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O*NET-SOC 2019 Taxonomy Development
Final Report

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Background

The Occupational Information Network (O*NET) is a comprehensive system developed by the U.S. Department of Labor that provides information for over 1,100 occupations within the U.S. economy. The database is maintained by the National Center for O*NET Development ("the Center"), sponsored by the U.S. Department of Labor through a grant to the North Carolina Department of Commerce. The backbone of the O*NET database is the O*NET-Standard Occupational Classification (O*NET-SOC) taxonomy, which is based on the Standard Occupation Classification (SOC) system published by the Office of Management and Budget (OMB). The Standard Occupational Classification Policy Committee (SOCPC)—a multiagency group led by the Bureau of Labor Statistics (BLS)—is responsible for updating the SOC. The SOC system is designed to assist federal agencies with classifying workers and occupations and provide a language and organizing structure for describing all occupations in the national economy (OMB, 2010; 2018). In 2018, OMB published a revised SOC manual, updating the previous system published in 2010 (OMB, 2010; 2018). When OMB publishes revisions to the SOC system, O*NET aligns the O*NET-SOC taxonomy with the revised SOC structure (Gregory, Lewis, Frugoli, & Nallin, 2019).

All OMB SOC occupations have a six-digit code, where the first two digits represent one of the 23 SOC major groups, the third digit represents the SOC minor group, the fourth and fifth digits represent the SOC broad occupation, and the sixth digit represents the SOC detailed occupation (Gregory et al., 2019). In the O*NET-SOC taxonomy, if an occupation comes directly from the SOC system, it has the same 6-digit code, along with a .00 extension. Additionally, the O*NET-SOC occupation title and definition for these occupations match the title and definition in the SOC system. These occupations are called "SOC-level occupations." A detailed O*NET-SOC occupation occurs when the O*NET-SOC occupation is more detailed than the SOC system occupation and does not exist in the SOC system. In the O*NET-SOC taxonomy, these occupations (hereafter referred to as "detailed occupations") are given the six-digit SOC code from the SOC system occupation from which it originated, plus a two-digit extension (.01, .02, etc.; Gregory et al., 2019).

Changes made by OMB between the 2010 SOC taxonomy and the 2018 SOC taxonomy included: (a) the aggregation of occupations (two or more occupations became one occupation), (b) the separation of occupations (one occupation was separated into two or more occupations), (c) the addition of new occupations, and (d) the dropping of occupations. To reflect these changes made to codes, titles, and definitions in the 2018 SOC system, the O*NET-SOC 2010 taxonomy was revised (Gregory et al., 2019). Specifically, the Center aligned the O*NET-SOC 2019 taxonomy with the new 2018 SOC structure. With the revision of the O*NET-SOC 2010 taxonomy structure, many data-level occupations (i.e., those for which the Center collects data from job incumbents, job postings, associations, etc.; Gregory et al., 2019) in the new O*NET-SOC 2019 taxonomy were in need of new, revised, or updated profile information. The purpose of the current report is to document the technical support provided by the Human Resources Research Organization (HumRRO) to update the occupation descriptions, tasks (Dierdorff & Norton, 2011), alternate titles (Gregory & Lewis, 2015), and exclusionary titles (O*NET, 2006) for SOC-level and detailed O*NET-SOC occupations.

Identifying 2019 O*NET-SOC Occupations to Update

The Center revised the O*NET-SOC 2010 taxonomy to adopt the 2018 SOC structure's codes, titles, and definitions. Additionally, the Center added and removed detailed occupations to reflect the current US economy. The Center's technical report provides a detailed description of those revisions (see Gregory et al., 2019). In short, 157 occupations were removed (37 SOC-level occupations, 120 detailed O*NET-SOC occupations) and 63 occupations were added (51 SOC-level occupation, 12 detailed occupations) to the taxonomy. Four of the detailed occupations added were new and emerging (N & E) occupations related to cybersecurity. The O*NET system is designed to reflect changes in workforce needs, particularly in high growth industries. Thus, these four occupations were identified as growing or promising, and were incorporated into the O*NET-SOC classification system via the N & E occupation process (see O*NET, 2006, for details). In addition, 13 O*NET-SOC 2010 detailed occupations were adopted by the SOC taxonomy and became 2018 SOC-level occupations. Finally, there were code, title, and description changes made to the O*NET-SOC taxonomy to mirror the 2018 SOC.

Following the taxonomy update work, the Center contracted with HumRRO to update or populate data-level information (specifically, tasks, alternate titles, exclusionary titles) for SOC-level and detailed occupations that changed between the O*NET-SOC 2010 taxonomy and the O*NET-SOC 2019 taxonomy. SOC-level and detailed occupation changes occurred because occupations were removed from or added to the revised taxonomy. However, not all occupations added needed entirely new occupation-level data. Also, every removed occupation did not have its data-level information completely deleted from the revised taxonomy. HumRRO populated added occupations with existing data-level information and retained data-level information from deleted occupations when it was relevant to occupations in the O*NET-SOC 2019 taxonomy.

To determine the relevance of data-level information, it was necessary to understand the changes to occupations and the linkages between O*NET-SOC 2010 to O*NET-SOC 2019 occupations. After reviewing the Center's 2019 technical report (Gregory et al., 2019) and meeting with Center staff, HumRRO identified three categories of occupational changes across SOC-level and detailed occupations.

1. *Rolled-Up Occupations* – First, a "rolled-up" occupation in the O*NET-SOC 2019 taxonomy meant that two or more occupations in the O*NET-SOC 2010 taxonomy were collapsed into one occupation in the O*NET-SOC 2019 taxonomy.[1] A "roll-up" of O*NET-SOC 2010 occupations could occur for several reasons including (a) a detailed occupation was absorbed into a SOC-level occupation, (b) two SOC-level occupations were combined, or (c) two detailed occupations were combined. In all cases, the task lists, alternate titles, and exclusionary titles from two or more O*NET-SOC 2010 occupations needed to be reconciled in order to create the task list, alternate titles, and exclusionary titles for the corresponding O*NET-SOC 2019 occupation.

2. *Split-Out Occupations* – Second, a "split-out" occupation in the O*NET-SOC 2019 taxonomy meant that one occupation from the O*NET-SOC 2010 taxonomy was split

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[1] Of the two or more occupations from the O*NET-SOC 2010 taxonomy that were "rolled-up," one or both of these occupations could have been designated as occupations that were "deleted" from the revised O*NET-SOC 2019 taxonomy. As these procedures will show, occupations that were "deleted" from the taxonomy were actually important and necessary to help update the occupations that remained (or that were "added") in the revised taxonomy.

into two or more occupations in the revised taxonomy. O*NET-SOC 2010 occupations were "split-out" for a variety of reasons including (a) a SOC-level occupation was broken out into two or more SOC-level or detailed occupations or (b) a single detailed occupation was split out into two detailed occupations. In all cases, the task list from the O*NET-SOC 2010 occupation could not be used to represent two or more O*NET-SOC 2019 occupations. In other words, two occupations in the revised taxonomy could not have the same profile information. HumRRO refined and tailored the task lists, alternate titles, and exclusionary titles for the "split-out" occupations so that each O*NET-SOC 2019 occupation had a list that matched its new definition and title.

3. ***New Occupations*** – Third, a "new" occupation in the O*NET-SOC 2019 taxonomy meant that an occupation in the revised taxonomy had no starting data-level profile information from the O*NET-SOC 2010 taxonomy. These "new" occupations resulted when (a) SOC-level occupations were added to the taxonomy and (b) N & E occupations were added by the Center.

