NEW PROGRAM PROPOSAL FORM

Name of Institution: **College of Charleston**

Name of Program: **Software Engineering, B.S./A.B.**

Program Designation:

- ☐ Associate's Degree
- ☐ Master's Degree
- ☒ Bachelor's Degree: 4 Year
- ☐ Specialist
- ☐ Bachelor's Degree: 5 Year
- ☐ Doctoral Degree: Research/Scholarship (e.g., Ph.D. and DMA)
- ☐ Doctoral Degree: Professional Practice (e.g., Ed.D., D.N.P., J.D., Pharm.D., and M.D.)

Consider the program for supplemental Palmetto Fellows and LIFE Scholarship awards?

- ☒ Yes
- ☐ No

Proposed Date of Implementation: **Fall 2022**

CIP Code: **14.0903**

Delivery Site(s): College of Charleston, Charleston, SC

Delivery Mode:

- ☒ Traditional/face-to-face
  *select if less than 25% online
- ☐ Distance Education
  - ☐ 100% online
  - ☐ Blended/hybrid (50% or more online)
  - ☐ Blended/hybrid (25-49% online)
  - ☐ Other distance education (explain if selected)

Program Contact Information (name, title, telephone number, and email address):

Dr. Renée McCauley
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Institutional Approvals and Dates of Approval (include department through Provost/Chief Academic Officer, President, and Board of Trustees approval):

1. Department of Computer Science: April 22, 2021
2. Dean, School of Sciences and Mathematics: August 4, 2021
3. Academic Planning Committee: September 10, 2021
4. Faculty Curriculum Committee: September 10, 2021
5. Faculty Senate: October 5, 2021
6. Board of Trustees: October 22, 2021

Background Information

State the nature and purpose of the proposed program, including target audience, centrality to institutional mission, and relation to the strategic plan.

Nature and purpose of the proposed program

The College of Charleston's Computer Science Department in the School of Sciences and Mathematics in partnership with the School of Languages, Cultures and World Affairs proposes the establishment of a new B.S./A.B. in Software Engineering degree program. Building on the strengths and existing resources in these units, the curriculum requires that students complete foundational computer science coursework, a suite of software engineering courses (already taught by the Computer Science Department), and a Minor in Foreign Language/Culture Studies.

This highly relevant program aims to produce globally-fluent software engineers who are highly capable of building complex software systems in culturally diverse and agile software development teams for international organizations. True to our vision, this new program is a shining exemplar of how the Liberal Arts can enhance and innovate a traditional pre-professional degree program.

This program is highly relevant to the economic development of the Lowcountry as it will provide future Computer Science students (who already attend the College of Charleston) a new pathway to a software engineering career while also attracting new students to our institutions, thereby growing the overall enrollment in our already diverse portfolio of computing degree programs.

The target audience

The target audience is the undergraduate student interested in software development and languages and cultures. Some students in one of our other programs (Computer Science, Computing in the Arts, Information Systems, and Data Science) may choose this program over their current one, but we expect to also attract new students not currently being serviced by our other programs.

Relationship to Mission and Strategic Plan

This program is also superbly aligned with the College of Charleston's new Mission statement:

> *Founded in 1770, the College of Charleston is a public university grounded in the principles of the liberal arts and committed to developing ethically centered,* ***intellectually versatile and globally fluent citizens*** *who create* ***innovative solutions*** *to social,* ***economic*** *and environmental* ***challenges****.*

The highlighted keywords of "intellectually versatile", "globally fluent", "innovative", and "economic challenges" are all directly related to the strengths of this Software Engineering degree proposal. True to Pillar 2 in the College of Charleston's new Strategic Plan, this will be a distinctive new program that transforms the Liberals Arts education.

Assessment of Need

Provide an assessment of the need for the program for the institution, the state, the region, and beyond, if applicable.

David Ginn, President and CEO of the Charleston Regional Development Alliance, really said it best in his attached support letter:

> *As president and CEO of the Charleston Regional Development Alliance (CRDA), the three-county Charleston metro's lead economic development organization, I am writing to express our strong support for the College of Charleston's proposal to establish a Bachelor's degree program in Software Engineering. There is a high demand in the Charleston region for talent with those skill sets, and we are excited to see the College of Charleston stepping up to strengthen a talent pipeline to support our existing and future high-tech, manufacturing, and engineering-related industries.*
>
> *Talent demand in STEM fields is currently outpacing supply and while we'd all prefer to "grow our own," the region must also depend on recruiting workers from out-of-the-area to fill local jobs. To give you some perspective, the Charleston region is projected to add 28,000 new jobs over the next five years. Occupations with the highest growth percentages include software/IT and engineers.*

It is easy to find numerous data sources to back up these assertions:

BLS

The US Bureau of Labor Statics' 2019-2029 Occupational Outlook for "Software Developers, Quality Assurance Analysts, and Testers" shows a 22% growth rate that BLS classifies as "Much faster than average".

INDEED.COM

"If you are considering a career as a software engineer, the job outlook for this profession is likely one of your primary considerations." Read full story here:
https://www.indeed.com/career-advice/finding-a-job/demand-of-software-engineers

SCWORKS.ORG

A search of SCWORKS.ORG on July 16, 2021 of just "software engineer" in the job title returned 406 open positions in South Carolina with 80 of those being in Charleston.

USNEWS.COM

According to usnews.com, Software Developers rank #1 in Best Technology Jobs. Jobs are ranked according to their ability to offer an elusive mix of factors:

#1 in Best Technology Jobs
#2 in 100 Best Jobs
#2 in Best STEM Jobs

While graduates of our existing computing degree programs are already capable of becoming software developers/engineers, our new Software Engineering program will be more intentional about preparing students to not only be software developers but to be globally-fluent software engineers.

Burning Glass - Labor Insight Reports

According to two Labor Insight Reports by Burning Glass Technologies in July 2021, the projected growth of "Software Developer / Engineer" is 33.7% over the next 10 years. One report analyzed the "Finance and Insurance, Professional, Scientific, and Technical Services" sectors of the South

Carolina economy, and the other report on "Computer and Electronic Product Manufacturing" job market in South Carolina. In both cases, Software Developer / Engineer had the highest projections of all the occupations listed in these reports.

Transfer and Articulation
Identify any special articulation agreements for the proposed program. Provide the articulation agreement or Memorandum of Agreement/Understanding.

There is no other Software Engineering Bachelor's degree in South Carolina. As with the existing computing degrees, students from two-year institutions would also be able to transfer into this program, but, no specific partner with another state institution is envisioned at this time.

Currently there is no MOU in development with a South Carolina Technical System institution.

Employment Opportunities

Occupation	State		National		Data Type and Source
	Expected Number of Jobs	Employment Projection	Expected Number of Jobs	Employment Projection	
Software Engineer	1,176	N/A	N/A	N/A	SCWorks.org search on 11/8/2021
Software Developers, Quality Assurance Analysts, and Testers	N/A	N/A	1,847,900 Jobs in 2020	22% Growth in 2020-2030	BLS
Software Developer or Engineer	43,166	23.3% Growth in 2021-2031	N/A	N/A	Burning Glass Market Study for SC

Supporting Evidence of Anticipated Employment Opportunities
Provide supporting evidence of anticipated employment opportunities for graduates.

Letters of support from the Charleston Regional Development Alliance, the Charleston County Economic Development Office, the Charleston Digital Corridor, and Booz Allen Hamilton are included with this proposal.

Description of the Program

Projected Enrollment		
Year	Fall Headcount	Spring Headcount
2022-2023	5	5
2023-2024	25	25
2024-2025	35	35
2025-2026	45	45
2026-2027	50	50

Explain how the enrollment projections were calculated.

Once implemented for fall 2022, this program will initially have few students enrolled since there will be no time to recruit/advertise. Similar to our newly launched Electrical Engineering program, we expect only a few new students enrolled in Fall 2022. In additional to new students, we expect some students to switch majors from Computer Science to Software Engineering, which explains why we anticipate the number of majors jumping from 5 to 25 in Year 2. Subsequently, we expect the growth rate to follow a similar/steady growth as with the "Data Science" program. Both of these programs require scientific calculus and a significant amount of coursework outside of computing courses: math/statistics for Data Science and Foreign Language/Culture Studies for Software Engineering. While this program grows, we anticipate that the growth rate for the Computer Science degree program will continue to slow. Although it is difficult to predict, of these 50 Software Engineering students by Year 5, we estimate only half will be "new students" who would not have come to the College of Charleston anyway to study one of the existing computing or engineering degree programs.

Besides the general institutional admission requirements, are there any separate or additional admission requirements for the proposed program? If yes, explain.

☐Yes

☒No

Curriculum

New Courses

List and provide course descriptions for new courses.

N/A: All courses are already currently taught in other programs.

See curriculum table ahead.

Total Credit Hours Required: 122*

Curriculum by Year					
Course Name	**Credit Hours**	**Course Name**	**Credit Hours**	**Course Name**	**Credit Hours**
Year 1					
Fall		**Spring**		**Summer**	
CSCI 220/L Computer Programming 1	4	CSCI 221 Computer Programming II	3		
Math 120 Introductory Calculus	4	MATH 207 Discrete Structures	3		
FYSE First Year Experience	3	History 1 of 2	3		
ENGL 110 Intro to Academic Writing	4	Humanities 1 of 4	3		
Foreign Language 1 of 4	3	Foreign Language 2 of 4	3		
Total Semester Hours	**18**	**Total Semester Hours**	**15**	**Total Semester Hours**	
Year 2					
Fall		**Spring**		**Summer**	
CSCI 230 Data Structures & Algorithm	3	CSCI 380 User Interface Design	3		
CSCI 332 Database Concepts	3	CSCI 300+ Elective 1 of 3	3		
Social Science 1 of 2	3	Social Science 2 of 2	3		
Natural Science with Lab 1 of 2	4	Natural Science with Lab 2 of 2	4		
Foreign Language 3 of 4	3	Foreign Language 4 of 4	3		
Total Semester Hours	**16**	**Total Semester Hours**	**16**	**Total Semester Hours**	
Year 3					
Fall		**Spring**		**Summer**	
CSCI 320 Programming Language Structures	3	CSCI 392 Seminar on Computing and Society	3		
CSCI 360 Software Architecture, Security, Testing	3	CSCI 300+ Elective 2 of 3	3		
COMM 104 Public Speaking	3	Humanities 2 of 4	3		
Foreign Language/Culture Minor Course 1 of 6	3	Foreign Language/Culture Minor Course 2 of 6	3		
History 2 of 2	3	General Elective	3		
Total Semester Hours	**15**	**Total Semester Hours**	**15**	**Total Semester Hours**	
Year 4					
Fall		**Spring**		**Summer**	
CSCI 362 Software Engineering	3	CSCI 462 Software Engineering Practicum	3		
CSCI 300+ Elective 3 of 3	3	Humanities 4 of 4	3		
Foreign Language/Culture Minor Course 3 of 6	3	Foreign Language/Culture Minor Course 5 of 6	3		
Foreign Language/Culture Minor Course 4 of 6	3	Foreign Language/Culture Minor Course 6 of 6	3		
Humanities 3 of 4	3				

Curriculum by Year					
Course Name	**Credit Hours**	**Course Name**	**Credit Hours**	**Course Name**	**Credit Hours**
Total Semester Hours	**15**	**Total Semester Hours**	**12**	**Total Semester Hours**	

*__REACH Act__: As confirmed in the September 21, 2021 letter from College of Charleston's President Andrew T. Hsu as issued to Rusty Monhollon, CHE's President and Executive Director, this new program along with every current and future undergraduate degree program beginning with the entering freshman class of the 2021-22 academic year, will require the completion of a 3-credit hour course covering in its entirety the United States Constitution, the Declaration of Independence, the Emancipation Proclamation, at least five *Federalist Papers* and at least one document that is foundational to the African American struggle among the following 12 courses that are currently offered regularly at the College of Charleston:

Political Science
POLI 101 American Government
HONS 165 Honors American Government
POLI 320 Constitutional Law
POLI 321 Civil Liberties
POLI 387 American Political Thought

History
HIST 201 United States to 1865
HIST 202 United States since 1865
HIST 216 African American History to 1865
HIST 217 African American History since 1865
HIST 304 History of the United States: Civil War and Reconstruction, 1845-1877

Philosophy
PHIL 209 Political Philosophy
PHIL 310 American Philosophy

Similar Programs in South Carolina offered by Public and Independent Institutions

Identify the similar programs offered and describe the similarities and differences for each program.

There is no Bachelor of Science in “Software Engineering” degree program in South Carolina, although most universities offer a computing-related degree with software development/engineering coursework. The required Minor in a Foreign or Cultural Studies is an added unique aspect of this Software Engineering Proposal. The closest existing programs are at USC-Aiken in Applied Computer Science, and Winthrop in Applied Software Development.

Program Name and Designation	Institution	Similarities	Differences
BS in Computer Science	The Citadel	Foundational computer science courses are similar.	Computer Science degrees include theoretical computer science courses that are relevant for a computer science graduate education. No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.
BS/BS in Computer Engineering	The Citadel	Foundational computer science courses are similar.	"Computer" Engineering in general differs from "Software" Engineering since the focus is on the design of computer chips/electronics and not solely on software. No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.
BS/BA in Computer Science	Clemson	Foundational computer science courses are similar.	Computer Science degrees include theoretical computer science courses that are relevant for a computer science graduate education. No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.
BS in Computer Information Systems	Clemson	Foundational computer science courses are similar.	Computer Information Systems degrees include business courses. No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.
BS in Computer Engineering	Clemson	Foundational computer science courses are similar.	"Computer" Engineering in general differs from "Software" Engineering since the focus is on the design of

			computer chips/electronics and not solely on software. No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.
BS in Computer Science	Coastal Carolina	Foundational computer science courses are similar.	Computer Science degrees include theoretical computer science courses that are relevant for a computer science graduate education. No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.
BS in Computer Science	Francis Marion	Foundational computer science courses are similar.	Computer Science degrees include theoretical computer science courses that are relevant for a computer science graduate education. No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.
BS in Computer Information Systems	Lander	Foundational computer science courses are similar.	Computer Information Systems degrees include business courses. No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.
BS in Computer Science	SC State	Foundational computer science courses are similar.	Computer Science degrees include theoretical computer science courses that are relevant for a computer science graduate education. No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.

BS in Computer Science	UofSC, Columbia	Foundational computer science courses are similar.	Computer Science degrees include theoretical computer science courses that are relevant for a computer science graduate education. No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.
BS in Computer Information Systems	UofSC, Columbia	Foundational computer science courses are similar.	Computer Information Systems degrees include business courses. No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.
BSE in Computer Engineering	UofSC, Columbia	Foundational computer science courses are similar.	"Computer" Engineering in general differs from "Software" Engineering since the focus is on the design of computer chips/electronics and not solely on software. No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.
BS in Applied Computer Science	UofSC, Aiken	This program is very similar to our proposal in terms of the computing and software engineering coursework.	No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.
BS in Computer Science	UofSC, Upstate	Foundational computer science courses are similar.	Computer Science degrees include theoretical computer science courses that are relevant for a computer science graduate education. No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.
BA in Computer Information Systems	UofSC, Upstate	Foundational computer science courses are similar.	Computer Information Systems degrees include business courses.

			No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.
BS in Computer Science	Winthrop	Foundational computer science courses are similar.	Computer Science degrees include theoretical computer science courses that are relevant for a computer science graduate education. No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.
BS in Applied Software Development	Winthrop	This program is very similar to our proposal in terms of the computing and software engineering coursework.	No Global Fluency Requirement that includes the completion of a Foreign Language or Cultural Studies Minor.

