

## Program Creation Process Sign-Off

**Program Title:** Software Development in Python

**Program Units:** 24

**Division: Proposing Faculty name(s):** Eric Reed

**Type of Program:** Transfer/Workforce

**Type of Award:**

Transcriptable certificate

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

Catalog Description

List of Courses

Completer Projections

Labor Market information

Identification of any similar program(s)  
in the area

Identification of any additional  
resources needed to establish program  
(i.e. faculty, equipment, etc.)

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**Transfer/Workforce Work Group:** Recommended Not Recommended  
**Comments:**

Work Group Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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**Supervising Vice President:** Recommended Not Recommended  
**Comments:**

Vice President Signature: \_\_\_\_\_ Date: \_\_\_\_\_

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**Planning & Resource Committee:** Recommended Not Recommended  
**Comments:**

Foothill College

Credit Program Narrative

Certificate of Achievement: \_\_\_\_\_Software Development in Python\_\_\_\_\_

**Item 1. Program Goals and Objectives**

Students learn software development techniques and methods for creating applications in Python. Students apply these skills in practical projects relevant to the software industry. The successful student will be able to use much of the coursework toward a BS in computer science.

Program Learning Outcomes:

- Students are able to design, document, test and debug programs using Python
- Students use design patterns in application programs
- Students demonstrate techniques for creating modular reusable code

**Item 2. Catalog Description**

Python is a high-level programming language that lets you work quickly and integrate systems more effectively. Python programmers are employed in research, data science, machine learning, artificial intelligence, quality assurance, web back-end, and other careers throughout the software industry.

**Item 3. Program Requirements**

Course Number	Title	Units
<b>Required: Both of the following (9 units)</b>		
CS 3A	OBJECT ORIENTED PROGRAMMING METHODOLOGIES IN PYTHON	4.5
CS 3B	INTERMEDIATE SOFTWARE DESIGN IN PYTHON	4.5
<b>Plus: at least 15 units from the following courses</b>		
CS 3C	ADVANCED DATA STRUCTURES AND ALGORITHMS IN PYTHON	4.5
CS 10	COMPUTER ARCHITECTURE AND ORGANIZATION	4.5
CS 18/ MATH 22	DISCRETE MATHEMATICS	5
CS 22A	JAVASCRIPT FOR PROGRAMMERS	4.5

<b>CS 30A</b>	INTRODUCTION TO LINUX	4.5
<b>CS 31A</b>	INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS	4.5
<b>CS 40A</b>	SOFTWARE ENGINEERING METHODOLOGY	4.5
<b>CS 50A</b>	SOFTWARE BASICS (CCNA)	4.5
<b>MATH 10</b>	ELEMENTARY STATISTICS	5.0
<b>MATH 48A</b>	PRECALCULUS I	5.0
<b>MATH 48B</b>	PRECALCULUS II	5.0
<b>MATH 48C</b>	PRECALCULUS III	5.0
<b>MATH 1A</b>	CALCULUS	5.0

**Suggested Sequence:**

**Fall: CS 3A and MATH 48A**

**Winter: CS 3B and CS 30A**

**Spring: CS 3C and CS 40A**

**Total Units = 27.5**

**Item 4. Master Planning**

Most of the prospective students of this Certificate of Achievement are from the San Francisco Bay Area, which is a hub of technological innovation in the world. However, the certificate is relevant and useful to any student who wishes to contribute to the area and potentially seek employment with one of the major multinational technology companies. There is a great need within the software industry for more trained graduates of diverse backgrounds, which is a need this certificate seeks to meet.

In addition to students from our home campus, Technology Innovation Design Engineering (TIDE) school students will complete this certificate. TIDE is recruiting first gen, Latinx, and African American students for an overall diverse population of students. Most of the students are from the Sequoia Atherton district, near Facebook, HP, and SAP. TIDE seeks to connect their students to these companies. Approximately 100 students will join the program each year beginning in 2020. By 2023, there should be 400 TIDE students in this certificate pipeline at any point in time.

**Item 5. Enrollment and Completer Projections**

<b>Course Number</b>	<b>Title</b>	<b>2016-17</b>	<b>2017-18</b>
<b>Required: Both of the following (9 units)</b>			

<b>CS 3A</b>	OBJECT ORIENTED PROGRAMMING METHODOLOGIES IN PYTHON	<b>189</b>	<b>381</b>
<b>CS 3B</b>	INTERMEDIATE SOFTWARE DESIGN IN PYTHON	<b>N/A</b>	<b>N/A</b>
<b>Plus: at least 15 units from the following courses</b>			
<b>CS 3C</b>	ADVANCED DATA STRUCTURES AND ALGORITHMS IN PYTHON	<b>N/A</b>	<b>N/A</b>
<b>CS 10</b>	COMPUTER ARCHITECTURE AND ORGANIZATION	<b>176</b>	<b>197</b>
<b>CS 18/ MATH 22</b>	DISCRETE MATHEMATICS	<b>230</b>	<b>239</b>
<b>CS 22A</b>	JAVASCRIPT FOR PROGRAMMERS	161	154
<b>CS 30A</b>	INTRODUCTION TO LINUX	231	170
<b>CS 31A</b>	INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS	140	123
<b>CS 40A</b>	SOFTWARE ENGINEERING METHODOLOGY	N/A	17
<b>CS 50A</b>	NETWORK BASICS (CCNA)	101	87
<b>MATH 10</b>	ELEMENTARY STATISTICS	1902	2024
<b>MATH 48A</b>	PRECALCULUS I	656	603
<b>MATH 48B</b>	PRECALCULUS II	604	599
<b>MATH 48C</b>	PRECALCULUS III	682	655
<b>MATH 1A</b>	CALCULUS	757	805

**Item 6. Place of Program in Curriculum/Similar Programs**

None.

### **Item 7. Similar Programs at Other Colleges in Service Area**

This program is similar to the De Anza College Certificate of Achievement for Programming in Python. Data shows that there is currently yet unmet demand for graduates in this area.

Many students at Foothill college travel from north of Foothill and will be better served by an offering of this program at our campus. Furthermore, the focus of our program is different from the De Anza offering due to our emphasis on software engineering patterns and principles.

None of the community colleges in the San Mateo Community College district (north of Foothill) offer this program currently.

#### **Additional Information Required for State Submission:**

**TOP Code:** \*0707.00

**Annual Completers:** 80 (expected) to 2023, 200 (post 2023), 600 (post 2026)

**Net Annual Labor Demand:** 9000 new jobs per year (SF Bay Area)

**Faculty Workload:** No change.

**New Faculty Positions:** No new positions.

**New Equipment:** No new equipment.

**New/Remodeled Facilities:** No new facilities.

**Library Acquisitions:** None

**Gainful Employment:** Yes

**Program Review Date:** TBD

**Distance Education:** 100% of the core courses are offered online or hybrid.

#### **ATTACH THE FOLLOWING:**

1. **Labor Market Information and Analysis**
2. **Advisory Committee Recommendation**
3. **Regional Consortia Approval Meeting Minutes**