



CENTER OF EXCELLENCE
FOR LABOR MARKET RESEARCH
ORANGE COUNTY

ORANGE COUNTY SECTOR PROFILE
SUPPLEMENTAL APPENDICES:
**ENERGY, CONSTRUCTION,
& UTILITIES**

2024

**ORANGE COUNTY
REGIONAL CONSORTIUM**

**WORKFORCE
DEVELOPMENT ALLIANCE**



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INTRODUCTION

The Orange County Center of Excellence for Labor Market Research (OC COE) is releasing a series of 12 sector profiles to provide a comprehensive analysis of Orange County's occupational landscape. This series dives into each of the 12 community college sectors, offering historical and projected occupational insights while building upon foundational research established through the Orange County Labor Market Overview.

In addition to the profiles themselves, supplemental appendices for each sector are being issued to provide detailed demand and supply data. The data in these appendices are presented to the region with the intent of being utilized for grant applications, project proposals, and the like. The full [Energy, Construction, and Utilities Sector Profile](#) is available on the COE Website.

Occupations are denoted throughout this report in italics, with their corresponding SOC code in parentheses. Middle-skill occupations have no special notation however, below middle-skill occupations are denoted with an * and above middle-skill occupations denoted with a ^. Occupations that are on U.S. News & World Report's 2024 100 Best Jobs list are denoted by a #, such as *Civil Engineers (17-2051)^#*.

By examining this labor market data, in conjunction with the individual sector profiles, the OC COE seeks to highlight underlying dynamics and intricacies shaping each sector in Orange County. Community colleges and regional stakeholders can use this information for strategic planning and data-informed decision making to address workforce needs in this sector.

APPENDIX E: ENERGY, CONSTRUCTION, AND UTILITIES (ECU) DEMAND – LABOR MARKET DATA

Exhibit 23 shows the traditional labor market data points for all 113 occupations analyzed in the Energy, Construction, and Utilities (ECU) Sector Profile. Below middle-skill occupations are indicated with light shading, middle-skill occupations are denoted with medium shading, and above middle-skill occupations are indicated with dark shading.

Exhibit 23: Occupational Demand for the 113 Energy, Construction, and Utilities (ECU) Occupations

Skill Level	SOC	Occupation	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Below Middle-Skill	49-9071	Maintenance and Repair Workers, General**	14,804	15,981	1,176	8%	1,725	\$18.43	\$22.89	\$29.13	High school diploma or equivalent	None	Moderate-term on-the-job training
	47-2061	Construction Laborers**	14,684	15,519	835	6%	1,648	\$18.54	\$22.23	\$31.53	No formal educational credential	None	Short-term on-the-job training
	47-2141	Painters, Construction and Maintenance*	6,200	6,376	176	3%	579	\$19.78	\$23.75	\$29.76	No formal educational credential	None	Moderate-term on-the-job training
	47-2081	Drywall and Ceiling Tile Installers*	4,427	4,663	236	5%	417	\$24.11	\$30.37	\$42.35	No formal educational credential	None	Moderate-term on-the-job training
	47-2051	Cement Masons and Concrete Finishers*	3,277	3,346	68	2%	308	\$24.21	\$30.94	\$41.60	No formal educational credential	None	Moderate-term on-the-job training
	47-2181	Roofers*	2,587	2,783	196	8%	290	\$27.79	\$30.34	\$38.14	No formal educational credential	None	Moderate-term on-the-job training
	47-2161	Plasterers and Stucco Masons*	1,176	1,230	54	5%	116	\$24.04	\$28.63	\$32.21	No formal educational credential	None	Long-term on-the-job training
	47-2044	Tile and Stone Setters*	1,172	1,204	31	3%	112	\$21.71	\$30.15	\$36.63	No formal educational credential	None	Long-term on-the-job training

Skill Level	SOC	Occupation	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Below Middle-Skill	47-2042	Floor Layers, Except Carpet, Wood, and Hard Tiles*	750	785	35	5%	73	\$22.64	\$24.67	\$35.65	No formal educational credential	None	Moderate-term on-the-job training
	47-3013	Helpers-Electricians*	491	534	43	9%	70	\$17.78	\$20.48	\$24.35	High school diploma or equivalent	None	Short-term on-the-job training
	47-3019	Helpers, Construction Trades, All Other*	519	539	19	4%	68	\$19.07	\$21.95	\$23.69	No formal educational credential	None	Short-term on-the-job training
	47-4031	Fence Erectors*	577	586	9	1%	61	\$18.08	\$21.44	\$30.63	No formal educational credential	None	Moderate-term on-the-job training
	47-2082	Tapers*	681	697	15	2%	60	\$21.77	\$26.19	\$34.36	No formal educational credential	None	Moderate-term on-the-job training
	47-4051	Highway Maintenance Workers*	435	489	54	12%	58	\$20.10	\$22.96	\$29.28	High school diploma or equivalent	None	Moderate-term on-the-job training
	47-3011	Helpers-Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters*	430	414	(17)	(4%)	51	\$17.38	\$21.74	\$23.46	No formal educational credential	None	Short-term on-the-job training
	47-3015	Helpers-Pipelayers, Plumbers, Pipefitters, and Steamfitters*	311	342	31	10%	45	\$18.28	\$18.70	\$22.08	High school diploma or equivalent	None	Short-term on-the-job training
	47-2041	Carpet Installers*	512	470	(42)	(8%)	42	\$18.21	\$22.20	\$29.85	No formal educational credential	None	Short-term on-the-job training