Faculty

Rank and Full- or Part-time	Courses Taught for the Program	Academic Degrees and Coursework Relevant to Courses Taught, Including Institution and Major	Other Qualifications and Relevant Professional Experience (e.g., licensures, certifications, years in industry, etc.)
New Tenure Track Assist. Professor (F)	Required and Elective Software Engineering Courses (CSCI 360, 362, 462)	Ph.D. Software Engineering or a closely related field and a research agenda in software engineering	
Professor and Dean (P)	Occasional foundational computer science course in the curriculum.	Ph.D. Computer Science, University of Central Florida	
Instructor (F)	CSCI 220 & 220L	M.S. Computer and Information Systems, College of Charleston	
Instructor (F)	CSCI 221	M.S. in Computer Science, University of South Carolina	
Assistant Professor (F)	CSCI 230, elective courses	Ph.D. Computer Science University of California, Irvine	
Professor (F)	CSCI 320, elective courses	Ph.D. Computer Science, University of Louisiana	
Professor (F)	CSCI 332, elective courses	Ph.D. Mathematics, Notre Dame University, M.S. in Computer Science, University of South Carolina	
Associate Professor (F)	CSCI 392, elective courses	Ph.D. Computer Science, The Ohio University	
Professor (F)	CSCI 380, elective courses	Ph.D. Computer Science, University of Louisiana	
Assistant Professor (F)	CSCI 380, elective courses	Ph.D. Digital Media with minor in Human Computer Interaction, Georgia Institute of Technology	

Total FTE needed to support the proposed program:
Faculty: 9
Staff: 3
Administration: .15

Faculty, Staff, and Administrative Personnel

Discuss the Faculty, Staff, and Administrative Personnel needs of the program.

Most of the courses required in the program are already being taught, except for CSCI 360. Also, we expect with the increased enrollments predicted, some of the courses we already offer will require an additional section. Much of this need can be absorbed by faculty already in the program and strategic use of adjunct faculty. However, hiring an additional faculty member (an assistant professor), with a research focus in software engineering, will eventually be important to cover required classes and bring the software engineering credentials to the program. No new administrative personnel are needed; current staff and administration can absorb the needs.

Resources

Library and Learning Resources

Explain how current library/learning collections, databases, resources, and services specific to the discipline, including those provided by PASCAL, can support the proposed program. Identify additional library resources needed.

A qualitative comparison of the College's current holdings (books, journals, databases) with a standard guide in relationship to this new program found that the library holdings could benefit from a $500-1000 annual expenditure. Specifically:

> To enhance the collection further to support a new undergraduate program, it is advised that the College actively attempt to collect outstanding academic titles in engineering, as well as continuing to build monographic collections in the highlighted Library of Congress Classification subject areas especially those in computer engineering, electronics, and computer science. A new firm order budget of **$500-$1,000** (dependent upon anticipated size of program) should eventually be allocated to software engineering to provide a dedicated fund that faculty associated with the program can use to build appropriate collections and fill the gaps recently identified. The libraries do wish to rely on the expertise of the associated faculty to request appropriate literature for this program using the funds available to them.
>
> There are a few journals rated highly by SCImago to which we do not currently subscribe. Therefore, the intention would be to eventually acquire subscriptions to the following journals in support of a software engineering program: *IEEE Network* ($705/year), and *IEEE Transactions on Cybernetics* ($590/year), and *Mathematical Programming Computation* (available from SpringerLink; $236/year). *Mathematical Programming Computation* publishes articles on innovative software, modeling environments, software frameworks and libraries, and new algorithmic techniques.
>
> The College of Charleston is confident that with our current print and electronic resources, the addition of a designated, recurring firm order fund of **$500-$1,000** for software engineering, and the acquisition of IEEEXplore, the Libraries will be well equipped to support a new undergraduate program in software engineering.

Student Support Services

Explain how current academic support services will support the proposed program. Identify new services needed and provide any estimated costs associated with these services.

In addition to the library and learning resources, a number of academic and student support resources are available to students at the College of Charleston.

- **Information Technology:** A variety of computing resources are available to students, including a COUGARS email account and student computing system assistance. A dedicated student help desk is available to students via email or telephone.
- **Center for Disability Services:** The College of Charleston is committed to ensuring that all programs and services are accessible to a diverse student population. The center provides reasonable and effective accommodations to facilitate student learning, and offers educational opportunities to students, faculty, and staff that enhance understanding of a broad spectrum of disabilities and promotes an environment of institutional respect for disabilities.

- **Office of Research and Grants Administration (ORGA):** ORGA is the central resource for information and assistance regarding major government agencies, foundations, and corporations that support research and scholarship. Dedicated staff is available to provide assistance to faculty, students, and administrators in identifying extramural funding sources, developing funding and completing proposals, developing narratives and budgets, ensuring compliance with federal and state regulations, negotiating grant awards and contracts, and administering funded projects.
- **Center for Student Learning (CSL):** CSL provides students with academic assistance to facilitate effective learning strategies. Supplemental instruction, study groups and study skills seminars are scheduled throughout each semester.
- **Career Center:** The Career Center is a multifaceted resource center with a goal of educating and assisting students in preparing for transition to the dynamic work environment.
- **Bookstore:** Barnes & Noble College Booksellers manages the College of Charleston Bookstore, which houses an extensive selection of periodicals, best sellers, and feature titles that reflect the breadth and depth of scholarship at the college.
- **Cougar Card Services:** All students will receive a Cougar Card. This official College of Charleston identification card connects students to all campus resources.
- **Resource Coordinator:** The Resource Coordinator acts as an impartial party who gives guidance and/or explanations of policies and procedures for employees, faculty and students who encounter problems arising from the operation of the college and who request assistance in identifying the proper person, office, policy, or procedure that can best address their particular situation.
- **Dining Services:** A variety of dining options located throughout the College of Charleston campus are available to students.
- **Attorney Assistance Program:** Up to one hour of legal services are available on a pro bono basis to students who face a variety of financial or legal difficulties.
- **Campus Recreation Services:** A number of fitness facilities and a swimming pool are available to students to enhance their overall physical wellness.
- **Counseling and Substance Abuse Services:** The mission of the College's Counseling and Substance Abuse Services is to increase student psychological resilience and personal growth to support persistence and success in school.
- **Student Health Services:** Student Health Services provide quality primary health care in an ambulatory setting. The center provides students with access to early diagnosis and treatment of the conditions that they have or develop while in attendance at the College, and promotes awareness of the importance of regular health maintenance
- **Office of Victims Services:** Services are available to College of Charleston students regardless of whether the crime occurs on campus or the student elects to file an official police report or not. Certified victim assistance specialists provide support for both short and long-term issues associated with trauma and victimization issues, and help students address issues related to the crime and its impact on the college experience.
- **Office of Institutional Diversity (OID):** The Office of Institutional Diversity offers education, training, resources, and support for all students, faculty, and staff. OID fosters and advocates for a globally diverse campus at the College of Charleston.

Physical Resources/Facilities

Identify the physical facilities needed to support the program and the institution's plan for meeting the requirements.

The physical facilities employed to support all the CSCI degrees (computer science, information systems, data science, computing in the arts) are sufficient to also support the software engineering program. One additional space, to house the new assistant professor's research lab, will eventually be important, but we believe that we can re-structure/re-organize existing lab and office spaces to accommodate this need.

Equipment

Identify new instructional equipment needed for the proposed program.

As is typical of new faculty hires, the new professor will be provided with start-up funds from which she/he can purchase her/his lab and office computer equipment. Other furnishings (such as desks and tables) are already owned by the department.

Impact on Existing Programs

Will the proposed program impact existing degree programs or services at the institution (e.g., course offerings or enrollment)? If yes, explain.

☒Yes

☐No

We believe that this program will attract students not currently enrolled in our other programs. However, we expect this program will also pull some students from our Computer Science degree programs. We expect the impact to be minimal, as many of the courses in the two programs of Software Engineering and Computer Science are the same.

Financial Support

Sources of Financing for the Program by Year												
	1st		2nd		3rd		4th		5th		Grand Total	
Category	**New**	**Total**	**New**	**Total**	**New**	**Total**	**New**	**Total**	**New**	**Total**	**New**	**Total**
Tuition Funding	$87,510	$87,510	$437,550	$437,550	$612,570	$612,570	$787,590	$787,590	$875,100	$875,100	$2,800,320	$2,800,320
Program-Specific Fees												
Special State Appropriation												
Reallocation of Existing Funds												
Federal, Grant, or Other Funding												
Total	$87,510	$87,510	$437,550	$437,550	$612,570	$612,570	$787,590	$787,590	$875,100	$875,100	$2,800,320	$2,800,320
Estimated Costs Associated with Implementing the Program by Year												
	1st		2nd		3rd		4th		5th		Grand Total	
Category	**New**	**Total**	**New**	**Total**	**New**	**Total**	**New**	**Total**	**New**	**Total**	**New**	**Total**
Program Administration and Faculty/Staff Salaries	$0	$10,892	$126,000	$155,564	$126,000	$174,236	$126,000	$174,236	$126,000	$174,236	$504,000	$689,164
Facilities, Equipment, Supplies, and Materials												
Library Resources	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$5,000	$5,000
Other: 41% RCM "tax" is invoked.	$35,879	$35,879	$179,396	$179,396	$251,154	$251,154	$322,912	$322,912	$358,791	$358,791	$1,148,132	$1,148,132
Total	$36,879	$47,771	$306,396	$335,960	$378,154	$426,390	$449,912	$498,148	$485,791	$534,027	$1,657,132	$1,842,296
Net Total (Sources of	$50,631	$39,739	$131,154	$101,590	$234,416	$186180	$337,678	$289,442	$390,309	$341,073	$1,143,188	$958,024

Financing Minus Estimated Costs)												

Note: New costs - costs incurred solely as a result of implementing this program. Total costs - new costs; program's share of costs of existing resources used to support the program; and any other costs redirected to the program.

Budget Justification

Provide an explanation for all costs and sources of financing identified in the Financial Support table. Include an analysis of cost-effectiveness and return on investment and address any impacts to tuition, other programs, services, facilities, and the institution overall.

REVENUE: Tuition Funding

The budget table has been completed using 2020-2021 tuition rates and assuming an approximate 2/3 resident and 1/3 nonresident student ratio. Per the enrollment table, it shows the revenue generated as the number of majors grows from 5 to 25 to 35 to 45 to 50 during years 1-5.

EXPENSES:

In anticipation of CofC moving to an RCM budget model, a 41% "RCM tax" is accounted for in the expenses table. This "tax" supports "cost centers" across campus that support student success and CofC's operation: the Library, Facilities Management, Registrar's Office, Career Center, Academic Planning, Center for Student Success, etc.

The primary "new" expense ($126,000) involves the hiring of a new assistant professor of computer science (with Software Engineering expertise) by Year 2 when the CSCI 360 course must start to be offered regularly. Additionally, a small designated, recurring Library firm order fund of $1,000 for software engineering is needed to support a new, small undergraduate program in software engineering at the College of Charleston.

A Software Engineering student takes 40 hours of Software Engineering or Computing courses – we refer to these as "Major Hours" below. The new faculty member will cover 9 of these hours (two sections of the three required courses each year, totally 18 hours per year). Although the new faculty member's courses will also have Computing students enrolled, we will disregard that aspect for our calculations to keep the math simple and to treat the new faculty member's salary as a new expense. The other 31 Major Hours will be covered by existing faculty and courses that will also be enrolled by computing students – we anticipate a 5 to 1 mixture of computing to software engineering students. The average salary of CofC computing faculty across the ranks is approximately $100,000 + 40% fringe = $140,000. The normal teaching load is 18 hours per year, meaning each CSCI course hour costs approximately $140,000 / 18 = $7,778 to deliver on average. Since only 1 of 5 students in these courses will be software engineering students, the course delivery cost to this segment of the student population is: $7,778 / 5 = $1,556. (NOTE: We will exclude adjunct salary possibilities since these salaries would simply bring the costs down further.)

Looking at the four-year degree completion plan earlier in this proposal, you can see that the "Major Hours" (the CSCI courses) are taken by the students as follows: Year 1: 7 hours; Year 2: 12 hours; Year 3: 12 hours; Year 4: 9 hours. Assuming the first three years of courses constitute the existing faculty contributions, we compute the following table (starting in Year 3, all 31 hours of existing hours are being enrolled by some software engineering):

Year	Major Hours	Running Total	Existing Faculty Salary	New Faculty Salary	Total Faculty Costs
1	7	7	7 x $1,556 = $10,892	$0	**$10,892**
2	12	19	19 x $1,556 = $29,564	$126,000	**$155,564**
3	12	31	31 x $1,556 = $48,236	$126,000	**$174,236**
4	0	31	31 x $1,556 = $48,236	$126,000	**$174,236**
5	0	31	31 x $1,556 = $48,236	$126,000	**$174,236**

Evaluation and Assessment

Program Objectives	Student Learning Outcomes Aligned to Program Objectives	Methods of Assessment
Students will be able to analyze the global and cultural impacts of software solutions.	Students will demonstrate their ability analyze the global and cultural impacts of software solutions in their Capstone Experience. All Software Engineering students are required to take a two-semester capstone course sequence: CSCI 362 and CSCI 462. Both courses require a significant software engineering project which will be required to have a global/international component to the design and/or documentation. Software Engineering student will specifically be assigned to projects from international companies when possible.	Measure 1: SLO1 will first be measured in the capstone project in CSCI 362. TARGET: At least 70% of all students will score 75% or higher on the global/cultural analysis module for capstone software project. Measure 2: Similar to the first measurement, the second measurement of SLO1 happens in CSCI 462 - the second course in the capstone sequence. TARGET: At least 70% of all students will score 75% or higher on the global/cultural analysis module for capstone software project.
Students will be able to work effectively in a software engineering/development team environment.	Students will demonstrate their ability work effectively in a software engineering/development team environment in their Capstone Experience. All Software Engineering students are required to take a two-semester capstone course sequence: CSCI 362 and CSCI 462. Both courses require a significant software engineering team project that follows modern development practices (agile, scrum, etc).	Measure 1: SLO1 will first be measured in the capstone project in CSCI 362. TARGET: At least 70% of all students will score 75% or higher on their individual performance assessment conducting by the instructor. Measure 2: Similar to the first measurement, the second measurement of SLO1 happens in CSCI 462 - the second course in the capstone sequence. TARGET: At least 70% of all students will score 75% or higher on their individual performance assessment conducting by the instructor.
Students will be able to design, build, and maintain software solutions.	The first assessment of this SLO comes in CSCI 221 - an intermediate course in the Computer Science foundational coursework. This is an important course because it is the prerequisite and sets the stage	Measure 1: Therefore, their performance will be measure on the last (most complex) programming assignment in this course. TARGET: At least 70% of all students will score 75% or

	for the challenges CSCI 230 course. Students must demonstrate the ability to developed medium-complexity software projects in this course to be successful in subsequent courses. The second assessment of this SLO comes in CSCI 360 Software Architecture, Security, and Testing. This is a very important course in the curriculum because it covers key aspects of proper software development.	higher on the final software project in the course. Measure 2: The assessment instrument will be the entire final exam in the course. TARGET: At least 70% of all students will score 75% or higher on the final exam in the course.
Student will be able to conduct themselves in a professional and ethical manner.	This SLO will first be assessed in the CSCI 392 Seminar on Computing and Society. This entire course focuses on both professional and ethical issues related to the field of computer science and software engineering. Student will be learning the standard ACM Code of Ethics, how to conduct themselves in a professional software engineering setting, and studying various ethical case studies and areas of concerns in computing, like cyber bullying and privacy. Once the foundation is set in CSCI 392, the second assessment of this SLO comes in CSCI 462 during the final semester of the capstone project. Essentially, professionalism and ethical behavior must be demonstrated in this course.	Measure 1: The final exam is the assessment instrument tool to ensure the students have this foundation. TARGET: At least 70% of all students will score 75% or higher on the final exam in the course. Measure 2: Every student works in a group setting and typically develops a software project for a company. Peer assessment surveys are used to determine each team member's professional and ethical performance throughout the semester. These surveys will be used as the assessment instruments. TARGET: At least 90% of all students will score "Strongly Agree" or "Agree" on the peer survey to the questions related to professional and ethical behavior.

Student Learning Outcome to Course Mapping										
SLO #	Student Learning Outcome Description	Required CSCI Courses								
		220	221	230	320	332	360	362	380	392	462
1	Students will be able to analyze the global and cultural impacts of software solutions.							I,R		I,R	M,D
2	Students will be able to work effectively in a software engineering/development team environment.							I,R			M,D
3	Students will be able to design, build, and maintain software solutions.	I	R	R	R	R	R	M,D	R		M,D
4	Students will be able to conduct themselves in a professional and ethical manner.							I,R		I,R	M,D

Introduce (I), Reinforce (R), Mastery (M), Demonstrate (D)

Accreditation and Licensure/Certification

Will the institution seek program-specific accreditation (e.g., CAEP, ABET, NASM, etc.)? If yes, describe the institution's plans to seek accreditation, including the expected timeline.

