** Drone Occupations**

**Labor Market Information Report**

**Diablo Valley College**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

January 2020

# Recommendation

Based on all available data, there appears to be a significant undersupply of Drone workers compared to the demand for this cluster of occupations in the Bay region and in the East Bay sub-region (Alameda and Contra Costa Counties.) There is a projected annual gap of about 14,694 students in the Bay region and 1,552 students in the East Bay Sub-Region.

This report also provides student outcomes data on employment and earnings for programs on TOP 2206.10 - Geographic Information Systems 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 Diablo Valley College and in the region.

# Introduction

This report profiles Drone Occupations in the 12 county Bay region and in the East Bay sub-region for a proposed new program at Diablo Valley College.

|  |  |
| --- | --- |
| * **Software Developers, Applications (SOC 15-1132):** Develop, create, and modify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use with the aim of optimizing operational efficiency. May analyze and design databases within an application area, working individually or coordinating database development as part of a team. May supervise computer programmers. | |
| *Entry-Level Educational Requirement: Bachelor's degree* | |
| *Training Requirement: None* | |
| *Percentage of Community College Award Holders or Some Postsecondary Coursework: 13%* | |
| * **Software Developers, Systems Software (SOC 15-1133):** Research, design, develop, and test operating systems-level software, compilers, and network distribution software for medical, industrial, military, communications, aerospace, business, scientific, and general computing applications. Set operational specifications and formulate and analyze software requirements. May design embedded systems software. Apply principles and techniques of computer science, engineering, and mathematical analysis. | |
| *Entry-Level Educational Requirement: Bachelor's degree* | |
| *Training Requirement: None* | |
| *Percentage of Community College Award Holders or Some Postsecondary Coursework: 13%* | |
| * **Electro-Mechanical Technicians (SOC 17-3024):** Operate, test, maintain, or calibrate unmanned, automated, servo-mechanical, or electromechanical equipment. May operate unmanned submarines, aircraft, or other equipment at worksites, such as oil rigs, deep ocean exploration, or hazardous waste removal. May assist engineers in testing and designing robotics equipment. | |
| *Entry-Level Educational Requirement: Associate's degree* | |
| *Training Requirement: None* | |
| *Percentage of Community College Award Holders or Some Postsecondary Coursework: 53%* | |
|  | |
| * **Camera Operators, Television, Video, and Motion Picture (SOC 27-4031):** Operate television, video, or motion picture camera to record images or scenes for various purposes, such as TV broadcasts, advertising, video production, or motion pictures. | |
| *Entry-Level Educational Requirement: Bachelor's degree* | |
| *Training Requirement: None* | |
| *Percentage of Community College Award Holders or Some Postsecondary Coursework: 27%* | |
|  | |
| * **Aircraft Mechanics and Service Technicians (SOC 49-3011):** Diagnose, adjust, repair, or overhaul aircraft engines and assemblies, such as hydraulic and pneumatic systems. Includes helicopter and aircraft engine specialists. Excludes “Avionics Technician" (49-2091). | |
| *Entry-Level Educational Requirement: Postsecondary nondegree award* | |
| *Training Requirement: Extensive skill, knowledge, and experience.* | |
| *Percentage of Community College Award Holders or Some Postsecondary Coursework: None* | |

# Occupational Demand

**Table 1. Employment Outlook for Drone Occupations in Bay Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation | 2018 Jobs | 2023 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 25% Hourly Wage | Median Hourly Wage |
| Software Developers, Applications | 93,746 | 113,800 | 20,054 | 21% | 52,135 | 10,427 | $49.53 | $63.41 |
| Software Developers, Systems Software | 45,858 | 49,986 | 4,128 | 9% | 19,125 | 3,825 | $52.78 | $67.11 |
| Electro-Mechanical Technicians | 849 | 862 | 13 | 2% | 397 | 79 | $23.16 | $28.62 |
| Camera Operators, Television, Video, and Motion Picture | 680 | 716 | 36 | 5% | 367 | 73 | $17.57 | $26.54 |
| Aircraft Mechanics and Service Technicians | 3,959 | 3,891 | -68 | -2% | 1,625 | 325 | $31.35 | $35.73 |
| **Total** | **145,093** | **169,255** | **24,162** | **17%** | **73,648** | **14,730** | **$49.75** | **$63.45** |

