College Curriculum Committee Meeting Agenda
Tuesday, May 20, 2014
2:00 p.m. – 3:30 p.m.
President's Conference Room

Item	Action	Attachment	Presenter/Time
1. Minutes: May 6, 2014	Action	#5/20/14-1	Escoto – 3 min
2. Announcements: a. New Course Proposal b. Curriculum Dates c. ADT Update d. Report Out from Divisions	 Information Information Information Information	 #5/20/14-2	 Escoto - 3 min Escoto – 3 min Nuñez - 2 min Curr Reps - 7 min
3. New Program Review	1st Read	#5/20/14-3 thru 6	Escoto, Lenkeit-Meezan - 7 min
4. Lecture & Lab Definitions	Information		Messina - 10 min
5. Academic Senate & CCC Interconnection	Discussion		Escoto - 10 min
6. Content Review Form	Discussion	#5/20/14-7	Escoto - 7 min
7. Course Outline Review	Information	#5/20/14-8	Nuñez - 15 min

Consent Calendar:
None

Attachment List:
#5/20/14-1 Draft Minutes: May 6, 2014
#5/20/14-2 New Course Proposal-PSE 49
#5/20/14-3 Geographic Information Systems AA State Application
#5/20/14-4 Geographic Information Systems I CA State Application
#5/20/14-5 Geographic Information Systems II CA State Application
#5/20/14-6 Geographic Information Systems III CA State Application
#5/20/14-7 Content Review Form - Single Form Draft
#5/20/14-8 Reviewing CORs

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: 5/20/14

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:

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College Curriculum Committee
Meeting Minutes
Tuesday, May 6, 2014
2:04 p.m. – 3:25 p.m.
President's Conference Room

Item	Discussion
1. Minutes: April 15, 2014	Minutes as written. **M/S** (Armstrong, Campbell) **Approved**
2. Announcements: a. Introduction	**Speaker: Isaac Escoto** a. Introduced Andrew LaManque as our new Associate Vice President of Instruction. He will be the administrator co-chair for CCC beginning in the Fall. Welcome Andrew!
b. New Course Proposal	b. New COR proposals introduced. Messina noted that the new HLTH courses presented today are actually intended to be part of a new program and therefore the New Program Creation process needs to be completed before these courses come through the C3MS system. Hueg mentioned that BSS had some Gerontology courses that are Stand Alone courses that have the possibility of working into this certificate. Horowitz is interested in building. The BSS part-time faculty are planning on working with an advisory group and local businesses to gather information to support a program application.
c. Justification for Course Changes	c. Nuñez informed the committee that the state is now requiring us to write a justification statement any time we make a substantial change to an existing outline. Nuñez will find a logistical way to request these justifications and record them to use for state reapplications.
d. CCC Rep Transitions	d. Are you returning next year? Please have these discussions in your divisions. Let us know if there's someone else from your division that will be joining us.
e. Curriculum Handbook	e. With so many moving parts, we definitely have the need for a curriculum handbook that will provide clear-cut instructions regarding the various processes we have for all aspects of curriculum. The intention is to begin this process this summer and have a draft available for discussion in the Fall.
f. Report Out from Divisions	f. Report Out: **BSS:** Currently working on Apprenticeship curriculum. The Humanities department will move to BSS as of Summer 2014. **PSME:** Francisco explained to the committee some important information regarding C-ID. We have some Math courses that originally had LDTP approval (the precursor system to C-ID) and with the advent of C-ID, they were moved directly to the C-ID system. These courses were re-reviewed and found that they did not meet the C-ID descriptor and therefore they needed updating to maintain C-ID approval. They had a short window of opportunity to correct and resubmit the outlines. Since the Math outlines are part of some of our ADTs, it was very important that we respond immediately. Francisco wanted to make sure that everyone was aware of the tenuous nature of C-ID.
3. Curriculum Calendar	**Speaker: Isaac Escoto, Kimberlee Messina** **Calendar:** Based on the recommendations of the CCC and faculty feedback, we will be moving to a June deadline for all curriculum. This year will be a little different as we transition. We will be working on 2 years of

