

# Labor Market Analysis for Program Recommendation

# Research, Design, and Development Occupations

# Foothill College

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

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## Recommendation

Based on all available data, there appears to be an “undersupply” of Research, Design, and Development workers compared to the demand for this cluster of occupations in the Bay region and in the Silicon Valley sub-region (Santa Clara county). There is a projected annual gap of about 1,512 students in the Bay region and 533 students in the Silicon Valley Sub-Region.

## Introduction

This report provides student outcomes data on employment and earnings for TOP 0860.00 Educational Technology programs in the state and region. It is recommended that these data be reviewed to better understand how outcomes for students taking courses on this TOP code compare to potentially similar programs at colleges in the state and region, as well as to outcomes across all CTE programs at Foothill College and in the region.

This report profiles Research, Design, and Development Occupations in the 12 county Bay region and in the Silicon Valley sub-region for a proposed new Research, Design, and Development for Global Good program at Foothill College.

* **Web Developers and Digital Interface Designers (15-1257):** Design, create, and modify Web sites. Analyze user needs to implement Web site content, graphics, performance, and capacity. May integrate Web sites with other computer applications. May convert written, graphic, audio, and video components to compatible Web formats by using software designed to facilitate the creation of Web and multimedia content. Excludes “Multimedia Artists and Animators” (27-1014).  
    Entry-Level Educational Requirement: Associate’s degree  
    Training Requirement: None  
    Percentage of Community College Award Holders or Some Postsecondary Coursework: 26%
* **Social Science Research Assistants (19-4061):** Assist social scientists in laboratory, survey, and other social science research. May help prepare findings for publication and assist in laboratory analysis, quality control, or data management. Excludes “Graduate Teaching Assistants” (25-1191).  
    Entry-Level Educational Requirement: Bachelor’s degree  
    Training Requirement: None  
    Percentage of Community College Award Holders or Some Postsecondary Coursework: 37%
* **Commercial and Industrial Designers (27-1021):** Develop and design manufactured products, such as cars, home appliances, and children’s toys. Combine artistic talent with research on product use, marketing, and materials to create the most functional and appealing product design.  
    Entry-Level Educational Requirement: Bachelor’s degree  
    Training Requirement: None  
    Percentage of Community College Award Holders or Some Postsecondary Coursework: 24%

## Occupational Demand

**Table 1. Employment Outlook for Research, Design, and Development Occupations in Bay Region**

| **Occupation** | **2020 Jobs** | **2025 Jobs** | **5-yr Change** | **5-yr % Change** | **5-yr Total Openings** | **Annual Openings** | **25% Hourly Earning** | **Median Hourly Wage** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Web Developers and Digital Interface Designers | 11,176 | 12,696 | 1,520 | 14% | 5,829 | 1,166 | $32 | $49 |
| Social Science Research Assistants | 1,591 | 1,704 | 113 | 7% | 1,126 | 225 | $21 | $26 |
| Commercial and Industrial Designers | 1,215 | 1,260 | 44 | 4% | 620 | 124 | $31 | $41 |
| **Total** | **13,982** | **15,661** | **1,679** | **12%** | **7,575** | **1,515** |  |  |
| Source: EMSI 2021.4 | | | | | | | | |

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

**Table 2. Employment Outlook for Research, Design, and Development Occupations in Silicon Valley Sub-region**

| **Occupation** | **2020 Jobs** | **2025 Jobs** | **5-yr Change** | **5-yr % Change** | **5-yr Total Openings** | **Annual Openings** | **25% Hourly Earning** | **Median Hourly Wage** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Web Developers and Digital Interface Designers | 3,537 | 4,142 | 604 | 17% | 1,988 | 398 | $34 | $50 |
| Social Science Research Assistants | 715 | 756 | 41 | 6% | 487 | 97 | $21 | $25 |
| Commercial and Industrial Designers | 367 | 385 | 18 | 5% | 190 | 38 | $31 | $47 |
| **Total** | **4,619** | **5,284** | **665** | **14%** | **2,666** | **533** |  |  |
| Source: EMSI 2021.4 | | | | | | | | |

**Silicon Valley Sub-Region includes:** Santa Clara County

### Job Postings in Bay Region and Silicon Valley Sub-Region

**Table 3. Number of Job Postings by Occupation for latest 12 months**

| **Occupation** | **Bay Region** | **Silicon Valley** |
| --- | --- | --- |
| Web Developers | 20,398 | 7,510 |
| Commercial and Industrial Designers | 5,535 | 1,812 |
| Social Science Research Assistants | 819 | 332 |
| City and Regional Planning Aides | 26 | 9 |
| Source: Burning Glass | | |

