

## Applicable Definitions

Variable	Definition and explanation
Annual Openings	Estimated employment change and turnover for an occupation in a given year. The number is calculated as the sum of new and replacement jobs in an occupation over the entire timeframe, divided by the number of years in the timeframe. New jobs are defined as openings due to growth. Replacement jobs are openings due to attrition.
Description	Official occupation name designated by the Bureau of Labor Statistics within the Standard Occupational Classification (SOC) reporting system.
Education Level	The most significant source of education or training for an occupation. Combines typical education, experience, and on-the-job training held by workers in the field. <i>(Source: Bureau of Labor Statistics)</i>
Job Change	The difference between the start-year job count and the end-year job count, indicating growth or decline in the number of jobs, between the two dates. This variable may reflect historical or projected data based upon analytic needs.
Jobs	<p>Any position in which a worker provides labor in exchange for monetary compensation. Employment data represents jobs, not workers, since one individual may hold multiple jobs. EMSI reports employment as annual job averages, taking the employment for each month and averaging it across the year in order to smooth out seasonal spikes and drops.</p> <p>Number of jobs reported for current or past years are based upon existing labor market data. Projections for anticipated future job counts are based upon regression models that average 5-, 10-, and 15-year historic trends. For EMSI data, the accuracy of projections is believed to be 94% at the national level, 88% at the state level and 84% at the county level.</p>
Median Hourly Earnings	Hourly earnings for the occupation reported at the 50 <sup>th</sup> percentile.
Postsecondary nondegree award	Educational level equivalent to the attainment of a CareerTech certificate, industry recognized certification, or licensure not requiring a college degree.
SOC (Standard Occupational Classification)	A system used by Federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data. All workers are classified into one of 840 detailed occupations according to their occupational definition. Occupations are combined to form 461 broad occupations, 97 minor groups, and 23 major groups. Detailed occupations in the SOC with similar job duties, and in some cases skills, education and/or training, are grouped together. <i>(Source: Bureau of Labor Statistics)</i>
Total Openings	Estimated employment change and turnover for an occupation over the span of a given timeframe. Calculated as the number of new jobs created due to growth plus replacement jobs open due to attrition.
Typical Entry Level Education	Typical level of education that most workers need to enter an occupation. Typical level of education is subject to change based upon local market demands or licensure requirements.
Unique Job Postings	Denotes the number of de-duplicated job advertisements listed by different companies on career sites and job boards. De-duplication is a process job postings must go through in order to best approximate demand for certain jobs.

## Data Limitations and Sources

<p>Labor Market Data Limitations</p>	<p>Labor market analyses rely upon a large amount of data gathered from a variety of federal and state government, as well as private, sources. Based upon staggered reporting cycles, there are often delays in obtaining and synthesizing this data. The data provided for these analyses are the most recent available and the only basis upon which to model projections for the future.</p>
<p>Occupational Data Limitations</p>	<p>Data for the Top 100 Demand and Top 100 Critical Occupation lists include QCEW (Quarterly Census of Employment and Wages) and Non-QCEW Employees. These data do not include individuals who are Self-employed or Extended Proprietors. Military occupations are aggregated and reported as one category rather than by equivalent SOC.</p>
<p>Job Postings Data Limitations</p>	<p>While labor market data are gleaned from standard reports, Job Postings data are scraped from the Internet by CareerBuilders.com and supplemented with data aggregated by multiple third-party groups. Some limitations to note: 1) Postings measure the <i>intentions</i> of <i>certain</i> companies, not all companies, to hire workers, but do not reflect actual hires; 2) Postings are voluntary and do not cover all occupations or regions equally. Professional, high tech, high skill educational level occupations typically have better representation in job postings. Middle and lower skill jobs are mostly, but not always, absent from postings. Each region and occupation are different, and the reasons for under- or over-representation in postings will differ from case to case; and, 3) Since employers typically post positions utilizing common working-titles rather than official SOC occupational titles, postings are generally not occupational-code specific. As a result, a job posting may be applicable to multiple occupational codes with similar titles or overlapping skill sets.</p>
<p>Data Sources</p>	<p>Except when otherwise cited, the data utilized for these analyses are extracted from the Economic Modeling Specialist International (EMSI) database software. EMSI aggregates data from over 90 publicly-available or proprietary data sources including a variety of data from the U.S. Census Bureau, the Bureau of Labor Statistics, the Bureau of Economic Analysis and the National Center for Education Statistics (NCES), among others. Examples of datasets incorporated into the EMSI software include:</p> <ol style="list-style-type: none"> <li>1) Quarterly Workforce Indicators (QWI);</li> <li>2) Local Area Personal Income (LAPI);</li> <li>3) Current Employment Statistics (CES);</li> <li>4) Non-Employer Statistics (NES);</li> <li>5) Quarterly Census of Employment and Wages (QCEW);</li> <li>6) Occupational Employment Statistics (OES);</li> <li>7) National Industry-Occupation Employment Matrix (NIOEM);</li> <li>8) Occupational Information Network (O*NET); and,</li> <li>9) Integrated Postsecondary Education Data System (IPEDS).</li> </ol>