	curriculum in the same fiscal year. The deadlines will be: December 5, 2014 for Summer 2015 and June 2015 for Summer 2016. If anyone would like to turn things in earlier than the December 5th deadline, it would be very welcome. **Lec/Lab Activity issue:** Definitions of the lecture and lab activities are being written and reviewed right now and those will be distributed as soon as possible. In addition, you will be provided a list of courses that currently have lec/lab hours. Day and Nuñez are available to meet with every department to discuss the ramifications of these changes. Any course that is only making the activity/hours/unit changes, will not need to go through the normal submission process in the C3MS and that process will also be outlined soon. Those course that will have more changes than those outlined, will need to follow the normal approval procedures established through your division and in C3MS.
4. Content Review Form Modifications	**Speaker: Isaac Escoto** Reviewed the form and suggestions and changes were recommended. Discussed the possibility of the form being electronic that might force portions of the document to be completed, based on the faculty members selection of a "new" or "confirmation of an existing requisite". We'd like it to be online so it could be updated as needed and readily accessible by anyone. Discussions will continue at future meetings.
5. Course Outline Check Sheet	**Speaker**: Isaac Escoto Presented a check sheet for faculty as they review outlines. Please distribute to your constituency groups as soon as possible. Please let us know if you find anything not mentioned so that the sheet can be updated.

Attendees: Micaela Agyare (LIBR), Kathy Armstrong (PSME), Rachelle Campbell (BH), Bea Cashmore (ALD), Bernie Day (Articulation Officer), Isaac Escoto (Faculty Co-Chair), Marnie Francisco (PSME), Hilary Gomes (FA), Robert Hartwell (FA), Ken Horowitz (BH), Kurt Hueg (Dean, BSS), Kay Jones (LIBR), Marc Knobel (PSME), Andrew LaManque (AVP Instruction), Allison Lenkeit Meezan (BSS), Kimberlee Messina (VP, Instruction, Administrator co-chair), Peter Murray (Dean, PSME), Kella Svetich (L A)
Minutes Recorded by: C Nuñez

Foothill College
College Curriculum Committee
New Course Proposal

This form should be completed by the faculty author as preparation to writing a new course. Your division CC rep can assist you in completing it appropriately, and will forward it to the Office of Instruction for inclusion as an announcement at the next available CCC meeting. The purpose of this form is ***interdisciplinary communication****. The responsibility to rigorously review and approve new courses remains with the divisional curriculum committees.*

Date Proposal Given to Division CCC Rep: April 29, 2014
Faculty Author: Sarah Parikh

Proposed Number: PSE 49
Proposed Transferability: UC and CSU
Proposed Title: Frontiers in Science

Proposed Catalog Description:
This course is intended for helping all students learn about the sciences, what science is, and what scientists do. Students taking this course will be able to make more informed decisions about future career paths in the sciences. This course covers the scientific method, data analysis, the idea of scientific evidence, the formation of scientific theories, and experimental design.

Proposed Discipline:
Chemistry, Physics, Engineering

Proposed Need/Justification Statement:
This course will be a required core course for the AS degree in general studies science.

To which Degree(s) or Certificate(s) would this course potentially be added?
AS degree in general studies science.

Comments & Other Relevant Information for Discussion:
Might be added to a ADT degree in the sciences, if there is room for it.

Instruction Office:
Date presented at CCC:
Number assigned:
Date number assigned/notification:

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.
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	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.

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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.
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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
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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.
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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.

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		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.

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Foothill College
Content Review Process & Form for Prerequisites and Co-requisites ("Requisites")

Number & Title of Target Course:

CHEM 1A General Chemistry

The "Target Course" is the one that has or will have the requisite.

Faculty participants in this content review process*:

Kathleen Armstrong, Richard Daley

*The content review process must include at least two faculty in the target course discipline. In the event that there is only one discipline faculty member at Foothill, the second reviewer(s) may be from another related discipline in the division.

In order to ensure that limitations on enrollment are both appropriate and necessary for student success, Title 5 requires faculty to complete a rigorous content review whenever new pre- or co-requisites ("requisites") are being considered for a course. Rigorous content review of requisites must also be completed during the regular Title 5 compliance review cycle. ***It is imperative that discipline faculty work with their college curriculum committee reps during this process****. For guidance regarding how to identify a course that may need a requisite review the document, "How to Identify Courses that May Need Pre- or Co-requisites."* **Please Note**: *Content review is* ***unnecessary*** *if the course is part of a closely related lecture and laboratory pairing within a discipline (e.g. anatomy laboratory course is co-requisite with anatomy lecture course).*

