



JOB TITLES AND ASSOCIATED TASKS Sorted by Cognofile

Theory Cognofile

11-1021.00 General and Operations Managers Senior level position assuming education and experience prerequisite

Plan, direct, or coordinate the operations of companies or public and private sector organizations. Duties and responsibilities include formulating policies, managing daily operations, and planning the use of materials and human resources, but are too diverse and general in nature to be classified in any one functional area of management or administration, such as personnel, purchasing, or administrative services. Includes owners and managers who head small business establishments whose duties are primarily managerial.

11-3031.01 Treasurers, Controllers, and Chief Financial Officers Senior level position assuming education and experience prerequisite

Coordinates and directs financial planning, budgeting, procurement, and investment activities of organization. Prepares reports or directs preparation of reports summarizing organization's current and forecasted financial position, business activity, and reports required by regulatory agencies. Delegates authority for receipt, disbursement, banking, protection and custody of funds, securities, and financial instruments. Analyzes past, present, and expected operations. Interprets current policies and practices and plans and implements new operating procedures to improve efficiency and reduce costs. Ensures that institution reserves meet legal requirements. Arranges audits of company accounts. Advises management on economic objectives and policies, investments, and loans for short- and long- range financial plans. Evaluates need for procurement of funds and investment of surplus.

11-9041.00 Engineering Managers Senior level position assuming education and experience prerequisite

Establishes procedures, and directs testing, operation, maintenance, and repair of transmitter equipment. Evaluates contract proposals, directs negotiation of research contracts, and prepares bids and contracts. Plans and directs installation, maintenance, testing, and repair of facilities and equipment. Directs, reviews, and approves product design and changes, and directs testing. Plans, coordinates, and directs engineering project, organizes and assigns staff, and directs integration of technical activities with products. Plans and directs oil field development, gas and oil production, and geothermal drilling. Analyzes technology, resource needs, and market demand, and confers with management, production, and marketing staff to plan and assess feasibility of project. Plans, directs, and coordinates survey work with activities of other staff, certifies survey work, and writes land legal descriptions. Administers highway planning, construction, and maintenance, and reviews and recommends or approves contracts and cost estimates. Directs engineering of water control, treatment, and distribution projects. Confers with and prepares reports for officials and speaks to public to solicit support.

11-9121.00 Natural Sciences Managers Mid – Senior level position assuming education and experience prerequisite

Schedules, directs, and assigns duties to engineers, technicians, researchers, and other staff. Plans and directs research, development, and production activities of chemical plant. Coordinates successive phases of problem analysis, solution proposals, and testing. Prepares and administers budget, approves and reviews expenditures, and prepares financial reports. Reviews project activities, and prepares and reviews research, testing, and operational reports. Confers with scientists, engineers, regulators, and others to plan and review projects, and to provide technical assistance. Advises and assists in obtaining patents or other legal requirements. Provides technical assistance to agencies conducting environmental studies.

13-1041.04 Government Property Inspectors and Investigators Mid – Senior level position assuming education and experience prerequisite

Investigates regulated activities to detect violation of law relating to such activities as revenue collection, employment practices, or fraudulent benefit claims. Inspects government-owned equipment and materials in hands of private contractors to prevent waste, damage, theft, and other irregularities. Examines records, reports, and documents to establish facts and detect discrepancies. Locates and interviews plaintiffs, witnesses, or representatives of business or government to gather facts relevant to inspection or alleged violation. Inspects manufactured or processed products to ensure compliance with contract specifications and legal requirements. Investigates character of applicant for special license or permit and misuses of license or permit. Prepares correspondence, reports of inspections or investigations, and recommendations for administrative or legal authorities. Submits samples of product to government laboratory for testing as indicated by departmental procedures. Testifies in court or at administrative proceedings concerning findings of investigation.

13-1041.05 Pressure Vessel Inspectors Mid – Senior level position assuming education and experience prerequisite

Inspects drawings, designs, and specifications for piping, boilers, and other vessels. Inspects gas mains to determine that rate of flow, pressure, location, construction, or installation conform to standards. Calculates allowable limits of pressure, strength, and stresses. Performs standard tests to verify condition of equipment and calibration of meters and gauges using test equipment and hand tools. Evaluates factors such as materials used, safety devices, regulators, construction quality, riveting, welding, pitting, corrosion, cracking, and safety valve operation. Recommends or orders actions to correct violations of legal requirements or to eliminate unsafe conditions. Witnesses acceptance and installation tests. Examines permits and inspection records to determine that inspection schedule and remedial actions conform to procedures and regulations. Investigates accidents to determine causes and to develop methods of preventing recurrences. Confers with engineers, manufacturers, contractors, owners, and operators concerning problems in construction, operation, and repair. Keeps records and prepares reports of inspections and investigations for administrative or legal authorities.