☐Yes

☒No

Our Software Engineering curriculum builds on the existing (relevant) courses already offered in the Computer Science department and the School of Languages, Cultures, and World Affairs. The existing "Computer Science" degree includes theoretical computer science courses (Operating Systems, Advanced Algorithms, Computer Architecture, Assembly Language, etc) and other prescribed ABET-CAC accreditation requirements that are not particularly relevant to a typical software engineer who will be developing a range of business software solutions. This new program extracts the relevant software engineering coursework in the computer science department. We will not be seeking ABET accreditation for this particular program. While our Computer Science program is ABET-CAC accredited and our Systems and Electrical Engineering programs will be ABET-EAC accredited, ABET accreditation does not add value to this program but would box us into additional requirements, thereby preventing us from offering this highly innovative approach to Software Engineering education.

Carnegie Mellon University is currently ranked by US News as having the best undergraduate Software Engineering program in America, and they are not ABET accredited: https://www.usnews.com/best-colleges/rankings/computer-science/software-engineering

BYU Idaho explains why neither their Computer Science nor Software Engineering programs are ABET accredited (https://www.byui.edu/computer-science-electrical-engineering/accreditation):

> *"Like all degrees at BYU-Idaho, the computer science and software engineering programs are accredited by the Northwest Commission on Colleges and Universities, but they do not have the additional discipline-specific ABET accreditation that our computer engineering and electrical engineering programs do. In addition to increased flexibility in the program, we have not pursued this additional certification because neither employers nor graduate schools have required this sort of accreditation of our graduates. Likely for these reasons, only about half of the computer science programs in the United States choose to obtain ABET accreditation. For example, Carnegie Mellon, one of the most prestigious computer science programs in the country, does not go through this additional accreditation process. We have placed graduates in a number of different graduate programs, and have not had any concerns expressed about the lack of ABET accreditation for our computer science or software engineering graduates. In these domains, the most important considerations from graduate schools and employers are the skills students demonstrate through projects and internships."*

Undergraduate enrollment in the Computer Science department has grown by 178% from 165 in Fall 2010 to 459 in Fall 2020. The department offers four undergraduate degree programs. Individually, the growth rates in descending order per program during the same timeframe are:

- Computer information Systems: 447% from 15 to 82
- Computing in the Arts (started 2011): 320% from 25 to 105
- Data Science: 147% from 17 to 42
- Computer Science (the only ABET accredited program): 53% from 150 to 230

The ABET-CAC accredited Computer Science, while indeed growing, is growing at the slowest rate in the department.

Will the proposed program lead to licensure or certification? If yes, identify the licensure or certification.

☐Yes

☒No

Explain how the program will prepare students for this licensure or certification.

If the program is an Educator Preparation Program, does the proposed certification area require national recognition from a Specialized Professional Association (SPA)? If yes, describe the institution's plans to seek national recognition, including the expected timeline.

☐Yes

☒No

Source: Labor Insight (Burning Glass Technologies)

Industry Analysis

Active Selections

SC, Computer and Electronic Product Manufacturing (334)

Key Metrics

Job Postings

Last 12 Months

Average Demand
1,854

Unemployment Rate

Apr 2021

3.3%

Projected Growth

10 Years

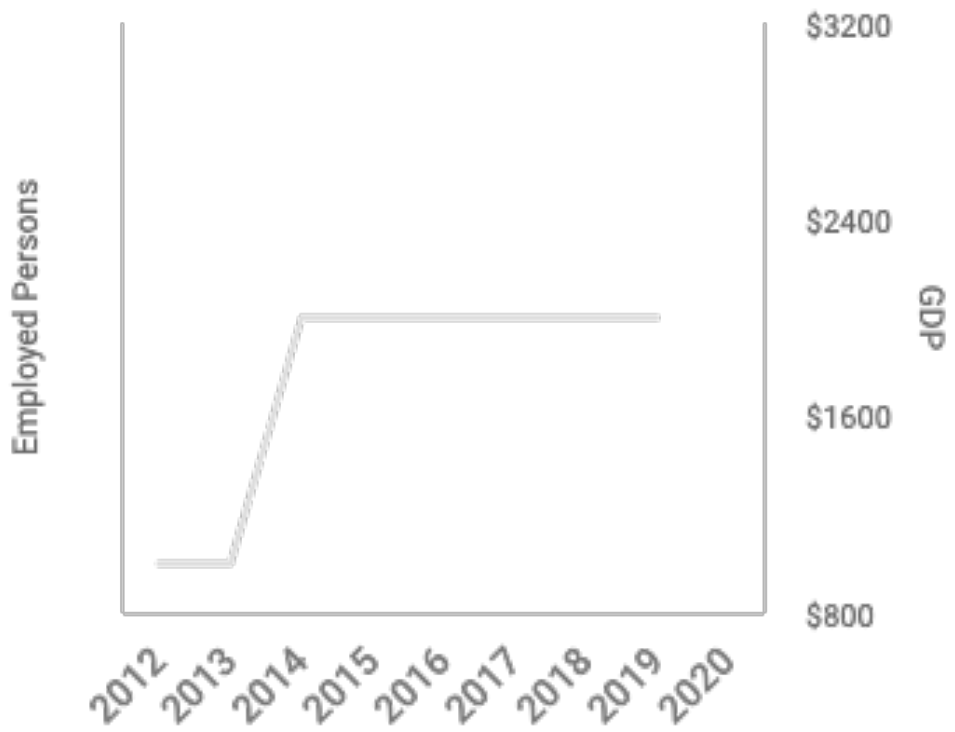
Location Quotient

Economic Impact

March 2021

Employment
N/A

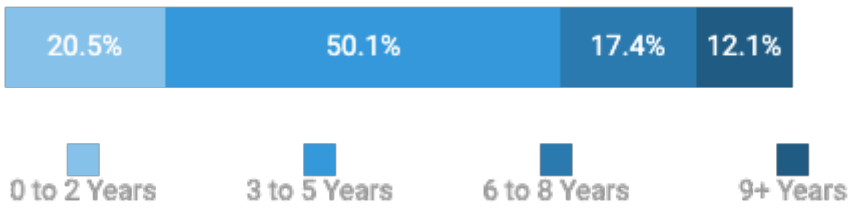
GDP
N/A



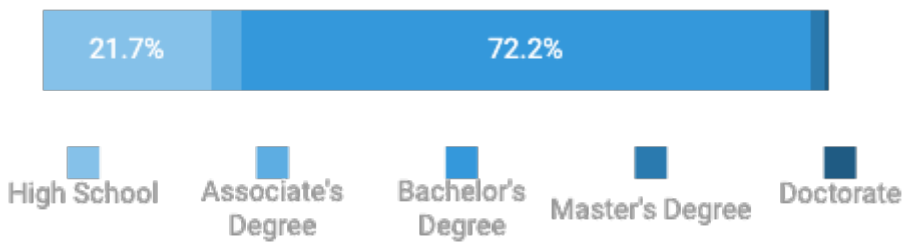
Note: GDP and Employment figures not available for all industries in all years

Source: Bureau of Labor Statistics, Bureau of Economic Analysis

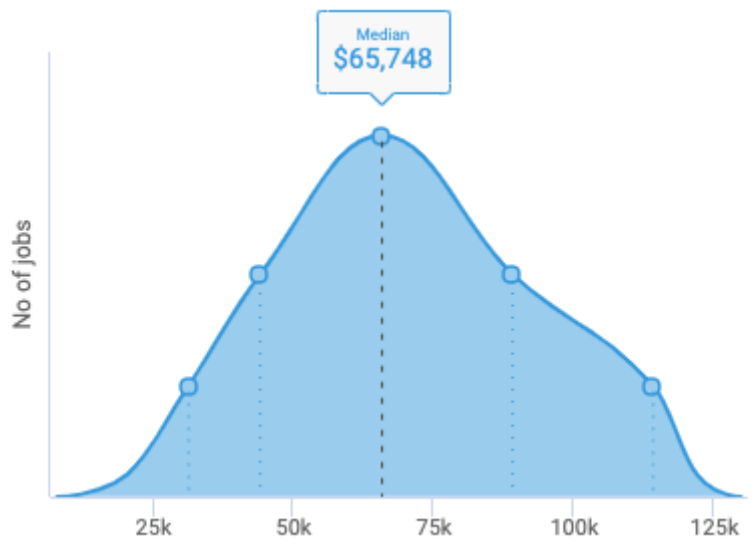
Job Qualifications - Years of Experience



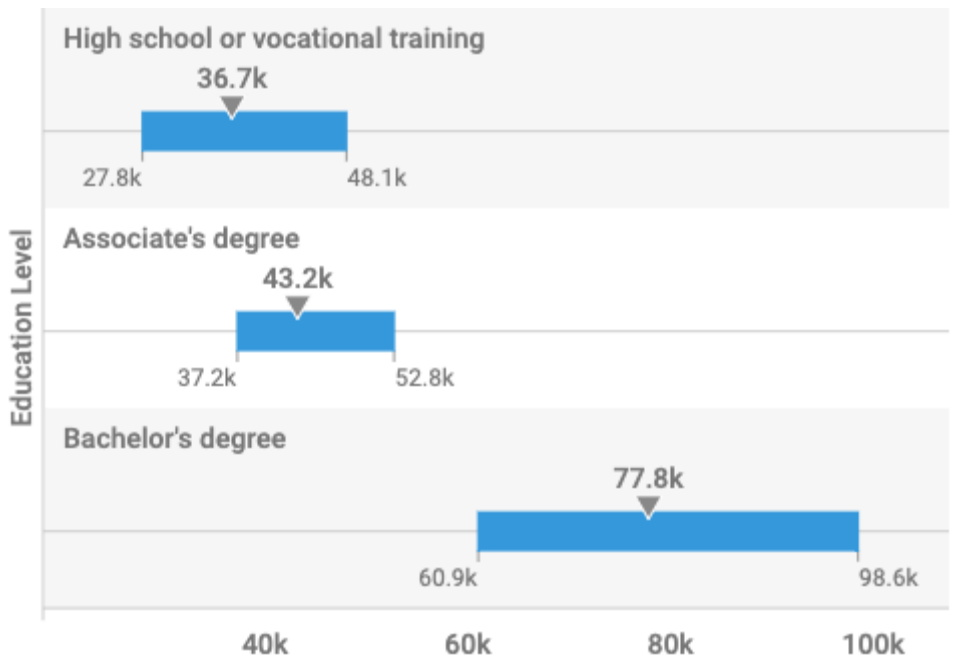
Job Qualifications - Education Level



Salary Overall

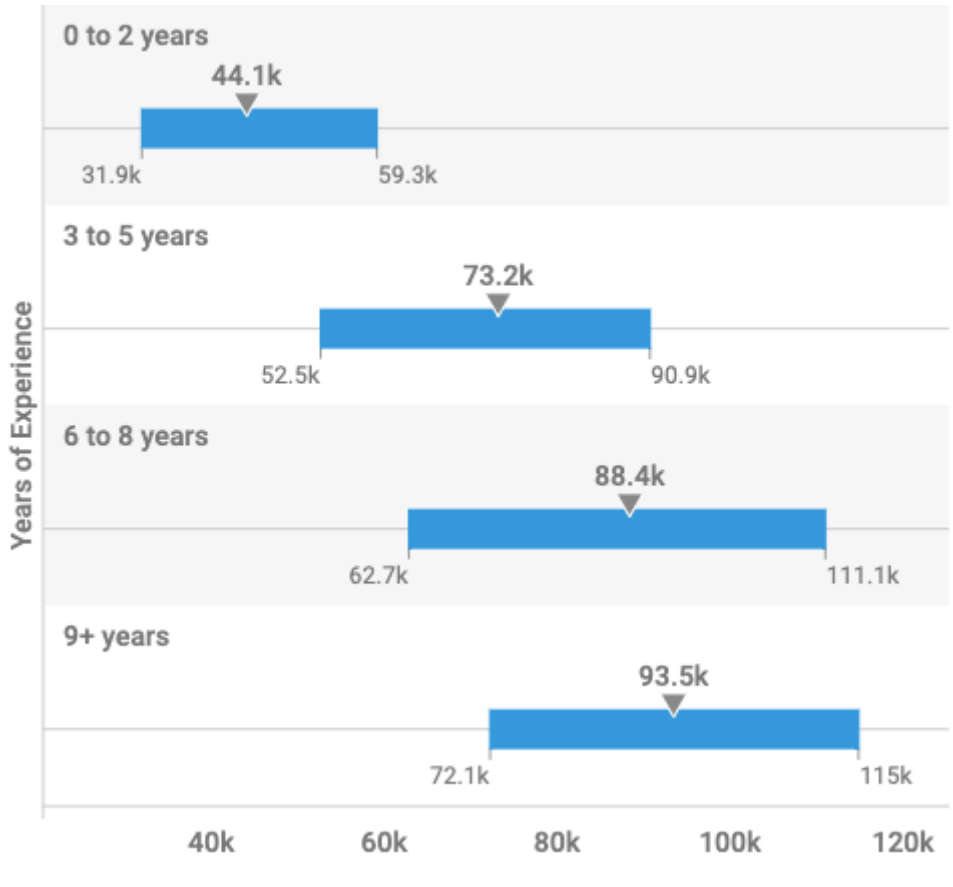


Salary By Education



Salary distribution is not shown for education levels with insufficient sample size

Salary By Experience



Top Requested Occupations

Retail Store Manager
Production Worker
Sales Representative
Software Developer / Engineer
Support Engineer
Application Developer / Engineer
Laborer / Warehouse Worker
Production Plant Manager
Senior Software Developer / Engineer
Manufacturing Quality Manager

Top Requested Skills - Specialized Skills

Project Management
Sales
Scheduling
Budgeting
Customer Service
Product Management
Key Performance Indicators (KPIs)
Technical Support
Repair
Quality Assurance and Control

Top Requested Skills - Baseline Skills

Communication Skills
Problem Solving
Teamwork / Collaboration
Planning
Microsoft Excel
Microsoft Office
Organizational Skills
Troubleshooting
Research
Writing

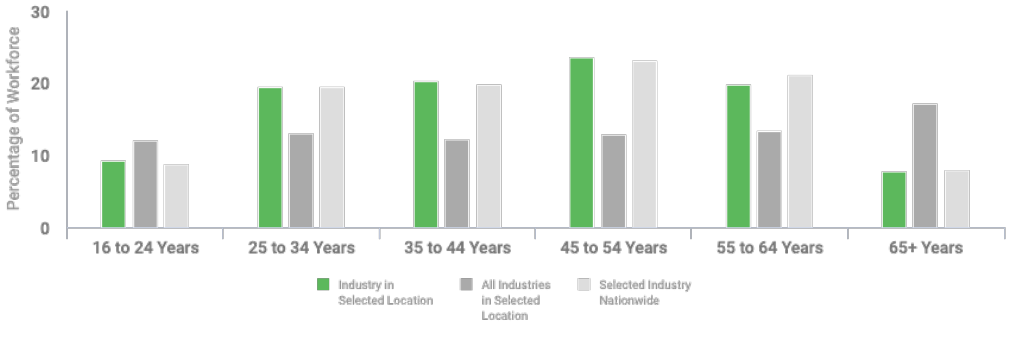
Age Breakdown

Median Age

This Industry in Selected Location
42 Years

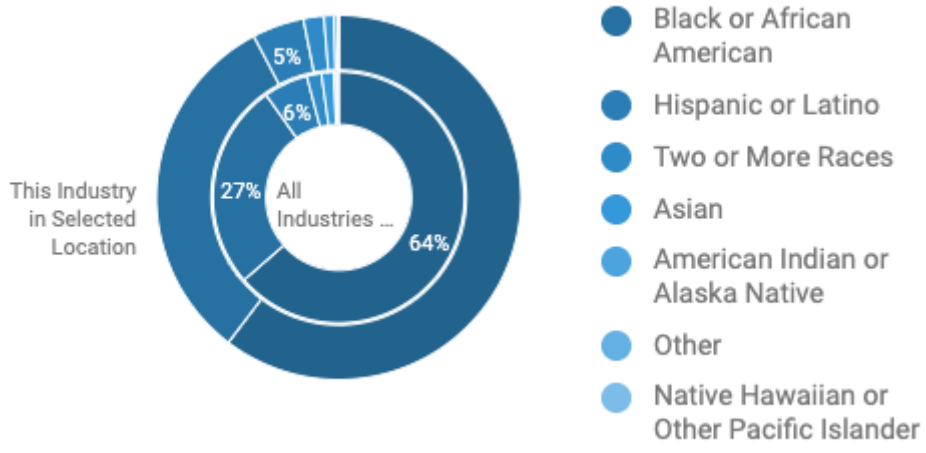
All Industries in Selected Location
39 Years

