

College Curriculum Committee Meeting Agenda

Tuesday, May 23, 2023

2:00 p.m. – 3:30 p.m.

Administrative Conference Room 1901; virtual option via Zoom

Masks required for all in-person attendees

Item	Time*	Action	Attachment(s)	Presenter(s)
1. Minutes: May 9, 2023	2:00	Action	#5/23/23-1	Kuehnl
2. Report Out from Division Reps	2:02	Discussion		All
3. Public Comment on Items Not on Agenda (CCC cannot discuss or take action)	2:12	Information		
4. Announcements a. New Course Proposals b. AB 1705 Update	2:17	Information	#5/23/23-2-6 #5/23/23-7	CCC Team
5. New Certificate Application: Non-Destructive Testing (NDT) Technician	2:22	2nd Read/ Action	#5/23/23-8	Kuehnl
6. New Degree Application: Industrial Technology and Building Construction Management BS	2:25	1st Read	#5/23/23-9	Kuehnl
7. Program Discontinuance Process	2:35	2nd Read/ Action	#5/23/23-10	Kuehnl
8. Process for Implementing Equity Updates to CORs	2:55	Discussion	#5/23/23-11	Kuehnl
9. Good of the Order	3:27			Kuehnl
10. Adjournment	3:30			Kuehnl

*Times listed are approximate

Attachments:

- #5/23/23-1 Draft Minutes: May 9, 2023
- #5/23/23-2-6 New Course Proposals: [C S 8](#); [MATH 233](#); NCBS [433](#), [440A](#); [PHOT 422](#)
- #5/23/23-7 AB 1705 Implementation Guide
- #5/23/23-8 New Certificate Application: Non-Destructive Testing (NDT) Technician
- #5/23/23-9 New Degree Application: Industrial Technology and Building Construction Management BS
- #5/23/23-10 Degree or Certificate (Program) Discontinuance Process—draft (updated)
- #5/23/23-11 Mock-up of Equity Text Field on COR Form

2022-2023 Curriculum Committee Meetings:

<u>Fall 2022 Quarter</u>	<u>Winter 2023 Quarter</u>	<u>Spring 2023 Quarter</u>
10/4/22	1/24/23	4/25/23
10/18/22	2/7/23	5/9/23
11/1/22	2/21/23	5/23/23
11/15/22	3/7/23	6/6/23
11/29/22	3/21/23	6/20/23

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

2022-2023 Curriculum Deadlines:

- 12/1/22 Deadline to submit courses to CSU for CSU GE approval (Articulation Office).

- ~~12/1/22~~ Deadline to submit courses to UC/CSU for IGETC approval (Articulation Office).
- ~~4/21/23~~ Deadline to submit curriculum sheet updates for 2023-24 catalog (Faculty/Divisions).
- 6/1/23 Deadline to submit new/revised courses to UCOP for UC transferability (Articulation Office).
- 6/23/23 Deadline to submit course updates and local GE applications for 2024-25 catalog (Faculty/Divisions).
- Ongoing Submission of courses for C-ID approval and course-to-course articulation with individual colleges and universities (Articulation Office).

Distribution:

Micaela Agyare (LRC), Chris Allen (Dean, APPR), Jeff Bissell (KA), Rachelle Campbell (HSH), Anthony Cervantes (Dean, Enrollment Services), Kelly Edwards (KA), Valerie Fong (Dean, LA), Evan Gilstrap (Articulation Officer), Hilary Gomes (FA), Tom Gough (FA), Allison Herman (LA), Kurt Hueg (Interim VP Instruction), Julie Jenkins (BSS), Ben Kaupp (SRC), Eric Kuehnl (Faculty Co-Chair), Andy Lee (CNSL), Ana Maravilla (CNSL), Tiffany Mitchener (HSH), Patrick Morriss (STEM), Brian Murphy (APPR), Tim Myres (APPR), Teresa Ong (AVP Workforce), Ron Painter (STEM), Sarah Parikh (STEM), Chrissy Penate (LRC), Amy Sarver (LA), JP Schumacher (Dean, SRC), Shaelyn St. Onge-Cole (HSH), Ram Subramaniam (Administrator Co-Chair), Kella Svetich (LA), Mary Vanatta (Curriculum Coordinator), Voltaire Villanueva (AS President)

CC: Interpreters

COLLEGE CURRICULUM COMMITTEE

Committee Members – 2022-23

Meeting Date: 5/23/23Co-Chairs (2)

<u>✓*</u>	Eric Kuehnl	7479	Vice President, Academic Senate (tiebreaker vote only)	kuehneric@fhda.edu
<u>✓</u>	Ram Subramaniam	7179	Acting Associate Vice President of Instruction	subramaniamram@fhda.edu

Voting Membership (1 vote per division)

<u>✓*</u>	Micaela Agyare	7086	LRC	agyaremicaela@fhda.edu
<u>✓</u>	Jeff Bissell	7663	KA	bisselljeff@fhda.edu
<u>✓</u>	Kelly Edwards	7327	KA	edwardskelly@fhda.edu
_____	Valerie Fong	7135	Dean—LA	fongvalerie@fhda.edu
<u>✓*</u>	Evan Gilstrap	7675	Articulation	gilstrapevan@fhda.edu
<u>✓*</u>	Tom Gough	7130	FA	goughtom@fhda.edu
_____	Allison Herman	7460	LA	hermanallison@fhda.edu
<u>✓*</u>	Julie Jenkins		BSS	jenkinsjulie@fhda.edu
<u>✓*</u>	Ben Kaupp		SRC	kauppben@fhda.edu
<u>✓*</u>	Andy Lee	7783	CNSL	leeandrew@fhda.edu
<u>✓*</u>	Ana Maravilla		CNSL	maravillaana@fhda.edu
<u>✓*</u>	Tiffany Mitchener	7468	HSH	mitchenertiffany@fhda.edu
<u>✓*</u>	Patrick Morriss	7548	STEM	morrisspatrick@fhda.edu
<u>✓</u>	Brian Murphy		APPR	brian@pttc.edu
_____	Tim Myres		APPR	tim@smw104jatc.org
<u>✓*</u>	Ron Painter		STEM	painterron@fhda.edu
<u>✓*</u>	Sarah Parikh	7748	STEM	parikhsarah@fhda.edu
<u>✓</u>	Chrissy Penate		LRC	penatechrisanthony@fhda.edu
<u>✓</u>	Amy Sarver	7459	LA	sarveramy@fhda.edu
_____	JP Schumacher	7549	Dean—SRC	schumacherjp@fhda.edu
_____	Shaelyn St. Onge-Cole	7818	HSH	stonge-coleshaelyn@fhda.edu
<u>✓*</u>	Kella Svetich	7924	LA	svetichkella@fhda.edu

Non-Voting Membership (4)

_____			ASFC Rep.	
<u>✓*</u>	Mary Vanatta	7439	Curr. Coordinator	vanattamary@fhda.edu
_____			Evaluations	
_____			SLO Coordinator	

Visitors

Chris Allen*, Kurt Hueg*

* Indicates in-person attendance

**College Curriculum Committee
Meeting Minutes**

Tuesday, May 9, 2023

2:00 p.m. – 3:30 p.m.

Administrative Conference Room 1901; virtual option via Zoom

Item	Discussion
1. Minutes: April 25, 2023	Approved by consensus.
2. Report Out from Division Reps	<p>Speaker: All STEM: Working on Title 5 updates and CORs for new courses.</p> <p>LRC: No updates to report.</p> <p>Language Arts: No updates to report.</p> <p>Kinesiology: No updates to report.</p> <p>HSH: Working on Title 5 updates.</p> <p>Fine Arts: Working on Title 5 updates.</p> <p>SRC: Working on Title 5 updates.</p> <p>Counseling: Working on Title 5 updates.</p> <p>BSS: Working on Title 5 updates.</p> <p>Apprenticeship: No updates to report.</p> <p>Note that JP Schumacher acting as in-person proxy vote for Valerie Fong.</p>
3. Public Comment on Items Not on Agenda	Sarver noted was unable to open/view some of the PDF attachments for this week’s meeting and asked if others had the same issue. Bissell noted had to restart computer to be able to open them; no others reported issues. Vanatta asked folks to reach out if they ever have trouble opening attachments and reminded folks about direct links to CourseLeaf-specific items in agenda and email notifications.
<p>4. Announcements</p> <p>a. New Course Proposals</p> <p>b. Curriculum Institute Conference (July 12-15—more info here)</p> <p>c. Spring Plenary Update</p> <p>d. Incoming Faculty Co-Chair!</p>	<p>Speakers: CCC Team The following proposals were presented: APPR 140A, 140B; RSPT 307, 308. No comments.</p> <p>Kuehnl mentioned CCC Team usually attends; conference sets the tone for the upcoming year, especially re: articulation matters and curriculum process/procedures.</p> <p>Packet of resolutions adopted at recent state-wide plenary. Kuehnl noted some are related to curriculum; reach out to Kuehnl or Academic Senate President Voltaire Villanueva with any questions.</p> <p>Ben Kaupp will be Faculty Co-Chair of CCC starting in fall 2023 quarter!</p>
5. New Certificate Application: Commercial Photography	<p>Speaker: Eric Kuehnl Second read of new Commercial Photography Certificate of Achievement. No comments.</p> <p><i>See item 9 for motion/approval details.</i></p>
6. New Certificate Application: Digital Photography Techniques	<p>Speaker: Eric Kuehnl Second read of new Digital Photography Techniques Certificate of</p>

	<p>Achievement. No comments.</p> <p><i>See item 9 for motion/approval details.</i></p>
7. New Certificate Application: Photography Criticism	<p>Speaker: Eric Kuehnl Second read of new Photography Criticism Certificate of Achievement. No comments.</p> <p><i>See item 9 for motion/approval details.</i></p>
8. New Certificate Application: Commercial Photography (noncredit)	<p>Speaker: Eric Kuehnl Second read of new Commercial Photography Certificate of Completion (noncredit). No comments.</p> <p><i>See item 9 for motion/approval details.</i></p>
9. New Certificate Application: Photography (noncredit)	<p>Speaker: Eric Kuehnl Second read of new Photography Certificate of Completion (noncredit). No comments.</p> <p>Group agreed to vote on items 5-9 as one motion. Motion to approve items 5-9 M/S (Kaupp, Gough). Approved.</p>
10. New Certificate Application: Educational Immersive Media	<p>Speaker: Eric Kuehnl Second read of new Educational Immersive Media Certificate of Achievement. No comments.</p> <p>Motion to approve M/S (Lee, Kaupp). Approved.</p>
11. Degree Name Change: Inside Wireman	<p>Speaker: Eric Kuehnl Apprenticeship changing name of General Electrician AS degree to Inside Wireman; will go into effect for 2023-24 catalog. Allen noted name change aligns with the industry.</p>
12. New Certificate Application: Non-Destructive Testing (NDT) Technician	<p>Speaker: Eric Kuehnl First read of new Non-Destructive Testing (NDT) Technician Certificate of Achievement. No comments.</p> <p>Second read and possible action will occur at next meeting.</p>
13. Curriculum Across the District— Poll	<p>Speaker: Eric Kuehnl Kuehnl and Subramaniam have been meeting w/ De Anza counterparts to discuss communication across the district re: curriculum; topic originated at Academic and Professional Matters (APM), which holds collegial meetings between faculty leadership, admin leadership, etc.— like a district-wide Academic Senate, but not subject to Brown Act. Topic has been discussed for the past few years, somewhat related to a few conflicts which have occurred regarding new CTE degrees/certs. No formal process in place for communication or notification of curriculum items between the two colleges. Gough asked if conflicts were related to overlap—Kuehnl responded, yes, generally. Kuehnl noted discussions have been driven by De Anza and APM; there’s general agreement between folks at both colleges for cross-campus sharing about new degrees/certs. Our new degree/cert. creation process does include a “trigger” step for notification to De Anza about new degrees/certs. once they include similar step in their own process; they have not yet done so but are promising to do at some point.</p> <p>De Anza also requesting we consult with them about individual new course proposals. Historically, Foothill CCC has opposed this. One reason is expediency—we create new courses throughout the year, but they create them during the fall only; two very different processes, and De Anza’s doesn’t allow for as rapid a response as we’d likely need. Also a question as to why consultation is needed, as many overlapping courses already exist (e.g., English, math), which weren’t questioned or</p>

scrutinized. Kuehnl would like CCC to discuss, to see if position has changed; if we do want this sort of communication, both colleges will need to determine process, as well as how to handle conflicts.