Skill Level	SOC	Occupation	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Below Middle-Skill	47-3012	Helpers-Carpenters*	321	328	6	2%	41	\$21.26	\$27.88	\$27.88	No formal educational credential	None	Short-term on-the-job training
	47-4098	Miscellaneous Construction and Related Workers*	301	311	10	3%	36	\$21.37	\$23.92	\$35.39	High school diploma or equivalent	None	Moderate-term on-the-job training
	47-3014	Helpers-Painters, Paperhangers, Plasterers, and Stucco Masons*	232	239	7	3%	30	\$18.66	\$20.90	\$25.01	No formal educational credential	None	Short-term on-the-job training
	47-2131	Insulation Workers, Floor, Ceiling, and Wall*	230	257	27	12%	27	\$22.53	\$28.37	\$43.09	No formal educational credential	None	Short-term on-the-job training
	47-3016	Helpers-Roofers*	182	197	15	8%	26	\$18.31	\$21.42	\$24.70	No formal educational credential	None	Short-term on-the-job training
	47-4071	Septic Tank Servicers and Sewer Pipe Cleaners*	196	209	13	7%	25	\$20.08	\$23.40	\$27.23	High school diploma or equivalent	None	Moderate-term on-the-job training
	47-5022	Excavating and Loading Machine and Dragline Operators, Surface Mining*	185	188	4	2%	20	\$29.88	\$36.44	\$45.05	High school diploma or equivalent	Less than 5 years	Moderate-term on-the-job training
	51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers*	195	181	(14)	(7%)	20	\$43.04	\$44.54	\$46.40	High school diploma or equivalent	None	Moderate-term on-the-job training
	47-2151	Pipelayers*	157	151	(6)	(4%)	15	\$20.78	\$28.03	\$35.58	No formal educational credential	None	Short-term on-the-job training

Skill Level	SOC	Occupation	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Below Middle-Skill	51-8099	Plant and System Operators, All Other*	96	95	(1)	(2%)	10	\$25.30	\$30.54	\$38.12	High school diploma or equivalent	None	Moderate-term on-the-job training
	47-5013	Service Unit Operators, Oil and Gas*	75	77	2	3%	9	\$23.43	\$28.83	\$31.61	No formal educational credential	None	Moderate-term on-the-job training
	47-2043	Floor Sanders and Finishers*	68	66	(2)	(3%)	6	\$26.10	\$32.69	\$39.61	No formal educational credential	None	Moderate-term on-the-job training
	47-2142	Paperhangers*	62	62	0	0%	6	\$18.12	\$22.77	\$31.73	No formal educational credential	None	Long-term on-the-job training
	47-5071	Roustabouts, Oil and Gas*	42	46	4	9%	6	\$18.25	\$28.43	\$31.11	No formal educational credential	None	Moderate-term on-the-job training
	47-5081	Helpers-Extraction Workers*	57	52	(5)	(9%)	6	\$21.39	\$24.09	\$31.35	High school diploma or equivalent	None	Moderate-term on-the-job training
	43-5041	Meter Readers, Utilities*	50	51	1	2%	4	\$23.25	\$29.56	\$34.72	High school diploma or equivalent	None	Short-term on-the-job training
	47-5012	Rotary Drill Operators, Oil and Gas*	22	22	0	1%	3	\$25.03	\$37.02	\$50.01	No formal educational credential	None	Moderate-term on-the-job training
	47-5041	Continuous Mining Machine Operators*	22	23	1	4%	3	\$24.27	\$25.59	\$26.74	No formal educational credential	None	Moderate-term on-the-job training
	47-5051	Rock Splitters, Quarry*	26	26	0	1%	3	\$23.15	\$28.45	\$32.05	No formal educational credential	None	Short-term on-the-job training
47-5099	Extraction Workers, All Other*	27	27	0	0%	3	\$14.93	\$21.00	\$25.59	High school diploma or equivalent	None	Moderate-term on-the-job training	