This Industry Nationwide
43 Years



Source: 2015 - 2019 American Community Survey 5-Year Estimates

Race Breakdown



Source: 2015 - 2019 American Community Survey 5-Year Estimates

Gender Breakdown

70%

All Industries in Selected Location
48.5%

30%

All Industries in Selected Location
51.5%

Source: 2015 - 2019 American Community Survey 5-Year Estimates

Top Occupations in Demand

Specialized Occupation	Occupation	Occupation Family	Job Postings(#) Last 12 months	Job Postings(%) Last 12 months	Projected Growth (10 years)	Salary Range (25th-75th percentile)	Risk of Automation	Location Quotient
Retail Store Manager	Retail Store Manager / Supervisor	Sales	117	6.8%	+11.1%	$50 - 79k	Low Risk	1.2
Production Worker	Production Worker	Manufacturing and Production	52	3.0%	+10.8%	$24 - 27k	High Risk	1.1
Sales Representative	Sales Representative	Sales	44	2.5%	+11.1%	$49 - 74k	Low Risk	1.1
Software Developer / Engineer	Software Developer / Engineer	Information Technology	44	2.5%	+33.7%	$83 - 116k	Low Risk	0.4
Support Engineer	Software Developer / Engineer	Information Technology	33	1.9%	+33.7%	$93 - 103k	Low Risk	2.2
Application Developer / Engineer	Software Developer / Engineer	Information Technology	30	1.7%	+33.7%	$93 - 119k	Low Risk	1
Laborer / Warehouse Worker	Laborer / Warehouse Worker	Business Management and Operations	27	1.6%	+22.2%	$23 - 26k	Medium Risk	1.1
Production Plant Manager	Production Plant Manager	Manufacturing and Production	27	1.6%	+10.5%	$82 - 92k	Low Risk	2.2
Senior Software Developer / Engineer	Software Developer / Engineer	Information Technology	26	1.5%	+33.7%	$88 - 133k	Low Risk	0.4
Manufacturing Quality Manager	Quality Control Systems Manager	Business Management and Operations	25	1.4%	+10.5%	$80 - 119k	Low Risk	1.9

Top Skills in Demand

Skill	Skill Type	Job Postings Requesting Skill(s)(#)	Job Postings Requesting Skill(s)(%)	Projected Growth	Location Quotient
Project Management	Specialized	366	20.5%	-12.7%	0.7
Sales	Specialized	243	13.6%	-7.3%	0.8
Scheduling	Specialized	229	12.8%	0.7%	0.7
Budgeting	Specialized	216	12.1%	-5.8%	0.6
Customer Service	Specialized	216	12.1%	-0.7%	0.6
Product Management	Specialized	212	11.9%	10.7%	0.9
Key Performance Indicators (KPIs)	Specialized	173	9.7%	7.6%	1.1
Technical Support	Specialized	169	9.5%	-6.6%	0.9
Repair	Specialized	163	9.1%	0.1%	0.9
Quality Assurance and Control	Specialized	162	9.1%	13.2%	0.9

Skills in Demand by Occupation

Occupation	Job Postings (#) (Last 12 Months)	Job Postings (%) (Last 12 Months)
Information Technology	**375**	**21.9%**

Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)
SQL	117	31.2%
Project Management	114	30.4%
Python	110	29.3%
Machine Learning	98	26.1%
Java	94	25.1%
Product Management	91	24.3%
Software Development	91	24.3%
Technical Support	82	21.9%
C++	74	19.7%
Artificial Intelligence	73	19.5%
Data Science	68	18.1%
Oracle	66	17.6%
Relational Databases	64	17.1%
Hardware and Software Installation	63	16.8%
Customer Service	61	16.3%
Information Systems	57	15.2%
Linux	56	14.9%
Stakeholder Management	55	14.7%
Microsoft C#	50	13.3%
Big Data	49	13.1%
Process Improvement	49	13.1%
Scheduling	47	12.5%
Customer Contact	42	11.2%
Apache Kafka	38	10.1%
Object Oriented Development Software	38	10.1%
Software Engineering	38	10.1%
Budgeting	37	9.9%
Business Process	36	9.6%
Pipeline (Computing)	35	9.3%
Data Analysis	34	9.1%
Data Visualization	33	8.8%
Product Development	33	8.8%
Root Cause Analysis	33	8.8%
PostgreSQL	32	8.5%
Agile Development	31	8.3%
MongoDB	31	8.3%
NoSQL	31	8.3%
Quality Assurance and Control	31	8.3%
Logistics	30	8%
Scala	30	8%
Apache Hadoop	29	7.7%
Cassandra	29	7.7%

Tableau	29	7.7%
Materials Control	28	7.5%
Data Structures	24	6.4%
DevOps	24	6.4%
Gurobi	24	6.4%
Cisco	23	6.1%
SQL Server Reporting Services (SSRS)	23	6.1%
Data Modeling	21	5.6%

Sales	**358**	**20.9%**

Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)
Sales	175	48.9%
Sales Goals	65	18.2%
Project Management	62	17.3%
Negotiation Skills	61	17%
Product Sales	61	17%
Sales Management	51	14.2%
Customer Service	50	14%
Salesforce	49	13.7%
Business Development	47	13.1%
Business Acumen	46	12.8%
Business Planning	43	12%
Sales Strategy	42	11.7%
Budgeting	39	10.9%
Scheduling	38	10.6%
Key Performance Indicators (KPIs)	36	10.1%
Medical Sales	36	10.1%
Product Management	36	10.1%
Strategic Sales	34	9.5%
Articulating Value Propositions	32	8.9%
Sales Support	32	8.9%
Technical Support	30	8.4%
Customer Contact	27	7.5%
Outside Sales	27	7.5%
Cost Control	26	7.3%
Presentation Design	26	7.3%
Account Management	25	7%
Market Strategy	25	7%
Cancer knowledge	24	6.7%
Sales Planning	24	6.7%
Client Base Retention	23	6.4%
Enterprise Resource Planning (ERP)	22	6.1%
Product Design	22	6.1%
Market Trend	21	5.9%
Product Knowledge	21	5.9%
Chemistry	20	5.6%
Marketing Development	20	5.6%

Process Engineering	20	5.6%
Prospective Clients	20	5.6%
Customer Accounts	19	5.3%
Description and Demonstration of Products	18	5%
Environmental Protection	18	5%
Technical Sales	17	4.7%
Business Management	16	4.5%
Semiconductor Industry Knowledge	16	4.5%
Customer Relationship Management (CRM)	15	4.2%
Direct Sales	15	4.2%
SAP	15	4.2%
Sales Channels	15	4.2%
Sales Training	15	4.2%
Biotechnology	14	3.9%

Manufacturing and Production	**229**	**13.4%**

Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)
Quality Assurance and Control	60	26.2%
Quality Management	54	23.6%
5S Methodology	39	17%
Key Performance Indicators (KPIs)	37	16.2%
Hand Tools	34	14.8%
Scheduling	32	14%
Budgeting	30	13.1%
Business Acumen	30	13.1%
Wiring	30	13.1%
Basic Mathematics	29	12.7%
Presentation Design	28	12.2%
Repair	25	10.9%
SAP	25	10.9%
Schematic Diagrams	23	10%
Lean Manufacturing	20	8.7%
Calipers	19	8.3%
Competitive Analysis	19	8.3%
Enterprise Resource Planning (ERP)	19	8.3%
Manufacturing Industry Knowledge	19	8.3%
Manufacturing Processes	19	8.3%
Marketing	19	8.3%
Marketing Management	19	8.3%
Negotiation Skills	19	8.3%
Process Improvement	19	8.3%
Product Promotion	19	8.3%
Packaging	18	7.9%
Kaizen	17	7.4%
Machining	17	7.4%
Process Control	17	7.4%
Statistical Process Control (SPC)	17	7.4%

Computer Numerical Control (CNC)	16	7%
Machine Operation	16	7%
Cancer knowledge	15	6.6%
Current Good Manufacturing Practices (CGMP)	15	6.6%
Environmental Protection	15	6.6%
Forklift Operation	15	6.6%
Personal Protective Equipment (PPE)	15	6.6%
Engineering Drawings	14	6.1%
Export Administration Regulations	13	5.7%
Welding	13	5.7%
Chemistry	12	5.2%
Electromechanical Assemblies	12	5.2%
International Traffic in Arms Regulations (ITAR)	12	5.2%
Kanban	12	5.2%
Bill of Materials	11	4.8%
Calculation	11	4.8%
Engineering Specifications	11	4.8%
Equipment Cleaning	11	4.8%
Good Manufacturing Practices (GMP)	11	4.8%
Circuit Board	10	4.4%

Business Management and Operations	**202**	**11.8%**

Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)
Project Management	66	32.7%
SAP	54	26.7%
Budgeting	53	26.2%
Scheduling	39	19.3%
Purchasing	32	15.8%
Quality Management	32	15.8%
Business Acumen	28	13.9%
Key Performance Indicators (KPIs)	27	13.4%
Project Planning and Development Skills	25	12.4%
Supply Chain Management	24	11.9%
Customer Contact	20	9.9%
Quality Assurance and Control	20	9.9%
Supply Chain Knowledge	20	9.9%
Customer Service	19	9.4%
Logistics	18	8.9%
Microsoft Project	18	8.9%
Cost Control	17	8.4%
Enterprise Resource Planning (ERP)	17	8.4%
Inventory Management	16	7.9%
Prospective Clients	15	7.4%
Kanban	14	6.9%
Program Management	14	6.9%
Forklift Operation	13	6.4%
Process Control	13	6.4%

Packaging	12	5.9%
Business Management	11	5.4%
Cancer knowledge	11	5.4%
Environmental Protection	11	5.4%
Inventory Control	11	5.4%
Negotiation Skills	11	5.4%
System Design	11	5.4%
5S Methodology	10	5%
Business Process	10	5%
Circuit Board	10	5%
Manufacturing Resource Planning (MRP)	10	5%
Materials Control	10	5%
Process Improvement	10	5%
Procurement	10	5%
Record Keeping	10	5%
Systems Engineering	10	5%
Current Good Manufacturing Practices (CGMP)	9	4.5%
Lean Six Sigma	9	4.5%
Oracle	9	4.5%
Presentation Design	9	4.5%
Product Development	9	4.5%
Product Improvement	9	4.5%
Statistical Process Control (SPC)	9	4.5%
Accounting	8	4%
Business Planning	8	4%
Business Strategy	8	4%

Engineering	**188**	**11%**

Skill	**Job Postings Requesting Skill(s) (#) (Last 12 Months)**	**Job Postings Requesting Skill(s) (%) (Last 12 Months)**
Project Management	35	18.6%
Manufacturing Processes	32	17%
Repair	30	16%
Quality Assurance and Control	26	13.8%
AutoCAD	25	13.3%
Scheduling	24	12.8%
Industrial Engineering Industry Expertise	22	11.7%
Budgeting	20	10.6%
Process Engineering	19	10.1%
Product Development	19	10.1%
Technical Writing / Editing	18	9.6%
Customer Service	17	9%
Mechanical Engineering	17	9%
Process Improvement	17	9%
Lean Manufacturing	16	8.5%
Root Cause Analysis	16	8.5%
ISO 9001 Standards	15	8%
New Product Development	15	8%

Product Improvement	15	8%
SQL	15	8%
Data Collection	14	7.4%
Industrial Engineering	14	7.4%
Manufacturing Engineering	14	7.4%
SolidWorks	14	7.4%
Systems Engineering	14	7.4%
3D Modeling / Design	13	6.9%
Customer Contact	13	6.9%
Key Performance Indicators (KPIs)	13	6.9%
Product Design	13	6.9%
Test Equipment	13	6.9%
Electrical Design	12	6.4%
Engineering Management	12	6.4%
Packaging	12	6.4%
Quality Management	12	6.4%
Statistical Process Control (SPC)	12	6.4%
Calculation	11	5.9%
SAP	11	5.9%
Algorithm Development	10	5.3%
Automation Systems	10	5.3%
Computer Aided Drafting/Design (CAD)	10	5.3%
Failure Mode and Effects Analysis (FMEA)	10	5.3%
Just-In-Time	10	5.3%
Just-In-Time (JIT) Production	10	5.3%
Mechanical Design	10	5.3%
Wiring	10	5.3%
System Administration	9	4.8%
Tableau	9	4.8%
Data Analysis	8	4.3%
Electrical Engineering	8	4.3%
Kaizen	8	4.3%

Marketing and Public Relations	**110**	**6.4%**

Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)
Product Management	61	55.5%
Project Management	42	38.2%
Product Marketing	32	29.1%
Key Performance Indicators (KPIs)	30	27.3%
Budgeting	26	23.6%
Digital Marketing	26	23.6%
Marketing Communications	26	23.6%
Competitive Analysis	24	21.8%
Cancer knowledge	23	20.9%
Articulating Value Propositions	22	20%
Marketing Development	22	20%
Market Analysis	21	19.1%

Environmental Protection	20	18.2%
Market Strategy	19	17.3%
Marketing Programs	19	17.3%
Business-to-Business	18	16.4%
Customer Contact	18	16.4%
Market Trend	18	16.4%
Business Development	17	15.5%
Market Research	17	15.5%
Marketing	17	15.5%
Business Strategy	16	14.5%
E-Commerce	15	13.6%
Stakeholder Management	15	13.6%
Consumer Segmentation	14	12.7%
Customer Acquisition	14	12.7%
Molecular Biology	14	12.7%
Product Development	14	12.7%
Sales	13	11.8%
Business Acumen	12	10.9%
Lifecycle Management	12	10.9%
Social Media	12	10.9%
Biology	11	10%
Consumer Research	11	10%
Content Management	11	10%
New Product Development	11	10%
Biotechnology	10	9.1%
Global Marketing	10	9.1%
Process Improvement	9	8.2%
Software Development	9	8.2%
Adobe Experience Manager (AEM)	8	7.3%
Biochemistry	8	7.3%
Branding Strategy	8	7.3%
Content Management Systems (CMS)	8	7.3%
Customer Service	8	7.3%
Genomics	8	7.3%
Market Planning	8	7.3%
Marketo	8	7.3%
Salesforce	8	7.3%
Thought Leadership	8	7.3%

Design, Media, and Writing	**76**	**4.4%**

Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)
Product Management	48	63.2%
Product Development	19	25%
New Product Development	18	23.7%
Market Analysis	17	22.4%
Lifecycle Management	16	21.1%
Market Trend	12	15.8%

Product Marketing	12	15.8%
Project Management	12	15.8%
Articulating Value Propositions	11	14.5%
Cancer knowledge	11	14.5%
Customer Contact	11	14.5%
Environmental Protection	11	14.5%
Business Development	10	13.2%
Budgeting	9	11.8%
Business Strategy	9	11.8%
Consumer Research	9	11.8%
Key Performance Indicators (KPIs)	9	11.8%
Market Research	9	11.8%
Software Development	9	11.8%
Technical Writing / Editing	9	11.8%
Molecular Biology	8	10.5%
Negotiation Skills	8	10.5%
Six Sigma	8	10.5%
Biochemistry	7	9.2%
Business Case Analysis	7	9.2%
Genomics	7	9.2%
Marketing Communications	7	9.2%
Presentation Design	7	9.2%
Scheduling	7	9.2%
Stakeholder Management	7	9.2%
Strategic Development	7	9.2%
Adobe Acrobat	6	7.9%
Adobe Indesign	6	7.9%
Adobe Photoshop	6	7.9%
Change Management	6	7.9%
Competitive Analysis	6	7.9%
Cost Control	6	7.9%
Customer Service	6	7.9%
Industrial Design	6	7.9%
Industrial Engineering Industry Expertise	6	7.9%
Simulation	6	7.9%
Strategic Sales	6	7.9%
Technical Support	6	7.9%
Adobe Creative Suite	5	6.6%
Adobe Illustrator	5	6.6%
Chemistry	5	6.6%
Conflict Management	5	6.6%
Description and Demonstration of Products	5	6.6%
Direct Sales	5	6.6%
Histocompatibility	5	6.6%

Maintenance, Repair, and Installation	**68**	**4%**

Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)