Parikh concerned it's hard enough to get a new course started, and doesn't see how this add'l step would be helpful. Suggested the two colleges discuss overlapping courses (existing and new) to see if certain aspects could be better aligned, such as textbooks; sees benefit in alignment of overlapping courses, but unsure if this needs to extend to notification of every new course. Kuehnl noted there is already room for collegial consultation between disciplines at both colleges. Gough pointed out some disciplines don't have a counterpart at the sister college and wondered if these disciplines would be subject to the same level of communication/scrutiny as those which do overlap. Agreed that the process of creating a new course is already bureaucratically overloaded enough.

Subramaniam noted the creation of a new course is not a secret, as they eventually go to the FHDA Board for approval; anyone interested in details can look them up. He and Kuehnl agree that any sort of communication w/ De Anza should not delay creation of a new course; faculty purview means De Anza shouldn't have any sort of vote on our courses. Edwards agreed and wouldn't feel comfortable with Foothill having any vote on De Anza courses, either. Also noted differences in colleges' processes, which would likely need to align if we want to institute communication. Hueg reminded the group about the upcoming Common Course Numbering mandate, which will require a lot of communication between the two colleges; believes the future will trend toward more communication rather than less.

Jenkins serves on executive board of Faculty Association (FA), so has a lot of communication w/ De Anza colleagues (encouraged everyone to communicate with their counterparts). Noted FA working on creating space for cross-campus communication, and pointed out that many students take classes at both colleges. Doesn't believe De Anza should be allowed to vote on our courses, but agrees that communication between disciplines at both colleges is valuable. Kuehnl agreed with encouraging collaboration between disciplines on things like textbooks. Kaupp feels very uncomfortable with De Anza having any official say on our curriculum but does see value (re: collegiality) in making them aware of what we're doing. Believes CCC Team does a good job of communication via the communiqué and suggested De Anza CCC be CC'd. Kuehnl suggested CCC agendas more important, as they provide more advance notice. Subramaniam noted agenda and minutes are public on CCC website, for anyone to review.

Svetich mentioned English dept. had extensive meetings w/ De Anza about 10 years ago, with great attendance and collegial discussion; a lot of discussion was about the ways courses align, and there actually wasn't as much alignment as one might expect, perhaps due to cultural differences between the two programs. Kuehnl again noted that notification of new degrees/certs. ready on our side, whenever De Anza builds it in to their process. Once that's in place, any conflicts which cannot be resolved between the colleges would be discussed at APM.

Kuehnl reiterated the point of today's discussion was for him and Subramaniam to ensure their opinion expressed at APM still reflects CCC's general opinion, as they are representing the group. Group informally confirmed there is no support for requiring new courses be

	<p>formally shared with De Anza as part of our new course creation process.</p>
<p>14. Program Discontinuance Process</p>	<p>Speaker: Eric Kuehnl First read of Degree or Certificate (Program) Discontinuance Process. Essentially mirrors formal steps for creating a new degree/cert. Kuehnl reiterated this does not include “political” part of the process; is the process used once decision has been made to discontinue a degree/cert. Pointed out note on document re: course deactivation. Hueg suggested notification to ACCJC be added and will send details to Vanatta.</p> <p>Re: Teach-Out section, Parikh asked if students declare a major for a certificate—Hueg responded, when a student declares a major, the certificate is part of the major. A student can be undeclared but still complete a cert. Parikh suggested current bullet (re: informing students completing certs.) might not capture all students, as some may simply be enrolled in cert. courses but have yet to actually complete any. For example, if student working toward a cert. which has only three courses and student has completed just one course, how would they be captured? Subramaniam agreed and suggested we look at this more carefully. Parikh suggested notifying students who have completed at least one course within the past 36 months, for certs. Noted some certs.’ courses are offered just once per year. Group agreed with change to document.</p> <p>Kuehnl mentioned need to consult w/ Institutional Research dept. to find out which students to contact; Vanatta asked if this should be added to document—no. Parikh asked if Teach-Out bullets make more sense as numbered list—yes. Group agreed with change to document.</p> <p>Second read and possible action will occur at next meeting.</p>
<p>15. Process for Implementing Equity Updates to CORs</p>	<p>Speaker: Eric Kuehnl Continuing discussion from previous meeting, regarding need to determine how Guiding Principles for Equitable CORs document will be used across campus. Kuehnl recapped previous discussion, which leaned toward adding a text field to COR form in CourseLeaf for faculty to explain how they have addressed equity in the COR. Still need to determine who will be responsible for reviewing such info and associated COR updates, likely to be division reps.</p> <p>Jenkins has been thinking about review being reps’ responsibility, as well as previous concerns about involving non-tenure track faculty in difficult conversations, and doesn’t believe it should be the reps’ responsibility. Although reps lead their division CC, all division faculty vote on CORs; suggested responsibility be on all division faculty. Kuehnl clarified although division CC, as a whole, approves CORs, reps serve as formal approver of CORs. Agreed division CC would review text field as part of regular COR review; we should make clear in resolution/process that review not responsibility of reps alone.</p> <p>Parikh suggested division could appoint an interested person to be equity advocate—Kuehnl responded, nothing stopping division from setting up such a role but doesn’t think it should be included in resolution/process. Parikh noted not every faculty in a given division attends/votes at all division CC meetings—group agreed. Subramaniam noted concern that adding checkbox to COR could result in the work itself losing value, turning this into a regulatory-type of mechanism. Suggested each dept. determine how they would like to handle process, which could lead to more meaningful change; perhaps each</p>

	<p>dept. determines specific courses to focus on each year. Believes work likely to evolve and change as process gets launched, faculty go through professional development (PD), emerging technologies come into play, etc. Doesn't believe formal process necessarily the right way to move forward. Kuehnl clarified not talking about just a checkbox but also a text field which would require faculty to describe how they have integrated equity into the COR, so reps would not need to scour COR to identify changes. Subramaniam worries will be too much burden on one or two people (reps) to be in charge of ensuring faculty are doing the work, even if text field is added. Parikh noted Academic Senate (AS) has tasked CCC with creating formal process; believes that without any sort of checkbox or text field some faculty will not believe/agree that the work is necessary.</p> <p>Jenkins mentioned Mentor Mindset Fellowship, noting that group's discussion about how to engage faculty members to have a "growth mindset" re: CORs, in general; need to consider how to faculty to engage with this process and understand how CORs are meaningful for students and faculty, as many faculty don't believe they're meaningful. Kuehnl agrees that things like PD are important but noted CCC not being tasked with figuring out how PD will be involved; our task is to come up with the process to implement the guidelines. AS and PD folks will be involved in other aspects. Jenkins mentioned recent discussion about the guidelines w/ colleagues who do not believe the document states why the work needs to be done. Svetich noted has not seen document, and asked if field-specific standard language included, for faculty to use on their CORs. Suggested standard language could make process easier for both faculty updating CORs and reviewers. Kuehnl responded, CCC decided to specifically not create standard language, in an effort to make process more meaningful.</p> <p>Kuehnl concedes we cannot force all faculty to put in the time to do the hard work, but need to nudge folks in the right direction. Reiterated that previous discussions leaned toward adding text field to COR form. Kaupp mentioned existing Need/Justification field, used to explain Stand Alone status; believes equity-related field can be viewed as somewhat similar, in that related courses may reasonably have similar info listed. Kaupp agreed with Jenkins' concerns and suggested once process is finalized the focus moves to figuring out how to engage faculty through PD, etc. Gough and Kuehnl mentioned plan to add details from guidelines to help pop-ups in CourseLeaf. Gough doesn't want to lose sight of hope for campus-wide session as part of Opening Day; Kuehnl agrees and will work with PD Coordinator Carolyn Holcroft.</p> <p>Gough asked about next step—Kuehnl would like to create mock-up to show how field(s) on COR would look; Vanatta will create mock-up for next meeting. Vanatta noted field(s) can be configured to clear out previous response, if group decides that's the best option.</p>
16. Good of the Order	
17. Adjournment	3:32 PM

Attendees: Micaela Agyare* (LRC), Chris Allen* (Dean, APPR), Jeff Bissell (KA), Kelly Edwards (KA), Tom Gough* (FA), Kurt Hueg* (Interim VP Instruction), Julie Jenkins* (BSS), Ben Kaupp* (SRC), Eric Kuehnl* (Faculty Co-Chair), Andy Lee* (CNSL), Ana Maravilla* (CNSL), Tiffany Mitchener* (HSH), Ron Painter* (STEM), Sarah Parikh* (STEM), Amy Sarver (LA), JP Schumacher* (Dean, SRC), Ram Subramaniam (Administrator Co-Chair), Kella Svetich* (LA), Mary Vanatta* (Curriculum Coordinator), Kristina Whalen* (Foothill President)

* Indicates in-person attendance

Minutes Recorded by: M. Vanatta

Course Change Request

New Course Proposal

Date Submitted: 05/12/23 4:34 pm

Viewing: **C S F008. : INTRODUCTION TO DATA SCIENCE**

Last edit: 05/16/23 3:34 pm

Changes proposed by: Joanna Lankester (20265154)

In Workflow

- 1PS Curriculum Rep
- Curriculum Coordinator
- Activation

Approval Path

- 05/16/23 2:09 pm
Ron Painter (painterron):
Approved for 1PS Curriculum Rep

Course Proposal Form

Faculty Author Joanna Lankester

Effective Term Summer 2024

Subject Computer Science (C S) Course Number F008.

Department Computer Science (C S)

Division Science Technology Engineering and Mathematics (1PS)

Units 4.5

Hours 4 lecture, 2 laboratory per week

Course Title INTRODUCTION TO DATA SCIENCE

Short Title

Proposed Transferability UC/CSU

Proposed Description and Requisites: Introduction to the fundamental concepts and computational skills needed to understand and analyze data arising from real-world phenomena. Key concepts covered include correlation vs. causation, randomness, sampling, uncertainty, predictive models, and classification. Students will use a tool such as Jupyter notebooks for data science coding exercises such as transformation and use of data tables, simulation models, and A/B testing.

Proposed Discipline Computer Science

To which Degree(s) or Certificate(s) would this course potentially be added?
Core course for future Certificate of Achievement in Data Science
Support course for AS Computer Science

Are there any other departments that may be impacted from the addition of this course?

No

Comments & Other Relevant Information for Discussion:
Modeled after similar course at UC Berkeley

Reviewer
Comments

Course Change Request

New Course Proposal

Date Submitted: 05/10/23 10:12 am

Viewing: **MATH F233. : JUST-IN-TIME SUPPORT FOR MATH 33**

Last edit: 05/16/23 3:38 pm

Changes proposed by: Jennifer Sinclair (10896469)

In Workflow

1. 1PS Curriculum Rep
2. Curriculum Coordinator
3. Activation

Approval Path

1. 05/16/23 2:17 pm
Ron Painter
(painterron):
Approved for 1PS
Curriculum Rep

Course Proposal Form

Faculty Author Jennifer Sinclair

Effective Term Summer 2024

Subject Mathematics (MATH) Course Number F233.

Department Mathematics (MATH)

Division Science Technology Engineering and Mathematics (1PS)

Units 2.5

Hours 2.5 hours lecture

Course Title JUST-IN-TIME SUPPORT FOR MATH 33

Short Title

Proposed Transferability None

Proposed Description and Requisites: A just-in-time approach to the core prerequisite skills, competencies, and concepts needed in Math For Financial Thriving. Intended for students who are concurrently enrolled in MATH 33 at Foothill College. Topics include: a review of computational skills developed in beginning and intermediate algebra, including order of operations, use of variables, percentages, ratios, rates, proportionality, use of formulas, linear equations, unit analysis and conversions.

Proposed Discipline Mathematics

To which Degree(s) or Certificate(s) would this course potentially be added?
None. This is a support class.

Are there any other departments that may be impacted from the addition of this course?
No

Comments & Other Relevant Information for Discussion:

This course will support students in doing transfer level work in the MATH 33 "Math for Financial Thriving" course.

