Technology program at Foothill College provides opportunities for career preparation and lifelong learning by providing courses that meet workforce needs. Geographic information systems are collections of computers, software applications and personnel used to capture, store, transform, manage, analyze and display spatial information. Geographic information systems skills are highly desirable in agriculture, archaeology, business, cartography, government, law enforcement, marketing, oil and gas, real estate and urban planning. The associate degree provides a solid technical background in geographic information systems concepts and applications including cartographic concepts, database design, programming and interdisciplinary applications of the technology. The outcomes of the associate degree align with the U.S. Department of Labor geospatial competency model for geospatial careers. The degree also includes general education and elective courses required for graduation. Completion of the degree requires practical work experience in geographic information systems. The Geographic Information Systems Technology degree prepares students for entry-level technician jobs.

Item 3. Program Requirements

Requirements	Crse #	Title	Units	CSU-GE	IGETC	Sequence
Required Core	GIST 11	Introduction to Mapping & Spatial Reasoning	4			Yr 1, Winter
	GIST 12	Introduction to Geospatial Technology	4			Yr 2, Fall
	GIST 52	Geospatial Data Acquisition & Management	4			Yr 2, Winter
	GIST 53	Advanced Geospatial Technology & Spatial Analysis	4			Yr 2, Spring
	GIST 54A	Seminar in Specialized Applications of	2			Yr 2, Winter

		Geographic Information Systems I				
	GIST 58	Remote Sensing & Digital Image Processing	3			Yr 1, Winter
	GIST 59	Cartography, Map Presentation & Design	2			Yr 1, Spring
	ITRN 52	Internship	3			Yr 2, Spring
	C S 1A	Object-Oriented Programming Methodologies in Java	5			Yr 1, Fall
Restricted Electives (select two)	C S 21A	Programming in Python	5			Yr 1, Winter
	C S 22A	Javascript for Programmers	5			
	HORT 45	Landscape Design: Computer Applications	3			
Other Electives (select one)	GEOG 1	Physical Geography	5			Yr 1, Fall
	GEOG 2	Human Geography	4			
	GEOG 10	World Regional Geography	4			

Required Major Total	**43-46 units**
Completion of Foothill GE pattern	30-35 units
Electives (as needed to reach 90 units)	9-17 units
TOTAL UNITS	**90 units**

Proposed Sequence (including GE courses):
Year 1, Fall = 9-14 units
Year 1, Winter = 14-17 units
Year 1, Spring = 12-14 units
Year 2, Fall = 15 units
Year 2, Winter = 15 units
Year 2, Spring = 15 units
TOTAL UNITS: 90 units

Item 4. Master Planning

Geographic Information Systems and its associated Geospatial Technology disciplines, Global Positioning Systems and Remote Sensing, have been around for over 40 years but have risen to prominence in the last 15 years with the advent of inexpensive and compact desktop computing and graphics capabilities and the declassification of many military supported data and hardware sources. Geospatial technologies are now widely integrated in information technology and asset management in a wide variety of disciplines. Geospatial Technology has moved from a subject of elite academic research to a technical skill required in a wide variety of fields.

Community colleges began offering Geographic Information Systems, Global Positioning Systems and Remote Sensing coursework beginning about 15 years ago in response to this emergence of the technology as an in-demand CTE technology and job area. In 2008, the U.S. Department of Labor listed Geospatial Technology as one of the three fastest growing technical fields, along with Biotechology and Nanotechnology. By 2016, the U.S. Department of Labor estimates that the U.S. will need 500,000 professionals trained in Geospatial Technology.

Foothill College established a Geographic Information Systems certificate program in 2000 and has maintained a robust offering of courses and certificates. The program annually enrolls around 60 FTE students and currently offers a series of courses culminating in a Certificate of Achievement in Geography with a focus on Geographic Information Systems. The program has been updated to reflect current industry model curriculum. The additional certificates for which we are applying represent our shift of programs and courses to the Geographic Information Systems Technology department, based on feedback from the program's professional advisory board. These new certificates and associate degree will replace the existing Certificate of Achievement in Geographic Information Systems that is presently housed in the Geography department.

Item 5. Enrollment and Completer Projections

Each course has 20-35 students per course. The number of projected completers per year is 30 graduates. These figures are based on the number of students completing certificates between the years 2006 through 2012. The economy and job availability has a direct affect on enrollment. Many local employers hiring in Geospatial Technology are in the public sector that has been greatly affected by the recent economic downturn. However, many program graduates are interested in using their skills as a vehicle to move to other regions of the state and country where even in the current economy, there is a very high demand for professionals with geospatial technology skills.

Current employment projections show that green technology trades such as Geospatial Technology are recovering faster than the local economy as a whole. According to EMSI, between 2012 and 2015 there are projected to be 511 jobs that require geospatial technology skills locally and 1490 statewide.

		Year 1		Year 2	
Course #	**Course Title**	**Annual Sections**	**Annual Enrollment**	**Annual Sections**	**Annual Enrollment**
GIST 11	Introduction to Mapping & Spatial Reasoning	4	120	4	120
GIST 12	Introduction to Geospatial Technology	2	46	2	48
GIST 52	Geospatial Data Acquisition & Management	1	24	1	25
GIST 53	Advanced Geospatial Technology & Spatial Analysis	new for 2015	N/A	N/A	N/A
GIST 54A	Seminar in Specialized Applications of Geographic Information Systems I	new for 2015	N/A	N/A	N/A
GIST 58	Remote Sensing & Digital Image Processing	1	28	1	25
GIST 59	Cartography, Map Presentation & Design	1	30	1	27
ITRN 52	Internship	1	20	1	25
C S 1A	Object-Oriented Programming Methodologies in Java	20	800	20	800
C S 21A	Programming in Python	5	200	5	200
C S 22A	Javascript for Programmers	6	240	6	240
HORT 45	Landscape Design: Computer Applications	1	30	1	30
GEOG 1	Physical Geography	24	840	24	840
GEOG 2	Human Geography	5	250	6	300
GEOG 10	World Regional Geography	5	250	6	300

Item 6. Place of Program in Curriculum/Similar Programs

There is currently no associate degree at Foothill College in this discipline. This program fulfills a need expressed by the industry advisory board. This program is aligned with national standards and as such will allow students to move between it and other statewide programs that also follow the national model curriculum standards.

The program will use college computer teaching labs and open computer labs for students to complete both lab and outside of class assignments. This program builds upon the existing Geographic Information Systems certificate program with updated, industry modeled curriculum and will make more productive use of existing computer laboratory facilities in the college.

Item 7. Similar Programs at Other Colleges in Service Area

There are no other colleges within commuting distance that offer a similar program. Diablo Valley College (65 miles away) is the only other community college that offers an associate degree in Geospatial Technology. The Geospatial Technology program at Foothill has worked closely with the Geographic Information Systems programs at Diablo Valley College and City College of San Francisco (the only two

regional colleges with similar programs) through the Bay Area Automated Mapping Association (BAAMA), the regional professional body, to insure that the programs complement each other.

The Diablo Valley College associate in science degree program in Geographic Information Systems/Global Positioning System is designed to prepare students for entry into careers that employ generalized or specialized applications of geographic information systems. Students learn technical and analytical skills for research as well as practical skills necessary to enter the job market and obtain positions with such titles as Geographic Information Systems technician, Geographic Information Systems specialist, Geographic Information Systems analyst, Geographic Information Systems programmer, Geographic Information Systems coordinator, Geographic Information Systems supervisor and Geographic Information Systems manager.

City College of San Francisco's Geographic Information Systems credit program is jointly offered by the Earth Sciences Department (through the Geography program) and the Engineering Department. Students earn a 9-unit certificate of accomplishment (non-transcriptable). Students in this program develop in-depth knowledge of the fundamental concepts and practice of geographic information systems and learn hands-on problem-solving skills doing real-world geographic information systems application projects. Students will apply this knowledge and hands-on skills to various fields.

FOOTHILL COLLEGE
Credit Program Narrative
Certificate of Achievement in Geographic Information Systems Technology I

Item 1. Program Goals and Objective

The goals of this program are to graduate students who are competent users and creators of geospatial technology and provide the opportunity for graduates to gain skills necessary to advance in their careers. This program will prepare students to apply for professional certification (GISP) through the Geographic Information Systems Certification Institute, administered through the Urban and Regional Information Systems Association.

Graduates will have achieved the following competencies:

- Apply cartographic principles of scale, resolution, projection, data management and spatial analysis to a geographic nature using a geographic information system.
- Plan, evaluate and execute an original geographic information systems project.
- Demonstrate the ability to communicate orally, in writing and graphically, the outcome of geographic information systems analysis.
- Demonstrate an awareness of professional obligations to society, employers and funders and individuals as outlined in the Geographic Information Systems Professional Certification Institute Code of Ethics.

Item 2. Catalog Description

Geospatial technology is the unifying tool with which spatial phenomena is explored. Geospatial technology consists of Geographic Information Systems, Global Positioning Systems and Remote Sensing. The Geographic Information Systems Technology program at Foothill College provides opportunities for career preparation and lifelong learning by providing courses that meet workforce needs. Geographic information systems are collections of computers, software applications and personnel used to capture, store, transform, manage, analyze and display spatial information. Geographic information systems skills are highly desirable in agriculture, archaeology, business, cartography, government, law enforcement, marketing, oil and gas, real estate and urban planning. The Certificate of Achievement in Geographic Information Systems Technology I provides a solid technical background in geographic information systems concepts and applications including cartographic concepts, database design, programming and interdisciplinary applications of the technology. The outcomes of the certificate align with the U.S. Department of Labor geospatial competency model for geospatial careers. Completion of the certificate requires practical work experience in geographic information systems. The Certificate of Achievement in Geographic Information Systems Technology I prepares students for entry-level geographic information systems technician jobs.

Item 3. Program Requirements

Requirement	Crse #	Title	Units	CSU-GE	IGETC	Sequence
Required Core	GIST 11	Introduction to Mapping & Spatial Reasoning	4			Yr 1, Fall
	GIST 12	Introduction to Geospatial Technology	4			Yr 1, Fall
	GIST 52	Geospatial Data Acquisition & Management	4			Yr 1, Winter
	GIST 53	Advanced Geospatial Technology & Spatial Analysis	4			Yr 1, Spring
	GIST 54A	Seminar in Specialized Applications of Geographic Information Systems I	2			Yr 1, Winter

	GIST 58 GIST 59 ITRN 52 C S 1A	Remote Sensing & Digital Image Processing Cartography, Map Presentation & Design Internship Object-Oriented Programming Methodologies in Java	3 2 3 5			Yr 1, Winter Yr 1, Spring Yr 1, Spring Yr 1, Fall
Restricted Electives (select two)	C S 21A C S 22A HORT 45	Programming in Python Javascript for Programmers Landscape Design: Computer Applications	5 5 3			Yr 1, Winter & Yr 2, Fall
Other Electives (select one)	GEOG 1 GEOG 2 GEOG 10	Physical Geography Human Geography World Regional Geography	5 4 4			Yr 2, Fall

Required Major Total **43-46 units**
TOTAL UNITS **43-46 units**

Proposed Sequence:
Year 1, Fall = 13 units
Year 1, Winter = 12-14 units
Year 1, Spring = 9 units
Year 2, Fall = 7-10 units
TOTAL UNITS: 43-46 units

Item 4. Master Planning

Geographic Information Systems and its associated Geospatial Technology disciplines, Global Positioning Systems and Remote Sensing, have been around for over 40 years but have risen to prominence in the last 15 years with the advent of inexpensive and compact desktop computing and graphics capabilities and the declassification of many military supported data and hardware sources. Geospatial technologies are now widely integrated in information technology and asset management in a wide variety of disciplines. Geospatial Technology has moved from a subject of elite academic research to a technical skill required in a wide variety of fields.

Community colleges began offering Geographic Information Systems, Global Positioning Systems and Remote Sensing coursework beginning about 15 years ago in response to this emergence of the technology as an in-demand CTE technology and job area. In 2008, the US Department of Labor listed Geospatial Technology as one of the three fastest growing technical fields, along with Biotechology and Nanotechnology. By 2016, the U.S. Department of Labor estimates that the U.S. will need 500,000 professionals trained in Geospatial Technology.

Foothill College established a Geographic Information Systems certificate program in 2000 and has maintained a robust offering of courses and certificates. The program annually enrolls around 60 FTE students and currently offers a series of courses culminating in a Certificate of Achievement in Geography with a focus on Geographic Information Systems. The program has been updated to reflect current industry model curriculum. The additional certificates for which we are applying represent our shift of programs and courses to the Geographic Information Systems Technology department, based on feedback from the program's professional advisory board. These new certificates and associate degree will replace the existing Certificate of Achievement in Geographic Information Systems that is presently housed in the Geography department.

Item 5. Enrollment and Completer Projections

Each course has 20-35 students per course. The number of projected completers per year is 30 graduates. These figures are based on the number of students completing certificates between the years 2006 through 2012. The economy and job availability has a direct affect on enrollment. Many local employers hiring in Geospatial Technology are in the public sector that has been greatly affected by the

recent economic downturn. However, many program graduates are interested in using their skills as a vehicle to move to other regions of the state and country where even in the current economy, there is a very high demand for professionals with geospatial technology skills.
Current employment projections show that green technology trades such as Geospatial Technology are recovering faster than the local economy as a whole. According to EMSI, between 2012 and 2015 there are projected to be 511 jobs that require geospatial technology skills locally and 1490 statewide.