**Table 4a. Top Job Titles for Research, Design, and Development Occupations for latest 12 months - Bay Region**

| **Title** | **Bay** | **Title** | **Bay** |
| --- | --- | --- | --- |
| Product Designer | 732 | Web Developer | 330 |
| Backend Engineer | 691 | Backend Engineer - Remote | 301 |
| Front End Engineer | 637 | Front End Engineer - Remote | 297 |
| Senior Backend Engineer | 578 | Senior Ux Designer | 284 |
| Senior Product Designer | 559 | Ui Developer | 265 |
| Senior Front End Engineer | 549 | Ui/Ux Designer | 182 |
| Front End Developer | 532 | Lead Product Designer | 165 |
| Ux Designer | 521 | Ux Research Associate | 163 |
| Ux Researcher | 401 | Senior Frontend Engineer | 149 |
| Source: Burning Glass | | | |

**Table 4b. Top Job Titles for Research, Design, and Development Occupations for latest 12 months - Silicon Valley Sub-Region**

| **Title** | **Silicon Valley** | **Title** | **Silicon Valley** |
| --- | --- | --- | --- |
| Front End Developer | 256 | Senior Product Designer | 108 |
| Ux Designer | 234 | Ux Researcher | 99 |
| Backend Engineer | 227 | Senior Ux Designer | 98 |
| Front End Engineer | 151 | Senior Backend Engineer | 93 |
| Ui Developer | 141 | Ruby On Rails Developer | 71 |
| Product Designer | 138 | Backend Developer | 63 |
| Web Developer | 130 | Frontend Developer | 63 |
| Ux Research Associate | 123 | Product Engineer | 63 |
| Senior Front End Engineer | 113 | Ui/Ux Designer | 61 |
| Source: Burning Glass | | | |

## Industry Concentration

**Table 5. Industries hiring Research, Design, and Development Workers in Bay Region**

| **Industry - 6 Digit NAICS (No. American Industry Classification) Codes** | **Jobs in Industry (2020)** | **Jobs in Industry (2025)** | **% Change (2020-25)** | **% Occupation Group in Industry (2020)** |
| --- | --- | --- | --- | --- |
| Internet Publishing and Broadcasting and Web Search Portals | 2,166 | 584 | 15% | 2% |
| Custom Computer Programming Services | 2,208 | 298 | 16% | 2% |
| Software Publishers | 1,437 | 315 | 10% | 2% |
| Computer Systems Design Services | 1,198 | 102 | 9% | 2% |
| Data Processing, Hosting, and Related Services | 472 | 104 | 3% | 1% |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) | 494 | 33 | 4% | 1% |
| Colleges, Universities, and Professional Schools (State Government) | 402 | 3 | 3% | 1% |
| Other Computer Related Services | 339 | 49 | 2% | 2% |
| Colleges, Universities, and Professional Schools | 299 | 21 | 2% | 1% |
| Research and Development in the Social Sciences and Humanities | 288 | 3 | 2% | 11% |
| Source: EMSI 2021.4 | | | | |

**Table 6. Top Employers Posting Research, Design, and Development Occupations in Bay Region and Silicon Valley Sub-Region**

| **Employer** | **Bay** | **Employer** | **Silicon Valley** |
| --- | --- | --- | --- |
| Amazon | 324 | Apple Inc. | 283 |
| Apple Inc. | 301 | Google Inc. | 146 |
| Google Inc. | 244 | Amazon | 122 |
| Facebook | 239 | Cisco Systems Incorporated | 113 |
| Uber | 215 | Intuit | 105 |
| Braintrust Group | 160 | Intel Corporation | 88 |
| Cisco Systems Incorporated | 154 | Stanford University | 78 |
| Intuit | 128 | Rivian | 77 |
| Stanford Medicine | 112 | Uber | 73 |
| Adobe Systems | 106 | Palo Alto Networks | 69 |
| Source: Burning Glass | | | |

## Educational Supply

There is a one (1) community college in the Bay Region issuing three (3) awards on average annually (last 3 years ending 2018-19) on TOP 0860.00 Educational Technology. In the Silicon Valley Sub-Region, there are no community colleges that issued awards on average annually (last 3 years) on this TOP code.

**Table 7. Community College Awards on TOP 0860.00 Educational Technology in Bay Region**

| **College** | **Subregion** | **Certificate Low** | **Total** |
| --- | --- | --- | --- |
| Merritt | East Bay | 3 | 3 |
| **Total** |  | **3** | **3** |
| Source: Data Mart | | | |

*Note: The annual average for awards is 2016-17 to 2018-19.*

## Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 1,515 annual openings for the Research, Design, and Development occupational cluster and three (3) annual (3-year average) awards for an annual undersupply of 1,512 students. In the Silicon Valley Sub-Region, there is also a gap with 533 annual openings and no annual (3-year average) awards for an annual undersupply of 533 students.