Reviewer
Comments

Course Change Request

New Course Proposal

Date Submitted: 05/10/23 10:36 am

Viewing: **NCBS F433. : JUST-IN-TIME SUPPORT FOR MATH 33**

Last edit: 05/16/23 3:40 pm

Changes proposed by: Jennifer Sinclair (10896469)

In Workflow

- 1PS Curriculum Rep
- Curriculum Coordinator
- Activation

Approval Path

- 05/16/23 2:17 pm
Ron Painter
(painterron):
Approved for 1PS
Curriculum Rep

Course Proposal Form

Faculty Author Jennifer Sinclair

Effective Term Summer 2024

Subject Non-Credit: Basic Skills (NCBS) Course Number F433.

Department Mathematics (MATH)

Division Science Technology Engineering and Mathematics (1PS)

Units 0

Hours 2.5 hours lecture

Course Title JUST-IN-TIME SUPPORT FOR MATH 33

Short Title

Proposed Transferability None

Proposed Description and Requisites: A just-in-time approach to the core prerequisite skills, competencies, and concepts needed in Math for Financial Thriving. Intended for students who are concurrently enrolled in MATH 33 at Foothill College. Topics include: a review of computational skills developed in beginning and intermediate algebra, including order of operations, use of variables, percentages, ratios, rates, proportionality, use of formulas, linear equations, unit analysis and conversions.

Proposed Discipline Mathematics

To which Degree(s) or Certificate(s) would this course potentially be added? None. This is a support class.

Are there any other departments that may be impacted from the addition of this course? No

Comments & Other Relevant Information for Discussion:

This course will support students in doing transfer level work in the MATH 33 Math for Financial Thriving course. There is a local belief that student situations are diverse and so a non-credit support class is preferable for some while a credit bearing class is preferable for others. NCBS 433 is intended to be a non-credit version of MATH 233. This is in line with the prior innovation for supporting students in MATH 48A, which has credit bearing support class MATH 248A and non-credit support class NCBS 448A.

Reviewer Comments

Course Change Request

New Course Proposal

Date Submitted: 05/10/23 10:42 am

Viewing: **NCBS F440A : JUST-IN-TIME SUPPORT FOR MATH 40A**

Last edit: 05/16/23 3:43 pm

Changes proposed by: Jennifer Sinclair (10896469)

In Workflow

- 1PS Curriculum Rep
- Curriculum Coordinator
- Activation

Approval Path

- 05/16/23 2:18 pm
Ron Painter
(painterron):
Approved for 1PS
Curriculum Rep

Course Proposal Form

Faculty Author Jennifer Sinclair

Effective Term Summer 2024

Subject Non-Credit: Basic Skills (NCBS) Course Number F440A

Department Mathematics (MATH)

Division Science Technology Engineering and Mathematics (1PS)

Units 0

Hours 2.5 hours lecture

Course Title JUST-IN-TIME SUPPORT FOR MATH 40A

Short Title

Proposed Transferability None

Proposed Description and Requisites: A just-in-time approach to the core prerequisite skills, competencies, and concepts needed in Quantitative Reasoning. Intended for students who are concurrently enrolled in MATH 40A at Foothill College. Topics include: a review of computational skills developed in beginning and intermediate algebra, including order of operations, use of variables, percentages, ratios, rates, proportionality, use of formulas, linear equations, unit analysis and conversions.

Proposed Discipline Mathematics

To which Degree(s) or Certificate(s) would this course potentially be added?
None. This is a support class.

Are there any other departments that may be impacted from the addition of this course?

No

Comments & Other Relevant Information for Discussion:

This course will support students in doing transfer level work in the MATH 40A course. There is a local belief that student situations are diverse and so a non-credit support class is preferable for some while a credit bearing class is preferable for others. NCBS 440A is intended to be a non-credit version of MATH 240A. This is in line with the prior innovation for supporting students in MATH 48A, which has credit bearing support class MATH 248A and non-credit support class NCBS 448A.

Reviewer
Comments

Course Change Request

New Course Proposal

Date Submitted: 05/09/23 10:55 am

Viewing: **PHOT F422. : PHOTOJOURNALISM**

Last edit: 05/17/23 10:32 am

Changes proposed by: Kate Jordahl (10781545)

In Workflow

- 1FA Curriculum Rep
- Curriculum Coordinator
- Activation

Approval Path

- 05/16/23 3:49 pm
Tom Gough (goughtom):
Approved for 1FA Curriculum Rep

Course Proposal Form

Faculty Author Kate Jordahl

Effective Term Summer 2024

Subject Photography (PHOT) Course Number F422.

Department Photography (PHOT)

Division Fine Arts and Communication (1FA)

Units 0

Hours 3 hours lecture, 3 hours lab

Course Title PHOTOJOURNALISM

Short Title

Proposed Transferability None

Proposed Description and Requisites: Instruction in basic skills needed for effective online and print photography for use in newspapers, magazines, web journals and blogs, with emphasis on developing appropriate behavior and craft needed in meeting deadlines for photojournal publication. Assignments include news photographs, human interest and feature pictures, and the picture story. Special emphasis on print quality, picture editing, layout design, image content and captioning. Introduction to digital capture, preparation of files and transmittal of photographs, and video and sound recording techniques.

Proposed Discipline Photography

To which Degree(s) or Certificate(s) would this course potentially be added?
Noncredit Certificate Completion Photography
Noncredit Certificate Completion Commercial Photography

Are there any other departments that may be impacted from the addition of this course?

No

Comments & Other Relevant Information for Discussion:
This course would be the non-credit parallel to the PHOT 22: Photojournalism class.

Reviewer
Comments



AB 1705 IMPLEMENTATION GUIDE

Overview

This AB 1705 implementation guide follows [ESS 22-400-009](#), the AB 1705 implementation guidance memorandum released in December 2022 by the Chancellor's Office for California Community Colleges.

ESS 22-400-009 summarized the impressive progress made by California community colleges in addressing systemic barriers that disproportionately impeded students of color, low-income students, and students with disabilities from achieving essential English and math milestones to a degree and transfer. The memo provided an overview of key provisions of the law, synthesized new mandates into five required actions, and reinforced recommended strategies from the AB 705 Improvement Plans for on-going work to produce strong, equitable, timely completion of transfer-level English and math/quantitative reasoning courses that count for a certificate, degree or transfer within a desired major or program.

This implementation guide summarizes the key required actions of AB 1705 and provides further guidance on how colleges can fulfill these mandates. Review ESS 22-400-009 to gain a fuller understanding of the actual statute. AB 1705 mandates build on extensive research in response to AB 705 that is summarized here ([linked here](#)).

AB 1705 Implementation

AB 1705 applies to all California community college students with an academic goal of a certificate, degree or transfer. Importantly, it also applies to students without declared goals or with undecided goals until those goals are declared.

Students with such goals, in programs with math and English requirements, must start in courses that maximize the probability that they enter and they complete gateway transfer-level English and math/quantitative reasoning requirements for their program within a one-year timeframe of their initial attempt in the discipline.

The phrase *gateway transfer-level course* is used in this implementation guide as a short-hand for the lowest transfer-level course that satisfies the English or mathematics course requirements of the intended certificate or associate degree, or a course requirement for transfer within the intended major. The phrase *academic goal* is used as a short-hand for an academic goal of certificate, degree or transfer.

This implementation guide is organized around the required actions stated in [ESS 22-400-009](#).

AB 1705 Required Actions

1. By July 1, 2023, all United States high school graduates, and those who have received a high school equivalency certificate, regardless of background or special population status, who plan to pursue a certificate, degree, or transfer program, shall be directly placed into, and, when beginning coursework in English or mathematics/quantitative reasoning, enrolled in, transfer-level English and mathematics/quantitative reasoning courses.

Statute reference: §78213(i)

Pretransfer-level enrollment is only an option for students described in §78213 (j) as exceptions to transfer-level placement and enrollment and for whom enrollment in pretransfer-level math or English maximizes their likelihood of completing transfer-level coursework as described in §78213 (d).

Statute references: §78213(d), (j)

The language of “when beginning coursework in” is important in that neither AB705 nor AB1705 requires students to start English or mathematics immediately nor do they apply to programs without English or math/quantitative reasoning requirements.

Do either A or B to achieve compliance by July 1, 2023

- A. Continue or implement default placement and enrollment into transfer-level English and math/quantitative reasoning courses with no enrollments at the college in pretransfer-level English and math courses (including multi-term transfer-level “stretch” courses), unless the pretransfer-level courses are low-unit or non-credit corequisites to transfer-level courses.

OR

- B. Continue or implement default transfer-level placement and enrollment into English and math/quantitative reasoning courses with pretransfer-level or non-credit English and math enrollments restricted to specialized programs serving the following student populations identified in §78213(j)
- Students enrolled in a noncredit ESL course who have not graduated from a United States high school or been issued a high school equivalency certificate
 - Students with documented disabilities in educational assistance classes, as described in Section 56028 of Title 5 of the California Code of Regulations, who are otherwise not able to benefit from general college classes even with appropriate academic adjustments, auxiliary aids, and services
 - Students enrolled in adult education programs who have not graduated from a United States high school or been issued a high school equivalency certificate
 - Current high school students in dual enrollment
 - Students in career technical education programs seeking a certificate or associate degree with specific requirements, as dictated by the program’s advisory or accrediting body, that cannot be satisfied with transfer-level coursework.
 - Specific subgroups of students for whom a community college district or

community college has provided local research and data meeting the evidence standards of §78213(d) that allow for the placement and enrollment of the student subgroup into pretransfer-level mathematics or English coursework.

Option B requires colleges to clearly define and implement a mechanism for restricting access to pretransfer-level or non-credit courses that are not corequisites to transfer-level courses to student groups described in §78213(j), and to document that students enrolled are from the groups described in §78213(j). If a college's placement process results in pretransfer-level or non-credit English and math enrollments, aside from corequisite enrollments for transfer-level courses, for students other than those groups specified in §78213(j), then the college is not compliant with AB 1705.

2. Students shall begin in the transfer-level English and math/quantitative reasoning coursework that satisfies a course requirement for the student's intended certificate or associate degree or a requirement for transfer within the intended major.

Statute references: §78213 (e), (f), (g) and (i)(2)

U.S. high school graduates (or the equivalent) with an academic goal of certificate, degree or transfer shall begin in their gateway transfer-level course, or higher, in English and math/quantitative reasoning. If the student's intended program does not have specific English or math/quantitative reasoning requirements, the coursework shall satisfy transfer-level general education requirements in English or math/quantitative reasoning.

If a college has provided local research and data to verify the benefit of the placement and enrollment into transfer-level prerequisites to gateway courses as described in §78213 subdivisions (e) and (f), students can be placed and enrolled into the transfer-level prerequisite course. If the transfer-level prerequisite to the gateway courses is not validated, (1) the college shall not require or recommend the prerequisite to students, and (2) the U.S. high school graduate (or the equivalent) shall be placed and enrolled into the gateway course when they begin coursework in English or math/quantitative reasoning.

Validation of transfer-level prerequisites to gateway courses largely applies to the placement and enrollment of students into transfer-level math courses associated with lower division requirements for the major. For example, the [Transfer Model Curricula for Business Administration](#) includes applied calculus or finite math as an option but does not include college algebra; therefore, if a college requires some students to take college algebra before having access to applied calculus or finite math, the college will need to validate that this practice improves students' likelihood of successfully completing the applied calculus or finite math requirements for the business degree within one year as described in §78213 (e). Similarly, Calculus I is the lowest transfer-level math course that satisfies requirements for associate degrees based on the [Transfer Model Curricula for Physics](#). If a college requires a college algebra course and/or a trigonometry course as a prerequisite sequence for Calculus I, the college will need to validate such prerequisites as effective in improving students' likelihood of successful completion of Calculus I as described in §78213 (f).

Community colleges are encouraged to explore the impact of concurrent support as an alternative to transfer-level preparatory courses that are not part of the degree or transfer coursework for the

major, and are specifically encouraged to do so for the first STEM Calculus course. (Statute reference: §78213(g))

All colleges should conduct an audit of their degrees and transfer pathways to identify transfer-level prerequisites to students' required gateway coursework in English or math/quantitative reasoning.

Do either A or B to achieve compliance by July 1, 2023. (STEM programs have an extended deadline of July 1, 2024.)