To determine the number of occupations that fell within each revision type ("rolled-up," "split-out," "new"), HumRRO consulted the crosswalk between the 2010 O*NET-SOC taxonomy and the 2019 O*NET-SOC taxonomy (Gregory et al., 2019). Specifically, if a 2019 O*NET-SOC occupation was listed more than once in the crosswalk, that meant that two or more 2010 O*NET-SOC occupations were being "rolled-up" into that 2019 O*NET-SOC occupation. In some cases, the 2019 O*NET-SOC occupation title (e.g., 11-3051.00 Industrial Production Managers) was identical to one of the linked 2010 O*NET-SOC occupation titles. When considering only the occupation title, it may seem as if the occupation has remained unchanged across taxonomies. However, the crosswalk would reveal that another 2010 O*NET-SOC occupation title (e.g., 11-3051.05 Methane/Landfill Gas Collection Systems Operators) was also linked to the 2019 O*NET-SOC occupation. In order to preserve the information from both 2010 O*NET-SOC occupations and ensure they were adequately reflected in the 2019 O*NET-SOC occupation, these 2019 O*NET-SOC occupations were qualified as "rolled-up" occupations.

Other "rolled-up" occupations reflected a more even combination between the two 2010 O*NET-SOC occupations. For instance, the data-level 2010 O*NET-SOC occupations of 13-2011.01 Accountants and 13-2011.02 Auditors were combined into a 2019 O*NET-SOC occupation of 13-2011.00 Accountants and Auditors.[2] HumRRO identified 73 "rolled-up" 2019 O*NET-SOC occupations. Appendix A contains the 2010-2019 O*NET-SOC taxonomy crosswalk for the "rolled-up" 2019 O*NET-SOC occupations.

Conversely, if a 2010 O*NET-SOC occupation was listed more than once in the 2010-2019 O*NET-SOC taxonomy crosswalk, that meant the 2010 O*NET-SOC occupation was being "split-out" into two or more 2019 O*NET-SOC occupations. Appendix B contains the 2010-2019 taxonomy crosswalk for the 33 "split-out" 2019 O*NET-SOC occupations.[3]

If a 2019 O*NET-SOC occupation was linked to a 2010 O*NET-SOC "All Other" occupation and the 2019 O*NET-SOC occupation was not an "All Other" occupation, this meant that this 2019 O*NET-SOC occupation had no starting data-level occupation information (e.g., tasks, alternate

[2] 13-2011.00 Accountants and Auditors is a "title only," non-data level occupation within the 2010 O*NET-SOC taxonomy. There are 45 "parent" occupations with more specific linked occupations for which data is not collected within the 2010 O*NET-SOC taxonomy.
[3] 2019 O*NET-SOC "All Other" occupations linked to the 2010 O*NET-SOC occupations listed in the crosswalk are excluded, as these "All Other" occupations did not require data-level occupation information.

titles, exclusionary titles). Thus, HumRRO classified these 2019 O*NET-SOC occupations as "new" because these occupations would need a completely new set of tasks, alternate titles, exclusionary titles. Appendix C contains the O*NET-SOC 2010-2019 taxonomy crosswalk for the 17 "new" O*NET-SOC 2019 occupations. Additionally, the Center provided HumRRO with four additional "new" occupations (i.e., N & E occupations with no starting data-level information) that would be added to the 2019 O*NET-SOC taxonomy. These four N & E occupations were related to the cybersecurity industry. Thus, HumRRO had 21 "new" O*NET-SOC 2019 occupations for which new data-level information was needed.

Finally, the Center identified nine occupations that required new or updated occupation descriptions in addition to updates to the occupation tasks, alternate titles, and exclusionary titles. These included occupation descriptions for the four N & E occupations, along with five other detailed occupations. The five detailed occupations included two 2010 O*NET-SOC detailed occupations that were "rolled-up" into one 2019 O*NET-SOC detailed occupation and two 2010 O*NET-SOC detailed occupations were "split-out" into four 2019 O*NET-SOC detailed occupations. As these were all detailed occupations (and not tied directly to the 2018 SOC system), the SOC system did not provide occupation descriptions. Thus, the Center tasked HumRRO with updating these occupation descriptions.

Occupation Update Procedures

HumRRO created a systematic process to update the information for the 127 "rolled-up", "split-out", and "new" occupations in the 2019 O*NET-SOC taxonomy. Each occupation had a template (i.e., Excel document) that contained the 2010-2019 O*NET-SOC occupation linkages (including titles, SOC codes, occupation descriptions), and the tasks, alternate titles, and exclusionary titles from linked 2010 O*NET-SOC occupations, when available. These templates were designed to record all 2010 O*NET-SOC occupation information (e.g., alternate title source codes, task IDs, task importance ratings, occupation of origin for each task and alternate title), along with every modification to the 2010 O*NET-SOC occupation information.

HumRRO worked with the Center to finalize the template layout and information provided so that the templates could be easily adopted into the Center's databases. To finalize the templates for the Center, HumRRO used automated programs to check for any inconsistencies (e.g., if more than 30 task statements were selected; if more than 10 alternate titles were to be displayed online) and provide additional information. For instance, if HumRRO staff modified an existing task statement (from a linked 2010 O*NET-SOC occupation), the automated program populated an additional column with the original task statement, so the Center could then compare the revised statement to its original. The templates also included notes about the changes that were made. Appendix D provides screenshots of a completed occupation template.

Prior to working on the templates, HumRRO analysts were trained both on how to use the templates and the style guidelines for the tasks, alternate titles, and exclusionary titles associated with each O*NET-SOC occupation. For instance, tasks should be at a particular level of detail and be formatted in a certain way to ensure consistency across occupations. Alternate titles need to follow certain rules, such as the need to avoid too specific and too general alternate titles and to ensure alternate titles are at the same level (e.g., in terms of expertise) as the target occupation. There are also guidelines when choosing exclusionary titles (e.g., do not include "All Other" occupations as exclusionary titles). Such guidelines and rules are explained further in the "Updating Occupation Profile Information" below. These guidelines and rules were consolidated into training manuals and presented to analysts in the context of

the templates (e.g., how to apply the formatting guidelines and make necessary changes to profile elements using the templates). Each HumRRO analyst reviewed training manuals with these rules and guidelines and participated in a formal training session relevant to the profile element for which they would be working (i.e., tasks, alternate titles, exclusionary titles). HumRRO analysts then completed practice templates for "rolled-up" and "split-out" occupations. These practice templates were discussed as a group and consensus was reached on all edits to ensure consistent application of the rules across analysts.

For each "rolled-up" and "split-out" occupation, HumRRO decided to "keep," "delete," and "add" each associated task, alternate title, and exclusionary title. Starting information from linked 2010 O*NET-SOC occupations was "kept" if it was still relevant to the "rolled-up" or "split-out" occupation and "deleted" if not. When necessary (e.g., to further distinguish two "split-out" occupations, to populate "new" occupations with information), HumRRO "added" task statements from other 2010 O*NET-SOC occupations or from outside research. HumRRO also modified tasks to better fit the 2019 O*NET-SOC occupation and altered existing alternate titles to align with the O*NET style guidelines. New 2019 O*NET-SOC occupation titles were "added" as exclusionary titles ("rolled-up," "split-out," "new") when relevant because these titles would not be covered by 2010 O*NET-SOC occupation exclusionary titles.

All decisions and modifications were recorded within the occupation template. These decisions and modifications went through one to two rounds of review by HumRRO staff that were highly experienced with the formatting requirements of the descriptor domain (e.g., tasks, alternate titles). Next, the decisions were reviewed twice by project management staff prior to being sent to the Center. These reviews were intended to ensure consistent application of guidelines and rules, and correct usage of the templates.

The 127 occupations were divided into seven batches based on the type of change and job family. There were three batches for "rolled-up" occupations, two batches for "split-out" occupations, and two batches for "new" occupations. HumRRO submitted completed batch templates to the Center and made revisions based on Center feedback. For instance, revisions to "split-out" occupations typically included adding task statements that would further differentiate the two or more 2019 O*NET-SOC occupations linked to the same 2010 O*NET-SOC occupation. Prior to resubmission of templates to the Center, revisions underwent the same level of review as initial drafts, with at least one round of review by HumRRO staff with experience with the occupational profile element and two rounds of review by project management staff.