13-1041.06 Coroners Mid – Senior level position assuming education and experience prerequisite

Directs activities of physicians and technologists conducting autopsies and pathological and toxicological analyses to determine cause of death. Directs investigations into circumstances of deaths to fix responsibility for accidental, violent, or unexplained death. Confers with officials of public health and law enforcement agencies to coordinate interdepartmental activities. Directs activities of workers involved in preparing documents for permanent records. Coordinates activities for disposition of unclaimed corpse and personal effects of deceased. Testifies at inquests, hearings, and court trials. Provides information concerning death circumstance to relatives of deceased.

13-1072.00 Compensation, Benefits, and Job Analysis Specialists Mid – Senior level position assuming education and experience prerequisite

Analyzes organizational, occupational, and industrial data to facilitate organizational functions and provide technical information to business, industry, and government. Prepares research results for publication in form of journals, books, manuals, and film. Consults with business, industry, government, and union officials to arrange for, plan, and design occupational studies and surveys. Plans and develops curricula and materials for training programs and conducts training. Evaluates and improves methods and techniques for selecting, promoting, evaluating, and training workers. Determines need for and develops job analysis instruments and materials. Researches job and worker requirements, structural and functional relationships among jobs and occupations, and occupational trends. Prepares reports, such as job descriptions, organization and flow charts, and career path reports, to summarize job analysis information. Observes and interviews employees to collect job, organizational, and occupational information.

13-1081.00 Logisticians Entry – Mid – Senior level position assuming education and experience prerequisite

Analyze and coordinate the logistical functions of a firm or organization. Responsible for the entire life cycle of a product including acquisition, distribution, internal allocation, delivery, and final disposal of resources.

13-1111.00 Management Analysts Mid – Senior level position assuming education and experience prerequisite

Reviews forms and reports, and confers with management and users about format, distribution, and purpose, and to identify problems and improvements. Develops and implements records management program for filing, protection, and retrieval of records, and assures compliance with program. Prepares manuals and trains workers in use of new forms, reports, procedures or equipment, according to organizational policy. Recommends purchase of storage equipment, and designs area layout to locate equipment in space available. Gathers and organizes information on problems or procedures. Documents findings of study and prepares recommendations for implementation of new systems, procedures, or organizational changes. Analyzes data gathered and develops solutions or alternative methods of proceeding. Confers with personnel concerned to ensure successful functioning of newly implemented systems or procedures. Plans study of work problems and procedures, such as organizational change, communications, information flow, integrated production methods, inventory control, or cost analysis. Designs, evaluates, recommends, and approves changes of forms and reports. Interviews personnel and conducts on-site observation to ascertain unit functions, work performed, and methods, equipment, and personnel used.

15-1011.00 Computer and Information Scientists, Research Entry – Mid – Senior level position assuming education and experience prerequisite

Conduct research into fundamental computer and information science as theorists, designers, or inventors. Solve or develop solutions to problems in the field of computer hardware and software.

15-1031.00 Computer Software Engineers, Applications Entry – Mid – Senior level position assuming education and experience prerequisite

Analyzes software requirements to determine feasibility of design within time and cost constraints. Analyzes information to determine, recommend, and plan layout for type of computers and peripheral equipment modifications to existing systems. Formulates and designs software system using scientific analysis and mathematical models to predict and measure outcome and consequences of design. Confers with data processing and project managers to obtain information on limitations and capabilities for data processing projects. Evaluates factors such as reporting formats required, cost constraints, and need for security restrictions to determine hardware configuration. Consults with engineering staff to evaluate interface between hardware and software and operational and performance requirements of overall system. Develops and directs software system testing procedures, programming, and documentation. Monitors functioning of equipment to ensure system operates in conformance with specifications. Coordinates installation of software system. Trains users to use new or modified equipment. Recommends purchase of equipment to control dust, temperature, and humidity in area of system installation. Enters data into computer terminal to store, retrieve, and manipulate data for analysis of system capabilities and requirements. Specifies power supply requirements and configuration. Consults with customer concerning maintenance of software system.

15-1032.00 Computer Software Engineers, Systems Software Entry – Mid – Senior level position assuming education and experience prerequisite

Analyzes software requirements to determine feasibility of design within time and cost constraints. Analyzes information to determine, recommend, and plan layout for type of computers and peripheral equipment modifications to existing systems. Evaluates factors such as reporting formats required, cost constraints, and need for security restrictions to determine hardware configuration. Consults with engineering staff to evaluate interface between hardware and software and operational and performance requirements of overall system. Trains users to use new or modified equipment. Recommends purchase of equipment to control dust, temperature, and humidity in area of system installation. Enters data into computer terminal to store, retrieve, and manipulate data for analysis of system capabilities and requirements. Specifies power supply requirements and configuration. Consults with customer concerning maintenance of software system. Monitors functioning of equipment to ensure system operates in conformance with specifications. Coordinates installation of software system. Develops and directs software system testing procedures, programming, and documentation. Confers with data processing and project managers to obtain information on limitations and capabilities for data processing projects. Formulates and designs software system using scientific analysis and mathematical models to predict and measure outcome and consequences of design.