A. Ensure that all students with an academic goal of certificate, degree or transfer begin English and math in an appropriate gateway transfer-level course that satisfies course requirements for the intended goal. For Option A, colleges ensure access, enrollment, and support opportunities.

(1) *ensure access*: placement rules and/or prerequisites give all students access to the transfer-level gateway courses for their programs or majors,

(2) *ensure enrollment*: no longer offer the transfer-level prerequisite if it does not satisfy specific math requirements for a degree or transfer within any major OR restrict enrollment in the transfer-level prerequisite to students seeking a degree or a major for which the course satisfies a transfer requirement for that degree or major, and

(3) *provide concurrent support*: for students with weaker high school math preparation and low high school GPA, provide concurrent support tailored to the gateway course, such as a low unit or non-credit corequisite course.

OR

B. Validate that the prerequisite to the gateway course meets the AB 1705 standards described in §78213(e) by acting in accordance with the statewide validation finding or replicating the validation study locally.

If the transfer-level prerequisite to the gateway courses is not validated, (1) the college shall not require or recommend the prerequisite to students, and (2) the U.S. high school graduate (or the equivalent) shall be placed and enrolled into the gateway course when they begin coursework in English or math/quantitative reasoning.

Timelines for validation:

- Non-STEM programs validate transfer-level prerequisites to gateway English and math/quantitative reasoning courses by July 1, 2023 and make changes if necessary by July 1, 2024 (additional guidance for this validation is forthcoming).
- STEM programs are limited to two transfer-level prerequisites prior to gateway STEM calculus after July 1, 2024. The college must validate the effectiveness of the transfer-level prerequisites to gateway STEM calculus as described in §78213(f) by July 1, 2024 and make changes if necessary by July 1, 2025 (additional guidance for this validation is forthcoming).

3. By July 1, 2023, a community college shall not require students to repeat coursework that they have successfully completed in high school or college or take coursework that repeats competencies that the student has demonstrated through other methods of credit for prior learning.

Statute references: §78213 (i)(3), also in §78213 (c)(3)(D)

This provision applies exclusively to courses that satisfy mathematics/quantitative reasoning. All colleges will need to update policies to comply with this provision.

High school math for placement and prerequisites: For the purposes of **placement or prerequisite clearance**, students cannot be required to repeat coursework that they have successfully completed in math in high school or college or through credit for prior learning. This mandate requires all colleges to make changes to their placement and prerequisite policies to honor successful completion (earning a grade of C or better) in high school math courses. For example, college calculus may have a prerequisite of college algebra or trigonometry or precalculus. A grade of C or better in a full year of high school precalculus should give the student access to an introductory engineering course with a precalculus prerequisite or to the gateway calculus course for calculus-based majors. Concurrent support can be required for students with low overall high school GPA or provided as an option for other students. For the purpose of placement, colleges shall honor a student's self-reported information about high school course taking and grades as stipulated in §78213 (c)(6).

High school math for math competency for non-transferable associate degrees: Satisfactory completion of a mathematics course at or above the level of Intermediate Algebra satisfies the math competency for the associate degree. Because students cannot be required to repeat coursework they successfully completed in high school, a grade of C or better in a math course at or above the level of high school Algebra 2 satisfies the math competency for the certificate or associate degree.

High school math for course credit: For the purpose of awarding course credit toward requirements for an associate degree for transfer, colleges may require a student to take a transfer-level math course that repeats a course they passed in high school if (1) the course satisfies a requirement for the transfer degree within the desired major and (2) the student's prior learning is not recognized by policies that are in place to award course credit. For example, consider a student who is seeking an AS-T in psychology, a degree that requires statistics. If the student passed statistics in high school with an A but does not meet the college's requirements for awarding course credit, such as a Statistics AP score at or above 3, the college can require the student to retake statistics. Similarly, awarding course credit toward satisfying general education requirements for the local non-transferable associate degree can be handled through existing processes at the college. Students seeking the local non-transferable associate degree are only exempt from transfer-level math placement and, when they begin in math/quantitative reasoning, direct transfer-level enrollment under very specific circumstances outlined in the law (78213 subsection (j)).

4. By July 1, 2023, a community college shall not enroll into non-credit coursework students who have graduated from a United States high school or been issued a high school equivalency certificate, as a substitute or replacement for direct placement and enrollment into transfer-level English and mathematics coursework.

Statute references: §78213 (i)(4)

Colleges shall only enroll U.S. high school graduates (or the equivalent) who have an academic goal of credit certificate, degree or transfer into non-credit math or English coursework if and when the student is concurrently enrolled in a transfer-level English or math/quantitative reasoning course.

To ensure compliance, colleges must restrict enrollment into other non-credit English and math courses to student groups defined as exemptions to transfer-level placement and enrollment in §78213 (j). This requires colleges to clearly define and implement a mechanism for restricting access to exempted populations.

Additional Clarifications and Required Actions

Concurrent Support

For students who need or desire extra academic support when enrolled in transfer-level math/quantitative reasoning or English, colleges shall provide access to tutoring, support-enhanced transfer-level coursework, concurrent low-unit credit or similar contact hour noncredit corequisite coursework for transfer-level math/quantitative reasoning or English, or other academic supports.

A college may require students to enroll in additional concurrent support, including additional language support for ESL students, if it is determined that the support will increase the student's likelihood of passing the transfer-level math/quantitative reasoning or English course. Colleges may require enrollment in corequisite support for (1) students in the lowest high school GPA bands of the default placement rules or (2) students who have not previously completed prerequisite coursework to gateway transfer-level math. Given both state and national research has consistently shown that corequisite remediation produces higher completion of transfer-level coursework when compared to prerequisite remediation, validation of the effectiveness of corequisite support is not currently required but is encouraged locally to ensure the effectiveness of the local implementation.

Changes to Placement, Including Guided Placement or Self-Placement

Colleges are still required to use high school transcript data to place students into English and math coursework.

Colleges must use self-reported high school information when transcript data is not available; this is not optional but required.

High school grade point average as a composite of student performance over multiple years of high school coursework is a sufficient use of multiple evidence-based measures.

Guided placement and self-placement shall not result in placement or enrollment below the transfer-level or into transfer-level coursework that does not satisfy requirements for the student's program of study.

Clarifications on Specific Prohibitions

Colleges are specifically prohibited from placing or enrolling students into pretransfer-level English or math/quantitative reasoning coursework, or transfer-level English or math/quantitative reasoning coursework that does not satisfy requirements for the certificate, degree or transfer within the student's intended program or major, based on the following:

1. The length of time between a student's enrollment date at the community college and the student's high school graduation date.
2. Whether the student belongs to a special population, including, but not limited to, foster youth, veterans, economically disadvantaged students or those students who participate in extended opportunity programs and services (EOPS), participants in disability services and programs for students (DSPS), and students in Umoja, Puente, or Mathematics, Engineering, Science Achievement (MESA) programs.
3. Whether the student can provide high school transcript information, self-reports high school information, or uses self-placement or guided placement.

In general, a college achieves AB 1705 compliance when placement policies, processes and practices ensure that students with an academic goal begin in transfer-level English and math/quantitative reasoning courses that satisfy a requirement for the certificate, degree or transfer within the chosen major, and when students who want or need concurrent academic support receive it. A college is not compliant when students begin in English or math coursework that hinders or delays their progress toward their academic goals, reducing their likelihood of completing their gateway transfer-level course in the appropriate time frame.

You can find all Equitable Placement, Support and Completion (AB 705/1705) materials here:

<https://assessment.cccco.edu/ab-705-implementation>

Foothill College
Credit Program Narrative
Certificate of Achievement in Non-Destructive Testing (NDT) Technician

Item 1. Program Goals and Objectives

The Certificate of Achievement in Non-Destructive Testing (NDT) Technician is offered in partnership with the American Aerospace Technical Academy (AATA) to provide students with on-the-job training and 400 hours of instruction in NDT. Students will learn to use a variety of testing techniques—such as magnetic particle (MT), liquid penetrant (PT), ultrasonic (UT), phased array ultrasonic, and radiographic (RT)—to perform non-destructive tests, to identify defects, and to examine the physical properties of materials and components to detect corrosion, cracks, voids, and flaws. Students will be trained in non-film radiography and radiation safety with a foundation in NDT math. This certificate program also prepares students for Level I and II NDT Certification. The certificate program will provide opportunities for students to secure a career in aerospace, construction, offshore drilling, manufacturing, automotive, shipbuilding, or any industry that uses NDT.

Program Learning Outcomes:

- Students will be able to interpret data and write the results of inspections.
- Students will be able to select and set up test equipment for each of the testing techniques.
- Students will be able to interpret results with respect to applicable codes and standards.
- Students will be able to understand and apply the basics in radiography inspection.
- Students will be able to understand and apply radiation safety requirements and standards.
- Students will be able to understand and apply the laws of physics in ultrasound inspection.
- Students will be able to understand and apply the requirements for surface inspection, such as magnetic particle inspection and penetrant inspection.
- Students will be able to understand the advantages of computed and digital radiography versus film radiography.

Item 2. Catalog Description

Non-destructive testing (NDT) is essential to companies in the shipping, construction, oil and gas, petrochemical, nuclear, automotive, and aerospace industries, and others, to keep their end users safe from using their goods, to lower production costs, and to maintain a uniform quality level for their products. It helps prevent catastrophic failures like pipe leaks, airplane crashes, nuclear reactor failure, and ships sinking. Foothill College, serving as a local education agency to the American Aerospace Technical Academy (AATA), offers the Certificate of Achievement in Non-Destructive Testing (NDT) Technician. Students will learn to use a variety of testing techniques—such as magnetic particle (MT), liquid penetrant (PT), ultrasonic (UT), phased array ultrasonic (PAUT), radiographic (RT), and digital radiography (DR)—to perform non-destructive tests, to identify defects, and to examine the physical properties of materials and components to detect corrosion, cracks, voids, and flaws. Students will be trained in non-film radiography and radiation safety with a foundation in NDT math.

Per California Code of Regulations, this course is limited to students admitted to the AATA's Apprenticeship Program.

Item 3. Program Requirements

Requirements	Course #	Title	Units	Sequence
Core Courses (27 units)	AATA 101A	Magnetic Particle Testing Level 1	1.5	Week 2
	AATA 101B	Magnetic Particle Testing Level 2	1	Week 2
	AATA 102A	Penetrant Testing Level 1	1.5	Week 1
	AATA 102B	Penetrant Testing Level 2	1.5	Week 1
	AATA 103A	Ultrasonic Testing Level 1	3	Week 3
	AATA 103B	Ultrasonic Testing Level 2	3	Week 4
	AATA 104A	Ultrasonic Phased Array Theory	3	Week 8
	AATA 104B	Ultrasonic Phased Array Laboratory	1	Week 9
	AATA 105A	Radiographic Testing Level 1	3	Week 6
	AATA 105B	Radiographic Testing Level 2	3	Week 7
	AATA 105C	Non-Film Radiographic Testing	2.5	Week 10
	AATA 105R	Radiation Safety	3	Week 5

TOTAL UNITS: 27 units

Proposed Sequence:

Full-time student: 10-week program = 27 units

Part-time student: 16-week program = 27 units

TOTAL UNITS: 27 units

Item 4. Master Planning

The Certificate of Achievement in Non-Destructive Testing (NDT) Technician aligns well with the vision of the College in serving underserved and underrepresented populations. AATA trains returning veterans, women, and residents from disadvantaged communities in the high-demand field of Non-Destructive Testing. Students who have at least 120 instructional hours are offered paid positions and are placed with established professionals who offer first-hand training and fieldwork. Employment opportunities are not limited to NDT assistant, technician, inspector, manager, instructor, and consultant.

Item 5. Enrollment and Completer Projections

We project to have about 60-70 students complete the program in academic year 2023-24 and about 300 to 350 students complete after five years. The projections are based on the historical enrollment data from the American Aerospace Technical Academy (AATA).

The courses for the NDT Technician were recently approved to offer as credit courses effective AY 2023-24. As a result, we have yet to have historical enrollment data from the college to provide.