Repair	50	73.5%
Scheduling	20	29.4%
Predictive / Preventative Maintenance	16	23.5%
Machinery	12	17.6%
Schematic Diagrams	12	17.6%
Energy Management	11	16.2%
HVAC	11	16.2%
Microprocessors	10	14.7%
Electronics Industry Knowledge	9	13.2%
5S Methodology	8	11.8%
Power Tools	8	11.8%
Product Sales	8	11.8%
Facility Maintenance	7	10.3%
Technical Support	7	10.3%
Test Equipment	7	10.3%
Calibration	6	8.8%
Cleaning	6	8.8%
Electrical Work	6	8.8%
Plumbing	6	8.8%
Welding	6	8.8%
Wiring	6	8.8%
Brazing	5	7.4%
Carpentry	5	7.4%
Equipment Repair	5	7.4%
Industrial Operations Industry Knowledge	5	7.4%
Kaizen	5	7.4%
Lean Manufacturing	5	7.4%
Lifting Ability	5	7.4%
Machine Tools	5	7.4%
National Electrical Code	5	7.4%
Personal Protective Equipment (PPE)	5	7.4%
Process Improvement	5	7.4%
Routers	5	7.4%
SAP	5	7.4%
Ammeters	4	5.9%
Basic Mathematics	4	5.9%
Boilers	4	5.9%
Chemistry	4	5.9%
Circuit Breakers	4	5.9%
Circuit Diagrams	4	5.9%
Conduit Installation	4	5.9%
Cooking	4	5.9%
Data Entry	4	5.9%
Electrical Wiring	4	5.9%
Emergency Lighting	4	5.9%
Equipment Maintenance	4	5.9%
Equipment Moving	4	5.9%

Estimating	4	5.9%
Good Manufacturing Practices (GMP)	4	5.9%
Laundry	4	5.9%

Planning and Analysis	**41**	**2.4%**

Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)
Project Management	14	34.1%
Customer Service	11	26.8%
Business Analysis	10	24.4%
Business Process	9	22%
Key Performance Indicators (KPIs)	8	19.5%
SQL	8	19.5%
Business Development	7	17.1%
Process Improvement	7	17.1%
Data Analysis	6	14.6%
Data Science	6	14.6%
Microsoft Power BI	6	14.6%
Product Management	6	14.6%
Customer Contact	5	12.2%
Enterprise Resource Planning (ERP)	5	12.2%
SAP	5	12.2%
Budgeting	4	9.8%
Business Intelligence	4	9.8%
Business Strategy	4	9.8%
Oracle	4	9.8%
Product Knowledge	4	9.8%
SQL Server	4	9.8%
Sales	4	9.8%
Visual Basic for Applications (VBA)	4	9.8%
Cancer knowledge	3	7.3%
Clinical Trials	3	7.3%
Data Management	3	7.3%
Data Migration	3	7.3%
Data Mining	3	7.3%
Data Modeling	3	7.3%
Data Quality	3	7.3%
End-user training	3	7.3%
Environmental Protection	3	7.3%
Information Systems	3	7.3%
Lifecycle Management	3	7.3%
Master Data Management (MDM)	3	7.3%
Microsoft Project	3	7.3%
Microsoft Sharepoint	3	7.3%
Python	3	7.3%
Quality Management	3	7.3%
Salesforce	3	7.3%
Software Engineering	3	7.3%

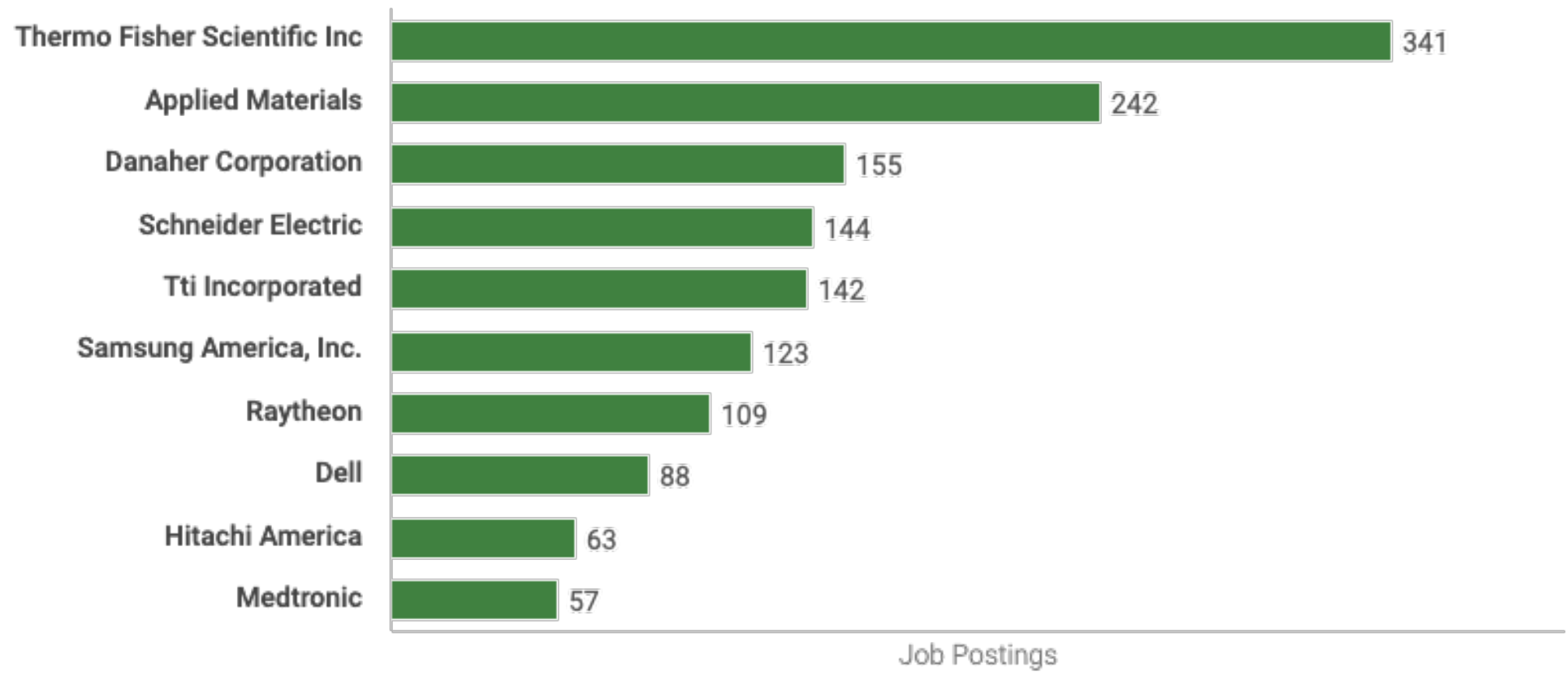
Supply Chain Knowledge	3	7.3%
Accounting	2	4.9%
Biomedical Engineering	2	4.9%
Business Acumen	2	4.9%
Business Planning	2	4.9%
Change Management	2	4.9%
Clinical Devices	2	4.9%
Clinical Experience	2	4.9%
Clinical Research	2	4.9%

Human Resources	**40**	**2.3%**

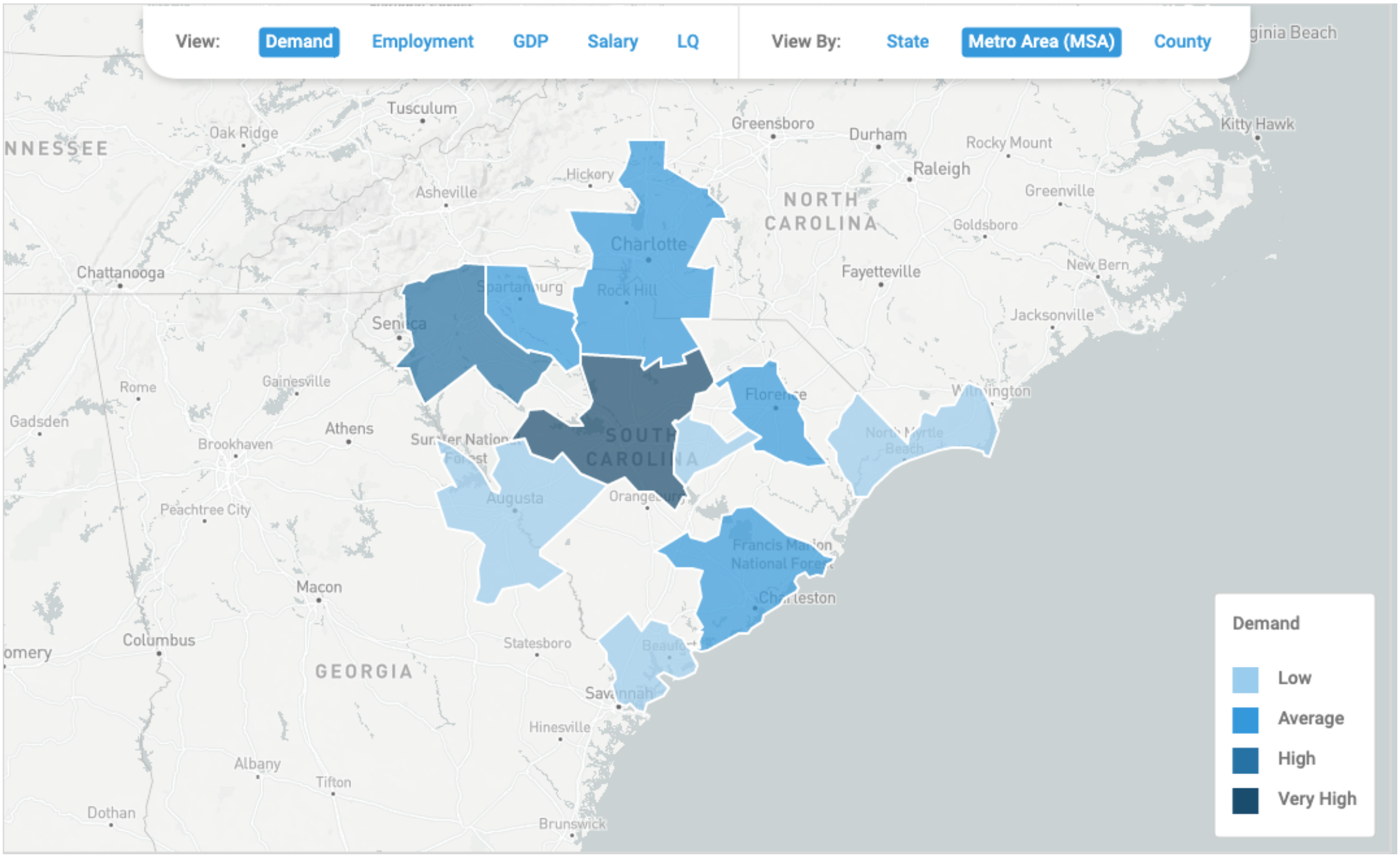
Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)
Employee Relations	14	35%
Onboarding	11	27.5%
Performance Management	9	22.5%
Scheduling	8	20%
Human Resource Information System (HRIS)	7	17.5%
Talent Acquisition	6	15%
Customer Service	5	12.5%
Human Resource Management	5	12.5%
Recruiting	5	12.5%
Applicant Tracking System	4	10%
Case Management	4	10%
Labor Relations	4	10%
Leadership Development	4	10%
Administrative Functions	3	7.5%
Business Administration	3	7.5%
Compliance Auditing	3	7.5%
Employee Relations Investigations	3	7.5%
Employee Training	3	7.5%
HR Metrics	3	7.5%
New Hire Orientation	3	7.5%
Payroll Processing	3	7.5%
Project Management	3	7.5%
Succession Planning	3	7.5%
Tableau	3	7.5%
Talent Management	3	7.5%
Technical Training	3	7.5%
Training Materials	3	7.5%
Administrative Support	2	5%
Adult Education	2	5%
Benchmarking	2	5%
Benefits Administration / Management	2	5%
Budgeting	2	5%
Business Strategy	2	5%
Cancer knowledge	2	5%
Change Management	2	5%

Clerical Duties	2	5%
Corporate Recruiting	2	5%
Customer Contact	2	5%
Data Entry	2	5%
Database Management	2	5%
Employee Engagement	2	5%
Environmental Protection	2	5%
Financial Analysis	2	5%
International Traffic in Arms Regulations (ITAR)	2	5%
Invoice Processing	2	5%
Key Performance Indicators (KPIs)	2	5%
Learning Management System	2	5%
Microsoft Visio	2	5%
Negotiation Skills	2	5%
New Product Information	2	5%

Top Employers



Top Locations



Metro Area (MSA)	Job Postings (Last 12 Months)	Employment (Last 12 Months)	GDP	Median Salary (in Thousands)	Location Quotient
Columbia, SC	471	NA	$2K	$67k	0.9
Greenville-Anderson-Mauldin, SC	343	NA	$6K	$64k	1.0
Charleston-North Charleston, SC	302	NA	$4K	$73k	0.4
Spartanburg, SC	82	NA	$3K	$56k	0.8
Charlotte-Concord-Gastonia, NC-SC	74	NA	$9K	$68k	0.3
Florence, SC	66	NA	$1K	$56k	0.8
Hilton Head Island-Bluffton-Beaufort, SC	61	NA	N/A	$73k	0.4
Sumter, SC	32	NA	$1K	$88k	0.8
Myrtle Beach-Conway-North Myrtle Beach, SC-NC	25	NA	N/A	$52k	0.2
Augusta-Richmond County, GA-SC	21	NA	$2K	$66k	0.2

Source: Bureau of Labor Statistics, Bureau of Economic Analysis

CHARLESTON • SC
DIGITAL CORRIDOR
WHERE TECH THRIVES™

July 14, 2021

To: The South Carolina Commission on Higher Education
1122 Lady Street
Columbia, SC 29201

From: The Charleston Digital Corridor
997 Morrison Dr Ste 200
Charleston, SC 29403

To the South Carolina Commission on Higher Education,

The Charleston Digital Corridor (CDC) endorses the College of Charleston's initiative to establish a Bachelor's degree program in Software Engineering. As the Charleston economy continues to growth, it is important for the College of Charleston to continue to develop and offer such relevant degree programs that contribute to the workforce pipeline.

The CDC is The Charleston Digital Corridor is a community-sourced initiative to attract, nurture and promote the regions tech economy through an array of impactful programs, products and events while leveraging Charleston's renowned livability.

Sincerely,

Ernest Andrade
Executive Director

CHARLESTON COUNTY ▪ SC
ECONOMIC DEVELOPMENT

July 22, 2021

To: The South Carolina Commission on Higher Education
1122 Lady Street
Columbia, SC 29201

From: Charleston County Economic Development
4000 Faber Place Dr.
Suite 200
North Charleston, SC 29405

Dear Commissioners:

I am writing this letter on behalf of the Charleston County Economic Development Office to endorse the College of Charleston's initiative to establish a Bachelor's degree program in Software Engineering. As the Charleston economy continues to grow, I believe it is important for the College of Charleston to continue to develop and offer such relevant degree programs that contribute to the workforce pipeline.

The Charleston County Economic Development Office was founded by Charleston County Council in 1993 and has as its mission: to recruit, retain, and expand primary businesses, and to safeguard and improve the local business climate. Our program has achieved great success over the past 25 years, helping companies create nearly 36,000 jobs and invest nearly $7 billion in Charleston County. We support The Boeing Company, Mercedes Benz Vans, Cummins, and a variety of other major domestic and international companies operating in the manufacturing, distribution, information technology, and life sciences sectors. In support of these employers, our staff is actively engaged with our K-12, technical college, higher education, and workforce development partners to support the full spectrum of education, training, and continuing education offerings for our citizens.

The growth of our Information Technology sector over the past 25 years has been nothing short of astounding. Thousands of electric engineering, software, and cyber-security jobs are supported by the presence of the Naval Warfare Information Center located at the Navy Weapons Station on Remount Rd. The Boeing Company has created "Centers of Excellence" in both Engineering and Information Technology at two facilities in North Charleston. The Digital Corridor has supported IT entrepreneurs since 2000, and recently cut a ribbon earlier this year on its $54 million 92,000 sq. ft. Charleston Technical Center in downtown Charleston. Companies like Blackbaud, benefitfocus.com, and Automated Trading Desk have secured multiple rounds of venture capital, been acquired, or gone public in recent years.