*Source: EMSI 2019.3*

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

**Table 2. Employment Outlook for Drone Occupations in East Bay Sub-Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation | 2018 Jobs | 2023 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 25% Hourly Wage | Median Hourly Wage |
| Software Developers, Applications | 12,199 | 13,438 | 1,239 | 10% | 5,248 | 1,050 | $47.22 | $59.45 |
| Software Developers, Systems Software | 5,712 | 5,895 | 183 | 3% | 2,011 | 402 | $46.69 | $58.02 |
| Electro-Mechanical Technicians | 142 | 154 | 12 | 8% | 75 | 15 | $25.73 | $31.71 |
| Camera Operators, Television, Video, and Motion Picture | 220 | 234 | 14 | 6% | 121 | 24 | $17.43 | $26.28 |
| Aircraft Mechanics and Service Technicians | 944 | 964 | 20 | 2% | 378 | 76 | $33.44 | $37.63 |
| **TOTAL** | **19,217** | **20,685** | **1,468** | **8%** | **7,833** | **1,567** | **$45.89** | **$57.37** |

*Source: EMSI 2019.3*

**East Bay Sub-Region** includes Alameda and Contra Costa Counties

### Job Postings in Bay Region and East Bay Sub-Region

**Table 3. Number of Job Postings by Occupation for latest 12 months (December 2018 - November 2019)**

| Occupation | Bay Region | East Bay |
| --- | --- | --- |
| Software Developers, Applications | 132,714 | 17,165 |
| Software Developers, Systems Software | 1,531 | 278 |
| Electro-Mechanical Technicians | 526 | 197 |
| Aircraft Mechanics and Service Technicians | 428 | 119 |
| Camera Operators, Television, Video, and Motion Picture | 270 | 60 |
| Robotics Technicians | 150 | 39 |
| **Total** | **135,619** | **17,858** |

*Source: Burning Glass*

**Table 4a. Top Job Titles for Drone Occupations for latest 12 months (December 2018 - November 2019) Bay Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Bay | Common Title | Bay |
| Software Development Engineer | 37,183 | Engineer | 1,247 |
| Java Developer | 10,241 | .Net Developer | 1,212 |
| Devops Engineer | 4,897 | Salesforce Developer | 1,049 |
| Software Developer | 3,858 | Software Engineering Manager | 1,046 |
| Applications Engineer | 3,621 | Senior Engineer | 965 |
| Java Engineer | 2,844 | Full Stack Developer | 819 |
| Python Developer | 2,470 | Software Architect | 800 |
| Senior Developer | 2,109 | C++ Developer | 712 |
| Android Developer | 2,062 | Full Stack Engineer | 700 |
| Developer | 1,994 | Oracle Developer | 659 |
| Applications Developer | 1,650 | Business Intelligence Developer | 634 |
| Principal Software Engineer | 1,456 | Lead Developer | 595 |
| iOS Developer | 1,335 | Solutions Engineer | 575 |
| Senior Devops Engineer | 1,328 | Developer, Information And Technology Industry | 548 |

**Table 4b. Top Job Titles for Drone Occupations for latest 12 months (December 2018 - November 2019) East Bay Sub-Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | East Bay | Common Title | East Bay |
| Software Development Engineer | 3,885 | Business Intelligence Developer | 143 |
| Java Developer | 1,546 | Salesforce Developer | 141 |
| Devops Engineer | 851 | Principal Software Engineer | 133 |
| Software Developer | 619 | Senior .Net Developer | 129 |
| Applications Engineer | 496 | Lead Developer | 123 |
| .Net Developer | 456 | Engineer | 119 |
| Developer | 330 | iOS Developer | 110 |
| Senior Developer | 311 | Junior Software Engineer | 110 |
| Java Engineer | 283 | Software Architect | 108 |
| Applications Developer | 271 | Sharepoint Developer | 106 |
| Android Developer | 212 | Java/J2EE Developer | 105 |
| Senior Devops Engineer | 200 | Full Stack Developer | 105 |
| Python Developer | 194 | Build Release Engineer | 88 |
| Oracle Developer | 150 | C# Developer | 85 |