Item 6. Place of Program in Curriculum/Similar Programs

As a local education agency, Foothill College has been partnering with seven unionized training centers to provide college credits, certificates, and degrees to apprentices who are in the career technical oriented programs and want to make a good living to support themselves and their families. AATA is the program sponsor of the registered apprenticeship NDT Technician program. Its mission is to remove barrier and help returning veterans, women, minorities, and disenfranchised individuals to get into STEM fields like NDT. Our mission is to provide academic and support services to apprentices in the NDT Technician program and to create an academic pathway that promotes academic mobility into an associate degree in engineering. This program is an add-on to our existing portfolio.

Item 7. Similar Programs at Other Colleges in Service Area

According to the Labor Market Information provided by the Centers of Excellence, there are no community colleges in the Bay Region issuing awards on TOP 0956.80. We would be the first college in the area to offer a certificate program in NDT.

Additional Information Required for State Submission:

TOP Code: 0956.80 - Industrial Quality Control

Annual Completers: 60-70

Net Annual Labor Demand: 349 students in the Bay Region and 98 students in the Silicon Valley sub-region

Faculty Workload: .6

New Faculty Positions: 0

New Equipment: 0

New/Remodeled Facilities: 0

Library Acquisitions: 0

Gainful Employment: Yes

Program Review Date: Fall, 2024

Distance Education: 50-99%



Labor Market Analysis for Program Recommendation Non-Destructive Testing (NDT) Technician Occupations Foothill College

Prepared by the San Francisco Bay Center of Excellence for Labor Market Research

March 2023

Recommendation

Based on all available data, there appears to be an “undersupply” of Non-Destructive Testing (NDT) Technician workers compared to the demand for this cluster of occupations in the Bay region and in the Silicon Valley sub-region (Santa Clara counties). There is a projected annual gap of about 349 students in the Bay region and 98 students in the Silicon Valley Sub-Region.

Introduction

This report provides student outcomes data on employment and earnings for TOP 0956.80 - Industrial Quality Control programs in the state and region. It is recommended that these data be reviewed to better understand how outcomes for students taking courses on this TOP code compare to potentially similar programs at colleges in the state and region, as well as to outcomes across all CTE programs at Foothill College and in the region.

This report profiles Non-Destructive Testing (NDT) Technician Occupations in the 12 county Bay region and in the Silicon Valley sub-region for a proposed new program at Foothill College. Labor market information (LMI) is not available at the eight-digit SOC Code level for Non-Destructive Testing Specialists (17-3029.01), therefore, the data shown in Tables 1 and 2 is for Engineering Technologists and Technicians, Except Drafters, All Other (at the six digit SOC level) and likely overstates demand for Non-Destructive Testing Specialists. Tables 3, 4, 6, 9, and 10 use job postings data from Burning Glass at the eight-digit SOC Code level for Non-Destructive Testing Specialists (17-3029.01).

- Engineering Technologists and Technicians, Except Drafters, All Other (17-3029):** All engineering technologists and technicians, except drafters, not listed separately.
 Entry-Level Educational Requirement: Associate’s degree
 Training Requirement: None
 Percentage of Community College Award Holders or Some Postsecondary Coursework: NA%

Occupational Demand

Table 1. Employment Outlook for Non-Destructive Testing (NDT) Technician Occupations in Bay Region

Occupation	2021 Jobs	2026 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Engineering Technologists and Technicians, Except Drafters, All Other	3,448	3,567	119	3%	1,744	349	\$23	\$26
Total	3,448	3,567	119	3%	1,744	349	\$23	\$26

Source: Lightcast 2022.3

Occupation	2021 Jobs	2026 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
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Bay Region includes: Alameda, Contra Costa, Marin, Monterey, Napa, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano and Sonoma Counties

Table 2. Employment Outlook for Non-Destructive Testing (NDT) Technician Occupations in Silicon Valley Sub-region

Occupation	2021 Jobs	2026 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Engineering Technologists and Technicians, Except Drafters, All Other	1,059	1,057	-1	-0%	490	98	\$23	\$32
Total	1,059	1,057	-1.4	0%	490	98	\$23	\$32

Source: Lightcast 2022.3

Silicon Valley Sub-Region includes: Santa Clara Counties

Job Postings in Bay Region and Silicon Valley Sub-Region

Table 3. Number of Job Postings by Occupation for latest 12 months (Feb. 2022 - Jan. 2023)

Occupation	Bay Region	Silicon Valley
Engineering Technologists and Technicians, Except Drafters, All Other	629	305

Source: Lightcast

Table 4a. Top Job Titles for Non-Destructive Testing (NDT) Technician Occupations for latest 12 months (Feb. 2022 - Jan. 2023) - Bay Region

Title	Bay	Title	Bay
Engineering Technicians	151	Hardware Engineering Technicians	8
Test Operators	34	Laser Technicians	8
Engineers	26	Simulation Engineers	7
Test Engineering Technicians	24	Technical Support Engineers	7
Process Engineering Technicians	12	Laboratory Technicians	5
Maintenance Engineering Technicians	11	Lead Engineers	5
Non-Destructive Testing Inspectors	9	Quality Engineering Technicians	5
Technical Solutions Engineers	9	Technical Lead Engineers	5
Equipment Engineering Technicians	8	Technical Support Managers	5

Source: Lightcast

Table 4b. Top Job Titles for Non-Destructive Testing (NDT) Technician Occupations for latest 12 months (Feb. 2022 - Jan. 2023) - Silicon Valley Sub-Region

Title	Silicon Valley	Title	Silicon Valley
Engineering Technicians	79	Radio Frequency Test Technicians	4
Test Operators	29	Semiconductor Engineers	4
Test Engineering Technicians	10	Data Entry Clerks	3
Maintenance Engineering Technicians	9	Engineering Operations Technicians	3
Hardware Engineering Technicians	8	HPC Engineers	3
Engineers	6	Laser Technicians	3
Process Engineering Technicians	6	Machine Learning Engineers	3
Technical Solutions Engineers	6	Technical Support Managers	3
Technical Support Engineers	5	Biomedical Engineering Technicians	2

Source: Lightcast

Industry Concentration

Table 5. Industries hiring Non-Destructive Testing (NDT) Technician Workers in Bay Region

Industry - 6 Digit NAICS (No. American Industry Classification) Codes	Jobs in Industry (2021)	Jobs in Industry (2026)	% Change (2021-26)	% Occupation Group in Industry (2022)
Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology)	418	481	15%	12%
Testing Laboratories	326	353	8%	9%
Research and Development in Biotechnology (except Nanobiotechnology)	279	353	27%	8%
Engineering Services	264	281	6%	8%
Federal Government, Civilian, Excluding Postal Service	259	252	-3%	7%
Temporary Help Services	241	256	6%	7%
Semiconductor and Related Device Manufacturing	116	121	4%	3%
Electronic Computer Manufacturing	103	108	5%	3%
Custom Computer Programming Services	80	91	14%	2%
Natural Gas Distribution	68	66	-3%	2%

Source: Lightcast 2022.3

Table 6. Top Employers Posting Non-Destructive Testing (NDT) Technician Occupations in Bay Region and Silicon Valley Sub-Region (Feb. 2022 - Jan. 2023)

Employer	Bay	Employer	Silicon Valley
Actalent	38	Aerotek	16
Tesla	31	Actalent	13
Aerotek	17	Apple	9
Cisco	10	Tesla	9
Apple	9	Applied Materials	8
Randstad	9	Cisco	8
San Francisco Public Utilities Commission	9	Danaher	7
Applied Materials	8	KLA	7
Danaher	8	Comtech Ef Data	5
Adecco	7	Adecco	4

Source: Lightcast

Educational Supply

There are no community colleges in the Bay Region issuing awards on average annually (last 3 years ending 2019-20) on TOP 0956.80 - Industrial Quality Control. There are no other CTE educational institutions in the Bay Region issuing awards on average annually (last 3 years ending 2019-20) on CIP 15.0702 - Quality Control Technology/Technician.

Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 349 annual openings for the Non-Destructive Testing (NDT) Technician occupational cluster and no annual (3-year average) awards for an annual undersupply of 349 students. In the Silicon Valley Sub-Region, there is also a gap with 98 annual openings and no annual (3-year average) awards for an annual undersupply of 98 students.

Student Outcomes

Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0956.80 - Industrial Quality Control

Metric Outcomes	Bay All CTE Programs	Foothill All CTE Programs	State 0956.80	Bay 0956.80	Silicon Valley 0956.80	Foothill 0956.80
Students with a Job Closely Related to Their Field of Study	74%	90%	71%	N/A	N/A	N/A
Median Annual Earnings for SWP Exiting Students	\$48,926	\$67,950	\$58,662	N/A	N/A	N/A
Median Change in Earnings for SWP Exiting Students	23%	44%	57%	N/A	N/A	N/A
Exiting Students Who Attained the Living Wage	50%	62%	70%	N/A	N/A	N/A

Metric Outcomes	Bay All CTE Programs	Foothill All CTE Programs	State 0956.80	Bay 0956.80	Silicon Valley 0956.80	Foothill 0956.80
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Source: Launchboard Strong Workforce Program Median of 2018 to 2021.

Skills and Education

Table 9. Top Skills for Non-Destructive Testing (NDT) Technician Occupations in Bay Region (Feb. 2022 - Jan. 2023)

Skill	Posting	Skill	Posting
Test Equipment	112	Instrumentation	41
Hand Tools	71	Electrical Wiring	39
Python (Programming Language)	66	New Product Development	39
Electronics	64	Oscilloscope	39
Automation	52	Tooling	35
Linux	50	Machining	34
Electromechanics	48	Data Analysis	33
Computer Science	47	Data Collection	33
Debugging	43	Manufacturing Processes	32
Data Acquisition	42	Process Improvement	29

Source: Lightcast

Table 10. Education Requirements for Non-Destructive Testing (NDT) Technician Occupations in Bay Region

Education Level	Job Postings	% of Total
High school or GED	101	22%
Associate degree	147	31%
Bachelor's degree & higher	219	47%

Source: Lightcast

Note: 47% of records have been excluded because they do not include a degree level. As a result, the chart above may not be representative of the full sample.

Methodology

Occupations for this report were identified by use of job descriptions and skills listed in O*Net. Labor demand data is sourced from Lightcast occupation and job postings data. Educational supply and student outcomes data is retrieved from multiple sources, including CCCCO Data Mart and CTE Launchboard.

Sources

O*Net Online

Lightcast

CTE LaunchBoard www.calpassplus.org

Launchboard

Statewide CTE Outcomes Survey

Employment Development Department Unemployment Insurance Dataset
Living Insight Center for Community Economic Development
Chancellor's Office MIS system

Contacts

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Foothill College
Credit Program Narrative

Bachelor in Science in Industrial Technology and Building Construction Management

- In Air Conditioning and Refrigeration Technology Concentration
- In Sheet Metal Building Concentration
- In Plumbing Technology Concentration
- In Inside Wireman Concentration
- In Plumbing and Pipefitting Apprenticeship Concentration
- In Test, Adjust, and Balancing (TAB) Technician Concentration
- In Air Conditioning Mechanic Concentration
- In Steamfitting and Pipefitting Concentration

Item 1. Program Goals and Objectives

The goal of the Baccalaureate Degree Program in Industrial Technology and Building Construction Management is to prepare our workforce with career readiness pathways that support the construction industry and create economic sustainability for both contractors and workers. The program is centered around accessibility, stacked-on ability, and affordability for apprentices and journeymen in the building trades programs.

Program Objectives:

- To provide students equitable access to attaining a four-year degree and to provide an affordable training and education pathways that result in high living-wage employment and career advancement opportunities within the construction career cluster.
- To create a long-term economic sustainability for both contractors and workers.
- To address our local workforce and employer's needs and to prepare students for upward career mobility.

Program Learning Outcomes:

- Students will be able to integrate occupational skills and construction project management knowledge in leading and managing construction related projects.
- Students will be able to apply critical, ethical, and socially responsible thinking when problem-solving.
- Students will be able to demonstrate interpersonal communication proficiency to effectively collaborate with stakeholders in a project.
- Students will attain office technical skills and management skills necessary to be able to transition from the field to office work environment swiftly and have a better competitive edge in management level positions due to advanced degree and occupational experience than those who complete with a certificate of achievement and/or an associate degree.
- Students will be able to manage cost and human resources.