Skill Level	SOC	Occupation	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Below Middle-Skill	49-9095	Manufactured Building and Mobile Home Installers*	34	32	(2)	(6%)	3	\$15.93	\$19.41	\$22.88	High school diploma or equivalent	None	Short-term on-the-job training
	51-4061	Model Makers, Metal and Plastic*	34	34	0	0%	3	\$26.94	\$33.66	\$46.27	High school diploma or equivalent	None	Moderate-term on-the-job training
	53-7031	Dredge Operators*	20	21	1	5%	3	\$23.08	\$29.76	\$45.17	High school diploma or equivalent	None	Moderate-term on-the-job training
	47-5011	Derrick Operators, Oil and Gas*	<10	12	Insf. Data	Insf. Data	2	Insf. Data	Insf. Data	Insf. Data	No formal educational credential	None	Short-term on-the-job training
	53-7073	Wellhead Pumpers*	15	12	(3)	(21%)	2	\$26.40	\$30.13	\$36.42	High school diploma or equivalent	Less than 5 years	Moderate-term on-the-job training
	53-7071	Gas Compressor and Gas Pumping Station Operators*	<10	<10	Insf. Data	Insf. Data	1	Insf. Data	Insf. Data	Insf. Data	High school diploma or equivalent	None	Moderate-term on-the-job training
	47-5043	Roof Bolters, Mining*	<10	<10	Insf. Data	Insf. Data	0	Insf. Data	Insf. Data	Insf. Data	High school diploma or equivalent	None	Moderate-term on-the-job training
	47-5044	Loading and Moving Machine Operators, Underground Mining*	<10	<10	Insf. Data	Insf. Data	0	Insf. Data	Insf. Data	Insf. Data	No formal educational credential	None	Short-term on-the-job training
	47-5049	Underground Mining Machine Operators, All Other*	<10	<10	Insf. Data	Insf. Data	0	Insf. Data	Insf. Data	Insf. Data	High school diploma or equivalent	None	Moderate-term on-the-job training
	51-4062	Patternmakers, Metal and Plastic*	<10	<10	Insf. Data	Insf. Data	0	Insf. Data	Insf. Data	Insf. Data	High school diploma or equivalent	None	Moderate-term on-the-job training

Skill Level	SOC	Occupation	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Middle-Skill	47-2031	Carpenters [#]	14,171	14,569	398	3%	1,445	\$22.18	\$30.10	\$39.68	High school diploma or equivalent	None	Apprenticeship
	47-2111	Electricians [#]	8,976	9,956	980	11%	1,159	\$24.26	\$35.18	\$47.09	High school diploma or equivalent	None	Apprenticeship
	47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	7,956	8,371	415	5%	858	\$32.56	\$41.90	\$59.37	High school diploma or equivalent	5 years or more	None
	47-2152	Plumbers, Pipefitters, and Steamfitters [#]	5,124	5,447	323	6%	599	\$24.32	\$31.22	\$44.21	High school diploma or equivalent	None	Apprenticeship
	49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	4,537	4,910	374	8%	519	\$23.80	\$31.23	\$41.18	Postsecondary nondegree award	None	Long-term on-the-job training
	49-9099	Installation, Maintenance, and Repair Workers, All Other	3,062	3,156	95	3%	337	\$17.48	\$20.99	\$26.57	High school diploma or equivalent	None	Moderate-term on-the-job training
	47-2073	Operating Engineers and Other Construction Equipment Operators	2,609	2,768	160	6%	306	\$29.70	\$39.54	\$52.26	High school diploma or equivalent	None	Moderate-term on-the-job training
	17-3011	Architectural and Civil Drafters	1,747	1,816	69	4%	218	\$25.76	\$30.49	\$37.25	Associate degree	None	None
	49-2098	Security and Fire Alarm Systems Installers	1,530	1,607	77	5%	184	\$24.46	\$33.31	\$39.63	High school diploma or equivalent	None	Moderate-term on-the-job training