15-1071.01 Computer Security Specialists Entry – Mid – Senior level position assuming education and experience prerequisite

Develops plans to safeguard computer files against accidental or unauthorized modification, destruction, or disclosure and to meet emergency data processing needs. Tests data processing system to ensure functioning of data processing activities and security measures. Confers with personnel to discuss issues such as computer data access needs, security violations, and programming changes. Writes reports to document computer security and emergency measures policies, procedures, and test results. Monitors use of data files and regulates access to safeguard information in computer files. Modifies computer security files to incorporate new software, correct errors, or change individual access status. Coordinates implementation of computer system plan with establishment personnel and outside vendors.

15-1081.00 Network Systems and Data Communications Analysts

Analyzes test data and recommends hardware or software for purchase. Reads technical manuals and brochures to determine equipment, which meets establishment requirements. Identifies areas of operation, which need upgraded equipment, such as modems, fiber optic cables, and telephone wires. Tests and evaluates hardware and software to determine efficiency, reliability, and compatibility with existing system. Monitors system performance. Develops and writes procedures for installation, use, and solving problems of communications hardware and software. Conducts survey to determine user needs. Trains users in use of equipment. Assists users to identify and solve data communication problems. Visits vendors to learn about available products or services.

15-2011.00 Actuaries Entry – Mid – Senior level position assuming education and experience prerequisite

Determines mortality, accident, sickness, disability, and retirement rates. Constructs probability tables regarding fire, natural disasters, and unemployment, based on analysis of statistical data and other pertinent information. Designs or reviews insurance and pension plans and calculates premiums. Ascertain premium rates required and cash reserves and liabilities necessary to ensure payment of future benefits. Determines equitable basis for distributing surplus earnings under participating insurance and annuity contracts in mutual companies.

15-2021.00 Mathematicians Entry – Mid – Senior level position assuming education and experience prerequisite

Conducts research in fundamental mathematics and in application of mathematical techniques to science, management and other fields. Conceives or directs ideas for application of mathematics to wide variety of fields, including science, engineering, military planning, electronic data processing, and management. Studies and test hypotheses and alternative theories. Performs computations and applies methods of numerical analysis. Conducts research in such branches of mathematics as algebra, geometry, number theory, logic and topology. Applies mathematics or mathematical methods of numerical analysis, and operates or directs operation of desk calculators and mechanical and other functional areas. Operates or directs operation of desk calculators and mechanical and electronic computation machines, analyzers, and plotters in solving problem support of mathematical, scientific or industrial research. Acts as advisor or consultant to research personnel concerning mathematical methods and applications. Utilizes knowledge of such subjects or fields as physics, engineering, astronomy, biology, economics, business and industrial management, or cryptography.

15-2031.00 Operations Research Analysts Entry – Mid – Senior level position assuming education and experience prerequisite

Analyzes problem in terms of management information and conceptualizes and defines problem. Prepares model of problem in form of one or several equations that relates constants and variables, restrictions, alternatives, conflicting objectives and their numerical parameters. Specifies manipulative or computational methods to be applied to model. Performs validation and testing of model to ensure adequacy, or determines need for reformulation. Designs, conducts, and evaluates experimental operational models where insufficient data exists to formulate model. Evaluates implementation and effectiveness of research. Prepares for management reports defining problem, evaluation, and possible solution. Studies information and selects plan from competitive proposals that afford maximum probability of profit or effectiveness relating to cost or risk. Defines data requirements and gathers and validates information, applying judgment and statistical tests. Develops and applies time and cost networks to plan and control large projects.

15-2041.00 Statisticians Entry – Mid – Senior level position assuming education and experience prerequisite

Applies statistical methodology to provide information for scientific research and statistical analysis. Plans methods to collect information and develops questionnaire techniques according to survey design. Conducts surveys utilizing sampling techniques or complete enumeration bases. Develops and tests experimental designs, sampling techniques and analytical methods, and prepares recommendations concerning their use. Analyzes and interprets statistics to identify significant differences in relationships among sources of information. Describes sources of information, and limitations on reliability and usability. Presents numerical information by computer readouts, graphs, charts, tables, written reports or other methods. Examines theories, such as those of probability and inference, to discover mathematical bases for new or improved methods of obtaining and evaluating numerical data. Develops statistical methodology. Evaluates reliability of source information, adjusts and weighs raw data, and organizes results into form compatible with analysis by computers or other methods. Investigates, evaluates, and reports on applicability, efficiency, and accuracy of statistical methods used to obtain and evaluate data.

15-3011.00 Mathematical Technicians Entry – Mid level position assuming education and experience prerequisite

Selects most feasible combination and sequence of computational methods to reduce raw data to meaningful and manageable terms. Selects most economical and reliable combination of manual, mechanical, or data processing methods and equipment consistent with data reduction requirements. Analyzes raw data from computer or recorded on photographic film or other media. Confers with professional scientific, and engineering personnel to plan project. Analyzes processed data to detect errors. Modifies standard formulas to conform to data processing method selected. Translates data into numerical values, equations, flow charts, graphs or other media. Calculates data for analysis, using computer or calculator.