		Year 1		Year 2	
Course #	**Course Title**	**Annual Sections**	**Annual Enrollment**	**Annual Sections**	**Annual Enrollment**
GIST 11	Introduction to Mapping & Spatial Reasoning	New for 2013	N/A	N/A	N/A
GIST 12	Introduction to Geospatial Technology	2	46	2	48
GIST 52	Geospatial Data Acquisition & Management	1	24	1	25
GIST 53	Advanced Geospatial Technology & Spatial Analysis	new for 2015	N/A	N/A	N/A
GIST 54A	Seminar in Specialized Applications of Geographic Information Systems I	new for 2015	N/A	N/A	N/A
GIST 58	Remote Sensing & Digital Image Processing	1	28	1	25
GIST 59	Cartography, Map Presentation & Design	1	30	1	27
C S 21A	Programming in Python	5	200	5	200
C S 1A	Object-Oriented Programming Methodologies in Java	20	800	20	800
C S 22A	Javascript for Programmers	6	240	6	240
HORT 45	Landscape Design: Computer Applications	1	30	1	30
GEOG 1	Physical Geography	24	840	24	840
GEOG 2	Human Geography	5	250	6	300
GEOG 10	World Regional Geography	5	250	6	300

Item 6. Place of Program in Curriculum/Similar Programs
There is currently no associate degree or certificates of achievement at Foothill College in this discipline. This program fulfills a need expressed by the industry advisory board. This program is aligned with national standards and as such will allow students to move between it and other statewide programs that also follow the national model curriculum standards.
The program will use college computer teaching labs and open computer labs for students to complete both lab and outside of class assignments. This program builds upon the existing Geographic Information Systems certificate program with updated, industry modeled curriculum and will make more productive use of existing computer laboratory facilities in the college.

Item 7. Similar Programs at Other Colleges in Service Area
There are no other colleges within commuting distance that offer a similar program. Diablo Valley College (65 miles away) is the only other community college that offers an associate degree in Geospatial Technology. The Geospatial Technology program at Foothill has worked closely with the Geographic Information Systems programs at Diablo Valley College and City College of San Francisco (the only two regional colleges with similar programs) through the Bay Area Automated Mapping Association (BAAMA), the regional professional body, to insure that the programs complement each other.

The Diablo Valley College associate in science degree program in Geographic Information Systems/Global Positioning System is designed to prepare students for entry into careers that employ generalized or specialized applications of geographic information systems. Students learn technical and

analytical skills for research as well as practical skills necessary to enter the job market and obtain positions with such titles as Geographic Information Systems technician, Geographic Information Systems specialist, Geographic Information Systems analyst, Geographic Information Systems programmer, Geographic Information Systems coordinator, Geographic Information Systems supervisor and Geographic Information Systems manager.

City College of San Francisco's Geographic Information Systems credit program is jointly offered by the Earth Sciences Department (through the Geography program) and the Engineering Department. Students earn a 9-unit certificate of accomplishment (non-transcriptable). Students in this program develop in-depth knowledge of the fundamental concepts and practice of geographic information systems and learn hands-on problem-solving skills doing real-world geographic information systems application projects. Students will apply this knowledge and hands-on skills to various fields.

FOOTHILL COLLEGE
Credit Program Narrative
Certificate of Achievement in Geographic Information Systems Technology II

Item 1. Program Goals and Objectives

The goals of this program are to graduate students who are competent users and creators of geospatial technology and provide the opportunity for graduates to gain skills necessary to advance in their careers.

Graduates will have achieved the following competencies:

- Apply cartographic principles of scale, resolution, projection and data management to a problem of a geographic nature using a geographic information system.
- Execute an original geographic information systems project under the supervision of a faculty or professional mentor.
- Demonstrate the ability to communicate, orally, in writing, and graphically, the outcome of geographic information systems analysis.

Item 2. Catalog Description

Geospatial technology is the unifying tool with which spatial phenomena is explored. Geospatial technology consists of Geographic Information Systems, Global Positioning Systems and Remote Sensing. The Geographic Information Systems Technology program at Foothill College provides opportunities for career preparation and lifelong learning by providing courses that meet workforce needs. Geographic information systems are collections of computers, software applications and personnel used to capture, store, transform, manage, analyze and display spatial information. Geographic information systems skills are highly desirable in agriculture, archaeology, business, cartography, government, law enforcement, marketing, oil and gas, real estate and urban planning. The Certificate of Achievement in Geographic Information Systems Technology II provides a solid technical background in geographic information systems concepts and applications including cartographic concepts, database design, programming and interdisciplinary applications of the technology. The outcomes of the certificate align with the U.S. Department of Labor geospatial competency model for geospatial careers. The courses in this certificate scale up to additional Geographic Information Systems Technology certificates and the associate degree in Geographic Information Systems Technology. This certificate provides students with skills necessary to advance in careers that require geospatial technology skills.

Item 3. Program Requirements

Requirements	Crse #	Title	Units	CSU-GE	IGETC	Sequence
Required Core	GIST 11	Introduction to Mapping & Spatial Reasoning	4			Yr 1, Fall
	GIST 12	Introduction to Geospatial Technology	4			Yr 1, Fall
	GIST 52	Geospatial Data Acquisition & Management	4			Yr 1, Winter
	GIST 54A	Seminar in Specialized Applications of Geographic Information Systems I	2			Yr 1, Winter
	GIST 58	Remote Sensing & Digital Image Processing	3			Yr 1, Winter
	GIST 59	Cartography, Map Presentation & Design	2			Yr 1, Spring
Restricted Electives (select one)	C S 21A	Programming in Python	5			Yr 1, Winter
	C S 1A	Object-Oriented Programming Methodologies in Java	5			
	C S 22A	Javascript for Programmers	5			
	HORT 45	Landscape Design: Computer Applications	3			

Required Major Total **22-24 units**
TOTAL UNITS **22-24 units**

Proposed Sequence:
Year 1, Fall = 8 units
Year 1, Winter = 12-14 units
Year 1, Spring = 2 units
TOTAL UNITS: 22-24 units

Item 4. Master Planning

Geographic Information Systems and its associated Geospatial Technology disciplines, Global Positioning Systems and Remote Sensing, have been around for over 40 years but have risen to prominence in the last 15 years with the advent of inexpensive and compact desktop computing and graphics capabilities and the declassification of many military supported data and hardware sources. Geospatial technologies are now widely integrated in information technology and asset management in a wide variety of disciplines. Geospatial Technology has moved from a subject of elite academic research to a technical skill required in a wide variety of fields.

Community colleges began offering Geographic Information Systems, Global Positioning Systems and Remote Sensing coursework beginning about 15 years ago in response to this emergence of the technology as an in-demand CTE technology and job area. In 2008, the U.S. Department of Labor listed Geospatial Technology as one of the three fastest growing technical fields, along with Biotechology and Nanotechnology. By 2016, the U.S. Department of Labor estimates that the U.S. will need 500,000 professionals trained in Geospatial Technology.

Foothill College established a Geographic Information Systems certificate program in 2000 and has maintained a robust offering of courses and certificates. The program annually enrolls around 60 FTE students and currently offers a series of courses culminating in a Certificate of Achievement in Geography with a focus on Geographic Information Systems. The program has been updated to reflect current industry model curriculum. The additional certificates for which we are applying represent our shift of programs and courses to the Geographic Information Systems Technology department, based on feedback from the program's professional advisory board. These new certificates and associate degree will replace the existing Certificate of Achievement in Geographic Information Systems that is presently housed in the Geography department.

Item 5. Enrollment and Completer Projections

Each course has 20-35 students per course. The number of projected completers per year is 30 graduates. These figures are based on the number of students completing certificates between the years 2006 through 2012. The economy and job availability has a direct affect on enrollment. Many local employers hiring in Geospatial Technology are in the public sector that has been greatly affected by the recent economic downturn. However, many program graduates are interested in using their skills as a vehicle to move to other regions of the state and country where even in the current economy, there is a very high demand for professionals with geospatial technology skills.

Current employment and projections show that green technology trades such as Geospatial Technology are recovering faster than the local economy as a whole. According to EMSI, between 2012 and 2015 there are projected to be 511 jobs that require geospatial technology skills locally and 1490 statewide.

		Year 1		Year 2	
Course #	**Course Title**	**Annual Sections**	**Annual Enrollment**	**Annual Sections**	**Annual Enrollment**
GIST 11	Introduction to Mapping & Spatial Reasoning	New for 2013	N/A	N/A	N/A
GIST 12	Introduction to Geospatial Technology	2	46	2	48
GIST 52	Geospatial Data Acquisition & Management	1	24	1	25
GIST 54A	Seminar in Specialized Applications of Geographic Information Systems I	new for 2015	N/A	N/A	N/A
GIST 58	Remote Sensing & Digital Image	1	28	1	25

	Processing				
GIST 59	Cartography, Map Presentation & Design	1	30	1	27
C S 21A	Programming in Python	5	200	5	200
C S 1A	Object-Oriented Programming Methodologies in Java	20	800	20	800
C S 22A	Javascript for Programmers	6	240	6	240
HORT 45	Landscape Design: Computer Applications	1	30	1	30

Item 6. Place of Program in Curriculum/Similar Programs

There is currently no associate degree or certificates of achievement at Foothill College in this discipline. This program fulfills a need expressed by the industry advisory board. This program is aligned with national standards and as such will allow students to move between it and other statewide programs that also follow the national model curriculum standards.

The program will use college computer teaching labs and open computer labs for students to complete both lab and outside of class assignments. This program builds upon the existing Geographic Information Systems certificate program with updated, industry modeled curriculum and will make more productive use of existing computer laboratory facilities in the college.

Item 7. Similar Programs at Other Colleges in Service Area

There are no other colleges within commuting distance that offer a similar program. Diablo Valley College (65 miles away) is the only other community college that offers an associate degree in Geospatial Technology. The Geospatial Technology program at Foothill has worked closely with the Geographic Information Systems programs at Diablo Valley College and City College of San Francisco (the only two regional colleges with similar programs) through the Bay Area Automated Mapping Association (BAAMA), the regional professional body, to insure that the programs complement each other.

The Diablo Valley College associate in science degree program in Geographic Information Systems/Global Positioning System is designed to prepare students for entry into careers that employ generalized or specialized applications of geographic information systems. Students learn technical and analytical skills for research as well as practical skills necessary to enter the job market and obtain positions with such titles as Geographic Information Systems technician, Geographic Information Systems specialist, Geographic Information Systems analyst, Geographic Information Systems programmer, Geographic Information Systems coordinator, Geographic Information Systems supervisor and Geographic Information Systems manager.

City College of San Francisco's Geographic Information Systems credit program is jointly offered by the Earth Sciences Department (through the Geography program) and the Engineering Department. Students earn a 9-unit certificate of accomplishment (non-transcriptable). Students in this program develop in-depth knowledge of the fundamental concepts and practice of geographic information systems and learn hands-on problem-solving skills doing real-world geographic information systems application projects. Students will apply this knowledge and hands-on skills to various fields.

FOOTHILL COLLEGE
Credit Program Narrative
Certificate of Achievement in Geographic Information Systems Technology III

Item 1. Program Goals and Objective

The goals of this program are to graduate students who are competent users and creators of geospatial technology and provide the opportunity for graduates to gain skills necessary to advance in their careers.

Graduates will have achieved the following competencies:

- Apply cartographic principles of scale, resolution, projection and data management to a problem of a geographic nature using a geographic information system.
- Execute an original geographic information systems project under the supervision of a faculty or professional mentor.
- Demonstrate the ability to communicate, orally, in writing, and graphically, the outcome of geographic information systems analysis.

Item 2. Catalog Description

Geospatial technology is the unifying tool with which spatial phenomena is explored. Geospatial technology consists of Geographic Information Systems, Global Positioning Systems and Remote Sensing. The Geographic Information Systems Technology program at Foothill College provides opportunities for career preparation and lifelong learning by providing courses that meet workforce needs. Geographic information systems are collections of computers, software applications and personnel used to capture, store, transform, manage, analyze and display spatial information. Geographic information systems skills are highly desirable in agriculture, archaeology, business, cartography, government, law enforcement, marketing, oil and gas, real estate and urban planning. The Certificate of Achievement in Geographic Information Systems Technology III provides a solid technical background in geographic information systems concepts and applications including cartographic concepts, database design, programming and interdisciplinary applications of the technology. The outcomes of the certificate align with the U.S. Department of Labor geospatial competency model for geospatial careers. The courses in this certificate scale up to additional Geographic Information Systems Technology certificates and the associate degree in Geographic Information Systems Technology. It provides students with skills necessary to advance in careers that require robust geospatial technology skills.

Item 3. Program Requirements

Requirement	Crse #	Title	Units	CSU-GE	IGETC	Sequence
Required Core	GIST 11	Introduction to Mapping & Spatial Reasoning	4			Yr 1, Fall
	GIST 12	Introduction to Geospatial Technology	4			Yr 1, Fall
	GIST 52	Geospatial Data Acquisition & Management	4			Yr 1, Winter
	GIST 53	Advanced Geospatial Technology & Spatial Analysis	4			Yr 1, Spring
	GIST 54A	Seminar in Specialized Applications of Geographic Information Systems I	2			Yr 1, Winter
	GIST 58	Remote Sensing & Digital Image Processing	3			Yr 1, Winter
	GIST 59	Cartography, Map Presentation & Design	2			Yr 1, Spring
Restricted	C S 21A	Programming in Python	5			Yr 1, Fall & Winter

Electives (select two)	C S 1A	Object-Oriented Programming Methodologies in Java	5			
	C S 22A	Javascript for Programmers	5			
	HORT 45	Landscape Design: Computer Applications	3			

Required Major Total **31-33 units**

Proposed Sequence:
Year 1, Fall = 11-13 units
Year 1, Winter = 12-14 units
Year 1, Spring = 6 units
TOTAL UNITS: 31-33 units

Item 4. Master Planning

Geographic Information Systems and its associated Geospatial Technology disciplines, Global Positioning Systems and Remote Sensing, have been around for over 40 years but have risen to prominence in the last 15 years with the advent of inexpensive and compact desktop computing and graphics capabilities and the declassification of many military supported data and hardware sources. Geospatial technologies are now widely integrated in information technology and asset management in a wide variety of disciplines. Geospatial Technology has moved from a subject of elite academic research to a technical skill required in a wide variety of fields.