Item 2. Catalog Description

The Bachelor in Science in Industrial Technology and Building Construction Management degree program prepares our workforce with career readiness pathways that support the construction industry and create economic sustainability for both contractors and workers. The

program is centered around accessibility, stacked-on ability, and affordability for apprentices and journeypersons in the building trades programs.

Item 3. Program Requirements

Foothill College requires the completion of 180 quarter units of approved General Education courses, elective courses, and upper-division level courses for Bachelor in Science in Industrial Technology and Building Construction Management.

To participate in the Baccalaureate Degree Program:

- Student must have graduated or get accepted into one of the following 5-year registered apprenticeship programs at Foothill College:
 - Air Conditioning and Refrigeration Technology
 - Sheet Metal Building
 - Plumbing Technology
 - Inside Wireman
 - Plumbing and Pipefitting Apprenticeship
 - Test, Adjust, and Balancing (TAB) Technician
 - Air Conditioning Mechanic
 - Steamfitting and Pipefitting Technology

OR

- Students who have completed one of the above programs may transfer credits earned from an accredited two-year community college to Foothill College.

OR

- **Credit for prior learning** is available to students who provide proof of completion of the Division Apprenticeship Standards' approved 5-year Inside Wireman; Plumbing; Sheet Metal Building Trade; Steamfitting and Pipefitting; Test, Adjust and Balancing (TAB); or Air Conditioning and Refrigeration apprenticeship programs. Credits for prior learning may vary depending on the program.

AND

- Students have completed the General Education requirements for AA/AS Degree, CSU, or the Intersegmental General Education Transfer Curriculum (IGETC)

Upper Division Courses (45 units)

- CMGT 310 Introduction to Estimating (5 units)
- CMGT 311 Scheduling of a LEAN Project (5 units)
- CMGT 312 Construction Finance for Commercial Construction (5 units)
- CMGT 313 Budgeting (5 units)
- CMGT 314 Building Information Modeling (BIM) (5 units)
- CMGT 315 Construction Cost Management (5 units)
- CMGT 316 Project Management Development for Commercial Construction (5 units)
- CMGT 317 Legal Aspects of Construction (5 units)
- CMGT 318 Green Building and LEED Certification (5 units)

Upper Division General Education Courses (13.5 units (Select 3 courses))

ENGL 3XX: Technical Writing for Business and Technology (4.5 units)
BUSI 3XX: Leadership Skills and Team Dynamics (4.5 units)
SOC 3XX: Society's Role in Environmental Sustainability (4.5 units)
BUSI 3XX: Applied and Professional Ethics (4.5 units)
SOC 3XX: Analysis of Social Change (4.5 units)

Lower Division Elective Courses (10-31 units)

CMGT 100A Construction Management Research and Capstone Project I (5 units)
CMGT 100B Construction Management Research and Capstone Project II (5 units)
CWE 65A Occupational Work Experience (7 units)
CWE 65C Occupational Work Experience (7 units)
CWE 65D Occupational Work Experience (7 units)

Core Electives for Air Conditioning Mechanic (69 units)

Core Electives for Sheet Metal Building Trade (58-62.5 units)

Core Electives for Steamfitting and Pipefitting Technology (53.5 units)

Core Electives for Test, Adjust and Balancing (TAB) Technician (70 units)

Core Electives for Inside Wireman Pathway #1 – IBEW Local 6 (46 unit)

Core Electives for Inside Wireman Pathway #2 – IBEW Local 332 (40 units)

Core Electives for Air Conditioning and Refrigeration Technology – Pathway #1 Local 393 (48 units)

Core Electives for Air Conditioning and Refrigeration Technology – Pathway #2 Local 467 (42.5 units)

Core Electives for Plumbing and Pipefitting Apprenticeship Pathway #1 – Local 467 (42.5 units)

Core Electives for Plumbing and Pipefitting Apprenticeship Pathway #2 – Local 62 (47-49 units)

Core Electives for Plumbing Technology (88.5 units)

Note for Plumbing Technology: Additionally, students who complete the core courses will satisfy Foothill GE Area II, English; Area III, Natural Sciences; Area IV, Social & Behavioral Sciences; Area V, Communication & Analytical Thinking; Area VI, United States Cultures & Communities; and Area VII, Lifelong Learning

Certificate of Achievement: The certificate of achievement is awarded upon completion of the core elective courses. General education courses are not required.

Associate Degree: Additional elective course work may be necessary to meet the 90-unit minimum requirement for the associate degree.

Baccalaureate Degree: Additional elective course work may be necessary to meet the 180-unit minimum requirement for the baccalaureate degree.

Note: All courses pertaining to the major must be taken for a letter grade. In addition, a grade of "C" or better is required for all core courses used for the degree or certificate.

Core Courses	Title	Units	Sequence
CMGT 310	Introduction to Estimating	5	Year 1, Fall
CMGT 311	Scheduling of a LEAN Project	5	Year 1, Fall
CMGT 312	Construction Finance for Commercial Construction	5	Year 1, Winter
CMGT 313	Budgeting	5	Year 1, Winter
CMGT 314	Building Information Modeling	5	Year 1, Spring
CMGT 315	Construction Cost Management	5	Year 1, Spring
CMGT 316	Project Management Development for Commercial Construction	5	Year 2, Fall
CMGT 317	Legal Aspects of Construction	5	Year 2, Fall
CMGT 318	Green Building and LEED Certification	5	Year 2, Winter
Restricted Electives	Title	Units	Sequence
CWE 65A	Occupational Work Experience	7	Year 1, Fall
CWE 65C	Occupational Work Experience	7	Year 1, Winter
CWE 65D	Occupational Work Experience	7	Year 1, Spring
CMGT 100A	Construction Management Research and Capstone Project I	5	Year 2, Fall
CMGT 100B	Construction Management Research and Capstone Project II	5	Year 2, Winter
Upper GE Courses (Select 3 courses)	Title	Units	Sequence
BUSI 3XX	Leadership Skills and Team Dynamics	4.5	Year 1, Fall
OR			
BUSI 3XX	Applied and Professional Ethics (4.5)	4.5	Year 1, Fall
SOC 3XX	Society's Role in Environmental Sustainability	4.5	Year 1, Winter
OR			
SOC 3XX	Analysis of Social Change	4.5	Year 1, Winter

ENGL 3XX	Technical Writing for Business and Technology	4.5	Year 1, Spring
OR			
BUSI 3XX	Applied and Professional Ethics (4.5)	4.5	Year 1, Spring

Note: We plan to collaborate with baccalaureate degree programs within our district and leverage the existing upper division level general education courses to reduce costs and increase productivity for long-term sustainability.

Proposed Sequence:

Year 1, Fall = 17 units

Year 1, Winter = 17 units

Year 1, Spring = 17 units

Year 2, Fall = 15 units

Year 2, Winter = 10 units

TOTAL PROGRAM UNITS: 45-76 units

TOTAL UNITS TO INCLUDE UPPER-LEVEL GE REQUIREMENTS: 68.5 - 89.5 units

Item 4. Master Planning

Foothill College's current mission states that “Believing a well-educated population is essential to sustaining and enhancing a democratic society, Foothill College offers programs and services that empower students to achieve their goals as members of the workforce, as future students, and as global citizens.” We work to obtain equity in achievement of student outcomes for all California student populations and are guided by our core values of honesty, integrity, trust, openness, transparency, forgiveness, and sustainability.

The proposed Bachelor in Science in Industrial Technology and Building Construction Management program focuses on career preparation and enhancement, aligned with the College mission statement. It gives students access to affordable training and education that results in high living-wage employment and career advancement opportunities.

Foothill College educates students from diverse backgrounds that represent the demographics of the Bay Area, with particular attention to underserved and underrepresented populations. Foothill College students master content and skills which are critical for their future success. They develop and act upon a sense of responsibility to be stewards of the public good.

The proposed program is also in alignment with the California Community College Chancellor’s Office’s Vision Goals and Commitments – “...we are narrowing equity gaps, decreasing time to degree and providing students with a system that works better for them.”

The proposed degree will offer baccalaureate-level courses appropriate to general education, eight specific occupational concentrations and the construction management major. Students who complete the baccalaureate degree will attain office technical skills and management skills necessary to be able to transition from the field to office work environment swiftly and have a

better competitive edge in management level positions due to advanced degree and occupational experience than those who complete with a certificate of achievement and/or an associate degree.

Item 5. Enrollment and Completer Projections

The chart below summarizes our 3 to 5-year completer and enrollment projections. In addition to recruiting our alumni and current students to participate in the baccalaureate degree program, we plan to host a partnership discussion with other community colleges and create an articulation plan for their students to enroll in our baccalaureate degree program, so we can aim for long-term sustainability. The proposed baccalaureate degree is intended to welcome Californians who are/were in any 5-year building trades program to participate in as we plan to offer all upper division level courses online. Foothill’s Online Learning Department currently has the infrastructure with staff and online instructional designers to support instructors who teach and students who participate in the baccalaureate degree program. The online experience and infrastructure of Foothill College with its existing two baccalaureate degree programs provides additional support with the online model of the degree. We are hoping by partnering with other colleges and offering them online will help the program have high productivity and generate more FTES apportionment for the District.

5-year Enrollment Projection

	2026-27	2027-28	2028-29	2029-30	2030-31
Foothill College	30	30	40	40	40
Potential CC Partnership	0	15	15	15	15
Total	30	45	45	45	45

3-year Completer Projection

Core Courses	Title	Year 1		Year 2		Year 3	
		# of Sections	Enrollment	# of Sections	Enrollment	# of Sections	Enrollment
CMGT 310	Introduction to Estimating	1	30-40	1	40-50		
CMGT 311	Scheduling of a LEAN Project	1	30-40	1	40-50		
CMGT 312	Construction Finance for Commercial Construction	1	30-40	1	40-50		
CMGT 313	Budgeting	1	30-40			1	40-50
CMGT 314	Building Information Modeling	1	30-40			1	40-50
CMGT 315	Construction Cost Management	1	30-40			1	40-50
CMGT 316	Project Management Development for Commercial Construction			1	30-40	1	40-50
CMGT 317	Legal Aspects of Construction			1	30-40	1	40-50
CMGT 318	Green Building and LEED Certification			1	30-40	1	40-50

		Year 1		Year 2		Year 3	
Restricted Electives	Title	# of Sections	Enrollment	# of Sections	Enrollment	# of Sections	Enrollment
CWE 65A	Occupational Work Experience	1	30-40	1	40-50	1	40-50
CWE 65C	Occupational Work Experience	1	30-40	1	40-50	1	40-50
CWE 65D	Occupational Work Experience	1	30-40	1	40-50	1	40-50
CMGT 100A	Construction Management Research and Capstone Project I			1	30-40	1	40-50
CMGT 100B	Construction Management Research and Capstone Project II			1	30-40	1	40-50
		Year 1		Year 2		Year 3	
Upper GE Courses (Select 3 courses)	Title	# of Sections	Enrollment	# of Sections	Enrollment	# of Sections	Enrollment
BUSI 3XX	Leadership Skills and Team Dynamics						
OR		1	30-40	1	40-50	1	40-50
BUSI 3XX	Applied and Professional Ethics (4.5)						
SOC 3XX	Society's Role in Environmental Sustainability						
OR		1	30-40	1	40-50	1	40-50
SOC 3XX	Analysis of Social Change						
ENGL3XX	Technical Writing for Business and Technology						
OR		1	30-40	1	40-50	1	40-50
BUSI 3XX	Applied and Professional Ethics (4.5)						

Item 6. Place of Program in Curriculum/Similar Programs

Foothill College has been serving apprentices/students in the building trades since the early 1980s. Through our partnerships with Locals 6, 62, 104, 332, 393, and 467, graduates have received certificates of achievement and associate degrees in:

- Air Conditioning and Refrigeration Technology
- Sheet Metal Building
- Plumbing Technology
- Inside Wireman
- Plumbing and Pipefitting Apprenticeship
- Test, Adjust, and Balancing (TAB) Technician
- Air Conditioning Mechanic
- Steamfitting and Pipefitting Technology

The proposed baccalaureate degree prepares students to be construction managers, cost estimators, superintendents, etc. The education requirements for these positions are bachelor's degrees. The annual median salaries for plumbers, pipefitters, and steamfitters, sheet metal workers, HVAC mechanics and installer, and electricians in San Jose-Sunnyvale-Santa Clara, California metro area are \$93,670, \$76,820, \$72,660, \$91,160, respectively. And the annual median salaries for construction managers, cost estimator, first-line supervisors of construction trades and extraction workers, construction and building inspectors for the same area are \$130,440, \$95,570, \$102,810, and \$101,400, respectively (see Wages in Comparison attachment).