17-1021.00 Cartographers and Photogrammetrics Entry – Mid – Senior level position assuming education and experience prerequisite

Prepares mosaic prints, contour maps, Cognofile sheets, and related cartographic material applying mastery of photogrammetric techniques and principles. Determines and defines production specifications, such as projection, scale, size, and colors of map product. Identifies, scales, and orients geodetic points, elevations, and other planimetric or topographic features, applying standard math formulas. Studies legal records to establish boundaries of local, national and international properties. Develops design concept of map product. Analyzes survey data, source maps and photos, computer or automated mapping products, and other records to determine location and name of features. Travels over photographed area to observe, identify, record and verify all features shown and not shown in photograph. Determines guidelines for source material to be used, such as maps, automated mapping products, photographic survey data, and place names. Revises existing maps and charts and corrects maps in various stages of compilation.

17-2011.00 Aerospace Engineers Entry – Mid – Senior level position assuming education and experience prerequisite

Develops design criteria for aeronautical or aerospace products or systems, including testing methods, production costs, quality standards, and completion dates. Analyzes project requests and proposals and engineering data to determine feasibility, producibility, cost, and production time of aerospace or aeronautical product. Formulates conceptual design of aeronautical or aerospace products or systems to meet customer requirements. Plans and conducts experimental, environmental, operational and stress tests on models and prototypes of aircraft and aerospace systems and equipment. Directs and coordinates activities of engineering or technical personnel designing, fabricating, modifying, or testing of aircraft or aerospace products. Reviews performance reports and documentation from customers and field engineers, and inspects malfunctioning or damaged products to determine problem. Directs research and development programs to improve production methods, parts, and equipment technology and reduce costs. Evaluates and approves selection of vendors by study of past performance and new advertisements. Maintains records of performance reports for future reference. Writes technical reports and other documentation, such as handbooks and bulletins, for use by engineering staff, management, and customers. Plans and coordinates activities concerned with investigating and resolving customers reports of technical problems with aircraft or aerospace vehicles. Evaluates product data and design from inspections and reports for conformance to engineering principles, customer requirements, and quality standards. Formulates mathematical models or other methods of computer analysis to develop, evaluate, or modify design according to customer engineering requirements.

17-2021.00 Agricultural Engineers Entry – Mid – Senior level position assuming education and experience prerequisite

Designs and directs manufacture of equipment for land tillage and fertilization, plant and animal disease and insect control, and for harvesting or moving commodities. Studies such problems as effect of temperature, humidity, and light on plants and animals and effectiveness of different insecticides. Designs sensing, measuring, and recording devices and instrumentation used to study plant or animal life. Conducts tests on agricultural machinery and equipment. Designs agricultural machinery and equipment. Conducts research to develop agricultural machinery and equipment. Designs and supervises erection of crop storage, animal shelter, and residential structures and heating, lighting, cooling, plumbing, and waste disposal systems. Develops criteria for design, manufacture, or construction of equipment, structures, and facilities. Plans and directs construction of rural electric power distribution systems, and irrigation, drainage, and flood control systems for soil and water conservation.

17-2031.00 Biomedical Engineers Entry – Mid – Senior level position assuming education and experience prerequisite

Apply knowledge of engineering, biology, and biomechanical principles to the design, development, and evaluation of biological and health systems and products such as artificial organs, prostheses, instrumentation, medical information systems, and health management and care delivery system.

17-2041.00 Chemical Engineers Entry – Mid – Senior level position assuming education and experience prerequisite

Develops processes to separate components of liquids or gases or generate electrical currents, using controlled chemical processes. Performs tests throughout stages of production to determine degree of control over variables, including temperature, density, specific gravity, and pressure. Performs laboratory studies of steps in manufacture of new product and tests proposed process in small scale operation (pilot plant). Directs activities of workers who operate or who are engaged in constructing and improving absorption, evaporation, or electromagnetic equipment. Prepares estimate of production costs and production progress reports for management. Develops safety procedures to be employed by workers operating equipment or working in close proximity to on-going chemical reactions. Conducts research to develop new and improved chemical manufacturing processes. Designs and plans layout of equipment. Designs measurement and control systems for chemical plants based on data collected in laboratory experiments and in pilot plant operations. Determines most effective arrangement of operations, such as mixing, crushing, heat transfer, distillation, and drying.

17-2051.00 Civil Engineers Entry – Mid – Senior level position assuming education and experience prerequisite

Analyzes survey reports, maps, drawings, blueprints, aerial photography, and other topographical or geologic data to plan projects. Prepares or presents public reports such as bid proposals, deeds, environmental impact statements, and property and right-of-way descriptions. Provides technical advice regarding design, construction, or program modifications and structural repairs to industrial and managerial personnel. Tests soils and materials to determine the adequacy and strength of foundations, concrete, asphalt, or steel. Conducts studies of traffic patterns or environmental conditions to identify engineering problems and assess the potential impact of projects. Inspects project sites to monitor progress and ensure conformance to design specifications and safety or sanitation standards.