Skill Level	SOC	Occupation	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Middle-Skill	47-4011	Construction and Building Inspectors	1,322	1,390	68	5%	179	\$27.47	\$38.43	\$49.45	High school diploma or equivalent	5 years or more	Moderate-term on-the-job training
	49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	1,491	1,447	(44)	(3%)	167	\$27.79	\$32.05	\$39.10	Postsecondary nondegree award	None	Moderate-term on-the-job training
	51-7011	Cabinetmakers and Bench Carpenters	1,300	1,321	21	2%	147	\$17.98	\$20.74	\$27.29	High school diploma or equivalent	None	Moderate-term on-the-job training
	49-9052	Telecommunications Line Installers and Repairers	1,380	1,316	(64)	(5%)	143	\$24.52	\$32.68	\$47.03	High school diploma or equivalent	None	Long-term on-the-job training
	47-2211	Sheet Metal Workers	1,224	1,277	53	4%	133	\$24.73	\$39.03	\$54.37	High school diploma or equivalent	None	Apprenticeship
	47-2221	Structural Iron and Steel Workers	1,009	1,058	49	5%	115	\$23.06	\$28.88	\$41.90	High school diploma or equivalent	None	Apprenticeship
	47-2121	Glaziers	713	740	27	4%	84	\$21.99	\$28.31	\$44.35	High school diploma or equivalent	None	Apprenticeship
	51-8021	Stationary Engineers and Boiler Operators	604	624	20	3%	80	\$23.10	\$28.92	\$42.61	High school diploma or equivalent	None	Long-term on-the-job training
	47-2231	Solar Photovoltaic Installers [#]	470	563	94	20%	74	\$21.00	\$21.80	\$25.63	High school diploma or equivalent	None	Moderate-term on-the-job training
	17-3022	Civil Engineering Technologists and Technicians	639	673	34	5%	71	\$29.39	\$37.24	\$45.35	Associate degree	None	None

Skill Level	SOC	Occupation	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Middle-Skill	19-4042	Environmental Science and Protection Technicians, Including Health	549	585	36	7%	66	\$19.99	\$24.15	\$33.55	Associate degree	None	None
	51-8011	Nuclear Power Reactor Operators	453	521	68	15%	61	\$49.37	\$59.21	\$69.96	High school diploma or equivalent	None	Long-term on-the-job training
	49-9051	Electrical Power-Line Installers and Repairers	564	608	44	8%	58	\$34.84	\$48.03	\$63.96	High school diploma or equivalent	None	Long-term on-the-job training
	17-3031	Surveying and Mapping Technicians	357	389	33	9%	53	\$27.93	\$37.23	\$48.57	High school diploma or equivalent	None	Moderate-term on-the-job training
	47-2021	Brickmasons and Blockmasons	527	527	0	0%	52	\$20.65	\$30.83	\$35.00	High school diploma or equivalent	None	Apprenticeship
	47-4021	Elevator and Escalator Installers and Repairers	448	481	32	7%	47	\$46.06	\$62.53	\$65.91	High school diploma or equivalent	None	Apprenticeship
	51-8031	Water and Wastewater Treatment Plant and System Operators	419	428	9	2%	43	\$27.35	\$35.32	\$41.76	High school diploma or equivalent	None	Long-term on-the-job training
	51-7042	Woodworking Machine Setters, Operators, and Tenders, Except Sawing	417	418	1	0%	42	\$17.83	\$18.91	\$22.49	High school diploma or equivalent	None	Moderate-term on-the-job training
	17-3019	Drafters, All Other	433	428	(5)	(1%)	40	\$23.45	\$25.40	\$36.59	Associate degree	None	None

Skill Level	SOC	Occupation	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Middle-Skill	47-2071	Paving, Surfacing, and Tamping Equipment Operators	265	295	29	11%	34	\$24.53	\$32.76	\$41.71	High school diploma or equivalent	None	Moderate-term on-the-job training
	19-4051	Nuclear Technicians	226	261	35	15%	33	\$38.28	\$46.05	\$47.58	Associate degree	None	Moderate-term on-the-job training
	49-2097	Audiovisual Equipment Installers and Repairers	315	303	(12)	(4%)	33	\$19.42	\$22.52	\$27.74	Postsecondary nondegree award	None	Short-term on-the-job training
	47-2171	Reinforcing Iron and Rebar Workers	292	302	10	3%	31	\$18.27	\$30.10	\$41.67	High school diploma or equivalent	None	Apprenticeship
	51-7099	Woodworkers, All Other	210	219	10	5%	25	\$14.04	\$17.96	\$22.73	High school diploma or equivalent	None	Moderate-term on-the-job training
	47-2022	Stonemasons	223	218	(5)	(2%)	21	\$20.55	\$28.70	\$30.03	High school diploma or equivalent	None	Apprenticeship
	17-3025	Environmental Engineering Technologists and Technicians	171	181	9	5%	19	\$28.05	\$35.63	\$40.97	Associate degree	None	None
	49-2095	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	169	180	11	7%	18	\$43.48	\$48.10	\$57.41	Postsecondary nondegree award	Less than 5 years	Moderate-term on-the-job training