## Student Outcomes

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0860.00 Educational Technology**

| **Metric Outcomes** | **Bay All CTE Programs** | **Foothill All CTE Programs** | **State 0860.00** | **Bay 0860.00** | **Silicon Valley 0860.00** | **Foothill 0860.00** |
| --- | --- | --- | --- | --- | --- | --- |
| Students with a Job Closely Related to Their Field of Study | 74% | 91% | 88% | 90% | 86% | 86% |
| Median Annual Earnings for SWP Exiting Students | $47,419 | $66,288 | $85,341 | $90,496 | $94,740 | $94,188 |
| Median Change in Earnings for SWP Exiting Students | 23% | 43% | 9% | 9% | 10% | 10% |
| Exiting Students Who Attained the Living Wage | 52% | 64% | 77% | 82% | 80% | 83% |
| Source: Launchboard Strong Workforce Program Median of 2017 to 2020. | | | | | | |

## Skills, Certifications and Education

**Table 9. Top Skills for Research, Design, and Development Occupations in Bay Region**

| **Skill** | **Posting** | **Skill** | **Posting** |
| --- | --- | --- | --- |
| JavaScript | 8,726 | Web Application Development | 3,135 |
| Software Engineering | 5,966 | Ruby on Rails | 3,035 |
| Front-end Development | 4,639 | Visual Design | 3,008 |
| React Javascript | 4,558 | Git | 2,991 |
| Java | 4,538 | UX Wireframes | 2,928 |
| Web Development | 4,091 | Product Management | 2,874 |
| Python | 4,011 | Ruby | 2,822 |
| Product Design | 3,752 | AngularJS | 2,747 |
| User Research | 3,705 | Adobe Indesign | 2,744 |
| Adobe Photoshop | 3,574 | Adobe Acrobat | 2,603 |
| Software Development | 3,557 | Adobe Creative Suite | 2,583 |
| Prototyping | 3,479 | Interaction Design | 2,582 |
| Product Development | 3,258 | User Interface (UI) Design | 2,578 |
| SQL | 3,201 | Adobe Illustrator | 2,570 |
| Source: Burning Glass | | | |

**Table 10. Certifications for Research, Design, and Development Occupations in Bay Region**

| **Certification** | **Posting** | **Certification** | **Posting** |
| --- | --- | --- | --- |
| Certified Scrum Trainer (CST) | 77 | Certified Novell Administrator | 15 |
| Driver's License | 70 | Mbe Certified | 13 |
| Project Management Certification | 49 | Certified Information Systems Security Professional (CISSP) | 11 |
| Security Clearance | 38 | Certified Clinical Research Professional | 9 |
| Certified Quality Engineer (CQE) | 38 | Six Sigma Certification | 8 |
| Certified Reliability Engineer | 34 | Agile Certification | 8 |
| American Society For Quality (ASQ) Certification | 34 | Six Sigma Black Belt Certification | 7 |
| IT Infrastructure Library (ITIL) Certification | 27 | Automation Certification | 7 |
| Certified ScrumMaster (CSM) | 25 | Six Sigma Green Belt Certification | 6 |
| Project Management Professional (PMP) | 21 |  |  |
| Source: Burning Glass | | | |

*Note: 98% of records have been excluded because they do not include a certification. As a result, the chart below may not be representative of the full sample.*

**Table 11. Education Requirements for Research, Design, and Development Occupations in Bay Region**

| **Education (minimum advertised)** | **Latest 12 Mos. Postings** | **Percent 12 Mos. Postings** |
| --- | --- | --- |
| High school or vocational training | 257 | 2% |
| Associate's degree | 147 | 1% |
| Bachelor's degree and higher | 15,282 | 97% |
| Source: Burning Glass | | |

*Note: 41% of records have been excluded because they do not include a degree level. As a result, the chart below may not be representative of the full sample.*

## Methodology

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

## Sources

O\*Net Online  
Labor Insight/Jobs (Burning Glass)  
Economic Modeling Specialists International (EMSI)  
CTE LaunchBoard www.calpassplus.org/Launchboard/  
Statewide CTE Outcomes Survey  
Employment Development Department Unemployment Insurance Dataset  
Living Insight Center for Community Economic Development  
Chancellor’s Office MIS system

## Contacts

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