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Plans and designs transportation or hydraulic systems and structures, following construction and government standards using design software and drawing tools. Estimates quantities and cost of materials, equipment, or labor to determine project feasibility. Directs construction, operations, and maintenance activities at project site. Directs or participates in surveying to lay out installations and establish reference points, grades, and elevations to guide construction. Computes load and grade requirements, water flow rates, and material stress factors to determine design specifications.

17-2061.00 Computer Hardware Engineers Entry – Mid – Senior level position assuming education and experience prerequisite

Analyzes software requirements to determine feasibility of design within time and cost constraints. Evaluates factors such as reporting formats required, cost constraints, and need for security restrictions to determine hardware configuration. Formulates and designs software system using scientific analysis and mathematical models to predict and measure outcome and consequences of design. Develops and directs software system testing procedures, programming, and documentation. Monitors functioning of equipment to ensure system operates in conformance with specifications. Specifies power supply requirements and configuration. Recommends purchase of equipment to control dust, temperature, and humidity in area of system installation. Trains users to use new or modified equipment. Enters data into computer terminal to store, retrieve, and manipulate data for analysis of system capabilities and requirements. Consults with customer concerning maintenance of software system. Coordinates installation of software system. Confers with data processing and project managers to obtain information on limitations and capabilities for data processing projects. Analyzes information to determine, recommend, and play layout for type of computers and peripheral equipment modifications to existing systems. Consults with engineering staff to evaluate interface between hardware and software and operational and performance requirements of overall system.

17-2071.00 Electrical Engineers Entry – Mid – Senior level position assuming education and experience prerequisite

Designs electrical instruments, equipment, facilities, components, products, and systems for commercial, industrial, and domestic purposes. Prepares and studies technical drawings, specifications of electrical systems, and topographical maps to ensure installation and operations conform to standards and customer requirements. Directs operations and coordinates manufacturing, construction, installation, maintenance, and testing activities to ensure compliance with specifications, codes, and customer requirements. Conducts field surveys and studies maps, graphs, diagrams, and other data to identify and correct power system problems. Confers with engineers, customers, and others to discuss existing or potential engineering projects and products. Evaluates and analyzes data regarding electric power systems and stations, and recommends changes to improve operating efficiency. Inspects completed installations and observes operations for conformance to design and equipment specifications, and operational and safety standards. Investigates customer or public complaints, determines nature and extent of problem and recommends remedial measures. Operates computer assisted engineering and design software and equipment to perform engineering tasks. Compiles data and writes reports regarding existing and potential engineering studies and projects. Collects data relating to commercial and residential development, population, and power system interconnection to determine operating efficiency of electrical systems. Estimates labor, material, and construction costs, and prepares specifications for purchase of materials and equipment. Performs detailed calculations to computer and establish manufacturing, construction, and installation standards and specifications. Plans layout of electric power generating plants and distribution lines and stations. Develops applications of controls, instruments, and systems for new commercial, domestic, and industrial uses. Plans and implements research methodology and procedures to apply principles of electrical theory to engineering projects.

17-2072.00 Electronics Engineers, Except Computer Entry – Mid – Senior level position assuming education and experience prerequisite

Designs electronic components, products and systems for commercial, industrial, medical, military, and scientific applications. Develops operational, maintenance, and testing procedures for electronic products, components, equipment, and systems. Plans and implements research, methodology, and procedures to apply principles of electronic theory to engineering projects. Evaluates operational systems and recommends repair or design modifications based on factors, such as environment, service, cost, and system capabilities. Conducts studies to gather information regarding current services, equipment capacities, traffic data, and acquisition and installation costs. Prepares engineering sketches and specifications for construction, relocation, and installation of transmitting and receiving equipment, facilities, products, and systems. Operates computer-assisted engineering and design software and equipment to perform engineering tasks. Confers with engineers, customers, and others to discuss existing and potential engineering projects or products. Investigates causes of personal injury resulting from contact with high voltage communications equipment. Determines material and equipment needs and orders supplies. Reviews or prepares budget and cost estimates for equipment, construction, and installation projects, and controls expenditures. Prepares, reviews, and maintains maintenance schedules and operational reports and charts. Provides technical assistance to field and laboratory staff regarding



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equipment standards and problems, and applications of transmitting and receiving methods. Inspects electronic equipment, instruments, products, and systems to ensure conformance to specifications, safety standards, and applicable codes and regulations. Analyzes system requirements, capacity, cost, and customer needs to determine feasibility of project and develop system plan. Directs and coordinates activities concerned with manufacture, construction, installation, maintenance, operation, and modification of electronic equipment, products, and systems. Plans and develops applications and modifications for electronic properties used in components, products, and systems, to improve technical performance.

17-2081.00 Environmental Engineers Entry – Mid – Senior level position assuming education and experience prerequisite

Research, design, develop, and test electronic components and systems for commercial, industrial, military, or specific use utilizing knowledge of electronic theory and materials properties. Design electronic circuits and components for use in fields such as telecommunications, aerospace guidance and propulsion control, acoustics, or instruments and controls.