## Methodology/Parameters

The top 100 Critical Occupation List is longitudinal, focused on job growth in the future and acknowledging the need for extended timeframes to achieve higher levels of education.

The methodologies for selecting occupations for inclusion in the Top 100 Critical Occupation List are designed to emphasize the state's desire to meet labor demands so that businesses and entrepreneurs can grow and prosper and Oklahoma citizens can maintain wealth-generating occupations. Factors included in the selection process demonstrate the values of job growth, wealth generation, and education, and are outlined below. Adjustments to the data may be made to address known industry-coding inconsistencies.

- 1) Occupations are limited to those vital to the success of Oklahoma's ecosystems. Ecosystems -- or economic systems -- are demand industry sectors/clusters identified as giving Oklahoma a competitive advantage in a global economy. Five key statewide ecosystems have been identified including Aerospace and Defense; Agriculture and Biosciences; Energy; Information and Finance; and, Transportation and Distribution. In addition to the five statewide ecosystems, four complementary ecosystems have been identified including Healthcare, Education, Construction, and Manufacturing.
- 2) Job growth: those occupations with projected negative growth (overall job loss) are eliminated from the list.
- 3) Wealth Generation: those occupations with median hourly salaries below \$12.00 per hour are eliminated from the list.
- 4) Education: those occupations requiring "no formal education" are eliminated from the list *unless* the occupation earns a median salary above \$20.00 per hour.
- 5) The occupations remaining on the list are sorted based on greatest job growth and stratified by education.
- 6) To ensure representation of occupations from all educational levels, the top ranked occupations are selected from each educational group.