Community colleges began offering Geographic Information Systems, Global Positioning Systems and Remote Sensing coursework beginning about 15 years ago in response to this emergence of the technology as an in-demand CTE technology and job area. In 2008, the U.S. Department of Labor listed Geospatial Technology as one of the three fastest growing technical fields, along with Biotechology and Nanotechnology. By 2016, the U.S. Department of Labor estimates that the U.S. will need 500,000 professionals trained in Geospatial Technology.

Foothill College established a Geographic Information Systems certificate program in 2000 and has maintained a robust offering of courses and certificates. The program annually enrolls around 60 FTE students and currently offers a series of courses culminating in a Certificate of Achievement in Geography with a focus on Geographic Information Systems. The program has been updated to reflect current industry model curriculum. The additional certificates for which we are applying represent our shift of programs and courses to the Geographic Information Systems Technology department, based on feedback from the program's professional advisory board. These new certificates and associate degree will replace the existing Certificate of Achievement in Geographic Information Systems that is presently housed in the Geography department.

Item 5. Enrollment and Completer Projections

Each course has 20-35 students per course. The number of projected completers per year is 30 graduates. These figures are based on the number of students completing certificates between the years 2006 through 2012. The economy and job availability has a direct affect on enrollment. Many local employers hiring in Geospatial Technology are in the public sector that has been greatly affected by the recent economic downturn. However, many program graduates are interested in using their skills as a vehicle to move to other regions of the state and country where even in the current economy, there is a very high demand for professionals with geospatial technology skills.

Current employment projections show that green technology trades such as Geospatial Technology are recovering faster than the local economy as a whole. According to EMSI, between 2012 and 2015 there are projected to be 511 jobs that require geospatial technology skills locally and 1490 statewide.

		Year 1		Year 2	
Course #	**Course Title**	**Annual Sections**	**Annual Enrollment**	**Annual Sections**	**Annual Enrollment**
GIST 11	Introduction to Mapping & Spatial Reasoning	New for 2013	N/A	N/A	N/A

GIST 12	Introduction to Geospatial Technology	2	46	2	48
GIST 52	Geospatial Data Acquisition & Management	1	24	1	25
GIST 53	Advanced Geospatial Technology & Spatial Analysis	new for 2015	N/A	N/A	N/A
GIST 54A	Seminar in Specialized Applications of Geographic Information Systems I	new for 2015	N/A	N/A	N/A
GIST 58	Remote Sensing & Digital Image Processing	1	28	1	25
GIST 59	Cartography, Map Presentation & Design	1	30	1	27
C S 21A	Programming in Python	5	200	5	200
C S 1A	Object-Oriented Programming Methodologies in Java	20	800	20	800
C S 22A	Javascript for Programmers	6	240	6	240
HORT 45	Landscape Design: Computer Applications	1	30	1	30

Item 6. Place of Program in Curriculum/Similar Programs

There is currently no associate degree or certificates of achievement at Foothill College in this discipline. This program fulfills a need expressed by the industry advisory board. This program is aligned with national standards and as such will allow students to move between it and other statewide programs that also follow the national model curriculum standards.

The program will use college computer teaching labs and open computer labs for students to complete both lab and outside of class assignments. This program builds upon the existing Geographic Information Systems certificate program with updated, industry modeled curriculum and will make more productive use of existing computer laboratory facilities in the college.

Item 7. Similar Programs at Other Colleges in Service Area

There are no other colleges within commuting distance that offer a similar program. Diablo Valley College (65 miles away) is the only other community college that offers an associate degree in Geospatial Technology. The Geospatial Technology program at Foothill has worked closely with the Geographic Information Systems programs at Diablo Valley College and City College of San Francisco (the only two regional colleges with similar programs) through the Bay Area Automated Mapping Association (BAAMA), the regional professional body, to insure that the programs complement each other.

The Diablo Valley College associate in science degree program in Geographic Information Systems/Global Positioning System is designed to prepare students for entry into careers that employ generalized or specialized applications of geographic information systems. Students learn technical and analytical skills for research as well as practical skills necessary to enter the job market and obtain positions with such titles as Geographic Information Systems technician, Geographic Information Systems specialist, Geographic Information Systems analyst, Geographic Information Systems programmer, Geographic Information Systems coordinator, Geographic Information Systems supervisor and Geographic Information Systems manager.

City College of San Francisco's Geographic Information Systems credit program is jointly offered by the Earth Sciences Department (through the Geography program) and the Engineering Department. Students earn a 9-unit certificate of accomplishment (non-transcriptable). Students in this program develop in-depth knowledge of the fundamental concepts and practice of geographic information systems and learn hands-on problem-solving skills doing real-world geographic information systems application projects. Students will apply this knowledge and hands-on skills to various fields.

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FOOTHILL COLLEGE
Credit Program Narrative
Associate in Science in Air Conditioning and Refrigeration Technology

Item 1. Program Goals and Objectives

The goals and objectives of the Associate in Science degree in Air Conditioning and Refrigeration Technology align with the primary mission of California community colleges, as established in Ed. Code § 66010.4, which mandate that community colleges provide vocational instruction to students and to advance California's economic growth and global competitiveness through education and training that contribute to workforce development. The Associate in Science degree in Air Conditioning and Refrigeration Technology aligns with Foothill College's Institutional Outcomes and directly supports the Computation and the Creative, Critical, and Analytical Thinking rubrics

The Associate in Science degree in Air Conditioning and Refrigeration Technology at Foothill College serves to align apprenticeship programs with college and university academic tracks as directed by the federal and state government. Foothill College and the Loyd E. Williams Pipe Trades Training Center are collaborating in an LEA program with the Division of Apprenticeship Standards for the state of California.

Foothill College is responding to local demand for Pipe Trades workers in Refrigeration, Heating, and Air Conditioning by establishing an Associate in Science degree in Air Conditioning and Refrigeration Technology in partnership with the Loyd E. Williams Pipe Trades Training Center the Joint Apprenticeship Training Center located in San Jose, CA. Graduates are recognized as journeypersons within the Pipe Trades industry and will increase their marketability and employment opportunities. Graduates will be employable as: Journeyman Commercial Plumber/Industrial Plumber, Foreman and General Foreman.

Program Learning Outcomes:

- In compliance with applicable standards and codes, students will demonstrate ability to install and remove refrigeration, heating, air conditioning, and ventilation systems, including the appropriate electrical/electronic control systems.
- In compliance with applicable standards and codes, students will demonstrate ability to maintain, repair, extend, and/or alter refrigeration, heating, air conditioning, and ventilation systems, including electronic control systems.

Students complete the associate degree through enrollment in the Refrigeration and Air Conditioning apprenticeship program at the Pipe Trades Training Center. To apply to the Pipe Trades Training Center apprenticeship program, potential students must be at least 18 years of age, be able to perform the work of the trade, present verification of high school completion, either through a high school diploma or GED or High School Proficiency certificate, and demonstrate the ability to read, write, and speak English. The selection, employment and training of apprentices by the Pipe Trades Training Center is without discrimination according to race, color, national or ethnic origin, age, gender, religion, sexual orientation or marital status. Students are admitted into the Pipe Trades Training Center apprenticeship program based on obtaining a passing (75%) score on the Pipe Trades Entrance Exam which measures the student's ability in math and mechanical reasoning. Students who pass the entrance exam are selected from an applicant waiting list, the order of which is established by the date the entrance exam was taken and the test score. Admission to apprenticeship classes is limited to apprentices registered with the California Division of Apprenticeships Standards and is authorized by the California Labor Code, Section § 3074.3.

Aside from Foothill College's ordinary enrollment fees, there are no additional costs to the student to complete the Associate in Science degree in Air Conditioning and Refrigeration Technology.

Item 2. Catalog Description

The Associate in Science degree in Air Conditioning and Refrigeration Technology program is conducted in partnership with the Pipe Trades Training Center apprenticeship program. The apprenticeship program is five years in duration, requiring a minimum of 9,000 hours of on-the-job training. After 5 years of classroom instruction and paid work experience, students are recognized as journeypersons within the Pipe Trades industry and work to insure indoor air quality by servicing and repairing all types of refrigeration equipment in all sizes of buildings, complex air conditioning, heating and refrigeration units used in hospitals, skyscrapers,

Edits cmln 5/29/14

manufacturing facilities and research development laboratories. Graduates will be employable as: Service Manager, Facilities Manager, Project Manager, Estimator, HVACR Instructor, HVACR Sustainable Technologies Technician, and/or a Union Business Agent/ Business Manager in almost any industry. Labor Market analysis indicates increased employment opportunities in the pipe trades through 2020. Students earning an associate degree increase their marketability and employment opportunities. Enrollment in apprenticeship courses is limited to apprentices registered with the California Division of Apprenticeships Standards, according to the California Labor Code, Section § 3074.3.

The apprenticeship program, which includes coursework, lab work and on-the-job training, involves learning about the assessment, installation, maintenance and repair of different types of pipe systems, electronic control systems, refrigeration and air conditioning systems, effective and safe tool use, material applications, electrical competency, related mathematics and science and storage. The courses required for the Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service also meet many of the requirements for the Associate in Science degree in Air Conditioning and Refrigeration Technology.

Students are admitted into the Pipe Trades Training Center apprenticeship program based on obtaining a passing (75%) score on the Pipe Trades Entrance Exam, which measures the student's ability in math and mechanical reasoning. Students who pass the entrance exam are selected from an applicant waiting list, the order of which is established by the date the entrance exam was taken and the test score.

Item 3. Program Requirements

Requirements	Crse #	Name	Units	CSU-GE	IGETC	Sequence
Core Courses (45.5 Units)	APPT 151	Advanced Chillers and Refrigeration	4.5			Yr 1, Fall
	APPT 152	Basic Electricity and Refrigeration	4.5			Year 1, Spring & Summer
	APPT 153	Mechanical Systems	4.5			Year 2, Fall & Winter
	APPT 154	Electrical Controls Fundamentals	4.5			Year 2, Spring & Summer
	APPT 155	Advanced Electric Controls	4.5			Year 3, Fall & Winter
	APPT 156	HVAC Pneumatic & Electric Controls	4.5			Year 3, Spring & Summer
	APPT 157	Industrial Refrigeration & Air-Conditioning Service	4.5			Year 4, Fall & Winter
	APPT 158	Advanced Refrigeration & Chillers	4.5			Year 4, Spring & Summer
	APPT 159	Start, Test, & Balance: HVAC Systems	4.5			Year 5, Fall & Winter
	APPT 129	Special Topics	2.5			Year 5, Spring & Summer
	APPT 130	Review and Turnout	2.5			Year 5, Spring & Summer

Please correct course titles as approved (http://www.foothill.edu/schedule/outlines.php) and the quarter in which the student will begin the course as technically we count the courses as taken in a quarter. (example APPT 151 would be Yr 1, Fall)

Required Major Total	**45.5 units**
Completion of Foothill GE pattern	35 units
Transferable electives (as needed to reach 60 units)	9.5 units
TOTAL UNITS	**90 units**

Proposed Sequence: (In this proposed sequence you'll need to add in the appropriate quarters the students will complete their GE courses)
Year 1, Fall & Winter = 4.5 units

Edits cmln 5/29/14

Year 1, Spring & Summer = 4.5 units
Year 2, Fall & Winter = 4.5 units
Year 2, Spring & Summer = 4.5 units
Year 3, Fall & Winter = 4.5 units
Year 3, Spring & Summer = 4.5 units
Year 4, Fall & Winter = 4.5 units
Year 4, Spring & Summer = 4.5 units
Year 5, Fall & Winter = 4.5 units
Year 5, Spring & Summer = 5.0 units
Year 6, Fall = 6 units
Year 6, Winter = 6 units
Year 6, Spring = 6 units
Year 6, Summer = 6 units
Year 7, Fall = 6 units
Year 7, Winter = 6 units
Year 7, Spring = 6 units
Year 7, Summer = 2.5 Units
TOTAL UNITS: 90 units

Item 4. Master Planning

The Associate in Science degree in Air Conditioning and Refrigeration Technology aligns with the planned goals of the College and the District because the program serves the regional area in support of workforce development and economic growth. The Associate in Science degree in Air Conditioning and Refrigeration Technology is a new degree and does not duplicate an already-existing program within the Foothill-De Anza district or the surrounding colleges.

The only competition to the Associate in Science degree in Air Conditioning and Refrigeration Technology program at Foothill College occurs from two out-of-state colleges that offer on-line degrees. Pipe Trades Training Center apprentices and recently-graduated journeymen are taking on-line courses at Washtenaw Community College and at National Labor College at considerably higher tuition, $194/credit hour and $297/credit hour respectively, and other expenses in order to earn an Associate in Applied Science degree in HVACR Sustainable Technologies or Industrial Journeyman. Offering an Associate in Science degree in Air Conditioning and Refrigeration Technology at Foothill College would well serve the college's primary stakeholders: the students, community partners, and the community at-large.

Local references in support of the Associate in Science degree in Air Conditioning and Refrigeration Technology include all Advisory Committee representatives from the Pipe Trades Training Center (Appendix B) who strongly support the partnership between the Pipe Trades Training Center and Foothill College due to their understanding of local economic workforce needs and their ongoing contact with apprenticeship students, which provides grounded understanding of their students' short-term and long-term educational goals.

Item 5. Enrollment and Completer Projections

		Year 1		Year 2	
Course #	**Course Title**	**Annual Sections**	**Annual Enrollment**	**Annual Sections**	**Annual Enrollment**
APPT 151	Advanced Refrigeration and Chillers	2	24	2	21
APPT 152	Basic Electricity and Refrigeration	2	23	2	22
APPT 153	Mechanical Systems	1	13	2	21
APPT 154	Electrical Controls Fundamentals	1	15	2	22
APPT 155	Advanced Electric Controls	1	6	1	14
APPT 156	HVAC Pneumatic and Electric Controls	1	6	1	14
APPT 157	Industrial Refrigeration and Air-Conditioning Service	2	19	1	6
APPT 158	Advanced Refrigeration and Chillers	2	19	1	7

Edits cmln 5/29/14

APPT 159	Start, Test, & Balance: HVAC Systems	2	24	2	19
APPT 129	Special Topics	3	25	2	20
APPT 130	Review and Turnout	2	25	2	21

Please correct the titles here as well.