Updating Occupation Profile Information

As described above, the 2019 O*NET-SOC occupations were organized into batches based on the type of change ("rolled-up," "split-out," "new") and by job family. Every occupation required updates to the tasks, alternate titles, and exclusionary titles. Nine of these occupations also required new or updated occupation descriptions. In the sections below, we explain the process used and the edits made to the profile elements based on the type of change.

Occupation Descriptions

Occupation descriptions were structured to follow the SOC structure set forth in the *2018 SOC User Guide* (OMB, 2018). To create or update the occupation descriptions, HumRRO staff conducted research on the occupation and related jobs. Information about the occupation was pulled from relevant professional association websites, job board postings for similar

occupations, and other online resources. This information was used to write new occupation descriptions for the four N & E 2019 O*NET-SOC occupations. For the five detailed occupations, HumRRO combined new research with the existing 2010 O*NET-SOC occupation descriptions to refine and edit the descriptions for the 2019 O*NET-SOC occupations. For the "split-out" occupations, the goal was to distinguish each 2019 O*NET-SOC occupation from the other "split-out" occupation. For the "rolled-up" occupation, the goal was to adequately reflect both the 2010 O*NET-SOC occupations that were combined into one. These nine 2019 O*NET-SOC occupation descriptions are provided in Appendix E.

Task Statements

Task statements are exemplars of the types of activities workers in an occupation may perform and are typically conceptualized as the smallest unit of activity with a meaningful outcome. For "rolled-up" or "split-out" occupations, HumRRO started with the task statements from the linked 2010 O*NET-SOC occupations. For "rolled-up" occupations, one or more task lists from 2010 O*NET-SOC occupations were combined and used as the starting task list for the 2019 O*NET-SOC occupation. Here, the typical goal was to reduce the list of statements so that the "rolled-up" occupation had no more than 30 (the maximum number of statements allotted) and was reflective of the 2019 O*NET SOC occupation's title and description.

HumRRO followed a set of general guidelines to help reduce the combined task list for "rolled-up" occupations. Duplicate task statements (across the two or more 2010 O*NET-SOC occupations) were removed and similar statements were identified. If two or more statements were similar, tasks with higher importance ratings or tasks that were identified as core were retained for the "rolled-up" occupation over tasks that were less important or supplemental.[4] Some O*NET task statements are general, while others are very specific. The amount of detail in the task statements was also considered so that simpler, broader statements were retained over longer, detailed statements, so that the final task information would be more user friendly for customers. The relevance of the tasks relative to the "rolled-up" occupation was also considered. A task may have had high importance ratings and been deemed core to a 2010 O*NET-SOC occupation (e.g., 11-2011.01 Green Marketers), but may not be as relevant to its 2019 O*NET-SOC "rolled-up" occupation (e.g., 11-2011.00 Advertising and Promotion Managers). In cases like this, irrelevant task statements were removed from the "rolled-up" occupation task list.

For "split-out" occupations, one task list from a 2010 O*NET-SOC occupation was used as the starting task list for two or more 2019 O*NET-SOC occupations. Here, the goal was to differentiate the task lists for the two or more "split-out" occupations. The 2019 O*NET-SOC occupation descriptions were carefully read to fully understand how the original 2010 O*NET-SOC occupation was divided into the two or more "split-out" occupations. Sometimes, the "split-out" occupations reflected differences in levels or expertise (e.g., technicians vs. technologists) or differences in the subject-matter (e.g., kindergarten vs. elementary school). This differentiation was achieved by assigning some tasks to only one of the two "split-out" occupations based on their fit with either occupation. For instance, task statements that focused on mentoring or overseeing others were included only for the higher level "split-out" occupation with the rationale that higher-level individuals were more likely to have subordinate employees to mentor. Some task statements were fundamental to both "split-out" occupations and thus

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[4] There are two categories of tasks for O*NET-SOC occupations. "Core" tasks are critical to the occupation and "supplemental" tasks are less relevant and/or less important to the occupation, as determined by incumbent and occupational expert ratings.

were retained on both. Based on feedback from the Center, some "split-out" occupations were further differentiated and augmented with additional task statements. The procedure to add task statements followed guidelines similar to those used to develop task lists for "new" occupations.

"New" occupations did not have starting task lists and thus HumRRO staff used the occupation title and description to conduct research and write task statements. Typical sources for information about the occupation included professional associations, job postings, information from other known taxonomies (e.g., National Initiative for Cybersecurity Education [NICE] Cybersecurity Workforce Framework5), and similar occupations within the 2010 O*NET-SOC taxonomy. The format of all new task statements followed the style and formatting guidelines set forth in previous O*NET research (Dierdorff & Norton, 2011).

Alternate Titles

O*NET alternate titles represent alternate or lay titles that are linked to O*NET-SOC occupations, helping customers gain a better understanding of occupations and aiding them in their occupational searches (Gregory & Lewis, 2015). Alternate titles guide keyword searches in several Department of Labor internet applications and they are incorporated into several public and private keyword searches through O*NET Web Services. A subset is also presented within occupation and career profiles in O*NET OnLine and the My Next Move sites as "reported job titles." Data sources for alternate titles include incumbent/occupational expert data collection, employer job postings, Occupational Code Assignment (OCA) submissions, customer and professional group requests, additional occupational classification systems, and other miscellaneous sources. For "rolled-up," "split-out," and "new" occupations in the 2019 O*NET-SOC taxonomy, HumRRO updated the alternate title lists. Similar to the task statement guidelines previously described, "rolled-up" and "split-out" occupations had starting lists of alternate titles from the linked 2010 O*NET-SOC occupations. To curate and finalize these lists, HumRRO retained all alternate titles that were still relevant to the "rolled-up" and "split-out" occupations and removed those no longer relevant due to changes in the occupation (e.g., occupation level, scope). Furthermore, HumRRO revised existing alternate titles to fit O*NET's alternate title style guidelines (e.g., avoid most abbreviations and compound titles). Finally, HumRRO selected the alternate titles that would appear within O*NET OnLine (up to 10 titles) and on the My Next Move occupation profile (up to 4 titles). Titles that appear within O*NET OnLine and on My Next Move are supported by data and thus, these titles were selected from the alternate titles linked to the 2010 O*NET-SOC occupations that appeared within O*NET OnLine and on My Next Move.

"New" occupations required generating lists of alternate titles. Like the task statements, alternate titles were developed after researching the new occupation. Job titles from relevant job postings and professional associations were included as alternate titles. When appropriate, alternate titles for similar 2010 O*NET-SOC occupations were pulled. All new alternate titles were formatted to follow O*NET's style guidelines.

Exclusionary Titles

Exclusionary titles are O*NET-SOC occupations that can be easily confused with, but are different from, the target occupation (O*NET, 2006). These exclusionary titles should include titles that are similar in terms of key words (e.g., 13-1081.01 Logistics Engineers vs. 13-1081.02

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5 https://www.nist.gov/itl/applied-cybersecurity/nice/nice-cybersecurity-workforce-framework-resource-center

Logistics Analysts) and meaning (e.g., 35-3022.01 Baristas vs. 35-2021.00 Food Preparation Workers). Similar to the approach for alternate titles, "rolled-up" and "split-out" occupations used exclusionary titles from their linked 2010 O*NET-SOC occupations as a starting point. Exclusionary titles were retained if they were likely to be confused with the "rolled-up" or "split-out" occupation and removed if they were no longer similar in title or meaning to the "rolled-up" or "split-out" occupation. The Center advised HumRRO to use occupation titles from the 2010 O*NET-SOC taxonomy. The exception was any "new" occupations that could be confused with the target occupation. Here, the occupation titles and codes from the 2019 O*NET-SOC taxonomy were added as exclusionary titles because there were no equivalent or linked 2010 O*NET-SOC occupations to include as exclusionary titles.