17-2111.03 Product Safety Engineers Entry – Mid – Senior level position assuming education and experience prerequisite

Conducts research to evaluate safety levels for products. Investigates causes of accidents, injuries, or illnesses from product usage to develop solutions to minimize or prevent recurrence. Participates in preparation of product usage and precautionary label instructions. Prepares reports of findings from investigation of accidents. Advises and recommends procedures for detection, prevention, and elimination of physical, chemical, or other product hazards. Evaluates potential health hazards or damage which could occur from misuse of product and engineers' solutions to improve safety.

17-2131.00 Materials Engineers Entry – Mid – Senior level position assuming education and experience prerequisite

Reviews new product plans and makes recommendations for material selection based on design objectives and cost. Confers with producers of material during investigation and evaluation of material for product applications. Reviews product failure data and interprets laboratory test results to determine material or process causes. Plans and implements laboratory operations to develop material and fabrication procedures that maintain cost and performance standards. Evaluates technical and economic factors relating to process or product design objectives.

17-2141.00 Mechanical Engineers Entry – Mid – Senior level position assuming education and experience prerequisite

Designs products and systems to meet process requirements, applying knowledge of engineering principles. Specifies system components or directs modification of products to ensure conformance with engineering design and performance specifications. Oversees installation to ensure machines and equipment are installed and functioning according to specifications. Coordinates building, fabrication, and installation of product design and operation, maintenance, and repair activities to utilize machines and equipment. Inspects, evaluates, and arranges field installations and recommends design modifications to eliminate machine or system malfunctions. Investigates equipment failures and difficulties, diagnoses faulty operation, and makes recommendations to maintenance crew. Alters or modifies design to obtain specified functional and operational performance. Conducts experiments to test and analyze existing designs and equipment to obtain data on performance of product, and prepares reports. Assists drafter in developing structural design of product using drafting tools or computer assisted design / drafting equipment and software. Selects or designs tools to meet specifications using manuals, drafting tools, computer, and specialized software programs. Tests ability of machines to perform tasks. Develops models of alternate processing methods to test feasibility or new applications of system components, and recommends implementation of procedures. Confers with establishment personnel and engineers to implement operating procedures and resolve system malfunctions, and to provide technical information. Plans and directs engineering personnel in fabrication of test control apparatus and equipment, and develops procedures for testing products. Researches and analyzes data such as customer design proposal, specifications, and manuals to determine feasibility of design or application. Determines parts supply, maintenance tasks, safety procedures, and service schedule required to maintain machines and equipment in prescribed condition. Studies industrial processes to determine where and how application of equipment can be made.

17-2151.00 Mining and Geological Engineers, Including Mining Safety Engineers Entry – Mid – Senior level position assuming education and experience prerequisite

Lays out and directs mine construction operations. Plans and coordinates mining processes and labor utilization. Plans, conducts, or directs others in performing mining experiments to test or prove research findings. Devises methods to solve environmental problems and reclaim mine sites. Inspects mining areas for unsafe structures, equipment, and working conditions. Designs and maintains protective and rescue equipment and safety devices.

Prepares technical reports for use by mining, engineering, and management personnel. Trains mine personnel in safe working practices and first aid. Tests air to detect toxic gases and recommends alterations or installation of ventilation shafts, partitions, or equipment, to remedy problem. Monitors production rate of gas, oil, or minerals from wells or mines. Provides technical consultation during drilling operations. Determines methods to extract minerals, considering factors such as safety, optimal costs, and deposit characteristics. Conducts or collaborates in geological exploration and reviews maps and drilling logs to determine location, size, accessibility, and value of mineral deposits, or optimal oil and gas reservoir locations. Designs, implements, and monitors facility projects such as water, communication, ventilation, drainage, power supply, and conveyor systems. Evaluates data to develop new mining products, equipment, or processes.

17-2161.00 Nuclear Engineers Entry – Mid – Senior level position assuming education and experience prerequisite

Determines potential hazard and accident conditions which may exist in fuel handling and storage and recommends preventive measures. Performs experiments to determine acceptable methods of nuclear material usage, nuclear fuel reclamation, and waste disposal. Formulates equations that describe phenomena occurring during fission of nuclear fuels and develops analytical models for research. Examines accidents and obtains data to formulate preventive measures. Synthesizes analyses of tests results and prepares technical reports of findings and recommendations. Monitors nuclear operations to identify potential or inherent design, construction, or operational problems to ensure safe operations. Designs and oversees construction and operation of nuclear fuels reprocessing systems and reclamation systems. Formulates and initiates corrective actions and orders plant shut down in emergency situations. Computes cost estimates of construction projects, prepares project proposals, and discusses projects with vendors, contractors, and nuclear facility's review board. Directs operating and maintenance activities of operational nuclear facility. Writes operational instructions relative to nuclear plant operation and nuclear fuel and waste handling and disposal. Maintains reports to summarize work and document plant operations. Designs and develops nuclear machinery and equipment, such as reactor cores, radiation shielding, and associated instrumentation and control mechanisms. Inspects nuclear fuels, waste, equipment, test-reactor vessel and related systems, and control instrumentation to identify potential problems or hazards. Evaluates research findings to develop new concepts of thermonuclear analysis and new uses of radioactive models. Conducts tests to research nuclear fuel behavior and nuclear machinery and equipment performance. Plans and designs nuclear research to discover facts, or to test, prove, or modify known nuclear theories. Analyzes available data and consults with other scientists to determine parameters of experimentation and suitability of analytical models.

