Program Creation Process Check List

Program Title: Certificate of Achievement in Geographic Information Systems I
Division: BSS **Proposing Faculty name(s):** K. Allison Lenkeit Meezan
Type of Program: _____ Transfer or X_____ Workforce
Type of Award:
____ Non-transcriptable certificate
X___ Certificate of Achievement
____ AA/AS Degree

Documentation checklists:

Transfer documentation
_____ Catalog Description
_____ List of Courses
_____ Articulation & transfer data
_____ Identification of existing program(s) at CSU/UCs
_____ Completer Projections
_____ Identification of any additional resources needed to establish program (i.e. faculty, equipment, etc.)

Workforce documentation
X___ Catalog Description
X___ List of Courses
X___ Completer Projections
X___ Labor Market information
X___ Identification of any similar program(s) in the area
X___ Identification of any additional resources needed to establish program (i.e. faculty, equipment, etc.

Transfer/Workforce Work Group Comments/Recommendations:
Recommend Approval for PaRC's consideration.

Work Group Signature: [signature] Date: 12/12/13

Supervising Vice President Comments/Recommendations:
Growing occupational need, and we have existing resources.

Vice President Signature: [signature] Date: 12-16-13

Planning & Resource Committee Comments/Recommendations:

PaRC Signature: Date:

Division Curriculum Committee Comments/Recommendations:

Division CC Signature: Date:

Following the review by the listed committees, this form should be forwarded to the Office of Instruction.
12/2/13

11/18/13 cmln

FOOTHILL COLLEGE
Credit Program Narrative
Geographic Information Systems Technology Certificate of Achievement 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. Following completion of the program, the graduate will be able to

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

Item 2. Catalog Description

Geospatial technology is the unifying tool with which spatial phenomena is explored. Geospatial technology consists of Geographic Information Systems (GIS), Global Positioning Systems (GPS) and Remote Sensing (RS). 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 (GIS) are a collection of computers, software applications, and personnel used to capture, store, transform, manage, analyze, and display spatial information. GIS skills are highly desirable in agriculture, archaeology, business, cartography, government, law enforcement, marketing, oil and gas, real estate and urban planning. The Geographic Information Systems Technology Certificate of Achievement I provides a solid technical background in GIS concepts and applications including cartographic concepts, database design, programming, and interdisciplinary applications of the technology. The outcomes of the certificate align with the Department of Labor geospatial competency model for geospatial careers. The courses in this certificate scale up to additional transcriptable Geographic Information Systems Technology certificates and the AA 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

SAMPLE A.A. Administration of Justice

Requirements	Dept. Name/#	Name	Units	CSU-GE	IGETC	Sequence
Required Core (6 units)	ADMJ 50 ADMJ 60	Introduction to Justice Criminal Law	3 3	A1 B2	Area 1 Area 4	Yr 1, Fall Yr 2, Spring
Two courses (6 units)	ADMJ 40 ADMJ 55 ADMJ 61 ADMJ 63 ADMJ 70 ADMJ 80 ADMJ 85	Juvenile Justice Procedures Introduction to Correctional Science Evidence Criminal Investigation Community Relations Criminal Trial Process Introduction to Forensics	3 3 3 3 3 3 3	 A1	Area 2	Yr 1, Fall Yr 2, Spring Yr 2, Spring Yr 1, Summer Yr 1, Fall/Spring Yr 2, Fall/Spring Yr 1, Spring/Summer Yr 2, Fall
Two courses (6 units)	SOC 1 PSY 1 PSY 5	Principles of Sociology General Psychology Behavioral Sciences	3 3 4	D6 A1	Area 1	Yr 2, Spring Yr 1, Summer Yr 1, Fall

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 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 (GIS) and its associated 'GeoSpatial Technology' disciplines Global Positioning Systems (GPS) and Remote Sensing (RS) have been around for over 40 years, but have risen to prominence in the last 15 years with the advent of cheap 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 GIS, GPS and RS 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 US Department of labor estimates that the US will need 500,000 professionals trained in Geospatial Technology.
Foothill College established a GIS 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 transcriptable Certificate of Achievement in Geography with a focus on GIS. The program has been updated to reflect current industry model curriculum. The additional certificates that are being applied for are shifted to the Geographic Information Systems Technology (GIST) department, based on feedback from the program's professional advisory board. These new certificates and associates degree will replace the existing Certificate of Achievement in GIS 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 which 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 state-wide.

		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				
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				
C S 1A	Object-Oriented Programming Methodologies in Java				
C S 22A	Javascript for Programmers				
HORT 45	Landscape Design: Computer Applications				

Item 6. Place of Program in Curriculum/Similar Programs
There are currently no similar programs at Foothill College. The curriculum requirements (31-33 required units) are in line with other Certificates of Achievement at the college. 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 work in lab time and outside of class. This program builds upon the existing GIS 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 reasonable commuting distance that offer a similar program. Diablo Valley College (65 miles away) is the only other regional college that offers a transcriptable certificate in Geospatial Technology. The Geospatial Technology program at Foothill has worked closely with the GIS 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.