In closing, a Bachelor's degree in Software Engineering will be a value-added offering in the Charleston area with great relevance to every economic target area that we address. I respectfully urge you to support this important request by the College of Charleston.

Sincerely,

Steve Dykes
Executive Director

Source: Labor Insight (Burning Glass Technologies)

Industry Analysis

Active Selections

SC, Finance and Insurance (52), Professional, Scientific, and Technical Services (54)

Key Metrics

Job Postings

Last 12 Months

Average Demand
43,166

Unemployment Rate

Apr 2021

2.4%

Projected Growth

10 Years

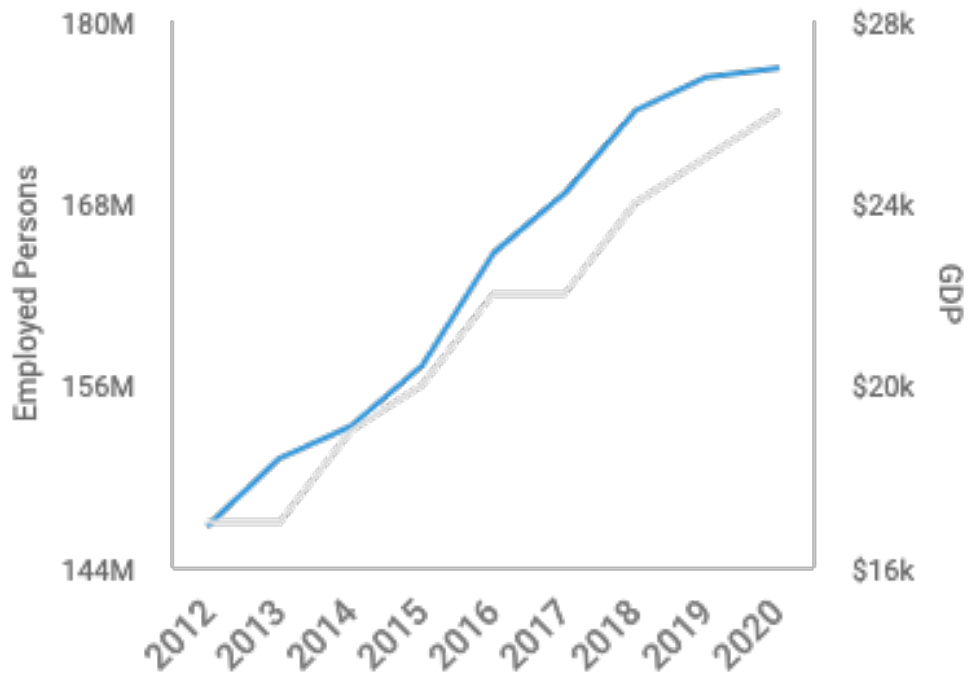
Location Quotient

Economic Impact

March 2021

Employment
176.9M
Ranked #47
Nationwide

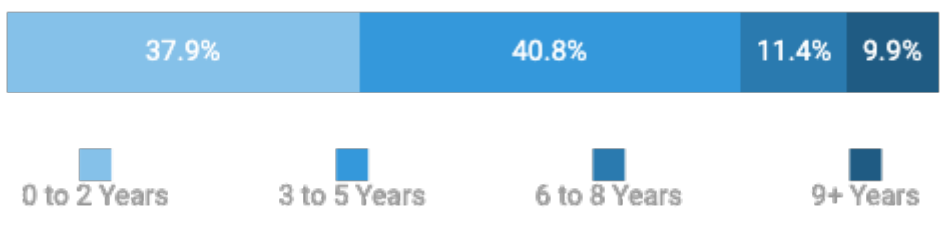
GDP
$26K
Ranked #55
Nationwide



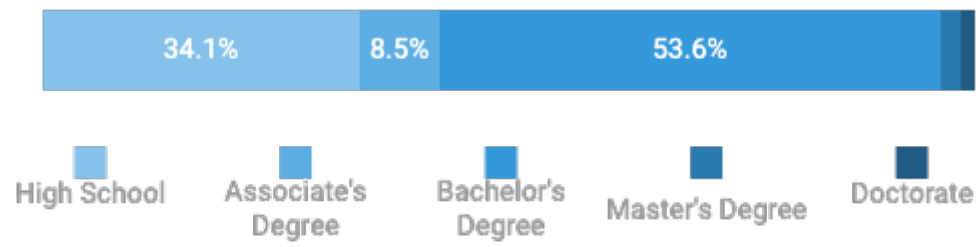
Note: GDP and Employment figures not available for all industries in all years

Source: Bureau of Labor Statistics, Bureau of Economic Analysis

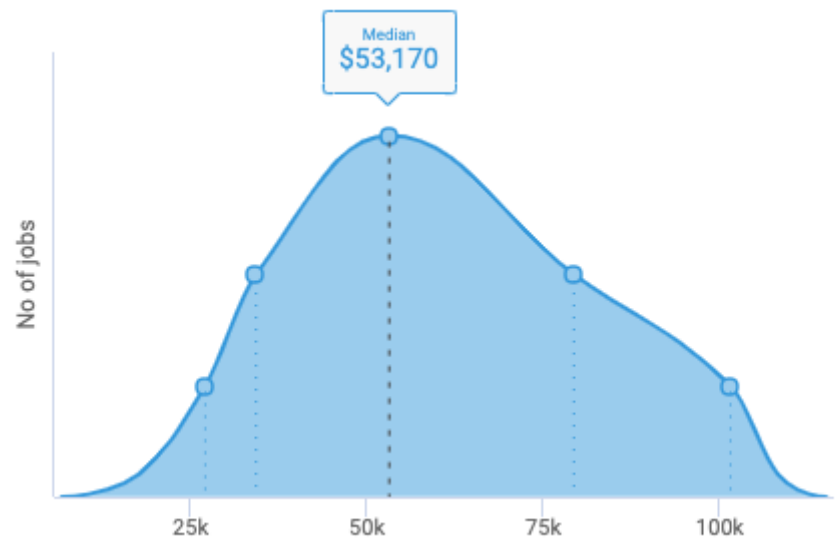
Job Qualifications - Years of Experience



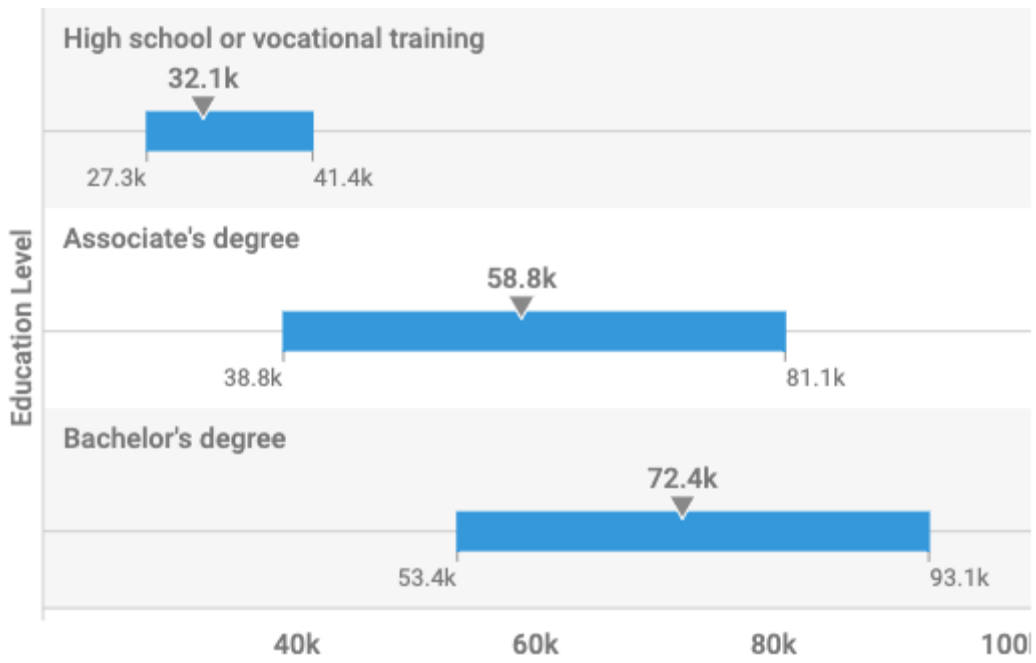
Job Qualifications - Education Level



Salary Overall

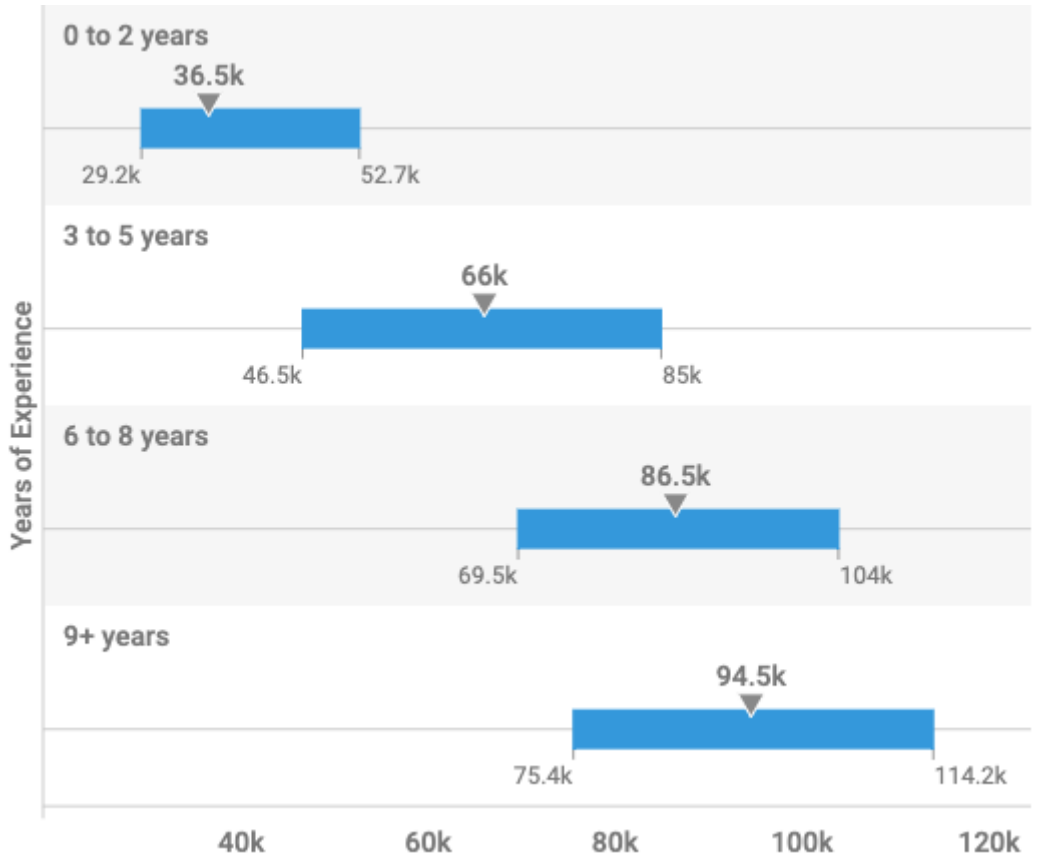


Salary By Education



Salary distribution is not shown for education levels with insufficient sample size

Salary By Experience



Top Requested Occupations

Life / Health Insurance Sales Agent
Customer Service Representative (General)
Insurance Sales Agent (General)
Veterinarian
Teller (General)
Personal Banker (General)
Sales Representative
Mortgage Loan Officer
Software Developer / Engineer
Paralegal / Legal Assistant

Top Requested Skills - Specialized Skills

Customer Service
Sales
Scheduling
Project Management
Customer Contact
Budgeting
Insurance Sales
SQL
Product Sales
Quality Assurance and Control

Top Requested Skills - Baseline Skills

Communication Skills
Microsoft Office
Problem Solving
Teamwork / Collaboration
Organizational Skills
Detail-Oriented
Microsoft Excel
Research
Planning
Written Communication

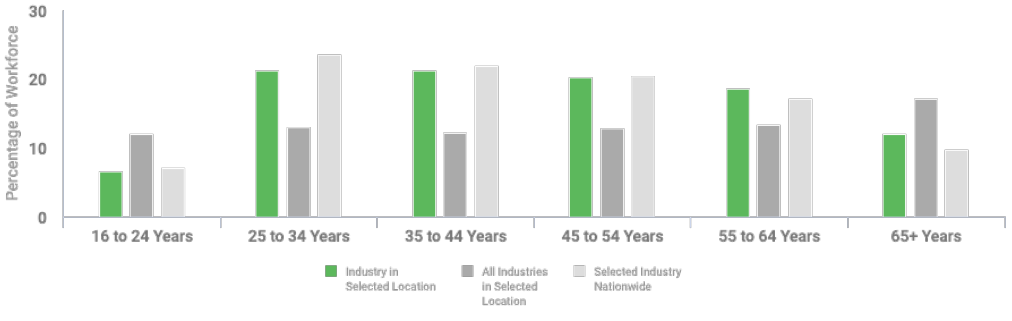
Age Breakdown

Median Age

These Industries in Selected Location
41 Years

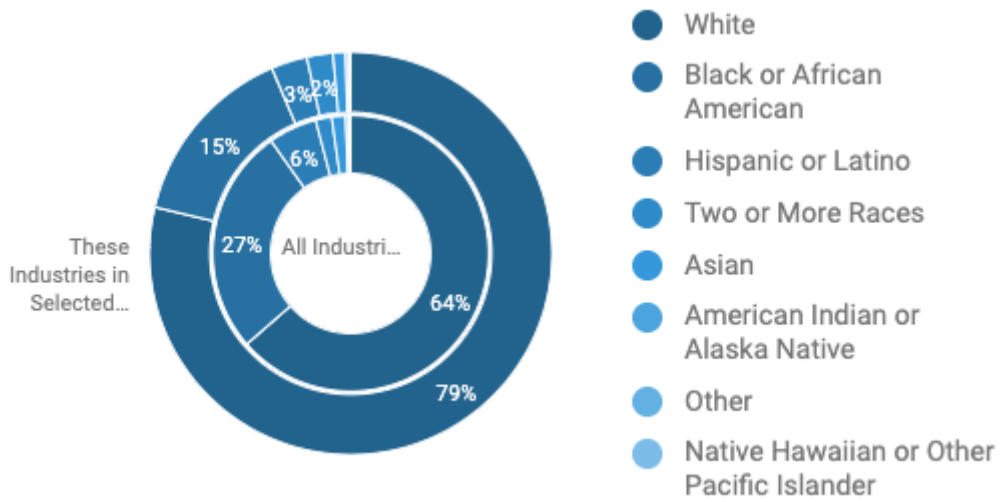
All Industries in Selected Location
39 Years

These Industries Nationwide
40 Years



Source: 2015 - 2019 American Community Survey 5-Year Estimates

Race Breakdown



Source: 2015 - 2019 American Community Survey 5-Year Estimates

Gender Breakdown

45.1%

All Industries in Selected Location
48.5%

54.9%

All Industries in Selected Location
51.5%

Source: 2015 - 2019 American Community Survey 5-Year Estimates

Top Occupations in Demand

Specialized Occupation	Occupation	Occupation Family	Job Postings(#) Last 12 months	Job Postings(%) Last 12 months	Projected Growth (10 years)	Salary Range (25th-75th percentile)	Risk of Automation	Location Quotient
Life / Health Insurance Sales Agent	Insurance Sales Agent	Finance	1,392	3.5%	+10.3%	$41 - 70k	High Risk	1.1
Customer Service Representative (General)	Customer Service Representative	Customer and Client Support	967	2.5%	+10.2%	$26 - 32k	Medium Risk	1.5
Insurance Sales Agent (General)	Insurance Sales Agent	Finance	955	2.4%	+10.3%	$33 - 51k	High Risk	1
Veterinarian	Veterinarian	Health Care including Nursing	831	2.1%	+17.9%	$73 - 86k	Low Risk	1.9
Teller (General)	Teller	Finance	814	2.1%	-5.6%	$22 - 28k	High Risk	1.2
Personal Banker (General)	Personal Banker / Banking Sales Staff	Finance	758	1.9%	+12.4%	$30 - 36k	Low Risk	1.2
Sales Representative	Sales Representative	Sales	736	1.9%	+11.1%	$36 - 59k	Low Risk	1
Mortgage Loan Officer	Loan Officer	Finance	729	1.8%	+15.4%	$44 - 70k	High Risk	1
Software Developer / Engineer	Software Developer / Engineer	Information Technology	605	1.5%	+33.7%	$72 - 101k	Low Risk	0.6
Paralegal / Legal Assistant	Paralegal / Legal Assistant	Law, Compliance, and Public Safety	579	1.5%	+15.7%	$33 - 43k	High Risk	0.9