17-2171.00 Petroleum Engineers Entry – Mid – Senior level position assuming education and experience prerequisite

Designs or modifies mining and oil field machinery and tools, applying engineering principles. Develops plans for oil and gas field drilling, and for product recovery and treatment. Confers with scientific, engineering, and technical personnel to resolve design, research and testing problems. Conducts engineering research experiments to improve or modify mining and oil machinery and operations. Evaluates findings to develop, design, or test equipment or processes. Analyzes data to recommend placement of wells and supplementary processes to enhance production. Coordinates activities of workers engaged in research, planning, and development. Assigns work to staff to obtain maximum utilization of personnel. Inspects oil and gas wells to determine that installations are completed. Writes technical reports for engineering and management personnel. Tests machinery and equipment to ensure conformance to performance specifications and to ensure safety. Interprets drilling and testing information for personnel. Assists engineering and other personnel to solve operating problems. Monitors production rates, and plans rework processes to improve production.

17-3021.00 Aerospace Engineering and Operations Technicians Entry – Mid level position assuming education and experience prerequisite

Determines data required, plans data acquisition operations, and sets up required data acquisition, test, and measurement equipment. Tests aircraft systems under simulated operational conditions, using test instrumentation and equipment, to determine design or fabrication parameters. Constructs and maintains test facilities for aircraft parts and systems, according to specifications, using hand tools, power tools, and test instruments. Records and interprets test data on parts, assemblies, and mechanisms, and confers with engineering personnel regarding test procedures and results. Inputs commands and data into computer systems to modify programs for specific test requirements or for equipment maintenance and calibration. Fabricates and installs parts and systems to be tested in test equipment, using hand tools, power tools, and test instruments. Discusses test data requirements and results with other personnel, determines data required, and calculates and modifies test parameters or equipment. Sets up, operates, maintains, and monitors computer systems and devices for data acquisition and analysis to detect malfunctions. Inspects, diagnoses, maintains, and operates test setup and equipment to detect malfunctions, and adjusts, repairs, or replaces faulty components.

17-3022.00 Civil Engineering Technicians Entry – Mid level position assuming education and experience prerequisite

Inspects project site and evaluates contractor work to detect design malfunctions and ensure conformance to design specifications and applicable codes. Drafts detailed dimensional drawings and designs layouts for projects and to ensure conformance to specifications. Reads and reviews project blueprints and structural specifications to determine dimensions of structure or system and material requirements. Develops plans and estimates costs for installation of systems, utilization of facilities, or construction of structures. Responds to public suggestions and complaints. Evaluates facility to determine suitability for occupancy and square footage availability. Prepares reports and documents project activities and data. Confers with supervisor to determine project details, such as plan preparation, acceptance testing, and evaluation of field conditions. Conducts materials test and analysis, using tools and equipment, and applying engineering knowledge. Reports maintenance problems occurring at project site to supervisor and negotiates changes to resolve system conflicts. Calculates dimensions, square footage, Cognofile and component specifications, and material quantities, using calculator or computer. Plans and conducts field surveys to locate new sites and analyze details of project sites. Analyzes proposed site factors and designs maps, graphs, tracings, and diagrams to illustrate findings.

19-1011.00 Animal Scientists Entry – Mid – Senior level position assuming education and experience prerequisite

Studies nutritional requirements of animals and nutritive value of feed materials for animals and poultry. Studies effects of management practices, processing methods, feed, and environmental conditions on quality and quantity of animal products, such as eggs and milk. Develops improved practices in incubation, brooding, and artificial insemination. Crossbreeds animals with existing strains, or crosses strains to obtain new combinations of desirable characteristics. Determines generic composition of animal population, and heritability of traits, utilizing principles of genetics. Develops improved practices in feeding, housing, sanitation, and parasite and disease control of animals and poultry. Researches and controls selection and breeding practices to increase efficiency of production and improve quality of animals.

19-1012.00 Food Scientists and Technologists Entry – Mid – Senior level position assuming education and experience prerequisite

Conducts research on new products and development of foods, applying scientific and engineering principles. Studies methods to improve physical, chemical, and microbiological composition of foods. Develops food standards, safety and sanitary regulations, and waste management and water supply specifications. Confers with process engineers, flavor experts, and packaging and marketing specialists to resolve problems in product development. Tests new products in test kitchen. Studies methods to improve quality of foods, such as flavor, color, texture, nutritional value, and convenience. Develops new and improved methods and systems for food processing, production, quality control, packaging, and distribution.