Item 7. Similar Programs at Other Colleges in Service Area

The proposed baccalaureate degree program with specific concentrations does not exist at other colleges in the service area, nor does it exist in California.

Additional Information Required for State Submission:

TOP Code: 0957.00 - Civil and Construction Management Technology

Annual Completers: 30-40

Net Annual Labor Demand: 8047

Faculty Workload: 1.326 to 1.623

New Faculty Positions: 1.4 to 1.7 FTE

New Equipment: 0

New/Remodeled Facilities: 0

Library Acquisitions: 0

Gainful Employment Yes

Program Review Date: January, 2026

Distance Education: 100



Labor Market Information Report

Construction Management Occupations

Foothill College

Prepared by the San Francisco Bay Center of Excellence for Labor Market Research

December 2022

Recommendation

Based on all available data, there appears to be an “undersupply” of Industrial Technology and Building Construction Management workers compared to the demand for this cluster of occupations in the Bay region and in the Silicon Valley sub-region (Santa Clara county). There is a projected annual gap of about 8,047 students in the Bay region and 1,707 students in the Silicon Valley Sub-Region.

Introduction

This report provides student outcomes data on employment and earnings for TOP 0957.00 Civil and Construction Management Technology programs in the state and region. It is recommended that these data be reviewed to better understand how outcomes for students taking courses on this TOP code compare to potentially similar programs at colleges in the state and region, as well as to outcomes across all CTE programs at Foothill College and in the region.

This report profiles Construction Management Occupations in the 12 county Bay region and in the Silicon Valley sub-region for an Industrial Technology and Building Construction Management program review at Foothill College.

- **Construction Managers (11-9021):** Plan, direct, or coordinate, usually through subordinate supervisory personnel, activities concerned with the construction and maintenance of structures, facilities, and systems. Participate in the conceptual development of a construction project and oversee its organization, scheduling, budgeting, and implementation. Includes managers in specialized construction fields, such as carpentry or plumbing.
Entry-Level Educational Requirement: Bachelor’s degree
Training Requirement: Moderate-term on-the-job training
Percentage of Community College Award Holders or Some Postsecondary Coursework: 33%
- **First-Line Supervisors of Construction Trades and Extraction Workers (47-1011):** Directly supervise and coordinate activities of construction or extraction workers.
Entry-Level Educational Requirement: High school diploma or equivalent
Training Requirement: None
Percentage of Community College Award Holders or Some Postsecondary Coursework: 32%
- **Construction Laborers (47-2061):** Perform tasks involving physical labor at construction sites. May operate hand and power tools of all types: air hammers, earth tampers, cement mixers, small mechanical hoists, surveying and measuring equipment, and a variety of other equipment and instruments. May clean and prepare sites, dig trenches, set braces to support the sides of excavations, erect scaffolding, and clean up rubble, debris and other waste materials. May assist other craft workers. Construction laborers who primarily assist a particular craft worker are classified under “Helpers, Construction Trades” (47-3010). Excludes

“Hazardous Materials Removal Workers” (47-4041).

Entry-Level Educational Requirement: No formal educational credential

Training Requirement: Short-term on-the-job training

Percentage of Community College Award Holders or Some Postsecondary Coursework: 22%

- **Construction and Building Inspectors (47-4011):** Inspect structures using engineering skills to determine structural soundness and compliance with specifications, building codes, and other regulations. Inspections may be general in nature or may be limited to a specific area, such as electrical systems or plumbing.

Entry-Level Educational Requirement: High school diploma or equivalent

Training Requirement: Moderate-term on-the-job training

Percentage of Community College Award Holders or Some Postsecondary Coursework: 46%

Occupational Demand

Table 1. Employment Outlook for Construction Management Occupations in Bay Region

Occupation	2020 Jobs	2025 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Construction Managers	13,840	15,556	1,716	12%	7,004	1,401	\$31	\$50
First-Line Supervisors of Construction Trades and Extraction Workers	17,074	20,108	3,033	18%	12,295	2,459	\$34	\$43
Construction Laborers	34,522	36,113	1,592	5%	19,259	3,852	\$18	\$24
Construction and Building Inspectors	3,326	3,550	224	7%	2,287	457	\$32	\$45
Total	68,762	75,326	6,564	10%	40,844	8,169		

Source: EMSI 2022.3

Bay Region includes: Alameda, Contra Costa, Marin, Monterey, Napa, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano and Sonoma Counties

Table 2. Employment Outlook for Construction Management Occupations in Silicon Valley Sub-region

Occupation	2020 Jobs	2025 Jobs	5-yr Change	5-yr % Change	5-yr Total Openings	Annual Openings	25% Hourly Earning	Median Hourly Wage
Construction Managers	2,782	3,186	404	15%	1,470	294	\$41	\$55
First-Line Supervisors of Construction Trades and Extraction Workers	3,432	4,284	852	25%	2,775	555	\$35	\$48
Construction Laborers	6,558	7,081	523	8%	3,851	770	\$19	\$26
Construction and Building Inspectors	731	735	4	1%	442	88	\$33	\$46
Total	13,503	15,286	1,783	13%	8,537	1,707		

Source: EMSI 2022.3

Silicon Valley Sub-Region includes: Santa Clara County

Job Postings in Bay Region and Silicon Valley Sub-Region

Table 3. Number of Job Postings by Occupation for 12 months (Nov. 2021 – Oct. 2022)

Occupation	Bay Region	Silicon Valley
Construction Managers	7,471	1,890
Construction Laborers	3,393	654
First-Line Supervisors of Construction Trades and Extraction Workers	1,448	330
Construction and Building Inspectors	722	156

Source: Burning Glass

Table 4a. Top Job Titles for Construction Management Occupations for 12 months (Nov. 2021 – Oct. 2022)

Bay Region

Title	Bay	Title	Bay
Construction Project Manager	564	Senior Project Manager	110
Project Manager	530	Assistant Project Manager	99
Superintendent	455	General Laborer	99
Construction Superintendent	368	Project Coordinator	95
Construction Manager	334	Senior Superintendent	91
Construction Laborer	282	Assistant Superintendent	89
Handyman	199	Construction Inspector	89
Foreman	143	Laborer	76
Fiber Construction Technician	112	Project Superintendent	75

Source: Burning Glass

Table 4b. Top Job Titles for Construction Management Occupations for 12 months (Nov. 2021 – Oct. 2022)

Silicon Valley Sub-Region

Title	Silicon Valley	Title	Silicon Valley
Project Manager	138	General Laborer	26
Construction Project Manager	135	Senior Superintendent	24
Construction Superintendent	103	Project Coordinator	22
Superintendent	89	Construction Inspector	21
Construction Manager	81	Assistant Project Manager	20
Handyman	42	Laborer	19
Construction Laborer	39	Construction Project Director	18
Senior Project Manager	33	Assistant Superintendent	17

Title	Silicon Valley	Title	Silicon Valley
Foreman	32	Construction Project Coordinator	17

Source: Burning Glass

Industry Concentration

Table 5. Industries hiring Construction Management Workers in Bay Region

Industry - 6 Digit NAICS (No. American Industry Classification) Codes	Jobs in Industry (2020)	Jobs in Industry (2025)	% Change (2020-25)	% Occupation Group in Industry (2020)
Commercial and Institutional Building Construction	8,867	9,097	3%	11%
Residential Remodelers	7,237	8,432	17%	10%
Electrical Contractors and Other Wiring Installation Contractors	5,755	6,689	16%	8%
New Single-Family Housing Construction (except For-Sale Builders)	5,592	5,561	-1%	7%
Plumbing, Heating, and Air-Conditioning Contractors	5,133	5,802	13%	7%
All Other Specialty Trade Contractors	3,376	3,494	4%	5%
Local Government, Excluding Education and Hospitals	2,899	3,398	17%	4%
Site Preparation Contractors	2,799	3,124	12%	4%
Highway, Street, and Bridge Construction	2,821	2,911	3%	4%
Poured Concrete Foundation and Structure Contractors	2,575	2,761	7%	3%

Source: EMSI 2022.3

Table 6. Top Employers Posting Construction Management Occupations in Bay Region and Silicon Valley Sub-Region (Nov. 2021 – Oct. 2022)

Employer	Bay	Employer	Silicon Valley
The Turner Corporation	103	The Turner Corporation	35
Econstruct	91	Gilbane Building Company	31
CBRE Group	82	CBRE Group	31
Maloney Construction	65	Cobe Construction Incorporated	27
Econstruct, Inc	62	Blusky	24
Tesla	59	Hitt Contracting Incorporated	20

Source: Burning Glass

Educational Supply

There are five (5) community colleges in the Bay Region issuing 93 awards on average annually (last 3 years ending 2019-20) on TOP 0957.00 Civil and Construction Management Technology. In the Silicon Valley Sub-Region, there are no community colleges that issued awards on average annually (last 3 years) on this TOP code.

There is one (1) four-year institution in the Bay Region issuing 29 Bachelor's degrees on average annually (last 3 years ending 2019-20) on CIP 52.2001- Construction Management, General. There are no four-year institutions in the Silicon Valley Sub-Region issuing Bachelor's degrees on this CIP code.

Table 7. Community College Awards on TOP 0957.00 - Civil and Construction Management Technology in Bay Region

College	Subregion	Associate Degree	High unit Certificate	Low unit Certificate	Total
Cabrillo	SC-Monterey	7	2	39	48
Diablo Valley	East Bay	5	2	0	7
Hartnell	SC-Monterey	3	0	0	3
Laney	East Bay	4	7	0	11
San Francisco	Mid-Peninsula	8	8	8	24
Total		27	19	47	93

Source: Data Mart

Note: The annual average for awards is 2017-18 to 2019-20.

Table 7b. Bachelor's Degree Awards on CIP 52.2001 - Construction Management, General in Bay Region

College	Subregion	Bachelor's degree	Total
California State University-East Bay	East Bay	20	29
Total		20	29

Note: The annual average for awards is 2017-18 to 2019-20.

Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 8,169 annual openings for the Construction Management occupational cluster and 122 annual (3-year average) awards for an annual undersupply of 8,047 students. In the Silicon Valley Sub-Region, there is also a gap with 1,707 annual openings and no annual (3-year average) awards for an annual undersupply of 1,707 students.

Student Outcomes

Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0957.00 - Civil and Construction Management Technology

Metric Outcomes	Bay All CTE Programs	Foothill All CTE Programs	State 0957.00	Bay 0957.00	Silicon Valley 0957.00	Foothill 0957.00
Students with a Job Closely Related to Their Field of Study	74%	91%	79%	79%	N/A	N/A
Median Annual Earnings for SWP Exiting Students	\$47,419	\$66,288	\$56,715	\$58,995	N/A	N/A
Median Change in Earnings for SWP Exiting Students	23%	43%	24%	29%	N/A	N/A

Metric Outcomes	Bay All CTE Programs	Foothill All CTE Programs	State 0957.00	Bay 0957.00	Silicon Valley 0957.00	Foothill 0957.00
Exiting Students Who Attained the Living Wage	52%	64%	71%	67%	N/A	N/A

Source: Launchboard Strong Workforce Program Median of 2017 to 2020.