"New" occupations required HumRRO to generate exclusionary title lists. HumRRO used a series of steps and guidelines to identify exclusionary titles for these "new" occupations, including (a) looking at occupations within the target occupation's Job Family, (b) entering words from the target occupation's title or occupation definition into O*NET OnLine's keyword search, and (c) identifying supervisory/subordinate titles.

Summary

HumRRO developed and updated occupation information (e.g., tasks, alternate titles, exclusionary titles) for 127 occupations in the 2019 O*NET-SOC taxonomy. Several of these occupations were new data-level occupations added to the 2019 O*NET-SOC taxonomy. Other occupations resulted from the separation or merger of 2010 O*NET-SOC occupations. HumRRO used a systematic approach to retain and update relevant information from the 2010 O*NET-SOC taxonomy while augmenting this information with outside research. These efforts resulted in 127 2019 O*NET-SOC occupations with appropriate, distinct, and properly formatted occupation information.

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Appendix A: 2010-2019 O*NET-SOC Crosswalk for Rolled-Up Occupations

O*NET-SOC 2010 Codes and Titles		O*NET-SOC 2019 Codes and Titles	
11-2011.00	Advertising and Promotions Managers	11-2011.00	Advertising and Promotions Managers
11-2011.01	Green Marketers	11-2011.00	Advertising and Promotions Managers
11-3031.00	Financial Managers	11-3031.00	Financial Managers
11-3031.02	Financial Managers, Branch or Department	11-3031.00	Financial Managers
11-3051.00	Industrial Production Managers	11-3051.00	Industrial Production Managers
11-3051.05	Methane/Landfill Gas Collection System Operators	11-3051.00	Industrial Production Managers
11-3071.00	Transportation, Storage, and Distribution Managers	11-3071.00	Transportation, Storage, and Distribution Managers
11-3071.01	Transportation Managers	11-3071.00	Transportation, Storage, and Distribution Managers
11-3071.02	Storage and Distribution Managers	11-3071.00	Transportation, Storage, and Distribution Managers
11-3071.03	Logistics Managers	11-3071.00	Transportation, Storage, and Distribution Managers
11-9013.00	Farmers, Ranchers, and Other Agricultural Managers	11-9013.00	Farmers, Ranchers, and Other Agricultural Managers
11-9013.01	Nursery and Greenhouse Managers	11-9013.00	Farmers, Ranchers, and Other Agricultural Managers
11-9013.02	Farm and Ranch Managers	11-9013.00	Farmers, Ranchers, and Other Agricultural Managers
11-9013.03	Aquacultural Managers	11-9013.00	Farmers, Ranchers, and Other Agricultural Managers
13-1031.00	Claims Adjusters, Examiners, and Investigators	13-1031.00	Claims Adjusters, Examiners, and Investigators
13-1031.01	Claims Examiners, Property and Casualty Insurance	13-1031.00	Claims Adjusters, Examiners, and Investigators
13-1031.02	Insurance Adjusters, Examiners, and Investigators	13-1031.00	Claims Adjusters, Examiners, and Investigators
13-1041.00	Compliance Officers	13-1041.00	Compliance Officers
13-1041.02	Licensing Examiners and Inspectors	13-1041.00	Compliance Officers
13-2011.00	Accountants and Auditors	13-2011.00	Accountants and Auditors
13-2011.01	Accountants	13-2011.00	Accountants and Auditors
13-2011.02	Auditors	13-2011.00	Accountants and Auditors
13-2021.00	Appraisers and Assessors of Real Estate	13-2023.00	Appraisers and Assessors of Real Estate
13-2021.01	Assessors	13-2023.00	Appraisers and Assessors of Real Estate

O*NET-SOC 2010 Codes and Titles		O*NET-SOC 2019 Codes and Titles	
13-2021.02	Appraisers, Real Estate	13-2023.00	Appraisers and Assessors of Real Estate
13-2051.00	Financial Analysts	13-2051.00	Financial and Investment Analysts
13-2099.03	Investment Underwriters	13-2051.00	Financial and Investment Analysts
13-2051.00	Financial Analysts	13-2054.00	Financial Risk Specialists
13-2099.00	Financial Specialists, All Other	13-2054.00	Financial Risk Specialists
13-2099.02	Risk Management Specialists	13-2054.00	Financial Risk Specialists
13-2071.01	Loan Counselors	13-2072.00	Loan Officers
13-2072.00	Loan Officers	13-2072.00	Loan Officers
15-1132.00	Software Developers, Applications	15-1252.00	Software Developers
15-1133.00	Software Developers, Systems Software	15-1252.00	Software Developers
15-1132.00	Software Developers, Applications	15-1253.00	Software Quality Assurance Analysts and Testers
15-1133.00	Software Developers, Systems Software	15-1253.00	Software Quality Assurance Analysts and Testers
15-1199.01	Software Quality Assurance Engineers and Testers	15-1253.00	Software Quality Assurance Analysts and Testers
15-1199.04	Geospatial Information Scientists and Technologists	15-1299.02	Geographic Information Systems Technologists and Technicians
15-1199.05	Geographic Information Systems Technicians	15-1299.02	Geographic Information Systems Technologists and Technicians
17-2031.00	Biomedical Engineers	17-2031.00	Bioengineers and Biomedical Engineers
17-2199.01	Biochemical Engineers	17-2031.00	Bioengineers and Biomedical Engineers
17-2111.00	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	17-2111.00	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors
17-2111.01	Industrial Safety and Health Engineers	17-2111.00	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors
17-2111.03	Product Safety Engineers	17-2111.00	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors
17-2121.00	Marine Engineers and Naval Architects	17-2121.00	Marine Engineers and Naval Architects
17-2121.01	Marine Engineers	17-2121.00	Marine Engineers and Naval Architects
17-2121.02	Marine Architects	17-2121.00	Marine Engineers and Naval Architects
17-3011.00	Architectural and Civil Drafters	17-3011.00	Architectural and Civil Drafters
17-3011.01	Architectural Drafters	17-3011.00	Architectural and Civil Drafters
17-3011.02	Civil Drafters	17-3011.00	Architectural and Civil Drafters

O*NET-SOC 2010 Codes and Titles		O*NET-SOC 2019 Codes and Titles	
17-3012.00	Electrical and Electronics Drafters	17-3012.00	Electrical and Electronics Drafters
17-3012.01	Electronic Drafters	17-3012.00	Electrical and Electronics Drafters
17-3012.02	Electrical Drafters	17-3012.00	Electrical and Electronics Drafters
17-3023.00	Electrical and Electronic Engineering Technicians	17-3023.00	Electrical and Electronic Engineering Technologists and Technicians
17-3023.01	Electronics Engineering Technicians	17-3023.00	Electrical and Electronic Engineering Technologists and Technicians
17-3023.03	Electrical Engineering Technicians	17-3023.00	Electrical and Electronic Engineering Technologists and Technicians
17-3029.02	Electrical Engineering Technologists	17-3023.00	Electrical and Electronic Engineering Technologists and Technicians
17-3029.04	Electronics Engineering Technologists	17-3023.00	Electrical and Electronic Engineering Technologists and Technicians
17-3024.00	Electro-Mechanical Technicians	17-3024.00	Electro-Mechanical and Mechatronics Technologists and Technicians
17-3029.03	Electromechanical Engineering Technologists	17-3024.00	Electro-Mechanical and Mechatronics Technologists and Technicians
17-3026.00	Industrial Engineering Technicians	17-3026.00	Industrial Engineering Technologists and Technicians
17-3029.05	Industrial Engineering Technologists	17-3026.00	Industrial Engineering Technologists and Technicians
17-3029.06	Manufacturing Engineering Technologists	17-3026.00	Industrial Engineering Technologists and Technicians
17-3029.09	Manufacturing Production Technicians	17-3026.00	Industrial Engineering Technologists and Technicians
17-3029.11	Nanotechnology Engineering Technologists	17-3026.01	Nanotechnology Engineering Technologists and Technicians
17-3029.12	Nanotechnology Engineering Technicians	17-3026.01	Nanotechnology Engineering Technologists and Technicians
17-3027.00	Mechanical Engineering Technicians	17-3027.00	Mechanical Engineering Technologists and Technicians
17-3029.07	Mechanical Engineering Technologists	17-3027.00	Mechanical Engineering Technologists and Technicians
17-3031.00	Surveying and Mapping Technicians	17-3031.00	Surveying and Mapping Technicians
17-3031.01	Surveying Technicians	17-3031.00	Surveying and Mapping Technicians
17-3031.02	Mapping Technicians	17-3031.00	Surveying and Mapping Technicians
19-1031.00	Conservation Scientists	19-1031.00	Conservation Scientists
19-1031.01	Soil and Water Conservationists	19-1031.00	Conservation Scientists
19-3031.00	Clinical, Counseling, and School Psychologists	19-3033.00	Clinical and Counseling Psychologists
19-3031.02	Clinical Psychologists	19-3033.00	Clinical and Counseling Psychologists