Item 6. Place of Program in Curriculum/Similar Programs

The Associate in Science degree in Air Conditioning and Refrigeration Technology does not adversely affect existing programs at Foothill College in terms of competition for students or courses, nor does it take material resources away from other existing programs at the College. The associate degree creates pathways for students from Pre-Apprenticeship and Apprenticeship through an associate's degree and potential transfer to a four-year institution. Thus, the students can easily move from the Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service to the Associate in Science degree in Air Conditioning and Refrigeration Technology. This streamlined approach facilitates the students' ability to readily complete their educational goals and to earn family-supporting wages.

Item 7. Similar Programs at Other Colleges in Service Area

There are no similar programs in existence in the college service area of Foothill College; the partnership with the Loyd E. Williams Pipe Trades Training Center is unique in the college service area.

FOOTHILL COLLEGE
Credit Program Narrative
Associate in Science Degree in Plumbing Technology

Item 1. Program Goals and Objectives

Foothill College is responding to local demand for Pipe Trades workers in Plumbing by establishing an Associate in Science degree in Plumbing Technology in partnership with the Loyd E. Williams Pipe Trades Training Center (PTTC), the Joint Apprenticeship Training Center located in San Jose, CA. Graduates are recognized as journeypersons within the Pipe Trades industry. Graduates of the Associate in Science degree in Plumbing Technology will be employable as: as a Journeyman Commercial Plumber/Industrial Plumber, Foreman, General Foreman, Superintendent, Project Manager, Estimator, Detailer, Building Trades Inspector, Building Trades Instructor, and Union Business Agent/Business Manager. Students earning an Associate in Science degree in Plumbing Technology will increase their marketability and employment opportunities.

The Associate in Science degree in Plumbing Technology at Foothill College serves to align apprenticeship programs with college and university academic tracks as directed by the federal and state government. Foothill College and the Loyd E. Williams Pipe Trades Training Center (PTTC) are collaborating in an LEA program with the Division of Apprenticeship Standards (DAS) for the state of California.

The program learning outcomes for the Associate in Science degree in Plumbing Technology are:

- In compliance with applicable standards and codes, students will demonstrate ability to install and remove plumbing systems such as drain waste and ventilation systems, systems for various industrial fluids, public or private water systems and gas piping systems.

- In compliance with applicable standards and codes, students will demonstrate ability to maintain, extend, and/or alter plumbing systems including drain waste and ventilation systems, systems for various industrial fluids, public or private water systems and gas piping systems.

Students complete the Associate in Science degree in Plumbing Technology through enrollment in the Plumbing apprenticeship program at the PTTC. To apply to the PTTC apprenticeship program, potential students must be at least 18 years of age, be able to perform the work of the trade, present verification of high school completion, either through a high school diploma or GED or High School Proficiency certificate, and demonstrate the ability to read, write, and speak English. The selection, employment and training of apprentices by the PTTC is without discrimination according to race, color, national or ethnic origin, age, gender, religion, sexual orientation or marital status. Students are admitted into the PTTC apprenticeship program based on obtaining a passing (75%) score on the "Pipe Trades Entrance Exam,' an exam which measures the student's ability in math and mechanical reasoning. Students who pass the entrance exam are selected from an applicant waiting list, the order of which is established by the date the entrance exam was taken and the test score. Admission to apprenticeship classes is limited to apprentices registered with the California Division of Apprenticeships Standards. This limitation is authorized by the California Labor Code, Section 3074.3.

Aside from Foothill College's ordinary enrollment fees, there are no additional costs to the student to complete the Associate in Science degree in Plumbing Technology.

In accordance with the State Chancellor's office, the goals and objectives of the Associate in Science degree in Plumbing Technology align with the primary mission of California community colleges, as established in Ed. Code § 66010.4, which mandate that community colleges provide vocational instruction to students and to advance California's economic growth and global competitiveness through education and training that contribute to workforce development. The Associate in Science degree in Plumbing Technology aligns with Foothill College's Institutional Outcomes and directly supports the Computation and the Creative, Critical, and Analytical Thinking rubrics.

Item 2. Catalog Description

The Associate in Science degree in Plumbing Technology program is conducted in partnership with the Pipe Trades Training Center apprenticeship program. The apprenticeship program is five years in duration, requiring a minimum of 9,000 hours of on-the-job training. After 5 years of classroom and paid work experience, students are recognized as journeypersons within the Pipe Trades industry, working to protect the health and safety of the community by piping pure water to commercial and industrial buildings for drinking, cooking, washing, cleaning, manufacturing or personal use, and removing waste water after it has served its purpose. A graduate will be prepared to work as a Journeyman Commercial Plumber/Industrial Plumber, Foreman, General Foreman, Superintendent, Project Manager, Estimator, Detailer, Building Trades Inspector, Building Trades Instructor, and Union Business Agent/ Business Manager in a variety of industries including the energy, biopharmaceutical, healthcare, aerospace, construction, housing, water treatment, and food and beverage processing industries. Labor Market Analysis indicates increased employment opportunities in the Pipe Trades through 2020. Students earning an Associate in Science degree in Plumbing Technology will increase their marketability and employment opportunities. Admission to apprenticeship classes is limited to apprentices registered with the California Division of Apprenticeships Standards, according to the California Labor Code, Section § 3074.3.

The apprenticeship program, which includes coursework, lab work and on-the-job training, involves learning about the assessment, installation, maintenance, and repair of different types of pipe systems, effective and safe tool use, material applications, related mathematics & science and storage. The student will learn how to read blueprints, apply layout and install, as well as estimate and repair both supply and waste water systems. The Associate in Science degree in Plumbing Technology builds on the Certificate of Achievement in Plumbing by adding requirements for general education courses and electives offered at Foothill College.

Item 3. Program Requirements

Associate in Science Degree in Plumbing Technology

Requirements	Dept. Name & Course #	Name	Units	CSU-GE	IGETC	Sequence
Core Courses (47.5 Quarter Units)	APPT 131	Basic Plumbing Skills	4.5	NA	NA	Year 1,Fall & Winter
	APPT 132	Applied & Related Theory	4.5	NA	NA	Year 1, Spring & Summer
	APPT 133	Beginning Drawing & Design	4.5	NA	NA	Year 2, Fall & Winter
	APPT 134A	Rigging & Layout	2.5	NA	NA	Year 2, Spring & Summer
	APPT 134B	Industrial Safety	2.5	NA	NA	Year 2, Spring & Summer
	APPT 135A	Plumbing Fixtures	2.5	NA	NA	Year 3, Fall & Winter
	APPT 135B	Plumbing Codes	2.5	NA	NA	Year 3, Fall & Winter
	APPT 136	Advanced Trade Math for Plumbers	4.5	NA	NA	Year 3, Spring & Summer
	APPT 137A	Water Systems	2.5	NA	NA	Year 4, Fall & Winter
	APPT 137B	Applied Welding	2.5	NA	NA	Year 4, Fall & Winter
	APPT 138	Advanced Drawing & Blueprint Reading	4.5	NA	NA	Year 4, Spring & Summer
	APPT 139A	Industrial Installation	2.5	NA	NA	Year 5, Fall & Winter
	APPT 139B	Medical Gas Installation	2.5	NA	NA	Year 5, Fall & Winter
	APPT 129	Special Topics	2.5	NA	NA	Year 5, Spring & Summer
	APPT 130	Review & Turnout	2.5	NA	NA	Year 5, Spring & Summer

Required Major Total	**47.5 units**
Completion of Foothill GE pattern	35 units
Transferable electives (as needed to reach 60 units)	7.5 units
TOTAL UNITS	**90 units**

Proposed Sequence:
Year 1, Fall & Winter = 4.5 units
Year 1, Spring & Summer = 4.5 units
Year 2, Fall & Winter = 4.5 units
Year 2, Spring & Summer = 5.0 units
Year 3, Fall & Winter = 5.0 units
Year 3, Spring & Summer = 4.5 units
Year 4, Fall & Winter = 5.0 units
Year 4, Spring & Summer = 4.5 units
Year 5, Fall & Winter = 5.0 units
Year 5, Spring & Summer = 5.0 units
Year 6, Fall = 6 units
Year 6, Winter = 6 units
Year 6, Spring = 6 units
Year 6, Summer = 6 units
Year 7, Fall = 6 units
Year 7, Winter = 6 units
Year 7, Spring = 3.5 units
Year 7, Summer = 3 units
TOTAL UNITS: 90 units

Associate Degree Requirements:
- English proficiency: ENGL 1A, 1AH, 1S & 1T, ESLL 26 or equivalent.
- Mathematics proficiency: MATH 57, 105, 108 or equivalent.

A minimum of 90 units is required to include:
- All Foothill General Education requirements (35 Units)
- Core courses (47.5 Units)
- Transferable Electives (7.5 Units)

Labor Market Analysis: The occupational outlook for the Pipe Trades industry shows strong demand and growth over the next ten years in Santa Clara and San Benito counties. The projected employment of Plumbers, Pipefitters, and Steamfitters is expected to grow by 29.8% in the period from 2010 to 2020. The California State Employment Development Department expects the number of professionals employed in the Pipe Trades to increase from 1,190 to 2,480. The Associate in Science degree in Plumbing Technology is an important contribution in efforts to educate California's workforce and meet local demands for educated professionals in the Pipe Trades. More generally, the National Skills Coalition reported in November, 2007, that jobs in the middle of the labor market, "those that require more than high school, but less than a four-year degree" are in demand, and will remain "robust relative to its supply." See Appendix A for Santa Clara County Labor Market Information.

Advisory Committee Meeting Minutes and Member list: See Appendix B

In addition to being members of the labor union, journeypersons are also employees of the labor union. Thus, as representatives of their constituents, the Board of Directors of the Pipe Trades Training Center actively considers member/employee career goals and objectives and has independently evaluated apprenticeship student interest in obtaining a Certificate of Achievement and/or an Associate of Science degree in Plumbing Technology from Foothill College. Attached, as Appendix C, is a letter from members of the Board of Directors of the Pipe Trades Training Center indicating that apprenticeship students consider the pursuit and completion of these degrees to be highly significant in obtaining their career goals and objectives; the board unanimously agreed to support the partnership with Foothill College in the development and maintenance of this (and other) degree programs.

Item 4. Master Planning
The Associate in Science degree in Plumbing Technology aligns with the planned goals of the College and the District because the program serves the regional area in support of workforce development and economic growth. The Associate in Science degree in Plumbing Technology is a new degree and does not duplicate an already-existing program within the Foothill-De Anza district or the surrounding colleges.

The only competition to the Associate of Science degree in Plumbing Technology program at Foothill College occurs from two out-of-state colleges that offer on-line degrees. PTTC apprentices and recently-graduated journeymen are taking on-line courses at Washtenaw Community College and at National Labor College at considerably higher tuition, $194/credit hour and $297/credit hour respectively, and other expenses in order to earn an Associate in Applied Science degree in Industrial Journeyman. Offering a Associate in Science degree in Plumbing Technology at Foothill College would well serve the college's primary stakeholders: the students, community partners, and the community at-large.

Local references in support of the Associate in Science degree in Plumbing Technology include all Advisory Committee representatives from the PTTC (Appendix B) who strongly support the partnership between the PTTC and Foothill College due to their understanding of local economic workforce needs and their ongoing contact with apprenticeship students, which provides grounded understanding of their students' short-term and long-term educational goals.

Item 5. Enrollment and Completer Projections

		Year 1		Year 2	
Course #	**Course Title**	**Annual Sections**	**Annual Enrollment**	**Annual Sections**	**Annual Enrollment**
APPT 131	Basic Plumbing Skills	3	36	2	30
APPT 132	Applied & Related Theory	1	6	3	33
APPT 133	Beginning Drawing & Design	1	6	2	24
APPT 134A	Rigging & Layout	1	13	1	12
APPT 134B	Industrial Safety	1	13	1	12
APPT 135A	Plumbing Fixtures	2	20	1	6
APPT 135B	Plumbing Codes	2	26	1	6
APPT 136	Advanced Trade Math for Plumbers	1	6	1	13
APPT 137A	Water Systems	2	22	1	8
APPT 137B	Applied Welding	2	21	1	8
APPT 138	Advanced Drawing and Blueprint Reading	2	25	2	18
APPT 139A	Industrial Installation	2	25	1	18
APPT 139B	Medical Gas Installation	1	20	1	12
APPT 129	Special Projects	3	25	2	21
APPT 130	Review and Turnout	2	25	2	18

Item 6. Place of Program in Curriculum/Similar Programs

The Associate in Science degree in Plumbing Technology does not adversely affect existing programs at Foothill College in terms of competition for students or courses, nor does it take material resources away from other existing programs at the College. The Associate in Science degree in Plumbing Technology is designed to create pathways for students from Pre-Apprenticeship and Apprenticeship through an Associate in Science degree and potential transfer to a four-year institution. Thus, the students can easily move from the Certificate of Achievement in Plumbing to the Associate in Science degree in Plumbing Technology. This streamlined approach facilitates the students' ability to readily complete their educational goals and to earn family-supporting wages.

Item 7. Similar Programs at Other Colleges in Service Area

Foothill College's partnership with the Loyd E. Williams Pipe Trade Training Center is unique in the college service area. This degree poses no competition with other public institutions of higher education in the college service area.

FOOTHILL COLLEGE
Credit Program Narrative
Associate in Science Degree in Steamfitting and Pipefitting Technology

Item 1. Program Goals and Objectives

Foothill College is responding to local demand for Pipe Trades workers in steamfitting and pipefitting by establishing an Associate in Science degree in Steamfitting and Pipefitting Technology in partnership with the Loyd E. Williams Pipe Trades Training Center (PTTC), the Joint Apprenticeship Training Center located in San Jose, CA. Graduates are recognized as journeypersons within the Pipe Trades industry. Graduates of the Associate in Science in Steamfitting and Pipefitting Technology degree program will be employable as: Foreman, General Foreman, Superintendent, Project Manager, Estimator, Detailer, Building Trades Inspector, Building Trades Instructor, and Union Business Agent/Business Manager. Students earning an Associate in Science degree in Steamfitting and Pipefitting Technology will increase their marketability and employment opportunities.