## 2018-2020 Critical Occupations List

SOC	Description	2018 Jobs	2028 Jobs	Change (2018 - 2028)	Median Hourly Earnings	Typical Entry Level Education	Work Experience Required	Typical On-The-Job Training	For Educational Levels of High School Diploma or Less, there is a Certificate available.	Annual Openings	Apr 2018 Unique Postings
29-1069	Physicians and Surgeons, All Other	2,511	3,023	294	\$105.76	Doctoral or professional degree	None	Internship/residency		108	546
29-1021	Dentists, General	1,294	1,486	192	\$65.78	Doctoral or professional degree	None	None		57	74
11-9041	Architectural and Engineering Managers	2,191	2,114	110	\$56.68	Bachelor's degree	5 years or more	None		153	157
17-2171	Petroleum Engineers	2,673	2,860	172	\$55.32	Bachelor's degree	None	None		204	69
19-2042	Geoscientists, Except Hydrologists and Geographers	1,040	1,180	97	\$54.73	Bachelor's degree	None	None		113	12
29-1041	Optometrists	671	831	152	\$49.30	Doctoral or professional degree	None	None		38	8
29-1071	Physician Assistants	1,452	1,762	278	\$49.20	Master's degree	None	None		115	238
11-3021	Computer and Information Systems Managers	3,264	3,561	315	\$47.42	Bachelor's degree	5 years or more	None		277	115
11-3031	Financial Managers	6,532	7,073	509	\$43.58	Bachelor's degree	5 years or more	None		543	449
29-1171	Nurse Practitioners	1,385	1,727	342	\$43.36	Master's degree	None	None		109	221
17-2071	Electrical Engineers	1,548	1,341	68	\$41.40	Bachelor's degree	None	None		90	283
29-1131	Veterinarians	984	1,115	117	\$39.73	Doctoral or professional degree	None	None		50	47
29-1123	Physical Therapists	2,014	2,544	511	\$39.44	Doctoral or professional degree	None	None		143	572
15-1132	Software Developers, Applications	4,801	4,923	494	\$39.05	Bachelor's degree	None	None		345	1,030
17-2112	Industrial Engineers	2,609	1,901	156	\$38.60	Bachelor's degree	None	None		134	583
17-2051	Civil Engineers	2,269	2,512	205	\$38.15	Bachelor's degree	None	None		193	204
11-1021	General and Operations Managers	27,503	29,825	2,167	\$37.47	Bachelor's degree	5 years or more	None		2,523	1,066
17-2141	Mechanical Engineers	3,037	2,704	134	\$37.39	Bachelor's degree	None	None		182	390
11-9111	Medical and Health Services Managers	5,899	6,585	426	\$37.09	Bachelor's degree	Less than 5 years	None		532	491
17-1011	Architects, Except Landscape and Naval	785	902	108	\$36.77	Bachelor's degree	None	Internship/residency		73	12
15-1121	Computer Systems Analysts	3,388	3,757	580	\$36.73	Bachelor's degree	None	None		277	454
15-1133	Software Developers, Systems Software	2,947	2,536	211	\$35.78	Bachelor's degree	None	None		175	158
29-2021	Dental Hygienists	2,050	2,385	329	\$35.63	Associate's degree	None	None		166	51
11-9021	Construction Managers	2,996	3,222	238	\$35.55	Bachelor's degree	None	Moderate-term on-the-job training		234	191
13-1081	Logisticians	2,280	2,436	114	\$35.28	Bachelor's degree	None	None		239	171
15-1122	Information Security Analysts	675	707	71	\$34.44	Bachelor's degree	Less than 5 years	None		52	197
13-1111	Management Analysts	4,492	5,201	492	\$33.84	Bachelor's degree	Less than 5 years	None		467	515
15-1141	Database Administrators	943	1,000	75	\$33.23	Bachelor's degree	None	None		68	91
17-2081	Environmental Engineers	710	785	61	\$32.38	Bachelor's degree	None	None		55	53
29-2032	Diagnostic Medical Sonographers	926	1,096	170	\$31.90	Associate's degree	None	None		69	40
29-9011	Occupational Health and Safety Specialists	1,363	1,502	86	\$31.41	Bachelor's degree	None	None		83	66
13-2051	Financial Analysts	1,780	1,883	205	\$30.80	Bachelor's degree	None	None		169	114
15-1142	Network and Computer Systems Administrators	2,897	3,019	170	\$30.52	Bachelor's degree	None	None		196	577
17-3023	Electrical and Electronics Engineering Technicians	1,510	1,549	22	\$30.16	Associate's degree	None	None		136	151
29-1127	Speech-Language Pathologists	1,617	1,865	228	\$30.00	Master's degree	None	Internship/residency		110	233
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	6,409	6,936	404	\$29.91	High school diploma or equivalent	Less than 5 years	None	Certificate Available	609	440
29-2035	Magnetic Resonance Imaging Technologists	330	373	43	\$29.83	Associate's degree	Less than 5 years	None		23	41
13-2052	Personal Financial Advisors	1,235	1,496	261	\$29.72	Bachelor's degree	None	Long-term on-the-job training		127	102
13-2011	Accountants and Auditors	14,926	17,050	2,066	\$29.34	Bachelor's degree	None	None		1,603	797
17-3026	Industrial Engineering Technicians	885	724	23	\$29.04	Associate's degree	None	None		64	85
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	9,396	10,572	1,152	\$28.94	High school diploma or equivalent	5 years or more	None	Certificate Available	1,072	190
29-1141	Registered Nurses	27,389	30,633	2,558	\$28.49	Associate's degree	None	None		1,751	5,483
15-2031	Operations Research Analysts	827	928	179	\$28.35	Bachelor's degree	None	None		67	62
13-1051	Cost Estimators	1,901	2,060	234	\$27.84	Bachelor's degree	None	Moderate-term on-the-job training		210	62
19-2041	Environmental Scientists and Specialists, Including Health	478	570	76	\$27.08	Bachelor's degree	None	None		56	15
13-1023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	3,883	3,849	76	\$27.07	Bachelor's degree	None	Moderate-term on-the-job training		338	224
13-1022	Wholesale and Retail Buyers, Except Farm Products	1,301	1,402	109	\$27.00	Bachelor's degree	None	Moderate-term on-the-job training		162	11
29-2011	Medical and Clinical Laboratory Technologists	2,041	2,348	253	\$26.82	Bachelor's degree	None	None		164	170
13-2061	Financial Examiners	429	549	58	\$26.52	Bachelor's degree	None	Long-term on-the-job training		44	15
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	2,972	3,230	230	\$26.03	High school diploma or equivalent	Less than 5 years	None	Certificate Available	340	828
19-4041	Geological and Petroleum Technicians	1,302	1,406	104	\$25.92	Associate's degree	None	Moderate-term on-the-job training		148	10
29-1031	Dietitians and Nutritionists	741	848	83	\$25.92	Bachelor's degree	None	Internship/residency		57	48