O*NET-SOC 2010 Codes and Titles		O*NET-SOC 2019 Codes and Titles	
19-3031.03	Counseling Psychologists	19-3033.00	Clinical and Counseling Psychologists
19-3051.00	Urban and Regional Planners	19-3051.00	Urban and Regional Planners
19-4061.01	City and Regional Planning Aides	19-3051.00	Urban and Regional Planners
19-3091.00	Anthropologists and Archeologists	19-3091.00	Anthropologists and Archeologists
19-3091.01	Anthropologists	19-3091.00	Anthropologists and Archeologists
19-3091.02	Archeologists	19-3091.00	Anthropologists and Archeologists
19-4011.00	Agricultural and Food Science Technicians	19-4012.00	Agricultural Technicians
19-4011.01	Agricultural Technicians	19-4012.00	Agricultural Technicians
19-4011.00	Agricultural and Food Science Technicians	19-4013.00	Food Science Technicians
19-4011.02	Food Science Technicians	19-4013.00	Food Science Technicians
19-4041.00	Geological and Petroleum Technicians	19-4043.00	Geological Technicians, Except Hydrologic Technicians
19-4041.01	Geophysical Data Technicians	19-4043.00	Geological Technicians, Except Hydrologic Technicians
19-4041.02	Geological Sample Test Technicians	19-4043.00	Geological Technicians, Except Hydrologic Technicians
19-4051.00	Nuclear Technicians	19-4051.00	Nuclear Technicians
19-4051.01	Nuclear Equipment Operation Technicians	19-4051.00	Nuclear Technicians
25-4021.00	Librarians	25-4022.00	Librarians and Media Collections Specialists
25-9011.00	Audio-Visual and Multimedia Collections Specialists	25-4022.00	Librarians and Media Collections Specialists
25-9031.00	Instructional Coordinators	25-9031.00	Instructional Coordinators
25-9031.01	Instructional Designers and Technologists	25-9031.00	Instructional Coordinators
27-2012.00	Producers and Directors	27-2012.00	Producers and Directors
27-2012.01	Producers	27-2012.00	Producers and Directors
27-2012.02	Directors- Stage, Motion Pictures, Television, and Radio	27-2012.00	Producers and Directors
27-2041.00	Music Directors and Composers	27-2041.00	Music Directors and Composers
27-2041.01	Music Directors	27-2041.00	Music Directors and Composers
27-2041.04	Music Composers and Arrangers	27-2041.00	Music Directors and Composers
27-2042.00	Musicians and Singers	27-2042.00	Musicians and Singers
27-2042.01	Singers	27-2042.00	Musicians and Singers
27-2042.02	Musicians, Instrumental	27-2042.00	Musicians and Singers

O*NET-SOC 2010 Codes and Titles		O*NET-SOC 2019 Codes and Titles	
27-3021.00	Broadcast News Analysts	27-3023.00	News Analysts, Reporters, and Journalists
27-3022.00	Reporters and Correspondents	27-3023.00	News Analysts, Reporters, and Journalists
27-3043.00	Writers and Authors	27-3043.00	Writers and Authors
27-3043.04	Copy Writers	27-3043.00	Writers and Authors
29-1069.05	Nuclear Medicine Physicians	29-1224.00	Radiologists
29-1069.10	Radiologists	29-1224.00	Radiologists
29-2034.00	Radiologic Technologists	29-2034.00	Radiologic Technologists and Technicians
29-2099.06	Radiologic Technicians	29-2034.00	Radiologic Technologists and Technicians
33-1021.00	First-Line Supervisors of Fire Fighting and Prevention Workers	33-1021.00	First-Line Supervisors of Firefighting and Prevention Workers
33-1021.01	Municipal Fire Fighting and Prevention Supervisors	33-1021.00	First-Line Supervisors of Firefighting and Prevention Workers
33-1021.02	Forest Fire Fighting and Prevention Supervisors	33-1021.00	First-Line Supervisors of Firefighting and Prevention Workers
33-2011.00	Firefighters	33-2011.00	Firefighters
33-2011.01	Municipal Firefighters	33-2011.00	Firefighters
33-2011.02	Forest Firefighters	33-2011.00	Firefighters
33-2021.00	Fire Inspectors and Investigators	33-2021.00	Fire Inspectors and Investigators
33-2021.01	Fire Inspectors	33-2021.00	Fire Inspectors and Investigators
33-2021.02	Fire Investigators	33-2021.00	Fire Inspectors and Investigators
33-3021.00	Detectives and Criminal Investigators	33-3021.00	Detectives and Criminal Investigators
33-3021.01	Police Detectives	33-3021.00	Detectives and Criminal Investigators
33-3021.03	Criminal Investigators and Special Agents	33-3021.00	Detectives and Criminal Investigators
33-3051.00	Police and Sheriff's Patrol Officers	33-3051.00	Police and Sheriff's Patrol Officers
33-3051.01	Police Patrol Officers	33-3051.00	Police and Sheriff's Patrol Officers
33-3051.03	Sheriffs and Deputy Sheriffs	33-3051.00	Police and Sheriff's Patrol Officers
35-3021.00	Combined Food Preparation and Serving Workers, Including Fast Food	35-3023.00	Fast Food and Counter Workers
35-3022.00	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	35-3023.00	Fast Food and Counter Workers
39-1011.00	Gaming Supervisors	39-1013.00	First-Line Supervisors of Gambling Services Workers
39-1012.00	Slot Supervisors	39-1013.00	First-Line Supervisors of Gambling Services Workers

O*NET-SOC 2010 Codes and Titles		O*NET-SOC 2019 Codes and Titles	
41-3031.00	Securities, Commodities, and Financial Services Sales Agents	41-3031.00	Securities, Commodities, and Financial Services Sales Agents
41-3031.01	Sales Agents, Securities and Commodities	41-3031.00	Securities, Commodities, and Financial Services Sales Agents
41-3031.02	Sales Agents, Financial Services	41-3031.00	Securities, Commodities, and Financial Services Sales Agents
41-3031.03	Securities and Commodities Traders	41-3031.00	Securities, Commodities, and Financial Services Sales Agents
41-3099.01	Energy Brokers	41-3031.00	Securities, Commodities, and Financial Services Sales Agents
43-3021.00	Billing and Posting Clerks	43-3021.00	Billing and Posting Clerks
43-3021.01	Statement Clerks	43-3021.00	Billing and Posting Clerks
43-3021.02	Billing, Cost, and Rate Clerks	43-3021.00	Billing and Posting Clerks
43-4031.00	Court, Municipal, and License Clerks	43-4031.00	Court, Municipal, and License Clerks
43-4031.01	Court Clerks	43-4031.00	Court, Municipal, and License Clerks
43-4031.02	Municipal Clerks	43-4031.00	Court, Municipal, and License Clerks
43-4031.03	License Clerks	43-4031.00	Court, Municipal, and License Clerks
43-4041.00	Credit Authorizers, Checkers, and Clerks	43-4041.00	Credit Authorizers, Checkers, and Clerks
43-4041.01	Credit Authorizers	43-4041.00	Credit Authorizers, Checkers, and Clerks
43-4041.02	Credit Checkers	43-4041.00	Credit Authorizers, Checkers, and Clerks
43-9041.00	Insurance Claims and Policy Processing Clerks	43-9041.00	Insurance Claims and Policy Processing Clerks
43-9041.01	Insurance Claims Clerks	43-9041.00	Insurance Claims and Policy Processing Clerks
43-9041.02	Insurance Policy Processing Clerks	43-9041.00	Insurance Claims and Policy Processing Clerks
45-1011.00	First-Line Supervisors of Farming, Fishing, and Forestry Workers	45-1011.00	First-Line Supervisors of Farming, Fishing, and Forestry Workers
45-1011.05	First-Line Supervisors of Logging Workers	45-1011.00	First-Line Supervisors of Farming, Fishing, and Forestry Workers
45-1011.06	First-Line Supervisors of Aquacultural Workers	45-1011.00	First-Line Supervisors of Farming, Fishing, and Forestry Workers
45-1011.07	First-Line Supervisors of Agricultural Crop and Horticultural Workers	45-1011.00	First-Line Supervisors of Farming, Fishing, and Forestry Workers
45-1011.08	First-Line Supervisors of Animal Husbandry and Animal Care Workers	45-1011.00	First-Line Supervisors of Farming, Fishing, and Forestry Workers
45-2092.00	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	45-2092.00	Farmworkers and Laborers, Crop, Nursery, and Greenhouse