Skills, Certifications and Education

Table 9. Top Skills for Construction Management Occupations in Bay Region (Nov. 2021 – Oct. 2022)

Skill	Posting	Skill	Posting
Project Management	5,814	Quality Management	959
Scheduling	4,861	Project Planning and Development Skills	950
Budgeting	4,618	Contract Review	910
Construction Management	3,712	Staff Management	893
Quality Assurance and Control	1,917	Managing Subcontractors	886
Occupational Health and Safety	1,760	Carpentry	861
Repair	1,668	Procure	760
Estimating	1,354	Request for Information (RFI)	758
Microsoft Project	1,287	Building Codes	754
Plumbing	1,277	Construction Industry Knowledge	753
Customer Service	1,169	Customer Contact	742
Cost Control	1,127	Civil Engineering	681
Commercial Construction	1,080	Cost Estimation	680
Procurement	1,028	Residential Construction	649

Source: Burning Glass

Table 10. Certifications for Construction Management Occupations in Bay Region (Nov. 2021 – Oct. 2022)

Certification	Posting	Certification	Posting
Driver's License	3,424	Leadership In Energy And Environmental Design (LEED) Certified	108
Project Management Certification	610	LEED AP	104
Project Management Professional (PMP)	322	Cdl Class C	96
Occupational Safety and Health Administration Certification	248	Electrician Certification	59
Certified Construction Manager	215	Certified Welding Inspector (CWI)	45

First Aid Cpr Aed	204	Welding Certification	43
Licensed Professional Engineer	172	Hazwoper	35
CDL Class A	172	CompTIA Advanced Security Practitioner (CASP)	35
OSHA Safety 30 Hour	129	Civil Engineering Certificate	33
Contractors License	123	Architecture License	30

Source: Burning Glass

Note: 62% of records have been excluded because they do not include a certification. As a result, the chart above may not be representative of the full sample.

Table 11. Education Requirements for Construction Management Occupations in Bay Region

Education (minimum advertised)	Latest 12 Mos. Postings	Percent 12 Mos. Postings
High school or vocational training	2,324	36%
Associate's degree	220	3%
Bachelor's degree and higher	3,838	60%

Source: Burning Glass

Note: 51% of records have been excluded because they do not include a degree level. As a result, the chart above may not be representative of the full sample.

Methodology

Occupations for this report were identified by use of skills listed in O*Net descriptions and job descriptions in Burning Glass. Labor demand data is sourced from Economic Modeling Specialists International (EMSI) occupation data and Burning Glass job postings data. Educational supply and student outcomes data is retrieved from multiple sources, including CTE Launchboard and CCCCCO Data Mart.

Sources

O*Net Online

Labor Insight/Jobs (Burning Glass)

Economic Modeling Specialists International (EMSI)

CTE LaunchBoard www.calpassplus.org/Launchboard/

Statewide CTE Outcomes Survey

Employment Development Department Unemployment Insurance Dataset

Living Insight Center for Community Economic Development

Chancellor's Office MIS system

Contacts

For more information, please contact:

- Leila Jamoosian, Research Analyst, for Bay Area Community College Consortium (BACCC) and Centers of Excellence (CoE), leila@baccc.net
- John Carrese, Director, San Francisco Bay Center of Excellence for Labor Market Research, jcarrese@ccsf.edu or (415) 267-6544

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Español

Compare Salaries

Compare By Locations**Compare By Occupations**[Chart](#) | [Table](#)Yearly | [Hourly](#)

San Jose-Sunnyvale-Santa Clara, CA Metro Area

Occupation	Low	Median	High
Construction Managers	\$92,230	\$130,440	\$206,080
Cost Estimators	\$58,150	\$95,570	\$155,020
First-Line Supervisors of Construction Trades and Extraction Workers	\$63,630	\$102,810	\$159,060
Construction and Building Inspectors	\$61,750	\$101,400	\$151,560

 [Download](#)**For information about jobs, training,
career resources, or unemployment****benefits call:**

1-877-US2-JOBS (1-877-872-5627) or TTY

1-877-889-5627

**For help using the CareerOneStop
website:**info@careeronestop.org

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Español

Compare Salaries

Compare By Locations**Compare By Occupations**[Chart](#) | [Table](#)Yearly | [Hourly](#)

San Jose-Sunnyvale-Santa Clara, CA Metro Area

Occupation	Low	Median	High
Plumbers, Pipefitters, and Steamfitters	\$48,590	\$93,670	\$156,030
Sheet Metal Workers	\$46,380	\$76,820	\$124,050
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	\$45,840	\$72,660	\$123,960
Electricians	\$45,510	\$91,160	\$129,760

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December 19, 2022

David Bini
 Executive Director
 Brett Davis
 President

To Whom This May Concern,

The Santa Clara and San Benito Counties Building and Construction Trades Council (Council) represents over 35,000 workers in 27 labor unions within the construction industry. Our mission is to provide our affiliated unions with the tools and opportunity to produce the most highly skilled and highly trained workers.

I write to express our strong support for Foothill College and their petition for a baccalaureate degree program to be offered in the field of Industrial Technology and Building Construction Management in Air Conditioning and Refrigeration Technology Concentration, Sheet Metal Building Trades Concentration, Plumbing Technology Concentration, Inside Wireman Concentration, Plumbing and Pipefitting Apprenticeship Concentration, Test, Adjust, and Balancing (TAB) Technician Concentration, Air Conditioning Mechanic Concentration, and Steamfitting and Pipefitting Concentration.

Currently there is no direct academic pathway to obtain a baccalaureate degree in California for the men and women in the 5-year building trades' programs. The Baccalaureate Degree of Science in Industrial Technology and Building Construction Management as proposed by Foothill College will include all approved apprenticeship courses in the building trades for all lower division level units, transferrable general education classes, and an emphasis on construction management courses for the upper division level requirements.

The Council is eager for this opportunity for craftspersons to continue their education beyond their apprenticeship training. It is important that we provide increased opportunities for workers, with career readiness pathways that support the construction industry and create economic sustainability for both contractors and workers. Foothill College currently offers ten certificates of achievement for the building trades programs and eight associate degree pathways. The baccalaureate degree is considered a "stackable credential" for the building trades industry and will help prepare our diverse workforce with a blended skill set of construction project management and occupational skills.

We value our long-standing and multi-faceted partnership with Foothill College, and as a graduate of the Inside Wireman Concentration, I have seen first-hand the success and results of our forty-year partnership. We are respectfully requesting the CCCCCO grant Foothill College an opportunity to offer the Baccalaureate Degree in Science in Industrial Technology and Building Construction Management for our industry with various concentrations to its alumni, current, and future students in the building trades.

Sincerely,

David Bini
 Executive Director

- Boilermakers 549
- Brick & Tile 3
- Carpenters 405
- Carpenters 2236
- Carpet & Linoleum 12
- Cement Masons 400
- Electricians 234
- Electricians 332
- Elevator Constructors 8
- Glaziers 1621
- Heat & Frost Insulators 16
- Iron Workers 377
- Laborers 67
- Laborers 270
- Lathers 9144
- Millwrights 102
- Operating Engineers 3
- Painters District Council 16
- Painters & Tapers 507
- Pile Drivers 34
- Plasterers 300
- Plumbers & Steamfitters 393
- Roofers 95
- Sheet Metal Workers 104
- Sign, Display 510
- Sprinkler Fitters 483
- Teamsters 853
- UA Local 355

- Affiliated with:
- State Building and Construction Trades Council of California
 - California Labor Federation, AFL-CIO
 - California Labor C.O.P.E.
 - South Bay AFL-CIO Labor Council





December 31, 2022

To Whom This May Concern,

Santa Clara County Construction Careers Association (S4CA) is writing to express our support for Foothill College in their interest to petition for a baccalaureate degree program to be offered in the field of Industrial Technology and Building Construction Management:

- In Air Conditioning and Refrigeration Technology Concentration
- In Sheet Metal Building Trades Concentration
- In Plumbing Technology Concentration
- In Inside Wireman Concentration
- In Plumbing and Pipefitting Apprenticeship Concentration
- In Test, Adjust, and Balancing (TAB) Technician Concentration
- In Air Conditioning Mechanic Concentration
- In Steamfitting and Pipefitting Concentration

Please consider in your deliberations that currently there is no direct academic pathway for the men and women in the 5-year building trades' programs to obtain a baccalaureate degree in California. Foothill College is committed to implementing the California Community College Chancellor's Office's (CCCCO) vision goals and commitments – "...narrowing equity gaps, decreasing time to degree, and providing students with a system that works better for them."

The Baccalaureate Degree of Science in Industrial Technology and Building Construction Management will include all approved apprenticeship courses in the building trades for all lower division level units, transferrable general education classes, and an emphasis on construction management courses for the upper division level requirements.

We strongly feel that this opportunity for the apprentices and journey person to continue their education beyond their apprenticeship training. It is important that we continue to invest in our workforce with career readiness pathways that support the building trades construction industry and create economic sustainability for both contractors and workers. Foothill College currently offers ten certificates of achievement for the building trades programs and eight associate degree pathways. The baccalaureate degree is considered a "stackable credential" for our building trades industry and will help prepare our diverse workforce with a blended skill set of construction project management and occupational skills.

We value our partnership with Foothill College and share in their vision to continue to advocate for the building trades industry. Foothill College has been in partnership with the building trades for over forty years. We are respectfully requesting the CCCCCO grant Foothill College an opportunity to offer the Baccalaureate Degree in Science in Industrial Technology and Building Construction Management for our industry with various concentrations to its alumni, current, and future students in the building trades.

Please do not hesitate to call me should you wish to discuss this more in depth.

Very truly yours,

A handwritten signature in blue ink, appearing to read 'Anthony P. Miranda', is written over a light blue horizontal line.

Anthony P. Miranda
Chair and Co-Founder

Foothill College
College Curriculum Committee
Degree or Certificate (Program) Discontinuance Process

The purpose of this process is to document local approval of the discontinuance (deactivation) of a degree or certificate, *after* the decision has been made to discontinue the degree/certificate. Also included is a process for teach-out of a degree/certificate, following its removal from the catalog.

1. Division CC Approval

Division CC documents approval of the discontinuance in the meeting minutes, which are forwarded to the Curriculum Coordinator along with a short memo explaining the reason for the discontinuance (to be attached to CCC agenda).

2. CCC Approval

Curriculum Coordinator agendas discontinuance on an upcoming CCC agenda. CCC approval is documented in the meeting minutes.

3. FHDA Board Approval

Curriculum Coordinator submits discontinuance to the FHDA Board for final local approval.

4. Removal from Catalog

Curriculum Coordinator removes degree or certificate from the applicable upcoming catalog edition (in most cases, the catalog for the next academic year).

Note: Discontinuance of a degree/certificate does not result in the automatic deactivation of its associated courses. If the division wishes to deactivate any courses, the regular process for course deactivation should be followed. Courses remaining active may need to obtain Stand Alone approval—the Curriculum Coordinator can help identify such courses.

Teach-Out

1. Initiator of the discontinuance should work with the dean to develop a schedule of the remaining offerings of the courses in the degree/certificate
2. Inform students about the plan for the last offerings of the courses in the degree/certificate
 - For certificates, contact all students who have completed one or more of the core/support courses within the past 36 months
 - For degrees, contact all students who have indicated it as their intended major
3. Refer students to counselors if they need to complete course substitution petitions
4. The dean will communicate to the Accreditation Liaison Officer the information necessary for the ALO to submit notice of the program elimination to ACCJC
5. The dean will communicate to the Curriculum Coordinator the date on which the degree/certificate may be changed to Inactive status in the state's inventory system

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Authorized Discipline(s):

Faculty Service Area (FSA Code):

Taxonomy of Program Code (TOP Code):

Foothill College Distance Learning Addendum

Addendum to the Course Outline of Record
Course Approval Application for Online/Distance Learning Delivery
Form approved by the College Curriculum Committee, November 3, 2020 (updated March 5, 2021)

Distance Learning Status

Select distance learning status below

- Approved for Distance Learning under all circumstances (including Online-Only delivery during State of Emergency)
- Approved for Distance Learning only if required during State of Emergency, and only via delivery using the modalities specified in the next question (course would be cancelled if delivery using the selected modalities is not possible)
- Not approved for Distance Learning, even during State of Emergency (course would be cancelled)

Note: "State of Emergency" refers to any situation where the FHDA Board of Trustees has declared that the physical campus is closed due to public health emergency or natural disaster.

Please describe how you have incorporated suggestions from Foothill's [Guiding Principles for Equitable CORs](#) document while creating or revising this COR:

Attach Historical Forms/Documents (if applicable)

Uploaded Files:

Files To Be Uploaded:

Articulation Office Only

C-ID Notation

IGETC Notation

- Area 1A: English Composition
- Area 1B: Critical Thinking - English Composition
- Area 1C: Oral Communication
- Area 2: Mathematical Concepts and Quantitative Reasoning
- Area 3: Arts
- Area 3: Humanities
- Area 4: Social and Behavioral Sciences