The Associate in Science degree in Steamfitting and Pipefitting Technology at Foothill College serves to align apprenticeship programs with college and university academic tracks as directed by the federal and state governments. Foothill College and the Loyd E. Williams Pipe Trades Training Center (PTTC) are collaborating in an LEA program with the Division of Apprenticeship Standards (DAS) for the state of California.

The program learning outcomes for the Associate in Science degree in Steamfitting and Pipefitting Technology are:

- In compliance with applicable standards and codes, students will demonstrate ability to install and remove piping and equipment for complex heating and air conditioning applications and special industrial piping systems, such as those used in semiconductor, biotechnology, and power generation facilities.

- In compliance with applicable standards and codes, students will demonstrate ability to maintain, extend, and/or alter piping and equipment for heating and air conditioning, and for special industrial piping systems, such as those used in semiconductor, biotechnology, and power generation facilities.

Students complete the Associate in Science degree in Steamfitting and Pipefitting Technology through enrollment in and completion of the Steamfitting/Pipefitting apprenticeship program at the PTTC, and through enrollment in and completion of the General Education requirements at Foothill College. To apply to the PTTC apprenticeship program, potential students must be at least 18 years of age, be able to perform the work of the trade, present verification of high school completion, either through a high school diploma or GED or High School Proficiency certificate, and demonstrate the ability to read, write, and speak English. The selection, employment, and training of apprentices by the PTTC is without discrimination according to race, color, national or ethnic origin, age, gender, religion, sexual orientation or marital status. Students are admitted into the PTTC apprenticeship program based on obtaining a passing (75%) score on the "Pipe Trades Entrance Exam,' an exam which measures the student's ability in math and mechanical reasoning. Students who pass the entrance exam are selected from an applicant waiting list, the order of which is established by the date the entrance exam was taken and the test score. Admission to apprenticeship classes is limited to apprentices registered with the California Division of Apprenticeships Standards. This limitation is authorized by the California Labor Code, Section § 3074.3.

Aside from Foothill College's ordinary enrollment fees, there are no additional costs to the student to complete the Associate in Science degree in Steamfitting and Pipefitting Technology.

In accordance with the State Chancellor's office, the goals and objectives of the Associate in Science degree in Steamfitting and Pipefitting Technology align with the primary mission of California community colleges, as established in Ed. Code § 66010.4, which mandate that community colleges provide vocational instruction to students and to advance California's economic growth and global competitiveness through education and training that contribute to workforce development. The Associate in Science degree in Steamfitting and Pipefitting Technology aligns with Foothill College's Institutional Outcomes and directly supports the Computation and the Creative, Critical, and Analytical Thinking rubrics.

Item 2. Catalog Description

The Associate in Science in Steamfitting and Pipefitting Technology degree program is conducted in partnership with the Pipe Trades Training Center apprenticeship program. The apprenticeship program is five years in duration, requiring a minimum of 9,000 hours of on-the-job training. After 5 years of classroom and paid work experience, students are recognized as journeypersons within the Pipe Trades industry and work to protect our environment by properly installing and maintaining piping and equipment for complex heating and air conditioning and special industrial piping systems. Upon graduation, a student can expect to work as a Foreman, General Foreman, Superintendent, Project Manager, Estimator, Detailer, Building Trades Inspector, Building Trades Instructor, and/or a Union Business Agent/ Business Manager in industries such as the semiconductor, biotechnology, power generation, healthcare, education, water treatment, and food and beverage processing industries. Labor Market Analysis indicates increased employment opportunities in the Pipe Trades through 2020. Students earning an Associate in Science in the Steamfitting and Pipefitting Technology degree program will increase their marketability and employment opportunities. Admission to apprenticeship classes is limited to apprentices registered with the California Division of Apprenticeships Standards, according to the California Labor Code, Section § 3074.3.

The apprenticeship program, which includes coursework, lab work and on-the-job training, involves learning about the assessment, installation, maintenance, and repair of different types of pipe systems, effective and safe tool use, material applications, related mathematics & science and storage. Upon completion of the program, students will be able to assess and install high-pressure pipe systems in order to move liquids or gases under high pressure. The General Education option at Foothill College includes courses to establish proficiency in English and Math and to survey other academic areas such as history and humanities. The Associate in Science degree in Steamfitting and Pipefitting Technology is not a transfer program. Foothill Steamfitting and Pipefitting students who intend to transfer must consult with a program advisor or counselor to ensure that the requirements for transfer to the baccalaureate institutions of their choice are met.

Item 3. Program Requirements

Associate in Science Degree in Steamfitting and Pipefitting Technology

Requirements	Dept. Name / Course #	Name	Units	CSU-GE	IGETC	Sequence
Core Courses (47 Units)	APPT 141	Basic Steamfitting Skills	4.5			Year 1, Fall & Winter
	APPT 142	Related Math, Drawing & Rigging	4.5			Year 1, Spring & Summer
	APPT 143	Cutting & Welding	4.5			Year 2, Fall & Winter
	APPT 144A	Science, Electricity & Air Conditioning	2.5			Year 2, Spring & Summer
	APPT 134B	Industrial Safety	2.5			Year 2, Spring & Summer
	APPT 145	Advanced Trade Math for Steamfitters	4.5			Year 3, Fall & Winter
	APPT 146	Steam Technology	4.5			Year 3, Spring & Summer
	APPT 147A	Hydronic Systems	2.5			Year 4, Fall & Winter
	APPT 147B	Industrial Rigging	2.5			Year 4, Fall & Winter
	APPT 148	Advanced Drawing & Blueprint Reading	4.5			Year 4, Spring & Summer
	APPT 139A	Industrial Installations	2.5			Year 5, Fall & Winter
	APPT 139B	Medical Gas Installations	2.5			Year 5, Fall & Winter
	APPT 129	Special Topics	2.5			Year 5, Spring & Summer
	APPT 130	Review & Turnout	2.5			Year 5, Spring & Summer

Required Major Total **47 units**

Completion of Foothill GE pattern	35 units
Transferable electives (as needed to reach 60 units)	08 units
TOTAL UNITS	**90 units**

Proposed Sequence:
Year 1, Fall & Winter = 4.5 units
Year 1, Spring & Summer = 4.5 units
Year 2, Fall & Winter = 4.5 units
Year 2, Spring & Summer = 5.0 units
Year 3, Fall & Winter = 4.5 units
Year 3, Spring & Summer = 4.5 units
Year 4, Fall & Winter = 5.0 units
Year 4, Spring & Summer = 4.5 units
Year 5, Fall & Winter = 5.0 units
Year 5, Spring & Summer = 5.0 units
Year 6, Fall = 6 units
Year 6, Winter = 6 units
Year 6, Spring = 6 units
Year 6, Summer = 3 units
Year 7, Fall = 6 units
Year 7, Winter = 6 units
Year 7, Spring = 6 units
Year 7, Summer = 4 units
TOTAL UNITS: 90 units

Associate Degree Requirements:
- English proficiency: ENGL 1A, 1AH, 1S & 1T, ESLL 26 or equivalent.
- Mathematics proficiency: MATH 57, 105, 108 or equivalent.

A minimum of 90 units is required to include:
- All Foothill General Education requirements (35 Units)
- Core courses (47 Units)
- Electives (8 Units)

Labor Market Analysis: The occupational outlook for the Pipe Trades industry shows strong demand and growth over the next ten years in Santa Clara and San Benito counties. The projected employment of Plumbers, Pipefitters, and Steamfitters is expected to grow by 29.8% in the period from 2010 to 2020. The California State Employment Development Department expects the number of professionals employed in the Pipe Trades to increase from 1,190 to 2,480. The Associate in Science degree in Steamfitting and Pipefitting Technology is an important contribution in efforts to educate California's workforce and meet local demands for educated professionals in the Pipe Trades. More generally, the National Skills Coalition reported in November, 2007, that jobs in the middle of the labor market, "those that require more than high school, but less than a four-year degree" are in demand, and will remain "robust relative to its supply." See Appendix A for Santa Clara County Labor Market Information.

Advisory Committee Meeting Minutes and Member list: See Appendix B

In addition to being members of the labor union, journeypersons are also employees of the labor union. Thus, as representatives of their constituents, the Board of Directors of the Pipe Trades Training Center actively considers member/employee career goals and objectives and has independently evaluated apprenticeship student interest in obtaining a Certificate of Achievement and/or an Associate of Science degree in Steamfitting and Pipefitting Technology from Foothill College. Attached, as Appendix C, is a letter from members of the Board of Directors of the Pipe Trades Training Center indicating that apprenticeship students consider the pursuit and completion of these degrees to be highly significant in obtaining their career goals and objectives; the board unanimously agreed to support the partnership with Foothill College in the development and maintenance of this (and other) degree programs.

Item 4. Master Planning

The Associate in Science degree in Steamfitting and Pipefitting Technology aligns with the planned goals of the College and the District because the program serves the regional area in support of workforce development and economic growth. The Associate in Science degree in Steamfitting and Pipefitting Technology is a new degree and does not duplicate an already-existing program within the Foothill-De Anza district or the surrounding colleges.

The only competition to the Associate in Science degree in Steamfitting and Pipefitting Technology at Foothill College occurs from two out-of-state colleges that offer on-line degrees. PTTC apprentices and recently-graduated journeymen are taking on-line courses at Washtenaw Community College and at National Labor College at considerably higher tuition, $194/credit hour and $297/credit hour respectively, and other expenses in order to earn an Associate's Degree in Steamfitting. Offering an Associate in Science degree in Steamfitting and Pipefitting Technology at Foothill College would well serve the college's primary stakeholders: the students, community partners, and the community at-large.

Local references in support of the Associate in Science degree in Steamfitting and Pipefitting Technology include all Advisory Committee representatives from the PTTC who strongly support the partnership between the PTTC and Foothill College due to their understanding of local economic workforce needs and their ongoing contact with apprenticeship students, which provides grounded understanding of their students' short-term and long-term educational goals.

Item 5. Enrollment and Completer Projections

		Year 1		Year 2	
Course #	Course Title	Annual Sections	Annual Enrollment	Annual Sections	Annual Enrollment
APPT 141	Basic Steamfitting Skills	3	36	2	29
APPT 142	Related Math, Drawing & Rigging	1	11	2	21
APPT 143	Cutting & Welding	2	20	1	13
APPT 144A	Science, Electricity & Air Conditioning	1	14	1	15
APPT 134B	Industrial Safety	1	13	1	12
APPT 145	Advanced Trade Math for Steamfitters	1	6	1	14
APPT 146	Steam Technology	1	7	1	13
APPT 147A	Hydronic Systems	1	12	1	8
APPT 147B	Industrial Rigging	1	12	1	9
APPT 148	Advanced Drawing & Blueprint Reading	1	12	1	8
APPT 139A	Industrial Installations	2	24	1	12
APPT 139B	Medical Gas Installations	2	27	1	11
APPT 129	Special Topics	2	25	2	23
APPT 130	Review & Turnout	2	24	1	16

Item 6. Place of Program in Curriculum/Similar Programs

The Associate in Science degree in Steamfitting and Pipefitting Technology does not adversely affect existing programs at Foothill College in terms of competition for students or courses, nor does it take material resources away from other existing programs at the College. The Associate in Science degree in Steamfitting and Pipefitting Technology is designed to create pathways for students from Pre-Apprenticeship and Apprenticeship through an Associate in Science degree and potential transfer to a four-year institution. Thus, the students can easily move from the Certificate of Achievement in Steamfitting/Pipefitting to the Associate in Science degree in Steamfitting and Pipefitting Technology. This streamlined approach facilitates the students' ability to readily complete their educational goals and to earn family-supporting wages.

Item 7. Similar Programs at Other Colleges in Service Area

There are no similar programs in existence in the college service area of Foothill College; the partnership with the Loyd E. Williams Pipe Trades Training Center is unique in the college service area.

FOOTHILL COLLEGE
Credit Program Narrative
Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service

Item 1. Program Goals and Objectives

Foothill College is responding to local demand for Pipe Trades workers in Refrigeration, Heating, and Air Conditioning by establishing a Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service in partnership with the Loyd E. Williams Pipe Trades Training Center (PTTC), the Joint Apprenticeship Training Center located in San Jose, CA. Graduates are recognized as journeypersons within the Pipe Trades industry. Graduates of the Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service program will be employable as a: Journeyman Commercial Plumber/Industrial Plumber, Foreman, and General Foreman. Students earning a certificate in Refrigeration and Air Conditioning Mechanical Service will increase their marketability and employment opportunities.

The Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service at Foothill College serves to align apprenticeship programs with college and university academic tracks as directed by the federal and state government. Foothill College and the Loyd E. Williams Pipe Trades Training Center (PTTC) are collaborating in an LEA program, along with the Division of Apprenticeship Standards (DAS) for the state of California.

The program learning outcomes for the Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service are:

- In compliance with applicable standards and codes, students will demonstrate ability to install and remove refrigeration, heating, air conditioning, and ventilation systems, including the appropriate electrical/electronic control systems.

- In compliance with applicable standards and codes, students will demonstrate ability to maintain, repair, extend, and/or alter refrigeration, heating, air conditioning, and ventilation systems, including electronic control systems.

Students complete the Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service through enrollment in the Refrigeration and Air Conditioning Mechanical Service apprenticeship program at the PTTC. To apply to the PTTC apprenticeship program, potential students must be at least 18 years of age, be able to perform the work of the trade, present verification of high school completion, either through a high school diploma or GED or High School Proficiency certificate, and demonstrate the ability to read, write, and speak English. The selection, employment and training of apprentices by the PTTC is without discrimination according to race, color, national or ethnic origin, age, gender, religion, sexual orientation or marital status. Students are admitted into the PTTC apprenticeship program based on obtaining a passing (75%) score on the "Pipe Trades Entrance Exam,' an exam which measures the student's ability in math and mechanical reasoning. Students who pass the entrance exam are selected from an applicant waiting list, the order of which is established by the date the entrance exam was taken and the test score. Admission to apprenticeship classes is limited to apprentices registered with the California Division of Apprenticeships Standards. This limitation is authorized by the California Labor Code, Section 3074.3.