Top Skills in Demand

Skill	Skill Type	Job Postings Requesting Skill(s)(#)	Job Postings Requesting Skill(s)(%)	Projected Growth	Location Quotient
Customer Service	Specialized	8,784	21.9%	-0.7% ↘	0.9 –
Sales	Specialized	6,085	15.2%	-7.3% ↘	0.9 –
Scheduling	Specialized	4,734	11.8%	0.7% ↗	0.9 –
Project Management	Specialized	4,563	11.4%	-12.7% ↘	0.8 ⌄
Customer Contact	Specialized	4,231	10.5%	-5.8% ↘	0.9 –
Budgeting	Specialized	3,502	8.7%	-5.8% ↘	0.7 ⌄
Insurance Sales	Specialized	2,211	5.5%	-9.2% ↘	1.1 –
SQL	Software and Programming	2,209	5.5%	-6.6% ↘	0.7 ⌄
Product Sales	Specialized	2,182	5.4%	-5.3% ↘	1.0 –
Quality Assurance and Control	Specialized	2,080	5.2%	13.2% ↗	0.8 ⌄

Skills in Demand by Occupation

Occupation	Job Postings (#) (Last 12 Months)	Job Postings (%) (Last 12 Months)
Finance	**9,630**	**24.6%**

Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)
Sales	2,398	24.9%
Customer Service	2,375	24.7%
Insurance Sales	1,898	19.7%
Customer Contact	1,539	16%
Accounting	1,168	12.1%
Mortgage Lending	1,085	11.3%
Product Sales	960	10%
Mortgage Underwriting	955	9.9%
Risk Management	934	9.7%
Insurance Underwriting	808	8.4%
Nationwide Mortgage Licensing System (NMLS)	789	8.2%
Financial Analysis	746	7.7%
Budgeting	735	7.6%
Cash Handling	671	7%
Cross Sell	647	6.7%
Financial Statements	611	6.3%
Life Insurance Sales	584	6.1%
Health Insurance Sales	574	6%
Sales Goals	562	5.8%
Prospective Clients	558	5.8%
Product Knowledge	544	5.6%
Appointment Setting	514	5.3%
Loan Processing	482	5%
Bank Secrecy Act (BSA)	478	5%
Sales Principles	478	5%
Scheduling	477	5%
Health Insurance Portability and Accountability Act (HIPAA)	463	4.8%
Financial Reporting	462	4.8%
Customer Checkout	456	4.7%
Account Reconciliation	440	4.6%
Business Development	435	4.5%
Claims Knowledge	412	4.3%
Financial Responsibility	403	4.2%
Project Management	395	4.1%
Financial Services Industry Experience	393	4.1%
Retail Industry Knowledge	393	4.1%
Onboarding	387	4%
Claims Adjustments	354	3.7%
Business Administration	342	3.6%
Staff Management	333	3.5%
Benefits Administration / Management	325	3.4%
Customer Billing	322	3.3%

Mobile Banking	321	3.3%
Calculation	320	3.3%
Spreadsheets	320	3.3%
Legal Compliance	319	3.3%
Financial Advising	293	3%
Cold Calling	291	3%
Data Entry	288	3%
General Ledger	287	3%

Information Technology	**6,053**	**15.5%**

Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)
SQL	1,363	22.5%
Software Development	1,061	17.5%
Project Management	1,016	16.8%
Information Systems	935	15.4%
Customer Service	764	12.6%
Python	754	12.5%
Technical Support	750	12.4%
Linux	699	11.5%
Java	697	11.5%
Software Engineering	625	10.3%
Information Security	608	10%
Business Process	575	9.5%
JavaScript	555	9.2%
Scheduling	544	9%
Information Technology Industry Knowledge	494	8.2%
Oracle	487	8%
Budgeting	483	8%
Scrum	477	7.9%
Network Security	475	7.8%
System Administration	475	7.8%
Technical Writing / Editing	473	7.8%
DevOps	458	7.6%
Microsoft Active Directory	455	7.5%
Microsoft C#	450	7.4%
VMware	418	6.9%
Cisco	413	6.8%
Systems Analysis	411	6.8%
Quality Assurance and Control	400	6.6%
UNIX	393	6.5%
Agile Development	377	6.2%
SQL Server	376	6.2%
.NET	365	6%
Systems Development Life Cycle (SDLC)	358	5.9%
Network Engineering	345	5.7%
Microsoft PowerShell	339	5.6%
Microsoft Azure	333	5.5%

Systems Engineering	328	5.4%
Microsoft Sharepoint	323	5.3%
ITIL	315	5.2%
Project Planning and Development Skills	308	5.1%
Virtualization	307	5.1%
Atlassian JIRA	305	5%
Extensible Markup Language (XML)	295	4.9%
Data Analysis	290	4.8%
Hardware and Software Installation	286	4.7%
Hardware and Software Configuration	284	4.7%
Information Assurance	272	4.5%
Repair	258	4.3%
System Design	251	4.1%
Configuration Management	249	4.1%

Health Care including Nursing	**4,374**	**11.2%**

Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)
Patient Care	740	16.9%
Advanced Cardiac Life Support (ACLS)	732	16.7%
Veterinary Medicine	590	13.5%
Customer Service	492	11.2%
Acute Care	463	10.6%
Life Support	437	10%
Surgery	428	9.8%
Clinical Experience	382	8.7%
Scheduling	373	8.5%
Managed Care	335	7.7%
Case Management	322	7.4%
Data Entry	322	7.4%
Treatment Planning	317	7.2%
Cardiopulmonary Resuscitation (CPR)	300	6.9%
Rehabilitation	248	5.7%
Quality Assurance and Control	232	5.3%
Cleaning	228	5.2%
Anesthesiology	221	5.1%
Medical Records Maintenance	220	5%
Infection Control	204	4.7%
Medical Management	201	4.6%
Quality Management	188	4.3%
Critical Care	186	4.3%
Radiology	185	4.2%
Patient/Family Education and Instruction	175	4%
Medical Coding	171	3.9%
Dentistry	170	3.9%
Care Planning	167	3.8%
Staff Management	163	3.7%
Discharge Planning	161	3.7%

Personal Protective Equipment (PPE)	161	3.7%
Behavioral Health	154	3.5%
Ultrasound	153	3.5%
Demographic Research	151	3.5%
Health Insurance Portability and Accountability Act (HIPAA)	151	3.5%
X-Rays	145	3.3%
Home Health	142	3.2%
Administrative Support	140	3.2%
Electronic Medical Records	134	3.1%
Appointment Setting	126	2.9%
Customer Contact	113	2.6%
Preventive Care	112	2.6%
Occupational Health and Safety	107	2.4%
Vital Signs Measurement	106	2.4%
Dental Care	103	2.4%
Injections	102	2.3%
Hospital Experience	99	2.3%
Customer Billing	91	2.1%
Budgeting	90	2.1%
Internal Medicine	89	2%

Sales	**4,257**	**10.9%**

Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)
Sales	2,489	58.5%
Customer Service	1,513	35.5%
Retail Industry Knowledge	1,004	23.6%
Merchandising	902	21.2%
Sales Goals	684	16.1%
Customer Contact	670	15.7%
Product Sales	648	15.2%
Business Development	562	13.2%
Retail Sales	551	12.9%
Scheduling	539	12.7%
Prospective Clients	404	9.5%
Sales Management	404	9.5%
Outside Sales	366	8.6%
Store Management	360	8.5%
Cleaning	353	8.3%
Account Management	328	7.7%
Insurance Underwriting	316	7.4%
Appointment Setting	276	6.5%
Budgeting	276	6.5%
Insurance Sales	262	6.2%
Description and Demonstration of Products	246	5.8%
Calculator	234	5.5%
Hand Trucks	233	5.5%
Lifting Ability	232	5.4%

Inside Sales	229	5.4%
Hammering	227	5.3%
Screwdrivers	221	5.2%
Cold Calling	212	5%
Cross Sell	204	4.8%
Financial Industry Knowledge	200	4.7%
Marketing	199	4.7%
Key Performance Indicators (KPIs)	195	4.6%
Training Activities	194	4.6%
Product Knowledge	192	4.5%
Project Management	191	4.5%
Staff Management	187	4.4%
Prevent And Treat Injuries	164	3.9%
Materials Transport	161	3.8%
Wireless Sales	161	3.8%
Negotiation Skills	159	3.7%
Onboarding	154	3.6%
Salesforce	145	3.4%
Business Planning	143	3.4%
Social Media	143	3.4%
Retail Accounts	140	3.3%
Nationwide Mortgage Licensing System (NMLS)	136	3.2%
Client Base Retention	133	3.1%
Market Strategy	133	3.1%
Telemarketing	128	3%
Cooking	121	2.8%

Business Management and Operations	**2,867**	**7.3%**

Skill	**Job Postings Requesting Skill(s) (#) (Last 12 Months)**	**Job Postings Requesting Skill(s) (%) (Last 12 Months)**
Project Management	1,089	38%
Budgeting	754	26.3%
Scheduling	648	22.6%
Customer Service	380	13.3%
Procurement	352	12.3%
Project Planning and Development Skills	300	10.5%
Staff Management	294	10.3%
Quality Assurance and Control	263	9.2%
Logistics	258	9%
Business Development	242	8.4%
Customer Contact	213	7.4%
Quality Management	205	7.2%
Microsoft Project	200	7%
Forklift Operation	199	6.9%
Business Process	198	6.9%
Business Administration	187	6.5%
Operations Management	173	6%
Strategic Planning	172	6%

Change Management	169	5.9%
Process Improvement	163	5.7%
Scrum	153	5.3%
Stakeholder Management	149	5.2%
Program Management	146	5.1%
Purchasing	144	5%
Occupational Health and Safety	137	4.8%
Information Systems	128	4.5%
Risk Management	125	4.4%
Supervisory Skills	124	4.3%
Onboarding	123	4.3%
Information Technology Industry Knowledge	122	4.3%
Key Performance Indicators (KPIs)	121	4.2%
Negotiation Skills	120	4.2%
Enterprise Resource Planning (ERP)	115	4%
Software Development	115	4%
SAP	113	3.9%
Accounting	110	3.8%
Conflict Management	110	3.8%
Sales	109	3.8%
Systems Development Life Cycle (SDLC)	102	3.6%
Proposal Writing	99	3.5%
Business Operations	98	3.4%
Six Sigma	97	3.4%
Contract Review	95	3.3%
SQL	93	3.2%
Microsoft Visio	91	3.2%
Data Analysis	87	3%
Performance Management	86	3%
Microsoft Sharepoint	85	3%
Scrum Master	79	2.8%
Calculation	74	2.6%

Customer and Client Support	**2,526**	**6.5%**

Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)
Customer Service	1,859	73.6%
Cash Handling	604	23.9%
Customer Contact	579	22.9%
Sales	470	18.6%
Bank Secrecy Act (BSA)	268	10.6%
Benefits Administration / Management	239	9.5%
Customer Checkout	215	8.5%
Product Sales	204	8.1%
Cross Sell	188	7.4%
Multilingual	185	7.3%
Scheduling	185	7.3%
Mobile Banking	182	7.2%

Retail Industry Knowledge	181	7.2%
Basic Mathematics	179	7.1%
Retail Sales	131	5.2%
Loan Processing	126	5%
General Office Duties	124	4.9%
Data Entry	123	4.9%
Customer Billing	118	4.7%
Product Knowledge	116	4.6%
Legal Compliance	111	4.4%
Risk Management	111	4.4%
Claims Knowledge	109	4.3%
Loan Payment Acceptance	109	4.3%
Sales Goals	106	4.2%
Prospective Clients	98	3.9%
New Hire Orientation	90	3.6%
Appointment Setting	86	3.4%
Customer Accounts	85	3.4%
Refunds Exchanges and Adjustments	75	3%
Tax Returns	65	2.6%
Customer Experience Improvement	61	2.4%
Upselling Products and Services	60	2.4%
Account Management	59	2.3%
Distribution Strategies	57	2.3%
Office Equipment	57	2.3%
Onboarding	57	2.3%
Finance	56	2.2%
Loan Closing	54	2.1%
Budgeting	53	2.1%
Process Improvement	53	2.1%
Bank Deposits	52	2.1%
Calculation	50	2%
Cleaning	43	1.7%
Bank Product Promotion	41	1.6%
Foreign Exchange	40	1.6%
Staff Management	40	1.6%
Bank Services and Products Recommendation	38	1.5%
Sales Principles	37	1.5%
Talent Acquisition	37	1.5%

Planning and Analysis	**1,796**	**4.6%**

Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)
Project Management	441	24.6%
SQL	425	23.7%
Business Analysis	394	21.9%
Data Analysis	351	19.5%
Business Process	290	16.1%
Customer Service	246	13.7%

SAS	201	11.2%
Process Improvement	199	11.1%
Python	181	10.1%
Scheduling	172	9.6%
Data Management	164	9.1%
Tableau	162	9%
Change Management	160	8.9%
Budgeting	150	8.4%
Data Science	149	8.3%
Business Intelligence	148	8.2%
Data Quality	137	7.6%
Economics	132	7.3%
Customer Contact	129	7.2%
Microsoft Power BI	126	7%
Software Development	122	6.8%
Quality Assurance and Control	119	6.6%
Information Systems	117	6.5%
Risk Management	107	6%
Microsoft Sharepoint	106	5.9%
Business Strategy	103	5.7%
Business Development	100	5.6%
Data Warehousing	97	5.4%
Data Visualization	95	5.3%
Strategic Planning	90	5%
Data Mining	88	4.9%
Microsoft Visio	88	4.9%
Business Operations	87	4.8%
Machine Learning	87	4.8%
Staff Management	86	4.8%
SAP	80	4.5%
Statistics	79	4.4%
Key Performance Indicators (KPIs)	77	4.3%
Statistical Analysis	76	4.2%
Relational Databases	75	4.2%
Data Governance	74	4.1%
Project Planning and Development Skills	74	4.1%
Atlassian JIRA	72	4%
Business Administration	72	4%
Systems Analysis	71	4%
Data Collection	66	3.7%
Oracle	66	3.7%
SQL Server	65	3.6%
Onboarding	63	3.5%
Root Cause Analysis	63	3.5%

Engineering	**1,603**	**4.1%**

Skill	**Job Postings Requesting Skill(s) (#) (Last 12 Months)**	**Job Postings Requesting Skill(s) (%) (Last 12 Months)**

Project Management	385	24%
Calculation	367	22.9%
Civil Engineering	313	19.5%
Budgeting	311	19.4%
Scheduling	289	18%
AutoCAD	283	17.7%
Quality Assurance and Control	190	11.9%
Professional Engineer	178	11.1%
Procurement	146	9.1%
Business Development	134	8.4%
Engineering Design and Installation	131	8.2%
Civil 3D	124	7.7%
Mechanical Engineering	122	7.6%
Engineering Design	120	7.5%
Microstation	120	7.5%
Customer Contact	116	7.2%
Repair	114	7.1%
Computer Aided Drafting/Design (CAD)	101	6.3%
Onboarding	95	5.9%
Technical Support	95	5.9%
Cost Estimation	85	5.3%
Customer Service	84	5.2%
Quality Management	84	5.2%
Engineering Calculations	82	5.1%
Process Engineering	79	4.9%
Construction Management	76	4.7%
Contract Review	75	4.7%
Process Improvement	74	4.6%
Revit	74	4.6%
Electrical Engineering	73	4.6%
Estimating	73	4.6%
Laboratory Testing	73	4.6%
Change Management	71	4.4%
Prepare Engineering Calculations	71	4.4%
Project Design	69	4.3%
Staff Management	68	4.2%
HVAC	67	4.2%
Industrial Engineering Industry Expertise	64	4%
Progress Reports	63	3.9%
3D Modeling / Design	59	3.7%
Schematic Diagrams	58	3.6%
Wiring	55	3.4%
Materials Selection	54	3.4%
Occupational Health and Safety	54	3.4%
Global Positioning System (GPS)	52	3.2%
Chemical Engineering	50	3.1%
Land Development	50	3.1%