Skill Level	SOC	Occupation	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Middle-Skill	49-2021	Radio, Cellular, and Tower Equipment Installers and Repairers	155	150	(6)	(4%)	17	\$21.75	\$32.01	\$45.43	Associate degree	None	Moderate-term on-the-job training
	47-2132	Insulation Workers, Mechanical	122	138	16	13%	15	\$26.49	\$51.19	\$61.18	High school diploma or equivalent	None	Apprenticeship
	47-5023	Earth Drillers, Except Oil and Gas	131	124	(6)	(5%)	13	\$21.86	\$27.18	\$38.04	High school diploma or equivalent	Less than 5 years	Long-term on-the-job training
	51-7041	Sawing Machine Setters, Operators, and Tenders, Wood	90	96	6	7%	12	\$17.68	\$19.73	\$23.23	High school diploma or equivalent	None	Moderate-term on-the-job training
	47-2072	Pile Driver Operators	75	79	5	6%	9	\$42.11	\$53.26	\$53.29	High school diploma or equivalent	None	Moderate-term on-the-job training
	49-9081	Wind Turbine Service Technicians#	67	77	10	14%	9	\$25.28	\$30.82	\$39.44	Postsecondary nondegree award	None	Long-term on-the-job training
	47-5032	Explosives Workers, Ordnance Handling Experts, and Blasters	82	83	1	1%	8	\$29.53	\$37.99	\$45.89	High school diploma or equivalent	Less than 5 years	Long-term on-the-job training
	47-2011	Boilermakers	72	73	1	1%	7	\$33.65	\$40.85	\$51.21	High school diploma or equivalent	None	Apprenticeship
	47-2053	Terrazzo Workers and Finishers	66	62	(4)	(6%)	6	\$20.23	\$23.85	\$26.80	High school diploma or equivalent	None	Apprenticeship
	51-8012	Power Distributors and Dispatchers	69	61	(8)	(11%)	6	\$36.57	\$45.37	\$55.46	High school diploma or equivalent	None	Long-term on-the-job training

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Middle-Skill	51-8013	Power Plant Operators	47	53	5	11%	6	\$37.49	\$49.88	\$57.73	High school diploma or equivalent	None	Long-term on-the-job training
	47-4061	Rail-Track Laying and Maintenance Equipment Operators	60	64	3	5%	5	\$31.13	\$31.94	\$40.49	High school diploma or equivalent	None	Moderate-term on-the-job training
	51-8092	Gas Plant Operators	55	45	(10)	(19%)	5	\$41.33	\$49.33	\$54.81	High school diploma or equivalent	None	Long-term on-the-job training
	19-4043	Geological Technicians, Except Hydrologic Technicians	24	28	4	17%	4	\$25.34	\$28.00	\$35.89	Associate degree	None	Moderate-term on-the-job training
	49-9092	Commercial Divers	31	33	2	6%	4	\$53.04	\$53.56	\$53.86	Postsecondary nondegree award	None	Moderate-term on-the-job training
	19-4044	Hydrologic Technicians	13	13	0	0%	1	\$23.85	\$35.18	\$41.52	Associate degree	None	Moderate-term on-the-job training
	51-7031	Model Makers, Wood	<10	<10	Insf. Data	Insf. Data	1	Insf. Data	Insf. Data	Insf. Data	High school diploma or equivalent	None	Moderate-term on-the-job training
	49-9045	Refractory Materials Repairers, Except Brickmasons	<10	<10	Insf. Data	Insf. Data	0	Insf. Data	Insf. Data	Insf. Data	High school diploma or equivalent	None	Moderate-term on-the-job training
	51-7032	Patternmakers, Wood	<10	<10	Insf. Data	Insf. Data	0	Insf. Data	Insf. Data	Insf. Data	High school diploma or equivalent	None	Moderate-term on-the-job training

Skill Level	SOC	Occupation	2022 Jobs	2027 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training
Above Middle-Skill	11-9021	Construction Managers ^{^#}	6,302	6,818	516	8%	601	\$35.84	\$52.02	\$71.59	Bachelor's degree	None	Moderate-term on-the-job training
	17-2051	Civil Engineers ^{^#}	5,357	5,806	449	8%	463	\$38.75	\$49.51	\$64.75	Bachelor's degree	None	None
	17-1011	Architects, Except Landscape and Naval ^{^#}	3,207	3,467	261	8%	282	\$30.19	\$45.62	\$61.59	Bachelor's degree	None	Internship/residency
	11-9041	Architectural and Engineering Managers [^]	3,833	3,883	50	1%	281	\$66.74	\$83.24	\$102.21	Bachelor's degree	5 years or more	None
	19-2041	Environmental Scientists and Specialists, Including Health [^]	645	703	58	9%	73	\$32.92	\$43.51	\$54.30	Bachelor's degree	None	None
	17-1022	Surveyors [^]	429	463	34	8%	40	\$35.05	\$47.52	\$61.12	Bachelor's degree	None	Internship/residency
	19-2042	Geoscientists, Except Hydrologists and Geographers [^]	299	322	23	8%	32	\$28.09	\$40.12	\$63.02	Bachelor's degree	None	None
	17-1012	Landscape Architects [^]	351	367	16	5%	31	\$30.65	\$43.86	\$58.88	Bachelor's degree	None	Internship/residency
	17-2161	Nuclear Engineers [^]	101	126	26	25%	13	\$55.26	\$59.26	\$79.48	Bachelor's degree	None	None
	17-2171	Petroleum Engineers [^]	146	152	5	4%	11	\$36.37	\$58.12	\$78.34	Bachelor's degree	None	None
17-2151	Mining and Geological Engineers, Including Mining Safety Engineers [^]	35	37	2	7%	3	\$48.66	\$69.84	\$76.09	Bachelor's degree	None	None	