*Source: Burning Glass*

# Industry Concentration

**Table 5. Industries hiring Drone Workers in Bay Region**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Industry – 6 Digit NAICS (No. American Industry Classification) Codes | Jobs in Industry (2018) | Jobs in Industry (2022) | % Change (2018-22) | % in Industry (2018) |
| Custom Computer Programming Services (541511) | 28,314 | 34,231 | 21% | 20% |
| Computer Systems Design Services (541512) | 18,041 | 21,026 | 17% | 12% |
| Software Publishers (511210) | 16,089 | 20,526 | 28% | 12% |
| Internet Publishing and Broadcasting and Web Search Portals (519130) | 14,893 | 19,769 | 33% | 10% |
| Electronic Computer Manufacturing (334111) | 14,280 | 15,760 | 10% | 10% |
| Data Processing, Hosting, and Related Services (518210) | 5,640 | 7,390 | 31% | 4% |
| Other Computer Related Services (541519) | 3,636 | 4,560 | 25% | 3% |
| Corporate, Subsidiary, and Regional Managing Offices (551114) | 3,247 | 3,576 | 10% | 2% |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715) | 2,270 | 2,479 | 9% | 2% |
| Semiconductor and Related Device Manufacturing (334413) | 2,184 | 2,061 | -6% | 2% |
| Engineering Services (541330) | 1,806 | 1,987 | 10% | 1% |

*Source: EMSI 2019.3*

**Table 6. Top Employers Posting Drone Occupations in Bay Region and East Bay Sub-Region (December 2018 - November 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Employer | Bay | Employer | Bay | Employer | East Bay |
| Apple Inc. | 2,067 | Intuit | 296 | Workday, Inc | 431 |
| Amazon | 1,340 | Splunk | 295 | Scoop Technologies | 282 |
| Cisco Systems Incorporated | 1,120 | Verizon Communications Incorporated | 290 | Oracle | 80 |
| Scoop Technologies | 902 | Intel Corporation | 267 | Kaiser Permanente | 79 |
| Google Inc. | 690 | Uber | 262 | NTT Data | 78 |
| Oracle | 609 | Xoriant Incorporated | 261 | The Nielsen Company | 75 |
| Workday, Inc | 606 | Adobe Systems | 261 | General Electric Company | 75 |
| Facebook | 601 | Accenture | 259 | Tesla | 74 |
| Vmware Incorporated | 594 | Wipro | 249 | Ellie Mae | 74 |
| IBM | 517 | Intelliswift Software | 237 | Perficient Incorporated | 73 |
| SAP | 400 | Neuvo Usa | 231 | Tesla Motors | 72 |
| Nvidia Corporation | 394 | Linkedin Limited | 229 | Albertsons | 66 |
| Paypal | 368 | eBay | 218 | Lucid Motors Inc | 65 |
| Walmart / Sam's | 361 | Splunk, Inc | 215 | 24 Hour Fitness | 64 |
| Visa | 334 | Nsys Design Systems | 209 | Lawrence Livermore National Laboratory | 55 |
| Salesforce | 328 | Jobot | 209 | Oakland Unified School District | 52 |
| Microsoft Corporation | 328 | Deloitte | 207 | IBM | 52 |

*Source: Burning Glass*

# Educational Supply

There are six (6) community colleges in the Bay Region issuing 36 awards on average annually (last 3 years) on TOP 2206.10 - Geographic Information Systems. There are two colleges in the East Bay Sub-Region issuing 15 awards on average annually (last 3 years) on this code.

**Table 7. Awards on TOP 2206.10 - Geographic Information Systems in Bay Region**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| College | Sub-Region | Associates | Certificate 18+ units | Certificate Low unit | Total |
| City College of San Francisco | Mid-Peninsula |  |  | 7 | 7 |
| Diablo Valley College | East Bay | 2 | 2 | 9 | 13 |
| Foothill College | Silicon Valley | 2 | 7 | 3 | 12 |
| Ohlone College | East Bay |  |  | 2 | 2 |
| Santa Rosa Junior College | North Bay | 1 |  |  | 1 |
| West Valley College | Silicon Valley |  | 1 |  | 1 |
| **Total Bay Region** | | **5** | **10** | **21** | **36** |
| **Total East Bay Sub-Region** | | **2** | **2** | **11** | **15** |

# *Source: Data Mart*

Note: The annual average for awards is 2015-16 to 2017-18.

# Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 14,730 annual openings for the Drone occupational cluster and 36 annual (3-year average) awards for an annual undersupply of 14,694 students. In the East Bay Sub-Region, there is also a gap with 1,567 annual openings and 15 annual (3-year average) awards for an annual undersupply of 1,552 students.