O*NET-SOC 2010 Codes and Titles		O*NET-SOC 2019 Codes and Titles	
45-2092.01	Nursery Workers	45-2092.00	Farmworkers and Laborers, Crop, Nursery, and Greenhouse
45-2092.02	Farmworkers and Laborers, Crop	45-2092.00	Farmworkers and Laborers, Crop, Nursery, and Greenhouse
45-3011.00	Fishers and Related Fishing Workers	45-3031.00	Fishing and Hunting Workers
45-3021.00	Hunters and Trappers	45-3031.00	Fishing and Hunting Workers
47-2031.00	Carpenters	47-2031.00	Carpenters
47-2031.01	Construction Carpenters	47-2031.00	Carpenters
47-2031.02	Rough Carpenters	47-2031.00	Carpenters
47-2152.00	Plumbers, Pipefitters, and Steamfitters	47-2152.00	Plumbers, Pipefitters, and Steamfitters
47-2152.01	Pipe Fitters and Steamfitters	47-2152.00	Plumbers, Pipefitters, and Steamfitters
47-2152.02	Plumbers	47-2152.00	Plumbers, Pipefitters, and Steamfitters
53-7033.00	Loading Machine Operators, Underground Mining	47-5044.00	Loading and Moving Machine Operators, Underground Mining
53-7111.00	Mine Shuttle Car Operators	47-5044.00	Loading and Moving Machine Operators, Underground Mining
49-2021.00	Radio, Cellular, and Tower Equipment Installers and Repairers	49-2021.00	Radio, Cellular, and Tower Equipment Installers and Repairers
49-2021.01	Radio Mechanics	49-2021.00	Radio, Cellular, and Tower Equipment Installers and Repairers
49-3023.00	Automotive Service Technicians and Mechanics	49-3023.00	Automotive Service Technicians and Mechanics
49-3023.01	Automotive Master Mechanics	49-3023.00	Automotive Service Technicians and Mechanics
49-3023.02	Automotive Specialty Technicians	49-3023.00	Automotive Service Technicians and Mechanics
49-9021.00	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	49-9021.00	Heating, Air Conditioning, and Refrigeration Mechanics and Installers
49-9021.01	Heating and Air Conditioning Mechanics and Installers	49-9021.00	Heating, Air Conditioning, and Refrigeration Mechanics and Installers
49-9021.02	Refrigeration Mechanics and Installers	49-9021.00	Heating, Air Conditioning, and Refrigeration Mechanics and Installers
51-4121.00	Welders, Cutters, Solderers, and Brazers	51-4121.00	Welders, Cutters, Solderers, and Brazers
51-4121.06	Welders, Cutters, and Welder Fitters	51-4121.00	Welders, Cutters, Solderers, and Brazers
51-4121.07	Solderers and Brazers	51-4121.00	Welders, Cutters, Solderers, and Brazers
51-8013.00	Power Plant Operators	51-8013.00	Power Plant Operators
51-8099.02	Methane/Landfill Gas Generation System Technicians	51-8013.00	Power Plant Operators

O*NET-SOC 2010 Codes and Titles		O*NET-SOC 2019 Codes and Titles	
51-9071.00	Jewelers and Precious Stone and Metal Workers	51-9071.00	Jewelers and Precious Stone and Metal Workers
51-9071.01	Jewelers	51-9071.00	Jewelers and Precious Stone and Metal Workers
51-9071.07	Precious Metal Workers	51-9071.00	Jewelers and Precious Stone and Metal Workers
51-9121.00	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	51-9124.00	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders
51-9122.00	Painters, Transportation Equipment	51-9124.00	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders
51-9195.00	Molders, Shapers, and Casters, Except Metal and Plastic	51-9195.00	Molders, Shapers, and Casters, Except Metal and Plastic
51-9195.07	Molding and Casting Workers	51-9195.00	Molders, Shapers, and Casters, Except Metal and Plastic
53-4012.00	Locomotive Firers	53-4022.00	Railroad Brake, Signal, and Switch Operators and Locomotive Firers
53-4021.00	Railroad Brake, Signal, and Switch Operators	53-4022.00	Railroad Brake, Signal, and Switch Operators and Locomotive Firers
53-5021.00	Captains, Mates, and Pilots of Water Vessels	53-5021.00	Captains, Mates, and Pilots of Water Vessels
53-5021.01	Ship and Boat Captains	53-5021.00	Captains, Mates, and Pilots of Water Vessels
53-5021.02	Mates- Ship, Boat, and Barge	53-5021.00	Captains, Mates, and Pilots of Water Vessels
53-5021.03	Pilots, Ship	53-5021.00	Captains, Mates, and Pilots of Water Vessels
53-6051.00	Transportation Inspectors	53-6051.00	Transportation Inspectors
53-6051.08	Freight and Cargo Inspectors	53-6051.00	Transportation Inspectors
43-5081.00	Stock Clerks and Order Fillers	53-7065.00	Stockers and Order Fillers
43-5081.01	Stock Clerks, Sales Floor	53-7065.00	Stockers and Order Fillers
43-5081.02	Marking Clerks	53-7065.00	Stockers and Order Fillers
43-5081.03	Stock Clerks- Stockroom, Warehouse, or Storage Yard	53-7065.00	Stockers and Order Fillers
43-5081.04	Order Fillers, Wholesale and Retail Sales	53-7065.00	Stockers and Order Fillers