13-2072	Loan Officers	4,222	4,674	409	\$25.61	Bachelor's degree	None	Moderate-term on-the-job training		402	206
51-1011	First-Line Supervisors of Production and Operating Workers	8,589	8,382	177	\$25.56	High school diploma or equivalent	Less than 5 years	None	Certificate Available	831	604
47-5012	Rotary Drill Operators, Oil and Gas	1,989	2,114	125	\$25.29	No formal educational credential	None	Moderate-term on-the-job training		268	21
29-1126	Respiratory Therapists	1,149	1,248	94	\$25.11	Associate's degree	None	None		66	148
17-3022	Civil Engineering Technicians	719	762	43	\$25.08	Associate's degree	None	None		69	30
49-9051	Electrical Power-Line Installers and Repairers	2,175	2,498	312	\$24.81	High school diploma or equivalent	None	Long-term on-the-job training	Certificate Available	218	24
13-2041	Credit Analysts	615	676	62	\$24.36	Bachelor's degree	None	None		58	33
15-1134	Web Developers	943	1,096	157	\$24.34	Associate's degree	None	None		86	502
13-1151	Training and Development Specialists	2,902	3,032	175	\$24.32	Bachelor's degree	Less than 5 years	None		298	288
29-2034	Radiologic Technologists	2,321	2,512	139	\$24.22	Associate's degree	None	None		144	170
49-9041	Industrial Machinery Mechanics	4,691	5,528	959	\$23.66	High school diploma or equivalent	None	Long-term on-the-job training	Certificate Available	526	197
47-2111	Electricians	6,658	7,631	995	\$23.47	High school diploma or equivalent	None	Apprenticeship	Certificate Available	887	193
47-5011	Derrick Operators, Oil and Gas	1,153	1,254	101	\$23.17	No formal educational credential	None	Short-term on-the-job training	Certificate Available	158	0
47-2152	Plumbers, Pipefitters, and Steamfitters	6,439	7,299	818	\$22.23	High school diploma or equivalent	None	Apprenticeship	Certificate Available	795	87
19-4031	Chemical Technicians	557	590	38	\$22.07	Associate's degree	None	Moderate-term on-the-job training		58	32
47-4011	Construction and Building Inspectors	1,688	1,904	189	\$21.81	High school diploma or equivalent	5 years or more	Moderate-term on-the-job training		211	37
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	3,421	3,964	531	\$21.11	Postsecondary nondegree award	None	Long-term on-the-job training		406	140
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	1,915	2,109	149	\$20.90	High school diploma or equivalent	None	Long-term on-the-job training	Certificate Available	207	50
47-5013	Service Unit Operators, Oil, Gas, and Mining	3,281	3,432	151	\$20.54	No formal educational credential	None	Moderate-term on-the-job training		437	136
51-4041	Machinists	6,066	5,653	250	\$20.07	High school diploma or equivalent	None	Long-term on-the-job training	Certificate Available	596	224
33-3051	Police and Sheriff's Patrol Officers	7,866	9,314	1,386	\$19.77	High school diploma or equivalent	None	Moderate-term on-the-job training	Certificate Available	687	38
15-1151	Computer User Support Specialists	7,899	8,244	360	\$19.69	Some college, no degree	None	None		621	896
49-9043	Maintenance Workers, Machinery	2,777	2,956	211	\$19.64	High school diploma or equivalent	None	Long-term on-the-job training	Certificate Available	309	0
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	11,338	11,576	238	\$19.61	Bachelor's degree	None	None		833	320
25-2022	Middle School Teachers, Except Special and Career/Technical Education	7,250	7,411	161	\$19.37	Bachelor's degree	None	None		548	82
33-2011	Firefighters	3,656	4,425	736	\$19.34	Postsecondary nondegree award	None	Long-term on-the-job training		339	9