Process Design	50	3.1%
CADD	48	3%
Engineering Management	47	2.9%

Clerical and Administrative	**1,554**	**4%**

Skill	Job Postings Requesting Skill(s) (#) (Last 12 Months)	Job Postings Requesting Skill(s) (%) (Last 12 Months)
Administrative Support	633	40.7%
Customer Service	421	27.1%
Scheduling	299	19.2%
Data Entry	230	14.8%
Customer Contact	182	11.7%
Appointment Setting	164	10.6%
Administrative Functions	153	9.8%
Spreadsheets	134	8.6%
Customer Billing	130	8.4%
Mailing	129	8.3%
Office Management	99	6.4%
Staff Management	97	6.2%
Customer Checkout	96	6.2%
Project Management	94	6%
Budgeting	93	6%
Record Keeping	80	5.1%
Accounting	70	4.5%
Insurance Underwriting	67	4.3%
Clerical Duties	66	4.2%
General Office Duties	62	4%
Mail Sorting	62	4%
Travel Arrangements	61	3.9%
Copying	60	3.9%
Cleaning	55	3.5%
Personal Protective Equipment (PPE)	55	3.5%
Process Improvement	55	3.5%
Sorting	54	3.5%
Calendar Management	51	3.3%
Expense Reports	51	3.3%
Front Office	46	3%
Business Administration	42	2.7%
Negotiation Skills	40	2.6%
Basic Mathematics	37	2.4%
Payment Processing	36	2.3%
Quality Assurance and Control	36	2.3%
Medical Terminology	35	2.3%
Recruiting	35	2.3%
Sales	35	2.3%
Business Process	34	2.2%
Cash Register Operation	32	2.1%
Health Insurance Portability and Accountability Act (HIPAA)	32	2.1%

Mortgage Lending	31	2%
Risk Management	31	2%
Manual Dexterity	30	1.9%
Filing	28	1.8%
Mortgage Underwriting	28	1.8%
Social Media	28	1.8%
Strategic Planning	27	1.7%
Technical Support	27	1.7%
Financial Services Industry Experience	26	1.7%

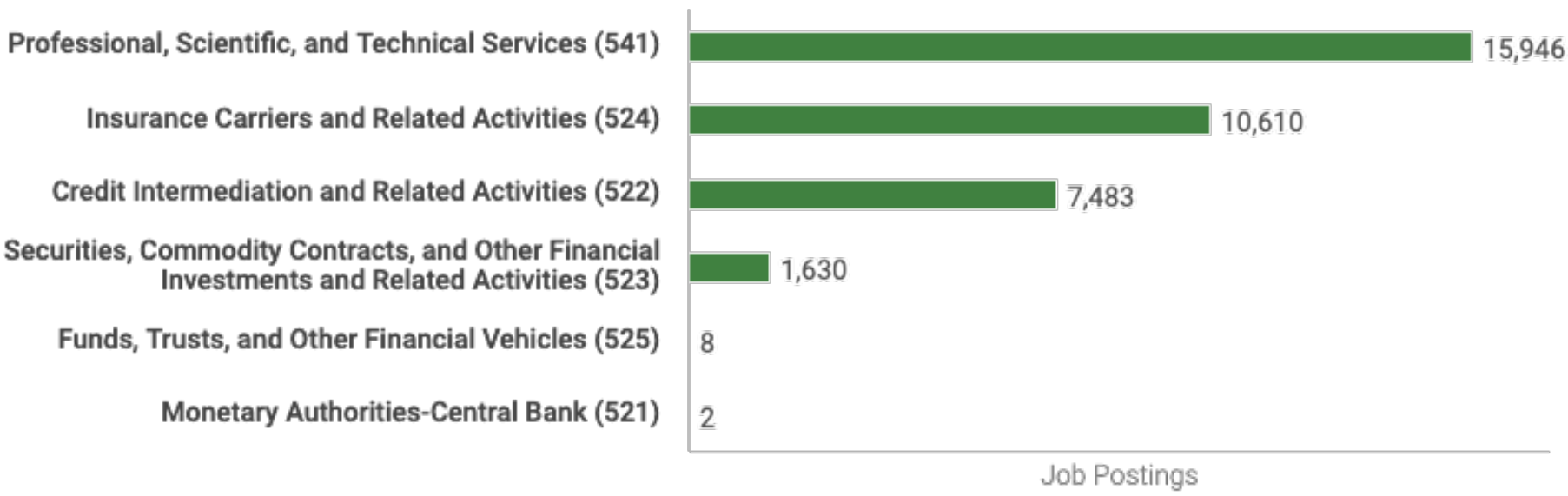
Law, Compliance, and Public Safety	**1,356**	**3.5%**

Skill	**Job Postings Requesting Skill(s) (#) (Last 12 Months)**	**Job Postings Requesting Skill(s) (%) (Last 12 Months)**
Litigation	379	27.9%
Legal Documentation	209	15.4%
Case Management	194	14.3%
Scheduling	191	14.1%
Legal Document Composition	149	11%
Customer Service	145	10.7%
Customer Contact	143	10.5%
Legal Research	138	10.2%
Risk Management	104	7.7%
Administrative Support	92	6.8%
Financial Services Industry Experience	91	6.7%
Legal Compliance	84	6.2%
Filing	77	5.7%
Preparation of Pleadings	74	5.5%
Workers' Compensation	72	5.3%
Business Process	71	5.2%
Cleaning	69	5.1%
Customer Billing	69	5.1%
Real Estate Experience	69	5.1%
Civil Litigation	60	4.4%
Document Management	57	4.2%
Project Management	53	3.9%
Administrative Functions	52	3.8%
Legal Document Preparation	52	3.8%
Transcription	52	3.8%
Personal Protective Equipment (PPE)	50	3.7%
Trial Preparation	50	3.7%
Staff Management	49	3.6%
Appointment Setting	45	3.3%
Legal Terminology	44	3.2%
Credit Risk	43	3.2%
Public Health and Safety	40	2.9%
Market Risk	39	2.9%
Mailing	38	2.8%
Mediation	37	2.7%

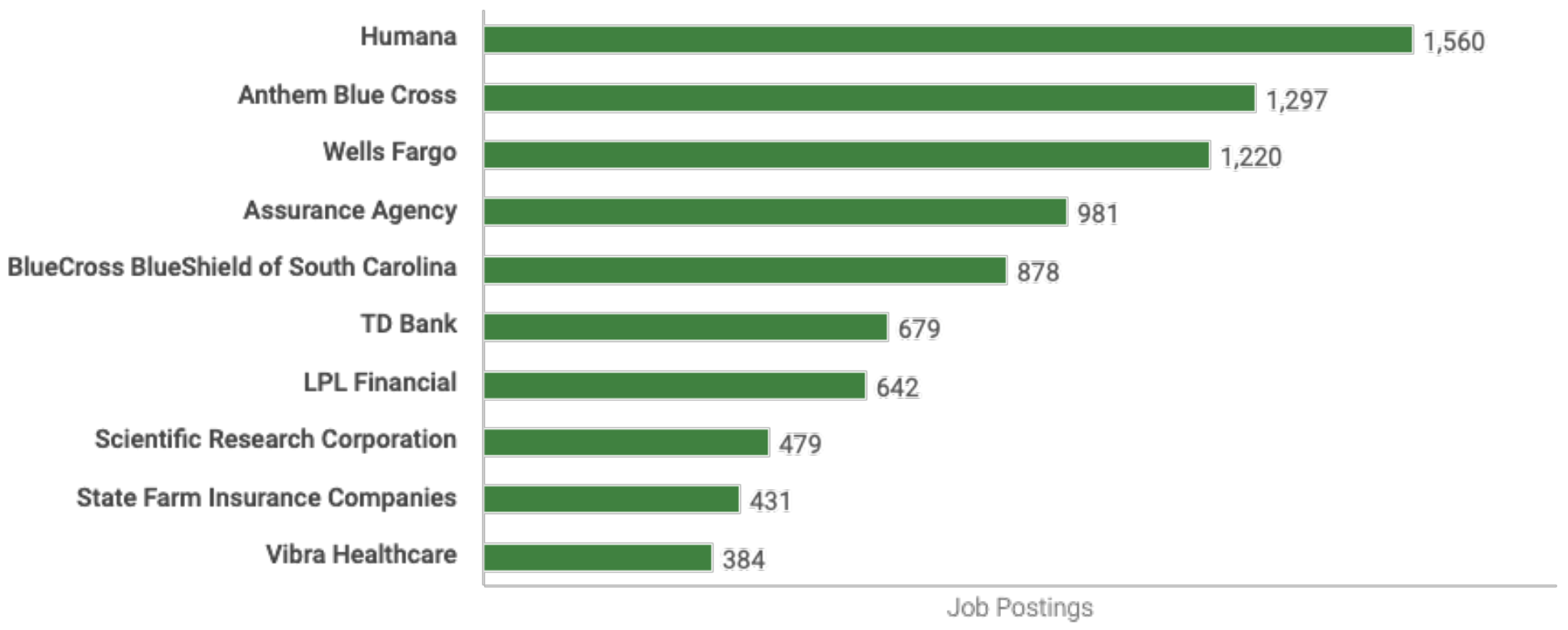
Secretarial Skills	37	2.7%
Contract Review	35	2.6%
Loss Mitigation	35	2.6%
Contract Preparation	34	2.5%
Contract Drafting	33	2.4%
Legal Solutions	33	2.4%
Record Keeping	33	2.4%
Spreadsheets	32	2.4%
Data Entry	31	2.3%
Dictation	31	2.3%
Negotiation Skills	31	2.3%
Legal Support	30	2.2%
Subpoena Preparation	28	2.1%
Notary Public	27	2%
Risk Management Framework	27	2%

Top Industries

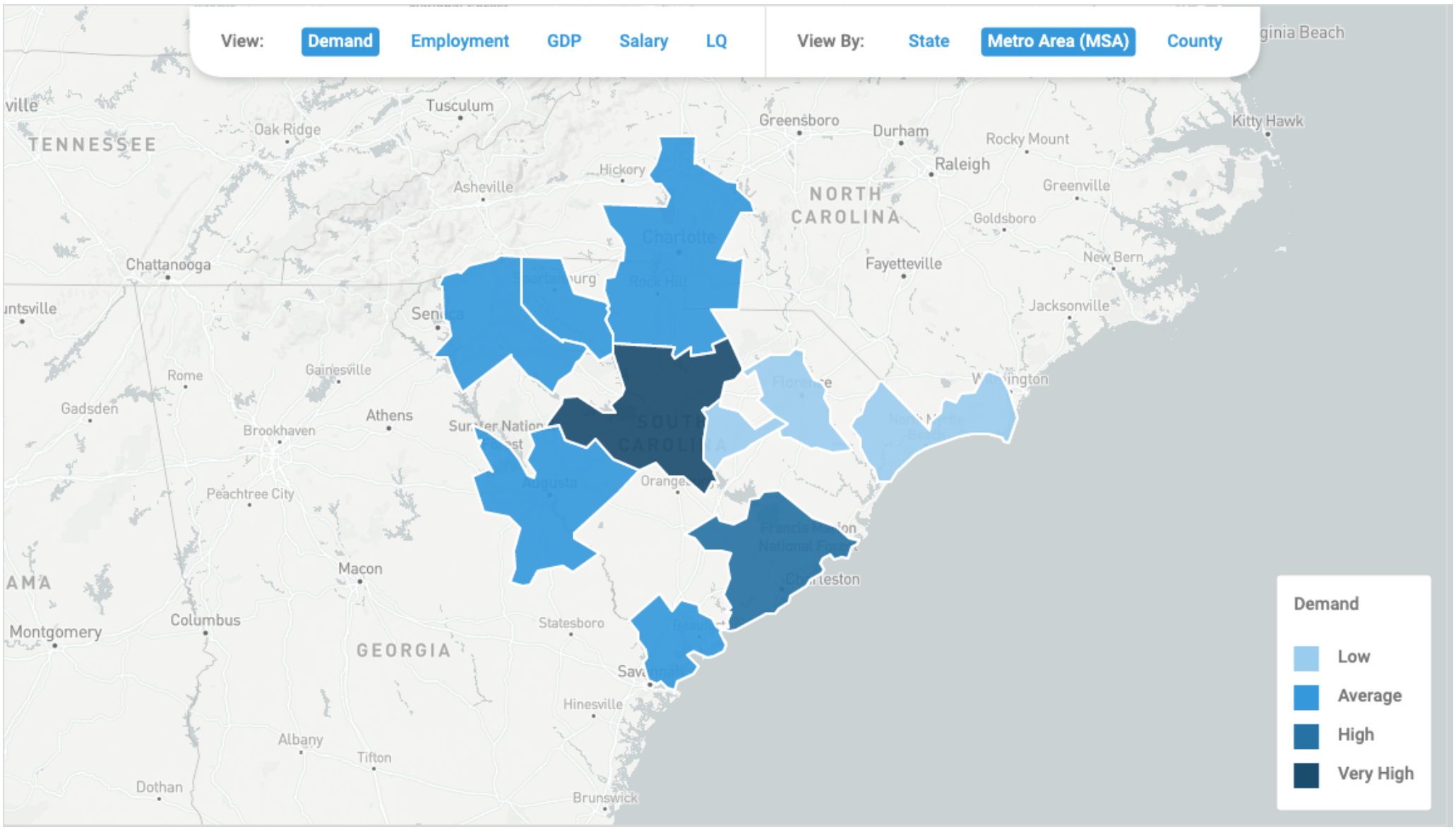
Currently displaying: 3digit



Top Employers



Top Locations



Metro Area (MSA)	Job Postings (Last 12 Months)	Employment (Last 12 Months)	GDP	Median Salary (in Thousands)	Location Quotient
Columbia, SC	11,050	NA	$6K	$58k	1.1
Charleston-North Charleston, SC	10,577	NA	$5K	$51k	0.8
Charlotte-Concord-Gastonia, NC-SC	5,718	166.4M	$56K	$66k	1.2
Greenville-Anderson-Mauldin, SC	5,285	NA	$2K	$50k	0.9
Hilton Head Island-Bluffton-Beaufort, SC	1,281	NA	$1K	$40k	0.5
Spartanburg, SC	1,238	NA	$1K	$48k	0.6
Augusta-Richmond County, GA-SC	1,169	NA	$1K	$49k	0.7
Florence, SC	835	NA	$1K	$34k	0.6
Myrtle Beach-Conway-North Myrtle Beach, SC-NC	776	NA	$2K	$38k	0.3
Sumter, SC	687	NA	N/A	$54k	1.0

Source: Bureau of Labor Statistics, Bureau of Economic Analysis

CHARLESTON REGIONAL DEVELOPMENT ALLIANCE
Berkeley, Charleston & Dorchester Counties

Charleston Inspired

July 16, 2021

The South Carolina Commission on Higher Education
1122 Lady Street
Columbia, SC 29201

RE: Support for College of Charleston's Bachelor's Degree in Software Engineering

To the South Carolina Commission on Higher Education,

As president and CEO of the Charleston Regional Development Alliance (CRDA), the three-county Charleston metro's lead economic development organization, I am writing to express our strong support for the College of Charleston's proposal to establish a Bachelor's degree program in Software Engineering. There is a high demand in the Charleston region for talent with those skill sets, and we are excited to see the College of Charleston stepping up to strengthen a talent pipeline to support our existing and future high-tech, manufacturing, and engineering-related industries.

Talent demand in STEM fields is currently outpacing supply and while we'd all prefer to "grow our own," the region must also depend on recruiting workers from out-of-the-area to fill local jobs. To give you some perspective, the Charleston region is projected to add 28,000 new jobs over the next five years. Occupations with the highest growth percentages include software/IT and engineers.

To be globally competitive, we must align workforce development, community development and economic development initiatives and resources on the same targets. Our region's business, community, elected, and educational leaders are working together to nurture and grow a skilled workforce pipeline that will support the knowledge economy for generations to come. STEM workforce training and higher education curricula aligned with business needs are critical components of that solution.

If you have any questions, or require additional information, please feel free to contact me.

Sincerely,

David T. Ginn
President and CEO
Charleston Regional Development Alliance

cc: Mike Fuller, CRDA Board Chairman

4401 Belle Oaks Drive, Suite 420 | North Charleston, SC 29405 | USA
843.767.9300 | charlestoneconomicdevelopment.com