Appendix B: 2010-2019 O*NET-SOC Crosswalk for Split-Out Occupations

O*NET-SOC 2010 Codes and Titles		O*NET-SOC 2019 Codes and Titles	
11-2031.00	Public Relations and Fundraising Managers	11-2032.00	Public Relations Managers
11-2031.00	Public Relations and Fundraising Managers	11-2033.00	Fundraising Managers
11-3011.00	Administrative Services Managers	11-3012.00	Administrative Services Managers
11-3011.00	Administrative Services Managers	11-3013.00	Facilities Managers
11-9199.07	Security Managers	11-3013.01	Security Managers
13-1199.02	Security Management Specialists	13-1199.07	Security Management Specialists
15-1141.00	Database Administrators	15-1242.00	Database Administrators
15-1141.00	Database Administrators	15-1243.00	Database Architects
15-1199.06	Database Architects	15-1243.00	Database Architects
15-1134.00	Web Developers	15-1254.00	Web Developers
15-1134.00	Web Developers	15-1255.00	Web and Digital Interface Designers
15-1199.00	Computer Occupations, All Other	15-1255.00	Web and Digital Interface Designers
19-3039.01	Neuropsychologists and Clinical Neuropsychologists	19-3039.02	Neuropsychologists
19-3039.01	Neuropsychologists and Clinical Neuropsychologists	19-3039.03	Clinical Neuropsychologists
25-2052.00	Special Education Teachers, Kindergarten and Elementary School	25-2055.00	Special Education Teachers, Kindergarten
25-2052.00	Special Education Teachers, Kindergarten and Elementary School	25-2056.00	Special Education Teachers, Elementary School
25-9041.00	Teacher Assistants	25-9042.00	Teaching Assistants, Preschool, Elementary, Middle, and Secondary School, Except Special Education
25-9041.00	Teacher Assistants	25-9043.00	Teaching Assistants, Special Education
29-1067.00	Surgeons	29-1243.00	Pediatric Surgeons
29-2011.03	Histotechnologists and Histologic Technicians	29-2011.04	Histotechnologists
29-2011.03	Histotechnologists and Histologic Technicians	29-2012.01	Histology Technicians
29-2041.00	Emergency Medical Technicians and Paramedics	29-2042.00	Emergency Medical Technicians
29-2041.00	Emergency Medical Technicians and Paramedics	29-2043.00	Paramedics
29-2071.00	Medical Records and Health Information Technicians	29-2072.00	Medical Records Specialists

O*NET-SOC 2010 Codes and Titles		O*NET-SOC 2019 Codes and Titles	
29-2071.00	Medical Records and Health Information Technicians	29-9021.00	Health Information Technologists and Medical Registrars
29-9099.00	Healthcare Practitioners and Technical Workers, All Other	29-9021.00	Health Information Technologists and Medical Registrars
39-1021.00	First-Line Supervisors of Personal Service Workers	39-1014.00	First-Line Supervisors of Entertainment and Recreation Workers, Except Gambling Services
39-1021.00	First-Line Supervisors of Personal Service Workers	39-1022.00	First-Line Supervisors of Personal Service Workers
47-5021.00	Earth Drillers, Except Oil and Gas	47-5023.00	Earth Drillers, Except Oil and Gas
47-5021.00	Earth Drillers, Except Oil and Gas	47-5032.00	Explosives Workers, Ordnance Handling Experts, and Blasters
47-5031.00	Explosives Workers, Ordnance Handling Experts, and Blasters	47-5032.00	Explosives Workers, Ordnance Handling Experts, and Blasters
53-1031.00	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	53-1043.00	First-Line Supervisors of Material-Moving Machine and Vehicle Operators
53-1031.00	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	53-1044.00	First-Line Supervisors of Passenger Attendants
39-1021.00	First-Line Supervisors of Personal Service Workers	53-1044.00	First-Line Supervisors of Passenger Attendants
53-3022.00	Bus Drivers, School or Special Client	53-3051.00	Bus Drivers, School
53-3022.00	Bus Drivers, School or Special Client	53-3053.00	Shuttle Drivers and Chauffeurs
53-3041.00	Taxi Drivers and Chauffeurs	53-3053.00	Shuttle Drivers and Chauffeurs
53-3041.00	Taxi Drivers and Chauffeurs	53-3054.00	Taxi Drivers

Appendix C: 2010-2019 O*NET-SOC Crosswalk for New Occupations

O*NET-SOC 2010 Codes and Titles		O*NET-SOC 2019 Codes and Titles	
11-9199.00	Managers, All Other	11-9072.00	Entertainment and Recreation Managers, Except Gambling
11-9199.00	Managers, All Other	13-1082.00	Project Management Specialists
13-1199.00	Business Operations Specialists, All Other	13-1082.00	Project Management Specialists
15-1199.00	Computer Occupations, All Other	13-1082.00	Project Management Specialists
13-2021.00	Appraisers and Assessors of Real Estate	13-2022.00	Appraisers of Personal and Business Property
15-2099.00	Mathematical Science Occupations, All Other	15-1299.04	Penetration Testers
		15-1299.05	Information Security Engineers
		15-1299.06	Digital Forensics Analysts
		15-1299.07	Blockchain Engineers
		15-2051.00	Data Scientists
17-3029.00	Engineering Technicians, Except Drafters, All Other	17-3028.00	Calibration Technologists and Technicians
19-4041.00	Geological and Petroleum Technicians	19-4044.00	Hydrologic Technicians
19-4099.00	Life, Physical, and Social Science Technicians, All Other	19-4044.00	Hydrologic Technicians
25-3099.00	Teachers and Instructors, All Other	25-3031.00	Substitute Teachers, Short-Term
27-2099.00	Entertainers and Performers, Sports and Related Workers, All Other	27-2091.00	Disc Jockeys, Except Radio
27-4099.00	Media and Communication Equipment Workers, All Other	27-4015.00	Lighting Technicians
29-1069.00	Physicians and Surgeons, All Other	29-1212.00	Cardiologists
29-1069.00	Physicians and Surgeons, All Other	29-1214.00	Emergency Medicine Physicians
29-2099.00	Health Technologists and Technicians, All Other	29-2036.00	Medical Dosimetrists
33-1099.00	First-Line Supervisors of Protective Service Workers, All Other	33-1091.00	First-Line Supervisors of Security Workers
33-9099.00	Protective Service Workers, All Other	33-9094.00	School Bus Monitors
39-9099.00	Personal Care and Service Workers, All Other	39-4012.00	Crematory Operators
41-3099.00	Sales Representatives, Services, All Other	41-3091.00	Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel
53-6099.00	Transportation Workers, All Other	53-6032.00	Aircraft Service Attendants

Appendix D: Screenshots from a Completed HumRRO Template

Occupation Description Tab

	A	B	C	D	E	F	G
1	Type of Change	O*NET-SOC 2010 Code	O*NET-SOC 2010 Title	O*NET-SOC 2010 Description	O*NET-SOC 2019 Code	O*NET-SOC 2019 Title	O*NET-SOC 2019 Description
2	Roll Up Occupations	15-1132.00	Software Developers, Applications	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.	15-1252.00	Software Developers	Research, design, and develop computer and network software or specialized utility programs. Analyze user needs and develop software solutions, applying principles and techniques of computer science, engineering, and mathematical analysis. Update software or enhance existing software capabilities. May work with computer hardware engineers to integrate hardware and software systems, and develop specifications and performance requirements. May maintain databases within an application area, working individually or coordinating database development as
3	Roll Up Occupations	15-1133.00	Software Developers, Systems Software	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.	15-1252.00	Software Developers	Research, design, and develop computer and network software or specialized utility programs. Analyze user needs and develop software solutions, applying principles and techniques of computer science, engineering, and mathematical analysis. Update software or enhance existing software capabilities. May work with computer hardware engineers to integrate hardware and software systems, and develop specifications and performance requirements. May maintain databases within an application area, working individually or coordinating database development as
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Occ Descriptions | Tasks | ATs | ETs | ⊕