Number & Title of Requisite Course(s)**

CHEM 20 I MATTER: Introduction to Green Chemistry and the Environment

*** This information should be completed after discussions and the remainder of the form has been completed.*
Note: *If more than one requisite meets this/these criterion, all may be listed.*

A. The Content Review requirement may be satisfied by one of the following:

1. Do baccalaureate institutions require a particular requisite(s) for articulation? If so, **please cite** the institution, the requisite course number and title here:

   You do NOT need to complete the remainder of the content review form, but you must attach documentation. See the Articulation Officer for assistance. The documentation may be one of the following depending on the baccalaureate institution:

   a. The catalog entry from the baccalaureate institution that details the requisite(s).
   b. A letter from the baccalaureate institution validating the requisite(s).
   c. Other (at the discretion of the Articulation Officer).

2. Is a particular requisite required by statute or regulation? If so, please cite the regulatory authority and the statute number or reference here:

   You do NOT need to complete the remainder of the content review form, but must attach a copy of the statute or regulation with the authority's heading.

B. Additional Considerations:

1. Does De Anza College offer an equivalent course?
   a. If so, what is the De Anza course number?

      CHEM 1A

b. If so, does their equivalent course have a requisite***? What is it?

Introductory Chemistry or equivalent, Intermediate Algebra

****If an appropriate pre- or co-requisite course is identified and supported by institutional research via the content review process outlined below, discipline faculty are strongly encouraged to consult with De Anza discipline faculty, as implementing a prerequisite on a course at one college and not the other may have unintended consequences on enrollment.*

2. Is there a C-ID descriptor for the target course?
   a. If yes, what's the C-ID number?

Chemistry 120S

   b. If there is a C-ID descriptor, does it require a requisite? If yes, what is it?

Intermediate Algebra

***Note:** If the C-ID descriptor requires a requisite, faculty should consider possible ramifications of adding the requisite to the equivalent Foothill course. In addition, the presence of a requisite on a C-ID descriptor does not remove the requirement for content review.*

C. Establishing New Requisites

1. Identify the skills and knowledge students must have prior to enrolling in the target course and list them here (these may be contained in Section 2 of the requisite course's COR):

A. understand the scientific method and distinguish between hypotheses and scientific laws.
B. use dimensional analysis to set up and solve numerical problems.
C. classify matter and describe the properties of matter.
D. understand the fundamental assumptions of atomic theory and describe the structure of the atom.
E. use the periodic table to explain and predict properties of elements.
F. interpret chemical formulas, write simple compound names and recognize classes of compounds based on their formulas.
G. write, balance, and classify chemical equations and recognize patterns of chemical reactivity to predict the products of a chemical reaction.
H. understand the meaning and uses of the mole and of Avogadro's number.
I. describe the properties of solutions and define and use molarity in calculations.
J. describe the properties of acids and bases and understand the basis of the pH scale.

2. Contact your Division Curriculum Rep to ensure they announce the proposal to implement the requisite at the next CCC meeting. This is to ensure faculty in other divisions/departments are made aware of the proposed requisite and have time to register feedback/concerns BEFORE the requisite is fully adopted. Document the date of the CCC meeting here:

3. Is the requisite a new course? If so, please state this below and then skip to the signature section, Section D. If not, please Contact the Institutional Researcher to gather and analyze data comparing success rates for students who have completed versus those that have not yet completed the identified prerequisite and document here.

The requisite course is a new course and so data is not currently available

D. Previously Implemented Requisites

1. Contact the Institutional Researcher to gather and analyze student success data disaggregated according to race, ethnicity, gender, age, economic circumstances and disability. Document methodology and findings here:

2. Review course syllabi (at least one from each faculty who taught a section in the previous year) and artifacts such as exams, assignments and grading criteria. Use the following space to document which of these provides explicit evidence that the identified requisite skills are necessary in ALL sections being offered.

Note: *If you cannot find evidence that the requisite skills are necessary **in every section** of the course, the requisite cannot be imposed. If the requisite is to remain in place, discipline faculty should collaborate with their CCC reps and their dean to agree on a plan to ensure that all sections are held to the same rigor necessitating the requisite.*

D. Signatures and Submission

1. If the Division CC determines that the identified requisite is necessary and appropriate for student success, the Division Curriculum Committee will consult with the Division Dean, Vice President of Instruction and Institutional Researcher to assure that the college is offering sufficient numbers of courses, with or without requisites, to accommodate the educational needs of our students.
2. The Division CCC rep(s) will notify the CCC of the new requisite at the next CCC meeting.