Aside from Foothill College's ordinary enrollment fees, there are no additional costs to the student to complete the Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service.

In accordance with the State Chancellor's office, the goals and objectives of the Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service align with the primary mission of California community colleges, as established in Ed. Code § 66010.4, which mandate that community colleges provide vocational instruction to students and to advance California's economic growth and global competitiveness through education and training that contribute to workforce development. The Certificate of Achievement program in Refrigeration and Air Conditioning Mechanical Service aligns with Foothill College's Institutional Outcomes and directly supports the Computation and the Creative, Critical, and Analytical Thinking rubrics.

Item 2. Catalog Description

The Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service program is conducted in partnership with the Pipe Trades Training Center apprenticeship program. The apprenticeship program is five years in duration, requiring a minimum of 9,000 hours of on-the-job training. After 5 years of classroom and paid work experience, students are recognized as journeypersons within the Pipe Trades industry and work to insure indoor air quality by servicing and repairing all types of refrigeration equipment in all sizes of buildings, complex air conditioning, heating, and refrigeration units used in hospitals, skyscrapers, manufacturing facilities, and research development laboratories. Graduates of the Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service program will be employable as: a Commercial/Industrial Journeyman, Refrigeration and HVAC Mechanic, Foreman, General Foreman, and Service Manager in almost any industry. Labor Market Analysis indicates increased employment opportunities in the Pipe Trades through 2020. Students earning a Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service will increase their marketability and employment opportunities. Admission to apprenticeship classes is limited to apprentices registered with the California Division of Apprenticeships Standards, according to the California Labor Code, Section § 3074.3.

The apprenticeship program, which includes coursework, lab work and on-the-job training, involves learning about the assessment, installation, maintenance, and repair of different types of pipe systems, effective and safe tool use, material applications, electrical competency, related mathematics & science and storage. The courses required for the Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service also meet many of the requirements for the Associate in Science degree in Air Conditioning and Refrigeration Technology.

Item 3. Program Requirements

Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service

Requirements	Dept. Name / Course #	Name	Units	CSU-GE	IGETC	Sequence
Core Courses (45.5 Quarter Units)	APPT 151	Advanced Chillers and Refrigeration	4.5	NA	NA	Year 1, Fall & Winter
	APPT 152	Basic Electricity and Refrigeration	4.5	NA	NA	Year 1, Spring & Summer
	APPT 153	Mechanical Systems	4.5	NA	NA	Year 2, Fall & Winter
	APPT 154	Electrical Controls Fundamentals	4.5	NA	NA	Year 2, Spring & Summer
	APPT 155	Advanced Electric Controls	4.5	NA	NA	Year 3, Fall & Winter
	APPT 156	HVAC Pneumatic & Electric Controls	4.5	NA	NA	Year 3, Spring & Summer
	APPT 157	Industrial Refrigeration & Air-Conditioning Service	4.5	NA	NA	Year 4, Fall & Winter
	APPT 158	Advanced Refrigeration & Chillers	4.5	NA	NA	Year 4, Spring & Summer
	APPT 159	Start, Test, & Balance: HVAC Systems	4.5	NA	NA	Year 5, Fall & Winter
	APPT 129	Special Topics	2.5	NA	NA	Year 5, Spring & Summer
	APPT 130	Review and Turnout	2.5	NA	NA	Year 5, Spring & Summer

TOTAL UNITS **45.5 units**

Proposed Sequence:
Year 1, Fall/Winter = 4.5 units
Year 1, Spring/Summer = 4.5 units
Year 2, Fall/Winter = 4.5 units
Year 2, Spring/Summer = 4.5 units
Year 3, Fall/Winter = 4.5 units
Year 3, Spring/Summer = 4.5 units
Year 4, Fall/Winter = 4.5 units
Year 4, Spring/Summer = 4.5 units
Year 5, Fall/Winter = 4.5 units
Year 5, Spring/Summer = 5.0 units

TOTAL UNITS: 45.5 units

Labor Market Analysis: The occupational outlook for the Pipe Trades industry shows strong demand and growth over the next ten years in Santa Clara and San Benito counties. The projected employment of Air Conditioning and Refrigeration journeymen is expected to grow by 29.8% in the period from 2010 to 2020. The California State Employment Development Department expects the number of professionals employed in the Pipe Trades to increase from 1,190 to 2,480. The Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service is an important contribution in efforts to educate California's workforce and meet local demands for educated professionals in the Pipe Trades. More generally, the National Skills Coalition reported in November, 2007, that jobs in the middle of the labor market, "those that require more than high school, but less than a four-year degree" are in demand, and will remain "robust relative to its supply." See Appendix A for Santa Clara County Labor Market Information.

Advisory Committee Meeting Minutes and Member list: See Appendix B

In addition to being members of the labor union, journeypersons are also employees of the labor union. Thus, as representatives of their constituents, the Board of Directors of the Pipe Trades Training Center actively considers member/employee career goals and objectives and has independently evaluated apprenticeship student interest in obtaining a Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service from Foothill College. Attached, as Appendix C, is a letter from members of the Board of Directors of the Pipe Trades Training Center indicating that apprenticeship students consider the pursuit and completion of these degrees to be highly significant in obtaining their career goals and objectives; the board unanimously agreed to support the partnership with Foothill College in the development and maintenance of this (and other) certificate and degree programs.

Item 4. Master Planning
The Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service aligns with the planned goals of the College and the District because the program serves the regional area in support of workforce development and economic growth. The Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service is a new degree and does not duplicate an already-existing program within the Foothill-De Anza district or the surrounding colleges.

The only competition to the Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service program at Foothill College occurs from two out-of-state colleges that offer on-line degrees. PTTC apprentices and recently-graduated journeymen are taking on-line courses at Washtenaw Community College and at National Labor College at considerably higher tuition, $194/credit hour and $297/credit hour respectively, and other expenses in order to earn a Certificate of Achievement in Apprenticeship Completion or Construction Management. Offering a Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service at Foothill College would well serve the college's primary stakeholders: the students, community partners, and the community at-large.

Local references in support of the Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service include all Advisory Committee representatives from the PTTC (Appendix B) who strongly support the partnership between the PTTC and Foothill College due to their understanding of local economic workforce needs and their ongoing contact with apprenticeship students, which provides grounded understanding of their students' short-term and long-term educational goals.

Item 5. Enrollment and Completer Projections

		Year 1		Year 2	
Course #	Course Title	Annual Sections	Annual Enrollment	Annual Sections	Annual Enrollment
APPT 151	Advanced Refrigeration and Chillers	2	24	2	21
APPT 152	Basic Electricity and Refrigeration	2	23	2	22
APPT 153	Mechanical Systems	1	13	2	21
APPT 154	Electrical Controls Fundamentals	1	15	2	22
APPT 155	Advanced Electric Controls	1	6	1	14
APPT 156	HVAC Pneumatic and Electric Controls	1	6	1	14
APPT 157	Industrial Refrigeration and Air-Conditioning Service	2	19	1	6
APPT 158	Advanced Refrigeration and Chillers	2	19	1	7
APPT 159	Start, Test, & Balance: HVAC Systems	2	24	2	19
APPT 129	Special Topics	3	25	2	20
APPT 130	Review and Turnout	2	25	2	21

Item 6. Place of Program in Curriculum/Similar Programs

The Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service does not adversely affect existing programs at Foothill College in terms of competition for students or courses, nor does it take material resources away from other existing programs at the College. The Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service is designed to create pathways for students from Pre-Apprenticeship and Apprenticeship through an Associate in Science degree and potential transfer to a four-year institution. Thus, the students can easily move from the Certificate of Achievement in Refrigeration and Air Conditioning Mechanical Service to the Associate in Science degree in Air Conditioning and Refrigeration Technology. This streamlined approach facilitates the students' ability to readily complete their educational goals and to earn family-supporting wages.

Item 7. Similar Programs at Other Colleges in Service Area

There are no similar programs in existence in the college service area of Foothill College; the partnership with the Loyd E. Williams Pipe Trades Training Center is unique in the college service area.

FOOTHILL COLLEGE
Credit Program Narrative
Certificate of Achievement in Residential Plumbing

Item 1. Program Goals and Objectives

Foothill College is responding to local demand for Pipe Trades workers in residential plumbing by establishing a Certificate of Achievement in Residential Plumbing in partnership with the Loyd E. Williams Pipe Trades Training Center (PTTC), the Joint Apprenticeship Training Center located in San Jose, CA. Graduates are recognized as journeypersons within the Pipe Trades industry. Graduates of the Certificate of Achievement in Residential Plumbing program will be employable as: Journeyman Residential Plumber, Foreman, and General Foreman. Students earning a Certificate of Achievement in Residential Plumbing will increase their marketability and employment opportunities as plumbers working on various residential-type buildings.

The Certificate of Achievement in Residential Plumbing at Foothill College serves to align apprenticeship programs with college and university academic tracks as directed by the federal and state government. Foothill College and the Loyd E. Williams Pipe Trades Training Center (PTTC) are collaborating in an LEA program, along with the Division of Apprenticeship Standards (DAS) for the state of California.

The program learning outcomes for the Certificate of Achievement in Residential Plumbing are:

- In compliance with applicable standards and codes, students will demonstrate ability to install and remove plumbing systems such as drain waste and ventilation systems, domestic water systems and gas piping systems for single and multiple family dwellings, hotels, and motels.

- In compliance with applicable standards and codes, students will demonstrate ability to maintain, extend, and/or alter plumbing systems including drain waste and ventilation systems, domestic water systems, and gas piping systems for single and multiple family dwellings, hotels, and motels.

Students complete the Certificate of Achievement in Residential Plumbing through enrollment in the Residential Plumbing apprenticeship program at the PTTC. To apply to the PTTC apprenticeship program, potential students must be at least 18 years of age, be able to perform the work of the trade, present verification of high school completion, either through a high school diploma or GED or High School Proficiency certificate, and demonstrate the ability to read, write, and speak English. The selection, employment and training of apprentices by the PTTC is without discrimination according to race, color, national or ethnic origin, age, gender, religion, sexual orientation or marital status. Students are admitted into the PTTC apprenticeship program based on obtaining a passing (75%) score on the "Pipe Trades Entrance Exam,' an exam which measures the student's ability in math and mechanical reasoning. Students who pass the entrance exam are selected from an applicant waiting list, the order of which is established by the date the entrance exam was taken and the student's test score. Admission to apprenticeship classes is limited to apprentices registered with the California Division of Apprenticeships Standards. This limitation is authorized by the California Labor Code, Section § 3074.3.

Aside from Foothill College's ordinary enrollment fees, there are no additional costs to the student to complete the Certificate of Achievement in Residential Plumbing.

In accordance with the State Chancellor's office, the goals and objectives of the Certificate of Achievement in Residential Plumbing align with the primary mission of California community colleges, as established in Ed. Code § 66010.4, which mandate that community colleges provide vocational instruction to students and to advance California's economic growth and global competitiveness through education and training that contribute to workforce development. The Certificate of Achievement program in Residential Plumbing aligns with Foothill College's Institutional Outcomes and directly supports the Computation and the Creative, Critical, and Analytical Thinking rubrics.

Item 2. Catalog Description

The Certificate of Achievement in Residential Plumbing program is conducted in partnership with the Pipe Trades Training Center apprenticeship program. The apprenticeship program is five years in duration, requiring a minimum of 6,900 hours of on-the-job training. After 4 years of classroom and paid work experience, students are recognized as journeypersons within the Pipe Trades industry, working to install and maintain waste lines, hot and cold water piping, and gas systems, including piping, accessories, fixtures and appliances to single and multiple family dwellings as well as hotels and motels. Graduates of the Residential Plumbing Certificate of Achievement program will be employable as: Journeyman Residential Plumber, Foreman, and General Foreman, working in residential construction, and repair of existing structures. Labor Market Analysis indicates increased employment opportunities in the Pipe Trades through 2020. Students earning a certificate in Residential Plumbing will increase their marketability and employment opportunities, although residential plumbers will find employment at about $27 less per hour than journeymen qualified for industrial plumbing. The starting salary for a residential plumbing journeyman is $30.50. Admission to apprenticeship classes is limited to apprentices registered with the California Division of Apprenticeships Standards, according to the California Labor Code, Section § 3074.3.

The apprenticeship program, which includes coursework, lab work and on-the-job training, involves learning about the assessment, installation, maintenance, and repair of residential and hotel/motel pipe systems, effective and safe tool use, material applications, related mathematics & science and storage. The student will learn how to read blueprints, apply layout and install, as well as estimate and repair both supply and waste water systems. The courses required for the Certificate of Achievement in Residential Plumbing also meet a few of the requirements for the Associate in Science degree in Plumbing Technology.