Tasks Tab

	O*NET-SOC 2010 Code	O*NET-SOC 2010 Title	O*NET Task ID	Original Task	Modified Task	Task Type	Legacy Importance Rating	Keep/ Delete /Add	Modified (Y)	Modification Record	Notes
1											
2	15-1133.00	Software Developers, Systems Software	3445	Modify existing software to correct errors, to adapt it to new hardware, or to upgrade interfaces and improve performance.	Modify existing software to correct errors, adapt it to new hardware, or upgrade interfaces and improve performance.	Core	4.40	K	Y	Remove "to" before "adapt" and "upgrade"	
3	15-1132.00	Software Developers, Applications	3431	Modify existing software to correct errors, allow it to adapt to new hardware, or to improve its		Core	4.23	D			similar to task 3445
4	15-1133.00	Software Developers, Systems Software	3454	Monitor functioning of equipment to ensure system operates in conformance with		Supplement al	4.19	K			
5	15-1132.00	Software Developers, Applications	3432	Analyze user needs and software requirements to determine feasibility of design within time		Core	4.14	K			
6	15-1133.00	Software Developers, Systems Software	3449	Develop or direct software system testing or validation procedures.		Core	3.97	D			similar to task 3436 with fewer examples
7	15-1133.00	Software Developers, Systems Software	3450	Direct software programming and development of documentation.		Core	3.95	D			similar to task 3449 and updated occupation suggests that directing others is not necessarily a core task
8	15-1132.00	Software Developers, Applications	3430	Confer with systems analysts, engineers, programmers and others to design system and to obtain information on project limitations and capabilities, performance requirements and	Confer with systems analysts, engineers, programmers and others to design systems and to obtain information on project limitations and capabilities, performance requirements and interfaces.	Core	3.93	K	Y	Add "s" after "system"	
9	15-1132.00; 15-1133.00	Software Developers, Applications; Software Developers, Systems Software	3442	Store, retrieve, and manipulate data for analysis of system capabilities and requirements.		Core; Core	3.88; 3.32	K			
10	15-1132.00	Software Developers, Applications	3435	Design, develop and modify software systems, using scientific analysis and mathematical models to predict and measure outcome and	Design, develop and modify software systems, using scientific analysis and mathematical models to predict and measure outcomes and consequences of	Core	3.86	K	Y	Add "s" after "outcome"	
11	15-1133.00	Software Developers, Systems Software	3451	Consult with customers or other departments on project status, proposals, or technical issues, such as software system design or maintenance.		Core	3.86	K			

Occ Descriptions | **Tasks** | ATs | ETs | ⊕

Alternate Titles Tab

	A	B	C	D	E	F	G	H	I	J	K	L
1	O*NET-SOC 2010 Code	O*NET-SOC 2010 Title	Alternate Title	Short Title	Short Title First (Y)	Source(s)	Keep/Delete /Add	Notes	Currently displayed online	Currently displayed on MyNextMove	Select the 10 that will appear online	Select the 4 that will appear on MyNextMove
2	15-1132.00	Software Developers, Applications	.NET Developer			02,08,10	K					
3	15-1132.00	Software Developers, Applications	Android Developer			10	K					
4	15-1132.00	Software Developers, Applications	Application Architect			09	K					
5	15-1132.00	Software Developers, Applications	Application Developer			02	K		X	X	X	X
6	15-1132.00	Software Developers, Applications	Application Integration Engineer			02,04	K		X	X	X	X
7	15-1132.00	Software Developers, Applications	Application Integrator			08	K					
8	15-1132.00	Software Developers, Applications	Applications Developer			02,04,06,07,10	K		X			
9	15-1132.00	Software Developers, Applications	Applications Engineer			08,10	K					
10	15-1132.00	Software Developers, Applications	Applications Programmer			09	K					
11	15-1132.00	Software Developers, Applications	Applications Quality Assurance Specialist			04,06,07	D	Better fit for 15-1253.00				
12	15-1132.00	Software Developers, Applications	Applications Software Engineering Information Technology Specialist	Applications Software Engineering IT Specialist		06	K					
13	15-1132.00	Software Developers, Applications	Applications System Analyst			08	K					
14	15-1132.00	Software Developers, Applications	Artificial Intelligence Specialist	AI Specialist		09	K	Added short title				
15	15-1132.00	Software Developers, Applications	Bioinformatics Specialist			08	D	Applies more to 19-1029.01				
16	15-1132.00	Software Developers, Applications	Business Intelligence Developer			10	D	not specific to software				
17	15-1132.00	Software Developers, Applications	Computer Applications Developer			04,06,07	K					

Occ Descriptions | Tasks | **ATs** | ETs | +

Exclusionary Titles Tab

	IDI	Excluded 2010 SOC Code	Excluded 2019 SOC Code	Title for Excluded SOC	Keep/Delete/Add	Notes
2	00016.03.1	11-3021.00		Computer and Information Systems Managers	K	
3	01200.02.1	15-1111.00		Computer and Information Research Scientists	K	
4	00192.03.1	15-1121.00		Computer Systems Analysts	K	
5	00196.03.1	15-1131.00		Computer Programmers	K	
6	01201.03.1	15-1132.00		Software Developers, Applications	D	Being rolled-up
7	01202.03.1	15-1133.00		Software Developers, Systems Software	D	Being rolled-up
8	00193.03.1	15-1141.00		Database Administrators	K	
9	01203.03.1	15-1142.00		Network and Computer Systems Administrators	K	
10	01690.01.1	15-1143.00		Computer Network Architects	K	
11	01691.01.1	15-1152.00		Computer Network Support Specialists	K	
12	00199.03.1	15-2031.00		Operations Research Analysts	K	
13	01207.03.1	17-2061.00		Computer Hardware Engineers	K	
14	00112.03.1	17-2071.00		Electrical Engineers	K	
15	00501.03.1	43-9011.00		Computer Operators	K	
16			15-2051.00	Data Scientists	A	
17			15-1299.05	Information Security Engineers	A	

Tabs: Occ Descriptions | Tasks | ATs | **ETs** | +

Appendix E: New Occupation Descriptions for Detailed Occupations in the 2019 O*NET-SOC Taxonomy

O*NET-SOC Code	Title	Description
17-3026.01	Nanotechnology Engineering Technologists and Technicians	Implement production processes and operate commercial-scale production equipment to produce, test, or modify materials, devices, or systems of unique molecular or macromolecular composition. Operate advanced microscopy equipment to manipulate nanoscale objects. Work under the supervision of nanoengineering staff.
19-3039.02	Neuropsychologists	Apply theories and principles of neuropsychology to evaluate and diagnose disorders of higher cerebral functioning, often in research and medical settings. Study the human brain and the effect of physiological states on human cognition and behavior. May formulate and administer programs of treatment.
19-3039.03	Clinical Neuropsychologists	Assess and diagnose patients with neurobehavioral problems related to acquired or developmental disorders of the nervous system, such as neurodegenerative disorders, traumatic brain injury, seizure disorders, and learning disabilities. Recommend treatment after diagnosis, such as therapy, medication, or surgery. Assist with evaluation before and after neurosurgical procedures, such as deep brain stimulation.
29-2011.04	Histotechnologists	Apply knowledge of health and disease causes to evaluate new laboratory techniques and procedures to examine tissue samples. Process and prepare histological slides from tissue sections for microscopic examination and diagnosis by pathologists. May solve technical or instrument problems or assist with research studies.
29-2012.01	Histology Technicians	Prepare histological slides from tissue sections for microscopic examination and diagnosis by pathologists. May assist with research studies.
15-1299.04	Penetration Testers	Evaluate network system security by conducting simulated internal and external cyberattacks using adversary tools and techniques. Attempt to breach and exploit critical systems and gain access to sensitive information to assess system security.
15-1299.05	Information Security Engineers	Develop and oversee the implementation of information security procedures and policies. Build, maintain and upgrade security technology, such as firewalls, for the safe use of computer networks and the transmission and retrieval of information. Design and implement appropriate security controls to identify vulnerabilities and protect digital files and electronic infrastructures. Monitor and respond to computer security breaches, viruses, and intrusions, and perform forensic investigation. May oversee the assessment of information security systems.

O*NET-SOC Code	Title	Description
15-1299.06	Digital Forensics Analysts	Conduct investigations on computer-based crimes establishing documentary or physical evidence, such as digital media and logs associated with cyber intrusion incidents. Analyze digital evidence and investigate computer security incidents to derive information in support of system and network vulnerability mitigation. Preserve and present computer-related evidence in support of criminal, fraud, counterintelligence, or law enforcement investigations.
15-1299.07	Blockchain Engineers	Maintain and support distributed and decentralized blockchain-based networks or block-chain applications such as cryptocurrency exchange, payment processing, document sharing, and digital voting. Design and deploy secure block-chain design patterns and solutions over geographically distributed networks using advanced technologies. May assist with infrastructure setup and testing for application transparency and security.