APPENDIX F: ENERGY, CONSTRUCTION, AND UTILITIES (ECU) SUPPLY – COMMUNITY COLLEGE AND NON-COMMUNITY COLLEGE AWARDS

This appendix provides labor market supply information, which equates to educational awards, for the Energy, Construction, and Utilities sector.

Exhibit 24 shows the distribution of community college awards in Orange County by program in the Energy, Construction, and Utilities sector.

Exhibit 24: Energy, Construction, and Utilities (ECU) Community College Awards by Program, 2020-2023

TOP	Program	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
0201.00	Architecture and Architectural Technology	45	79	68	64
0299.00	Other Architecture and Environmental Design	-	-	-	-
0934.40	Electrical Systems and Power Transmission	33	-	-	11
0935.00	Electro-Mechanical Technology	-	4	8	4
0946.00	Environmental Control Technology (HVAC)	169	169	186	175
0946.10	Energy Systems Technology	-	-	-	-
0952.00	Construction Crafts Technology	106	57	71	78
0952.10	Carpentry	-	1	4	2
0952.20	Electrical	54	16	168	79
0952.30	Plumbing, Pipefitting and Steamfitting	-	5	3	3
0952.40	Glazing	-	-	-	-
0952.50	Mill and Cabinet Work	-	-	2	1
0952.60	Masonry, Tile, Cement, Lath and Plaster	-	3	3	2
0952.70	Painting, Decorating, and Flooring	-	-	-	-
0952.80	Drywall and Insulation	5	1	6	4
0952.90	Roofing	-	-	-	-
0953.00	Drafting Technology	51	32	68	50
0953.10	Architectural Drafting	3	8	17	9
0953.20	Civil Drafting	1	6	14	7

TOP	Program	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
0956.40	Sheet Metal and Structural Metal	-	-	-	-
0957.00	Civil and Construction Management Technology	7	16	18	14
0957.20	Construction Inspection	42	36	60	46
0957.30	Surveying	59	25	99	61
0958.00	Water and Wastewater Technology	369	111	220	233
2102.10	Public Works	18	21	19	19
2206.10	Geographic Information Systems	9	5	6	7
Total/Average		971	595	1,040	869

Exhibit 25 details Energy, Construction, and Utilities sector supply award counts by Orange County community college.

Exhibit 25: Energy, Construction, and Utilities (ECU) Community College Awards by College, 2020-2023

College	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
Coastline	12	15	31	19
Cypress	137	130	162	143
Fullerton	34	41	72	49
Golden West	4	3	4	4
Irvine Valley	28	22	41	30
North Orange Adult	-	-	-	-
Orange Coast	93	152	134	126
Saddleback	12	6	14	11
Santa Ana	117	56	80	84
Santiago Canyon	534	170	502	402
Total/Average	971	595	1,040	869

Exhibit 26 provides the number of Energy, Construction, and Utilities sector awards conferred by non-community college programs.

Exhibit 26: Energy, Construction, and Utilities (ECU) Non-Community College Awards by Program, 2019-2022

CIP	Program	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
03.0103	Environmental Studies	19	39	50	36
03.0104	Environmental Science	62	35	34	44
04.0301	City/Urban, Community, and Regional Planning	24	36	35	32
04.0501	Interior Architecture	3	6	-	3
14.0101	Engineering, General	10	3	-	4
14.0201	Aerospace, Aeronautical, and Astronautical/Space Engineering, General	59	72	78	70
14.0501	Bioengineering and Biomedical Engineering	178	188	221	196
14.0701	Chemical Engineering	86	76	107	90
14.0801	Civil Engineering, General	300	303	326	310
14.0901	Computer Engineering, General	350	297	321	323
14.0903	Computer Software Engineering	158	175	192	175
14.0999	Computer Engineering, Other	17	-	11	9
14.1001	Electrical and Electronics Engineering	336	267	247	283
14.1401	Environmental/Environmental Health Engineering	50	56	71	59
14.1801	Materials Engineering	51	58	60	56
14.1901	Mechanical Engineering	577	568	474	540
14.3601	Manufacturing Engineering	9	6	5	7
40.0509	Environmental Chemistry	-	-	1	0
40.0601	Geology/Earth Science, General	100	80	85	88
40.0699	Geological and Earth Sciences/Geosciences, Other	17	12	17	15
45.0701	Geography	42	36	41	40
45.0702	Geographic Information Science and Cartography	2	2	1	2

CIP	Program	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
46.0302	Electrician	225	293	277	265
47.0201	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	109	274	321	235
51.2202	Environmental Health	5	2	6	4
Grand Total		2,789	2,884	2,981	2,885

Exhibit 27 includes the number of Energy, Construction, and Utilities sector awards conferred by non-community college institutions.