Item 3. Program Requirements

Certificate of Achievement in Residential Plumbing

Requirements	Dept. Name & Course #	Name	Units	CSU-GE	IGETC	Sequence
Core Courses (24 Quarter Units)	APPT 121	Introduction to Residential Plumbing, Safety, and Tools	2.5	NA	NA	Year 1,Fall & Winter
	APPT 122	Residential Drainage Systems	2.5	NA	NA	Year 1, Spring & Summer
	APPT 123	Residential Gas and Water Installations	2.5	NA	NA	Year 2, Fall & Winter
	APPT 124	Mathematics for Residential Plumbing	2.5	NA	NA	Year 2, Spring & Summer
	APPT 125	Residential Blueprint Reading	4.5	NA	NA	Year 3, Fall & Winter
	APPT 126	Residential Piping Lay-Out and Installation	4.5	NA	NA	Year 3, Spring & Summer
	APPT 127	Residential Fixtures and Residential Plumbing Codes	2.5	NA	NA	Year 4, Fall & Winter
	APPT 128	Residential Gas Installations & Service Work	2.5	NA	NA	Year 4, Fall & Winter

TOTAL UNITS **24 units**

Proposed Sequence:
Year 1, Fall & Winter = 2 units
Year 1, Spring & Summer = 2 units
Year 2, Fall & Winter = 2 units
Year 2, Spring & Summer = 2 units
Year 3, Fall & Winter = 2 units
Year 3, Spring & Summer = 2 units
Year 4, Fall & Winter = 2 units
Year 4, Spring & Summer = 2 units

TOTAL UNITS: 24 units

Labor Market Analysis: The occupational outlook for the Pipe Trades industry shows strong demand and growth over the next ten years in Santa Clara and San Benito counties. The projected employment of Plumbers, Pipefitters, and Steamfitters is expected to grow by 29.8% in the period from 2010 to 2020. The California State Employment Development Department expects the number of professionals employed in the Pipe Trades to increase from 1,190 to 2,480. The Certificate of Achievement in Residential Plumbing is an important contribution in efforts to educate California's workforce and meet local demands for educated professionals in the Pipe Trades. More generally, the National Skills Coalition reported in November, 2007, that jobs in the middle of the labor market, "those that require more than high school, but less than a four-year degree" are in demand, and will remain "robust relative to its supply." See Appendix A for Santa Clara County Labor Market Information.

Advisory Committee Meeting Minutes and Member list: See Appendix B

In addition to being members of the labor union, journeypersons are also employees of the labor union. Thus, as representatives of their constituents, the Board of Directors of the Pipe Trades Training Center actively considers member/employee career goals and objectives and has independently evaluated apprenticeship student interest in obtaining a Certificate of Achievement in Residential Plumbing from Foothill College. Attached, as Appendix C, is a letter from members of the Board of Directors of the Pipe Trades Training Center indicating that apprenticeship students consider the pursuit and completion of these degrees to be highly significant in obtaining their career goals and objectives; the board unanimously agreed to support the partnership with Foothill College in the development and maintenance of this (and other) certificate and degree programs.

Item 4. Master Planning
The Certificate of Achievement in Residential Plumbing aligns with the planned goals of the College and the District because the program serves the regional area in support of workforce development and economic growth. The Certificate of Achievement in Residential Plumbing is a new degree and does not duplicate an already-existing program within the Foothill-De Anza district or the surrounding colleges.

The only competition to the Certificate of Achievement in Residential Plumbing program at Foothill College occurs from two out-of-state colleges that offer on-line degrees. PTTC apprentices and recently-graduated journeymen are taking on-line courses at Washtenaw Community College and at National Labor College at considerably higher tuition, $194/credit hour and $297/credit hour respectively, and other expenses in order to earn a Certificate of Achievement in Apprenticeship Completion or Construction Management. Offering a Certificate of Achievement in Residential Plumbing at Foothill College would well serve the college's primary stakeholders: the students, community partners, and the community at-large.

Local references in support of the Certificate of Achievement in Residential Plumbing include all Advisory Committee representatives from the PTTC (Appendix B) who strongly support the partnership between the PTTC and Foothill College due to their understanding of local economic workforce needs and their ongoing contact with apprenticeship students, which provides grounded understanding of their students' short-term and long-term educational goals.

Item 5. Enrollment and Completer Projections

		Year 1		Year 2	
Course #	**Course Title**	**Annual Sections**	**Annual Enrollment**	**Annual Sections**	**Annual Enrollment**
APPT 121	Introduction to Residential Plumbing, Safety, and Tools	2	7	1	13
APPT 122	Residential Drainage Systems	2	7	1	3
APPT 123	Residential Gas and Water Installations	2	10	1	13
APPT 124	Mathematics for Residential Plumbing	2	7	1	13
APPT 125	Residential Blueprint Reading	2	7	1	4
APPT 126	Residential Piping Lay-Out and Installation	2	10	2	12
APPT 127	Residential Fixtures and Residential Plumbing Codes	2	4	3	17
APPT 128	Residential Gas Installations & Service Work	1	4	1	13

The number of students completing the required courses aligns with the Labor Market Analysis (Appendix A).

Item 6. Place of Program in Curriculum/Similar Programs

The Certificate of Achievement in Residential Plumbing does not adversely affect existing programs at Foothill College in terms of competition for students or courses, nor does it take material resources away from other existing programs at the College. The Certificate of Achievement in Residential Plumbing is designed to create pathways for students from Pre-Apprenticeship and Apprenticeship through an Associate in Science degree and potential transfer to a four-year institution. Students wishing to complete the Associate in Science degree in Plumbing Technology must first complete the courses and training hours required for the Certificate of Achievement in Plumbing.

Item 7. Similar Programs at Other Colleges in Service Area

There are no similar programs in existence in the college service area of Foothill College; the partnership with the Loyd E. Williams Pipe Trades Training Center is unique in the college service area.

FOOTHILL COLLEGE
Credit Program Narrative
Certificate of Achievement in Plumbing

Item 1. Program Goals and Objectives

Foothill College is responding to local demand for Pipe Trades workers in Plumbing by establishing a Certificate of Achievement in Plumbing in partnership with the Loyd E. Williams Pipe Trades Training Center (PTTC), located in San Jose, CA. Graduates are recognized as journeypersons within the Pipe Trades industry. Graduates of the Certificate of Achievement in Plumbing program will be employable as: Journeyman Commercial Plumber/Industrial Plumber, Foreman, and General Foreman. Students earning a Certificate of Achievement in Plumbing will increase their marketability and employment opportunities.

The Certificate of Achievement in Plumbing at Foothill College serves to align apprenticeship programs with college and university academic tracks as directed by the federal and state government. Foothill College and the Loyd E. Williams Pipe Trades Training Center (PTTC) are collaborating in an LEA program, along with the Division of Apprenticeship Standards (DAS) for the state of California.

The program learning outcomes for the Certificate of Achievement in Plumbing are:

- In compliance with applicable standards and codes, students will demonstrate ability to install and remove plumbing systems such as drain waste and ventilation systems, systems for various industrial fluids, public or private water systems and gas piping systems.

- In compliance with applicable standards and codes, students will demonstrate ability to maintain, extend, and/or alter plumbing systems including drain waste and ventilation systems, systems for various industrial fluids, public or private water systems and gas piping systems.

Students complete the Certificate of Achievement in Plumbing through enrollment in the Plumbing apprenticeship program at the PTTC. To apply to the PTTC apprenticeship program, potential students must be at least 18 years of age, be able to perform the work of the trade, present verification of high school completion, either through a high school diploma or GED or High School Proficiency certificate, and demonstrate the ability to read, write, and speak English. The selection, employment and training of apprentices by the PTTC is without discrimination according to race, color, national or ethnic origin, age, gender, religion, sexual orientation or marital status. Students are admitted into the PTTC apprenticeship program based on obtaining a passing (75%) score on the "Pipe Trades Entrance Exam,' an exam which measures the student's ability in math and mechanical reasoning. Students who pass the entrance exam are selected from an applicant waiting list, the order of which is established by the date the entrance exam was taken and the test score. Admission to apprenticeship classes is limited to apprentices registered with the California Division of Apprenticeships Standards. This limitation is authorized by the California Labor Code, Section 3074.3.

Aside from Foothill College's ordinary enrollment fees, there are no additional costs to the student to complete the Certificate of Achievement in Plumbing.

In accordance with the State Chancellor's office, the goals and objectives of the Certificate of Achievement in Plumbing align with the primary mission of California community colleges, as established in Ed. Code § 66010.4, which mandate that community colleges provide vocational instruction to students and to advance California's economic growth and global competitiveness through education and training that contribute to workforce development. The Certificate of Achievement program in Plumbing aligns with Foothill College's Institutional Outcomes and directly supports the Computation and the Creative, Critical, and Analytical Thinking rubrics.

Item 2. Catalog Description

The apprenticeship program, which includes coursework, lab work and on-the-job training, involves learning about the assessment, installation, maintenance, and repair of different types of pipe systems, effective and safe tool use, material applications, related mathematics & science and storage. The student will learn how to read blueprints, apply layout and install, as well as estimate and repair both supply and

waste water systems. The courses required for the Certificate of Achievement in Plumbing also meet many of the requirements for the Associate in Science degree in Plumbing Technology.

The Certificate of Achievement in Plumbing program is conducted in partnership with the Pipe Trades Training Center apprenticeship program. The apprenticeship program is five years in duration, requiring a minimum of 9,000 hours of on-the-job training. After 5 years of classroom and paid work experience, students are recognized as journeypersons within the Pipe Trades industry, working to protect the health and safety of the community by piping pure water to commercial and industrial buildings for drinking, cooking, washing, cleaning, manufacturing or personal use, and removing waste water after it has served its purpose. Graduates of the Plumbing Certificate of Achievement program will be employable as: Journeyman Commercial Plumber/Industrial Plumber, Foreman, and General Foreman in a variety of industries including the energy, biopharmaceutical, healthcare, aerospace, construction, housing, water treatment, and food and beverage processing industries. Labor Market Analysis indicates increased employment opportunities in the Pipe Trades through 2020. Students earning a certificate in Plumbing will increase their marketability and employment opportunities. Admission to apprenticeship classes is limited to apprentices registered with the California Division of Apprenticeships Standards, according to the California Labor Code, Section § 3074.3.

Item 3. Program Requirements

Certificate of Achievement in Plumbing

Requirements	Dept. Name & Course #	Name	Units	CSU-GE	IGETC	Sequence
Core Courses (47.5 Quarter Units)	APPT 131	Basic Plumbing Skills	4.5	NA	NA	Year 1,Fall & Winter
	APPT 132	Applied & Related Theory	4.5	NA	NA	Year 1, Spring & Summer
	APPT 133	Beginning Drawing & Design	4.5	NA	NA	Year 2, Fall & Winter
	APPT 134A	Rigging & Layout	2.5	NA	NA	Year 2, Spring & Summer
	APPT 134B	Industrial Safety	2.5	NA	NA	Year 2, Spring & Summer
	APPT 135A	Plumbing Fixtures	2.5	NA	NA	Year 3, Fall & Winter
	APPT 135B	Plumbing Codes	2.5	NA	NA	Year 3, Fall & Winter
	APPT 136	Advanced Trade Math for Plumbers	4.5	NA	NA	Year 3, Spring & Summer
	APPT 137A	Water Systems	2.5	NA	NA	Year 4, Fall & Winter
	APPT 137B	Applied Welding	2.5	NA	NA	Year 4, Fall & Winter
	APPT 138	Advanced Drawing & Blueprint Reading	4.5	NA	NA	Year 4, Spring & Summer
	APPT 139A	Industrial Installation	2.5	NA	NA	Year 5, Fall & Winter
	APPT 139B	Medical Gas Installation	2.5	NA	NA	Year 5, Fall & Winter
	APPT 129	Special Topics	2.5	NA	NA	Year 5, Spring & Summer
	APPT 130	Review & Turnout	2.5	NA	NA	Year 5, Spring & Summer

TOTAL UNITS **47.5 units**

Proposed Sequence:

Year 1, Fall & Winter = 4.5 units
Year 1, Spring & Summer = 4.5 units
Year 2, Fall & Winter = 4.5 units
Year 2, Spring & Summer = 5.0 units
Year 3, Fall & Winter = 5.0 units
Year 3, Spring & Summer = 4.5 units
Year 4, Fall & Winter = 5.0 units
Year 4, Spring & Summer = 4.5 units
Year 5, Fall & Winter = 5.0 units
Year 5, Spring & Summer = 5.0 units

TOTAL UNITS: 47.5 units

Labor Market Analysis: The occupational outlook for the Pipe Trades industry shows strong demand and growth over the next ten years in Santa Clara and San Benito counties. The projected employment of Plumbers, Pipefitters, and Steamfitters is expected to grow by 29.8% in the period from 2010 to 2020. The California State Employment Development Department expects the number of professionals employed in the Pipe Trades to increase from 1,190 to 2,480. The Certificate of Achievement in Plumbing is an important contribution in efforts to educate California's workforce and meet local demands for educated professionals in the Pipe Trades. More generally, the National Skills Coalition reported in November, 2007, that jobs in the middle of the labor market, "those that require more than high school, but less than a four-year degree" are in demand, and will remain "robust relative to its supply." See Appendix A for Santa Clara County Labor Market Information.

Advisory Committee Meeting Minutes and Member list: See Appendix B

In addition to being members of the labor union, journeypersons are also employees of the labor union. Thus, as representatives of their constituents, the Board of Directors of the Pipe Trades Training Center actively considers member/employee career goals and objectives and has independently evaluated apprenticeship student interest in obtaining a Certificate of Achievement in Plumbing from Foothill College. Attached, as Appendix C, is a letter from members of the Board of Directors of the Pipe Trades Training Center indicating that apprenticeship students consider the pursuit and completion of these degrees to be highly significant in obtaining their career goals and objectives; the board unanimously agreed to support the partnership with Foothill College in the development and maintenance of this (and other) certificate and degree programs.

Item 4. Master Planning

The Certificate of Achievement in Plumbing aligns with the planned goals of the College and the District because the program serves the regional area in support of workforce development and economic growth. The Certificate of Achievement in Plumbing is a new degree and, therefore, does not duplicate an already-existing program within the Foothill-De Anza district or the surrounding colleges.

The only apparent competition to the Certificate of Achievement in Plumbing program at Foothill College occurs from two out-of-state colleges that offer on-line degrees. PTTC apprentices and recently-graduated journeymen are taking on-line courses at Washtenaw Community College and at National Labor College at considerably higher tuition, $194/credit hour and $297/credit hour respectively, and other expenses in order to earn a Certificate of Achievement in Apprenticeship Completion or Construction Management. Offering a Certificate of Achievement in Plumbing at Foothill College would well serve the college's primary stakeholders: the students, community partners, and the community at-large.