Submit this completed form and appropriate attachments to your Division Curriculum Committee for review and approval.

Target Discipline Faculty Signature:		Date:	
Target Discipline Faculty Signature:		Date	
Requisite Discipline Faculty Signature:		Date	
Division CC Review & Date of Approval:			
Division Dean Signature:		Date	
Division CC Rep Signature:	Kathleen Armstrong	Date	2/11/2014
Articulation Officer Signature:		Date	

Reviewing CORs

1. Is the course to be active or inactive?
   a. Active, continue.
   b. Inactive, move directly to next **status level**, as no other action is necessary.
2. The title should be all caps. Use the "&" instead of the word "and".
3. Do the hours and units match? 1 hour lecture per week= 1 unit, 3 hours lab per week= 1 unit. Do not forget to add homework hours: for every lecture hour, there should be 2 hours of homework and we must record that on the outline.
4. The quarter and year should be "**Summer**" and the next year. If not, please correct.
5. Are the "**Units**" and "**Max Units**" correct? Both boxes should be completed.
6. Does the **Hourly** text statement agree with the hourly boxes? The hour amount is written numerically (i.e. 2 hours lecture, 3 hours laboratory).
7. Repeatability? Credit courses can no longer be repeated unless under special circumstances. Use the pull-down for the "repeat" rule. If it's "Not Repeatable", the textbox should be empty.
8. Degree Status: most courses are "**Degree Applicable**". This **does NOT** mean that it's part of a degree but rather refers to the collegiate level of the course.
9. Grading: there are 4 options: Letter grade only, letter grade with a P/NP option, Pass/No Pass and No Credit. If "Pass/No Pass" is selected, there must also be a notation in section #1d of "**Advisory: Pass/No Pass**".
10. Part of a degree/certificate?
    a. if YES, select all options for this course. Is it also noted in the Need/Justification Statement?
    b. if NO, check for a STAND ALONE form. Is there a completed form?
11. FHGE course?
    a. If YES, check the appropriate box(es) for which the course has approval (each course is allowed to be in 2 areas). If it has not been approved as yet but there is an application pending, please select "**Non-GE applicable**" When the application is approved, the Instruction Office will make the correction.
    b. If it's a FHGE course, is this noted in the Need/Justification Statement? If not, add the appropriate wording.
    c. If NO, check "**Non-GE applicable**" box.
12. Transferability:
    a. If it says UC/CSU, the number should be 1-49
    b. If it says CSU, the number should be 50-99
    c. If it doesn't follow these guidelines, please go back and make a correction.
13. Distance Learning?
    a. Is there an **approved** addendum on file with the Instruction Office?
14. Need/Justification Statement: Does the statement explain the course's place in our curriculum? If not, check the N/J spreadsheet and/or the instruction sheet for examples of what is appropriate for this section.
15. Requisites:
    a. Make sure the word "Prerequisite, Corequisite or Advisory" is in the field. If it's a prerequisite, it needs to read "**Prerequisite:**"

   b. Is there a Content Review form on file for the Prereq or Coreq?
   c. Advisory is singular, not Advisories.
16. If any course is mentioned in the outline proper, it should be written using their four-letter indicator (all caps), a space, and the number. Example: MATH 10. No title please.
17. In section #2, Course Objectives, always begin with: **The student will be able to:**
18. Sections 2, 4, 6, 10 & 12 should all be in outline format which is A., 1., a., 1), a). Sections 3 & 9 may be written in outline format or as a paragraph, author's preference.
19. Section #6, "attendance" cannot be listed as it is not an evaluative measure.
20. Section #7, the text notation is:
    a. Nunez, Corinne, <u>How To Teach</u>, 2nd ed. New York, Delmar Publishing, 2010.
    b. There is no extra return between each textbook reference.
    c. Please use the "Help me" button in C3MS for other examples of notation for various types of references.
21. Section #8 requires a discipline(s) from the approved list only, **nothing else may be used**. There may be multiple disciplines but there are 2 types of notations:
    a. "English, Reading". This means the faculty **must have both**.
    b. "English or Reading." This means that the faculty may have one or the other.
22. If there are lab hours listed in the top, section #10 must be completed. If there's no lab info needed, this should have the following statement: "Not applicable".
23. Section #12 should be EXAMPLES of reading and writing assignments, not a reiteration of the textbook information.