# Student Outcomes

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 2206.10 - Geographic Information Systems**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2015-16 | Bay  (All CTE Programs) | Diablo Valley College (All CTE Programs) | State (2206.10) | Bay (2206.10) | East Bay (2206.10) | Diablo Valley College (2206.10) |
| % Employed Four Quarters After Exit | 74% | 68% | 77% | 74% | 100% | 100% |
| Median Quarterly Earnings Two Quarters After Exit | $10,550 | $9,308 | $12,780 | $12,349 | $14,188 | $12,067 |
| Median % Change in Earnings | 46% | 55% | 38% | 48% | 22% | 17% |
| % of Students Earning a Living Wage | 63% | 55% | 70% | 73% | 100% | 100% |

*Source: Launchboard Pipeline (version available on 12/20/19)*

# Skills, Certifications and Education

**Table 9. Top Skills for Drone Occupations in Bay Region (December 2018 - November 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Skill | Postings | Skill | Postings | Skill | Postings |
| Java | 55,515 | Data Structures | 10,703 | Machine Learning | 8,107 |
| Software Engineering | 52,574 | Continuous Integration (CI) | 10,678 | Extensible Markup Language (XML) | 7,825 |
| Software Development | 38,356 | Scrum | 10,635 | Big Data | 7,691 |
| Python | 37,381 | NoSQL | 10,554 | Relational Databases | 7,655 |
| SQL | 28,876 | UNIX | 10,296 | React Javascript | 7,636 |
| JavaScript | 28,460 | Web Application Development | 10,084 | JavaScript Object Notation (JSON) | 7,573 |
| Linux | 22,347 | Agile Development | 9,935 | Apache Hadoop | 7,407 |
| C++ | 22,086 | Docker Software | 9,462 | Salesforce | 7,315 |
| Git | 16,707 | Microsoft C# | 9,330 | Project Management | 7,137 |
| DevOps | 15,979 | MySQL | 9,269 | Node.js | 6,975 |
| Debugging | 15,231 | Software Architecture | 9,144 | HTML5 | 6,735 |
| Object-Oriented Analysis and Design (OOAD) | 14,361 | Quality Assurance and Control | 8,746 | Ruby | 6,692 |
| Oracle | 12,912 | Apache Kafka | 8,724 | Product Development | 6,530 |
| Unit Testing | 12,389 | Scalability Design | 8,399 | Product Management | 6,396 |
| Kubernetes | 11,223 | AngularJS | 8,313 | PostgreSQL | 6,286 |

*Source: Burning Glass*

**Table 10. Certifications for Drone Occupations in Bay Region (December 2018 - November 2019)**

Note: 95% 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.

|  |  |  |  |
| --- | --- | --- | --- |
| Certification | Postings | Certification | Postings |
| Security Clearance | 1,925 | Cisco Certified Network Professional (CCNP) | 197 |
| IT Infrastructure Library (ITIL) Certification | 688 | SANS/GIAC Certification | 196 |
| Driver's License | 589 | CompTIA Security+ | 160 |
| Certified Salesforce Platform Developer | 371 | First Aid CPR AED | 130 |
| Certified Information Systems Security Professional (CISSP) | 322 | Certified Salesforce Platform Developer I | 127 |
| Salesforce Developer | 312 | Certified Salesforce Advanced Administrator | 113 |
| Project Management Certification | 278 | Mbe Certified | 112 |
| Cisco Certified Network Associate (CCNA) | 262 | Salesforce Platform App Builder | 105 |
| ITIL Certification | 241 | Certified Information Systems Auditor (CISA) | 102 |
| Certified Salesforce Platform Developer II | 206 | Project Management Professional (PMP) | 90 |
| Cisco Certified Internetwork Expert (CCIE) | 203 | Certified ScrumMaster (CSM) | 88 |
| Certified Salesforce Administrator | 203 | Microsoft Certified Solutions Associate (MCSA) | 87 |

*Source: Burning Glass*

**Table 11. Education Requirements for Drone Occupations in Bay Region**

Note: 46% 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.

|  |  |  |
| --- | --- | --- |
| Education (minimum advertised) | Latest 12 Mos. Postings | Percent 12 Mos. Postings |
| High school or vocational training | 1,125 | 2% |
| Associate Degree | 490 | 1% |
| Bachelor’s Degree or Higher | 65,295 | 97% |

*Source: Burning Glass*

# 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/](http://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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