53-3032	Heavy and Tractor-Trailer Truck Drivers	24,021	26,425	2,426	\$19.28	Postsecondary nondegree award	None	Short-term on-the-job training		2,928	17,573
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	2,847	3,254	393	\$19.16	High school diploma or equivalent	None	Long-term on-the-job training	Certificate Available	309	484
51-4121	Welders, Cutters, Solderers, and Brazers	9,334	9,583	329	\$19.07	High school diploma or equivalent	None	Moderate-term on-the-job training	Certificate Available	1,045	281
25-2052	Special Education Teachers, Kindergarten and Elementary School	2,140	2,192	52	\$18.94	Bachelor's degree	None	None		162	61
25-2021	Elementary School Teachers, Except Special Education	16,151	16,515	364	\$18.67	Bachelor's degree	None	None		1,221	799
29-2061	Licensed Practical and Licensed Vocational Nurses	11,306	11,995	469	\$18.64	Postsecondary nondegree award	None	None		893	586
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	5,881	5,261	257	\$18.07	High school diploma or equivalent	None	Moderate-term on-the-job training	Certificate Available	638	219
49-3021	Automotive Body and Related Repairers	1,672	1,830	157	\$18.06	High school diploma or equivalent	None	Long-term on-the-job training	Certificate Available	182	30
47-2073	Operating Engineers and Other Construction Equipment Operators	6,184	7,102	900	\$17.95	High school diploma or equivalent	None	Moderate-term on-the-job training	Certificate Available	815	65
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	3,197	3,083	309	\$17.69	High school diploma or equivalent	None	Moderate-term on-the-job training	Certificate Available	322	85
17-3025	Environmental Engineering Technicians	349	372	26	\$17.57	Associate's degree	None	None		33	9
47-2031	Carpenters	5,070	5,533	468	\$17.42	High school diploma or equivalent	None	Apprenticeship	Certificate Available	526	78
29-2031	Cardiovascular Technologists and Technicians	599	691	92	\$16.59	Associate's degree	None	None		43	126
51-8031	Water and Wastewater Treatment Plant and System Operators	2,059	2,372	314	\$15.38	High school diploma or equivalent	None	Long-term on-the-job training		215	36
29-2012	Medical and Clinical Laboratory Technicians	2,201	2,583	339	\$14.99	Associate's degree	None	None		183	87
29-2056	Veterinary Technologists and Technicians	906	1,121	211	\$14.98	Associate's degree	None	None		101	38
53-3033	Light Truck or Delivery Services Drivers	9,111	9,687	592	\$14.75	High school diploma or equivalent	None	Short-term on-the-job training	Certificate Available	1,051	2,263
19-4091	Environmental Science and Protection Technicians, Including Health	371	403	31	\$14.41	Associate's degree	None	None		48	105
29-2052	Pharmacy Technicians	5,248	5,646	319	\$13.98	High school diploma or equivalent	None	Moderate-term on-the-job training	Certificate Available	462	367
29-2081	Opticians, Dispensing	853	1,074	221	\$13.71	High school diploma or equivalent	None	Long-term on-the-job training		90	6
29-2041	Emergency Medical Technicians and Paramedics	3,571	4,409	837	\$13.23	Postsecondary nondegree award	None	None		324	105
53-3021	Bus Drivers, Transit and Intercity	1,074	1,245	170	\$13.05	High school diploma or equivalent	None	Moderate-term on-the-job training	Certificate Available	157	36
		397,904	430,546	36,050						37,116	

The Jobs listed on the Top 100 Critical Occupations List represent:

24.0% of all jobs in 2028

47.1% of all jobs in 2028 requiring a Postsecondary Nondegree Award or higher

84.5% of all anticipated newly-created jobs, 2018 to 2028, requiring a Postsecondary Nondegree Award or higher

29.4% of all anticipated newly-created jobs, 2028 to 2028