Exhibit 27: Energy, Construction, and Utilities (ECU) Non-Community College Awards by Institution, 2019-2021

Institution	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
Brownson Technical School	13	142	161	105
California State University-Fullerton	829	688	707	741
Chapman University	26	22	26	25
InterCoast Colleges-Santa Ana	37	12	9	19
Interior Designers Institute	3	6	-	3
Southern California Institute of Technology	265	336	289	297
UEI College-Garden Grove	94	132	160	129
University of California-Irvine	1,520	1,544	1,627	1,564
University of Massachusetts Global	2	2	1	2
Vanguard University of Southern California	-	-	1	0
Grand Total	2,789	2,884	2,981	2,885

APPENDIX G: ENERGY, CONSTRUCTION, AND UTILITIES CIP CODES

This appendix provides the list of CIP codes that crosswalk to the occupations in the Energy, Construction, and Utilities sector but did not have any supply (Exhibit 28).

Exhibit 28: List of CIP Codes with no Supply in Orange County

CIP	Program	CIP	Program
04.0201	Architecture	14.2501	Petroleum Engineering
04.0202	Architectural Design	14.2701	Systems Engineering
04.0401	Environmental Design/Architecture	14.2801	Textile Sciences and Engineering
04.0402	Healthcare Environment Design/Architecture	14.3201	Polymer/Plastics Engineering
04.0601	Landscape Architecture	14.3301	Construction Engineering
04.0801	Architectural History and Criticism, General	14.3401	Forest Engineering
04.0901	Architectural Technology/Technician	14.3501	Industrial Engineering
04.0902	Architectural and Building Sciences/Technology	14.3801	Surveying Engineering
04.0999	Architectural Sciences and Technology, Other	14.3901	Geological/Geophysical Engineering
14.0202	Astronautical Engineering	14.4001	Paper Science and Engineering
14.0299	Aerospace, Aeronautical, and Astronautical/Space Engineering, Other	14.4101	Electromechanical Engineering
14.0301	Agricultural Engineering	14.4201	Mechatronics, Robotics, and Automation Engineering
14.0401	Architectural Engineering	14.4301	Biochemical Engineering
14.0601	Ceramic Sciences and Engineering	14.4401	Engineering Chemistry
14.0702	Chemical and Biomolecular Engineering	14.4501	Biological/Biosystems Engineering
14.0799	Chemical Engineering, Other	14.4701	Electrical and Computer Engineering
14.0802	Geotechnical and Geoenvironmental Engineering	14.4801	Energy Systems Engineering, General
14.0803	Structural Engineering	14.4802	Power Plant Engineering
14.0804	Transportation and Highway Engineering	14.4899	Energy Systems Engineering, Other
14.0805	Water Resources Engineering	14.9999	Engineering, Other
14.0899	Civil Engineering, Other	15.0000	Engineering Technologies/Technicians, General
14.0902	Computer Hardware Engineering	15.0101	Architectural Engineering Technologies/Technicians
14.1003	Laser and Optical Engineering	15.0201	Civil Engineering Technologies/Technicians
14.1004	Telecommunications Engineering	15.0303	Electrical, Electronic, and Communications Engineering Technology/Technician
14.1099	Electrical, Electronics, and Communications Engineering, Other	15.0501	Heating, Ventilation, Air Conditioning and Refrigeration Engineering Technology/Technician
14.1101	Engineering Mechanics	15.0506	Water Quality and Wastewater Treatment Management and Recycling Technology/Technician
14.1201	Engineering Physics/Applied Physics	15.0507	Environmental/Environmental Engineering Technology/Technician
14.1301	Engineering Science	15.0508	Hazardous Materials Management and Waste Technology/Technician
14.2001	Metallurgical Engineering		
14.2101	Mining and Mineral Engineering		
14.2201	Naval Architecture and Marine Engineering		
14.2301	Nuclear Engineering		
14.2401	Ocean Engineering		