Local references in support of the Certificate of Achievement in Plumbing include all Advisory Committee representatives from the PTTC (Appendix B) who strongly support the partnership between the PTTC and Foothill College due to their understanding of local economic workforce needs and their ongoing contact with apprenticeship students, which provides grounded understanding of their students' short-term and long-term educational goals.

Item 5. Enrollment and Completer Projections

		Year 1		Year 2	
Course #	Course Title	Annual Sections	Annual Enrollment	Annual Sections	Annual Enrollment
APPT 131	Basic Plumbing Skills	3	36	2	30
APPT 132	Applied & Related Theory	1	6	3	33
APPT 133	Beginning Drawing & Design	1	6	2	24
APPT 134A	Rigging & Layout	1	13	1	12
APPT 134B	Industrial Safety	1	13	1	12
APPT 135A	Plumbing Fixtures	2	20	1	6
APPT 135B	Plumbing Codes	2	26	1	6
APPT 136	Advanced Trade Math for Plumbers	1	6	1	13

APPT 137A	Water Systems	2	22	1	8
APPT 137B	Applied Welding	2	21	1	8
APPT 138	Advanced Drawing and Blueprint Reading	2	25	2	18
APPT 139A	Industrial Installation	2	25	1	18
APPT 139B	Medical Gas Installation	1	20	1	12
APPT 129	Special Projects	3	25	2	21
APPT 130	Review and Turnout	2	25	2	18

The number of students completing the required courses aligns with the Labor Market Analysis (Appendix A).

Item 6. Place of Program in Curriculum/Similar Programs

The Certificate of Achievement in Plumbing does not adversely affect existing programs at Foothill College in terms of competition for students or courses, nor does it take material resources away from other existing programs at the College. The Certificate of Achievement in Plumbing is designed to create pathways for students from Pre-Apprenticeship and Apprenticeship through an Associate in Science degree and potential transfer to a four-year institution. Thus, the students can easily move from the Certificate of Achievement in Plumbing to the Associate in Science degree in Plumbing Technology. This streamlined approach facilitates the students' ability to readily complete their educational goals and to earn family-supporting wages.

Item 7. Similar Programs at Other Colleges in Service Area

There are no similar programs in existence in the college service area of Foothill College; the partnership with the Loyd E. Williams Pipe Trades Training Center is unique in the college service area.

FOOTHILL COLLEGE
Credit Program Narrative
Certificate of Achievement in Steamfitting/Pipefitting

Item 1. Program Goals and Objectives

Foothill College is responding to local demand for Pipe Trades workers in Steamfitting/Pipefitting by establishing a Certificate of Achievement in Steamfitting/Pipefitting in partnership with the Loyd E. Williams Pipe Trades Training Center (PTTC), located in San Jose, CA. Graduates are recognized as journeypersons within the Pipe Trades industry. Graduates of the Certificate of Achievement in Steamfitting/Pipefitting program will be employable as: Journeyman Commercial/Industrial Steamfitter and Pipefitter, Commercial/Industrial Welder, Foreman, and General Foreman. Students earning a certificate in Steamfitting/Pipefitting will increase their marketability and employment opportunities.

The certificate in Steamfitting/Pipefitting at Foothill College serves to align apprenticeship programs with college and university academic tracks as directed by the federal and state government. Foothill College and the Loyd E. Williams Pipe Trades Training Center (PTTC) are collaborating in an LEA program along with the Division of Apprenticeship Standards (DAS) for the state of California.

The program learning outcomes for the Certificate of Achievement in Steamfitting/Pipefitting are:

- In compliance with applicable standards and codes, students will demonstrate ability to install and remove piping and equipment for complex heating and air conditioning applications and special industrial piping systems, such as those used in semiconductor, biotechnology, and power generation facilities.

- In compliance with applicable standards and codes, students will demonstrate ability to maintain, extend, and/or alter piping and equipment for heating and air conditioning, and for special industrial piping systems, such as those used in semiconductor, biotechnology, and power generation facilities.

Students complete the Certificate of Achievement in Steamfitting/Pipefitting through enrollment in and completion of the Steamfitting/Pipefitting apprenticeship program at the PTTC. To apply to the PTTC apprenticeship program, potential students must be at least 18 years of age, be able to perform the work of the trade, present verification of high school completion, either through a high school diploma or GED or High School Proficiency certificate, and demonstrate the ability to read, write, and speak English. The selection, employment and training of apprentices by the PTTC is without discrimination according to race, color, national or ethnic origin, age, gender, religion, sexual orientation or marital status. Students are admitted into the PTTC apprenticeship program based on obtaining a passing (75%) score on the "Pipe Trades Entrance Exam,' an exam which measures the student's ability in math and mechanical reasoning. Students who pass the entrance exam are selected from an applicant waiting list, the order of which is established by the date the entrance exam was taken and the test score. Admission to apprenticeship classes is limited to apprentices registered with the California Division of Apprenticeships Standards. This limitation is authorized by the California Labor Code, Section § 3074.3.

Aside from Foothill College's ordinary enrollment fees, there are no additional costs to the student to complete the Certificate of Achievement in Steamfitting/Pipefitting.

In accordance with the State Chancellor's office, the goals and objectives of the Certificate of Achievement in Steamfitting/Pipefitting align with the primary mission of California community colleges, as established in Ed. Code § 66010.4, which mandate that community colleges provide vocational instruction to students and to advance California's economic growth and global competitiveness through education and training that contribute to workforce development. The Certificate of Achievement program in Steamfitting/Pipefitting aligns with Foothill College's Institutional Outcomes and directly supports the Computation and the Creative, Critical, and Analytical Thinking rubrics.

Item 2. Catalog Description

The apprenticeship program, which includes coursework, lab work and on-the-job training, involves learning about the assessment, installation, maintenance, and repair of different types of pipe systems, effective and safe tool use, material applications, related mathematics & science and storage. Upon completion of the program, students will be able to assess and install high-pressure pipe systems in order to move liquids or gases under high pressure. The courses required for the Certificate of Achievement in Steamfitting/Pipefitting also meet many of the requirements for the Associate in Science degree in Steamfitting and Pipefitting Technology.

The Steamfitting/Pipefitting Certificate of Achievement program is conducted in partnership with the Pipe Trades Training Center apprenticeship program. The apprenticeship program is five years in duration, requiring a minimum of 9,000 hours of on-the-job training. After 5 years of classroom and paid work experience, students are recognized as journeypersons within the Pipe Trades industry and work to protect our environment by properly installing and maintaining piping and equipment for complex heating and air conditioning and special industrial piping systems. Graduates of the Certificate of Achievement program will be employable as: Journeyman Commercial/Industrial Steamfitter and Pipefitter, Commercial/Industrial Welder, Foreman, and General Foreman in industries such as the semiconductor, biotechnology, energy, healthcare, education, housing, water treatment, and food and beverage processing industries. Labor Market Analysis indicates increased employment opportunities in the Pipe Trades through 2020. Students earning a certificate in Steamfitting/Pipefitting will increase their marketability and employment opportunities. Admission to apprenticeship classes is limited to apprentices registered with the California Division of Apprenticeships Standards, according to the California Labor Code, Section § 3074.3.

Item 3. Program Requirements

Certificate of Achievement in Steamfitting/Pipefitting

Require-ments	Dept. Name / Course #	Name	Units	CSU-GE	IGETC	Sequence
Core Courses (47 Units)	APPT 141	Basic Steamfitting Skills	4.5	NA	NA	Year 1, Fall & Winter
	APPT 142	Related Math, Drawing & Rigging	4.5	NA	NA	Year 1, Spring & Summer
	APPT 143	Cutting & Welding	4.5	NA	NA	Year 2, Fall & Winter
	APPT 144A	Science, Electricity & Air Conditioning	2.5	NA	NA	Year 2, Spring & Summer
	APPT 134B	Industrial Safety	2.5	NA	NA	Year 2, Spring & Summer
	APPT 145	Advanced Trade Math for Steamfitters	4.5	NA	NA	Year 3, Fall & Winter
	APPT 146	Steam Technology	4.5	NA	NA	Year 3, Spring & Summer
	APPT 147A	Hydronic Systems	2.5	NA	NA	Year 4, Fall & Winter
	APPT 147B	Industrial Rigging	2.5	NA	NA	Year 4, Fall & Winter
	APPT 148	Advanced Drawing & Blueprint Reading	4.5	NA	NA	Year 4, Spring & Summer
	APPT 139A	Industrial Installations	2.5	NA	NA	Year 5, Fall & Winter
	APPT 139B	Medical Gas Installations	2.5	NA	NA	Year 5, Fall & Winter
	APPT 129	Special Topics	2.5	NA	NA	Year 5, Spring & Summer
	APPT 130	Review & Turnout	2.5	NA	NA	Year 5, Spring & Summer

Required Major Total: 47 units

Proposed Sequence:

Year 1, Fall & Winter = 4.5 units
Year 1, Spring & Summer = 4.5 units
Year 2, Fall & Winter = 4.5 units
Year 2, Spring & Summer = 5.0 units
Year 3, Fall & Winter = 4.5 units

Year 3, Spring & Summer = 4.5 units
Year 4, Fall & Winter = 5.0 units
Year 4, Spring & Summer = 4.5 units
Year 5, Fall & Winter = 5.0 units
Year 5, Spring & Summer = 5.0 units
TOTAL UNITS: 47 units

Labor Market Analysis: The occupational outlook for the Pipe Trades industry shows strong demand and growth over the next ten years in Santa Clara and San Benito counties. The projected employment of Plumbers, Pipefitters, and Steamfitters is expected to grow by 29.8% in the period from 2010 to 2020. The California State Employment Development Department expects the number of professionals employed in the Pipe Trades to increase from 1,190 to 2,480. The Certificate of Achievement in Steamfitting/Pipefitting is an important contribution in efforts to educate California's workforce and meet local demands for educated professionals in the Pipe Trades. More generally, the National Skills Coalition reported in November, 2007, that jobs in the middle of the labor market, "those that require more than high school, but less than a four-year degree" are in demand, and will remain "robust relative to its supply." See Appendix A for Santa Clara County Labor Market Information.

Advisory Committee Meeting Minutes and Member list: See Appendix B

In addition to being members of the labor union, journeypersons are also employees of the labor union. Thus, as representatives of their constituents, the Board of Directors of the Pipe Trades Training Center actively considers member/employee career goals and objectives and has independently evaluated apprenticeship student interest in obtaining a Certificate of Achievement in Steamfitting/Pipefitting from Foothill College. Attached, as Appendix C, is a letter from members of the Board of Directors of the Pipe Trades Training Center indicating that apprenticeship students consider the pursuit and completion of these degrees to be highly significant in obtaining their career goals and objectives; the board unanimously agreed to support the partnership with Foothill College in the development and maintenance of this (and other) certificate and degree programs.

Item 4. Master Planning

The Certificate of Achievement in Steamfitting/Pipefitting aligns with the planned goals of the College and the District because the program serves the regional area in support of workforce development and economic growth. The Certificate of Achievement in Steamfitting/Pipefitting is a new degree and does not duplicate an already-existing program within the Foothill-De Anza district or the surrounding colleges.

The only competition to the Certificate of Achievement in Steamfitting/Pipefitting program at Foothill College occurs from two out-of-state colleges that offer on-line degrees. PTTC apprentices and recently-graduated journeymen are taking on-line courses at Washtenaw Community College and at National Labor College at considerably higher tuition, $194/credit hour and $297/credit hour respectively, and other expenses in order to earn a Certificate of Achievement in Apprenticeship Completion or Construction Management. Offering a Certificate of Achievement in Steamfitting/Pipefitting at Foothill College would well serve the college's primary stakeholders: the students, community partners, and the community at-large.

Local references in support of the Certificate of Achievement in Steamfitting/Pipefitting include all Advisory Committee representatives from the PTTC who strongly support the partnership between the PTTC and Foothill College due to their understanding of local economic workforce needs and their ongoing contact with apprenticeship students, which provides grounded understanding of their students' short-term and long-term educational goals.

Item 5. Enrollment and Completer Projections

		Year 1		Year 2	
Course #	Course Title	Annual Sections	Annual Enrollment	Annual Sections	Annual Enrollment
APPT 141	Basic Steamfitting Skills	3	36	2	29
APPT 142	Related Math, Drawing & Rigging	1	11	2	21
APPT 143	Cutting & Welding	2	20	1	13
APPT 144A	Science, Electricity & Air Conditioning	1	14	1	15
APPT 134B	Industrial Safety	1	13	1	12
APPT 145	Advanced Trade Math for Steamfitters	1	6	1	14
APPT 146	Steam Technology	1	7	1	13
APPT 147A	Hydronic Systems	1	12	1	8
APPT 147B	Industrial Rigging	1	12	1	9
APPT 148	Advanced Drawing & Blueprint Reading	1	12	1	8
APPT 139A	Industrial Installations	2	24	1	12
APPT 139B	Medical Gas Installations	2	27	1	11
APPT 129	Special Topics	2	25	2	23
APPT 130	Review & Turnout	2	24	1	16

The number of students completing the required courses aligns with the Labor Market Analysis (Appendix A).

Item 6. Place of Program in Curriculum/Similar Programs

The Certificate of Achievement in Steamfitting/Pipefitting does not adversely affect existing programs at Foothill College in terms of competition for students or courses, nor does it take material resources away from other existing programs at the College. The Certificate of Achievement in Steamfitting/Pipefitting is designed to create pathways for students from Pre-Apprenticeship and Apprenticeship through an Associate in Science degree and potential transfer to a four-year institution. Thus, the students can easily move from the Certificate of Achievement in Steamfitting/Pipefitting to the Associate in Science degree in Steamfitting and Pipefitting Technology. This streamlined approach facilitates the students' ability to readily complete their educational goals and to earn family-supporting wages.

Item 7. Similar Programs at Other Colleges in Service Area

There are no similar programs in existence in the college service area of Foothill College; the partnership with the Loyd E. Williams Pipe Trades Training Center is unique in the college service area.