CIP	Program
15.0704	Hazardous Materials Information Systems Technology/Technician
15.0901	Mining Technology/Technician
15.0903	Petroleum Technology/Technician
15.0999	Mining and Petroleum Technologies/Technicians, Other
15.1001	Construction Engineering Technology/Technician
15.1102	Surveying Technology/Surveying
15.1301	Drafting and Design Technology/Technician, General
15.1302	CAD/CADD Drafting and/or Design Technology/Technician
15.1303	Architectural Drafting and Architectural CAD/CADD
15.1304	Civil Drafting and Civil Engineering CAD/CADD
15.1307	3-D Modeling and Design Technology/Technician
15.1399	Drafting/Design Engineering Technologies/Technicians, Other
15.1401	Nuclear Engineering Technology/Technician
15.1501	Engineering/Industrial Management
15.1502	Engineering Design
15.1503	Packaging Science
15.1702	Power Plant Technology/Technician
15.1703	Solar Energy Technology/Technician
15.1704	Wind Energy Technology/Technician
15.1705	Hydroelectric Energy Technology/Technician
26.1004	Toxicology
26.1005	Molecular Toxicology
26.1006	Environmental Toxicology
30.3201	Marine Sciences
30.3301	Sustainability Studies
30.3801	Earth Systems Science
30.4101	Environmental Geosciences
30.4201	Geoarchaeology
30.4301	Geobiology
30.4401	Geography and Environmental Studies
40.0602	Geochemistry
40.0603	Geophysics and Seismology
40.0604	Paleontology
40.0605	Hydrology and Water Resources Science
40.0606	Geochemistry and Petrology
40.0607	Oceanography, Chemical and Physical

CIP	Program
40.1001	Materials Science
41.0000	Science Technologies/Technicians, General
41.0204	Industrial Radiologic Technology/Technician
41.0205	Nuclear/Nuclear Power Technology/Technician
41.0299	Nuclear and Industrial Radiologic Technologies/Technicians, Other
41.0303	Chemical Process Technology
41.0399	Physical Science Technologies/Technicians, Other
41.9999	Science Technologies/Technicians, Other
44.0402	Public Works Management
46.0000	Construction Trades, General
46.0101	Mason/Masonry
46.0201	Carpentry/Carpenter
46.0301	Electrical and Power Transmission Installation/Installer, General
46.0303	Lineworker
46.0399	Electrical and Power Transmission Installers, Other
46.0401	Building/Property Maintenance
46.0402	Concrete Finishing/Concrete Finisher
46.0403	Building/Home/Construction Inspection/Inspector
46.0404	Drywall Installation/Drywaller
46.0406	Glazier
46.0408	Painting/Painter and Wall Coverer
46.0410	Roofer
46.0411	Metal Building Assembly/Assembler
46.0412	Building/Construction Site Management/Manager
46.0413	Carpet, Floor, and Tile Worker
46.0414	Insulator
46.0415	Building Construction Technology/Technician
46.0502	Pipefitting/Pipefitter and Sprinkler Fitter
46.0503	Plumbing Technology/Plumber
46.0504	Well Drilling/Driller
46.0505	Blasting/Blaster
46.0599	Plumbing and Related Water Supply Services, Other
47.0000	Mechanics and Repairers, General
47.0101	Electrical/Electronics Equipment Installation and Repair Technology/Technician, General
47.0103	Communications Systems Installation and Repair Technology/Technician

CIP	Program
47.0110	Security System Installation, Repair, and Inspection Technology/Technician
47.0199	Electrical/Electronics Maintenance and Repair Technologies/Technicians, Other
47.0303	Industrial Mechanics and Maintenance Technology/Technician
47.0402	Gunsmithing/Gunsmith
47.0409	Parts and Warehousing Operations and Maintenance Technology/Technician
47.0701	Energy Systems Installation and Repair Technology/Technician
47.0703	Solar Energy System Installation and Repair Technology/Technician
47.0704	Wind Energy System Installation and Repair Technology/Technician
47.0705	Hydroelectric Energy System Installation and Repair Technology/Technician
47.0706	Geothermal Energy System Installation and Repair Technology/Technician
47.0799	Energy Systems Maintenance and Repair Technologies/Technicians, Other

CIP	Program
48.0506	Sheet Metal Technology/Sheetworking
48.0701	Woodworking, General
48.0702	Furniture Design and Manufacturing
48.0703	Cabinetmaking and Millwork
48.0704	Wooden Boatbuilding Technology/Technician
48.0799	Woodworking, Other
48.0801	Boilermaking/Boilermaker
49.0202	Construction/Heavy Equipment/Earthmoving Equipment Operation
49.0206	Mobil Crane Operator/Operation
49.0207	Flagging and Traffic Control
49.0304	Diver, Professional and Instructor
51.0916	Radiation Protection/Health Physics Technician
52.0216	Science/Technology Management
52.2001	Construction Management, General
52.2002	Construction Project Management
52.2099	Construction Management, Other



Important Disclaimers

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. This study examines the most recent data available at the time of the analysis; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and the report findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor’s Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

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