19-1013.01 Plant Scientists Entry – Mid – Senior level position assuming education and experience prerequisite

Conducts research to determine best methods of planting, spraying, cultivating, and harvesting horticultural products. Improves bee strains, utilizing selective breeding by artificial insemination. Identifies and classifies species of insects and allied forms, such as mites and spiders. Develops methods for control of noxious weeds, crop diseases, and insect pests. Conducts experiments and investigations to determine methods of storing, processing, and transporting horticultural products. Studies insect distribution and habitat and recommends methods to prevent importation and spread of injurious species. Conducts experiments regarding causes of bee diseases and factors affecting yields of nectar pollen on various plants visited by bees. Aids in control and elimination of agricultural, structural and forest pests by developing new and improved pesticides. Studies crop production to discover effects of various climatic and soil conditions on crops. Experiments to develop new or improved varieties of products having specific features, such as higher yield, resistance to disease, size, or maturity.

19-1013.02 Soil Scientists Entry – Mid – Senior level position assuming education and experience prerequisite

Studies soil characteristics and classifies soils according to standard types. Performs chemical analysis on microorganism content of soil to determine microbial reactions and chemical mineralogical relationship to plant growth. Provides advice on rural or urban land use. Investigates responses of specific soil types to soil management practices, such as fertilization, crop rotation, and industrial waste control. Conducts experiments on farms or experimental stations to determine best soil types for different plants.

19-1020.01 Biologists Entry – Mid – Senior level position assuming education and experience prerequisite

Studies basic principles of plant and animal life, such as origin, relationship, development, anatomy, and functions. Studies and manages wild animal populations. Measures salinity, acidity, light, oxygen content, and other physical conditions of water to determine their relationship to aquatic life. Develops methods of extracting drugs from aquatic plants and animals. Researches environmental effects of present and potential uses of land and water areas and

determines methods of improving environment or crop yields. Plans and administers biological research programs for government, research firms, medical industries, or manufacturing firms. Cultivates, breeds, and grows aquatic life, such as lobsters, clams, or fish farming. Prepares environmental impact reports for industry, government, or publication. Communicates test results to state and federal representatives and general public. Investigates and develops pest management and control measures. Develops methods and apparatus for securing representative plant, animal, aquatic, or soil samples. Studies aquatic plants and animals and environmental conditions affecting them, such as radioactivity or pollution. Collects and analyzes biological data about relationship among and between organisms and their environment. Studies reactions of plants, animals, and marine species to parasites. Identifies, classifies, and studies structure, behavior, ecology, physiology, nutrition, culture, and distribution of plant and animal species.

19-1021.01 Biochemists Entry – Mid – Senior level position assuming education and experience prerequisite

Studies chemistry of living processes, such as cell development, breathing and digestion, and living energy changes, such as growth, aging, and death. Prepares reports and recommendations based upon research outcomes. Develops and tests new drugs and medications used for commercial distribution. Analyzes foods to determine nutritional value and effects of cooking, canning, and processing on this value. Cleans, purifies, refines, and otherwise prepares pharmaceutical compounds for commercial distribution. Design and build laboratory equipment needed for special research projects. Researches and determines chemical action of substances, such as drugs, serums, hormones, and food on tissues and vital processes. Isolates, analyzes, and identifies hormones, vitamins, allergens, minerals, and enzymes, and determines their effects on body functions. Develops and executes tests to detect disease, genetic disorders, or other abnormalities. Develops methods to process, store, and use food, drugs, and chemical compounds. Examines chemical aspects of formation of antibodies, and researches chemistry of cells and blood corpuscles. Researches methods of transferring characteristics, such as resistance to disease, from one organism to another.

19-1021.02 Biophysicists Entry – Mid – Senior level position assuming education and experience prerequisite

Studies physical principles of living cells and organisms and their electrical and mechanical energy. Investigates damage to cells and tissues caused by x-rays and nuclear particles. Investigates transmission of electrical impulses along nerves and muscles. Analyzes functions of electronic and human brains, such as learning, thinking, and memory. Studies absorption of light by chlorophyll in photosynthesis or by pigments of eye involved in vision. Researches cancer treatment, using radiation and nuclear particles. Investigates dynamics of seeing and hearing. Studies spatial configuration of submicroscopic molecules, such as proteins, using x-ray and electron microscope. Researches manner in which characteristics of plants and animals are carried through successive generations. Researches transformation of substances in cells, using atomic isotopes.

19-1022.00 Microbiologists Entry – Mid – Senior level position assuming education and experience prerequisite

Studies growth, structure, development, and general characteristics of bacteria and other micro-organisms. Conducts chemical analyses of substances such as acids, alcohols, and enzymes. Prepares technical reports and recommendations based upon research outcomes. Researches use of bacterial and micro-organisms to develop vitamins, antibiotics, amino acids, grain alcohol, sugars, and polymers. Isolates and makes cultures of bacteria or other micro-organisms in prescribed media, controlling moisture, aeration, temperature, and nutrition. Examines physiological, morphological, and cultural characteristics using microscope to identify micro-organisms. Observes action of micro-organisms upon living tissues of plants, higher animals, and other micro-organisms, and on dead organic matter. Studies growth structure and development of viruses and rickettsiae.

19-1023.00 Zoologists and Wildlife Biologists Entry – Mid – Senior level position assuming education and experience prerequisite

Studies origin, interrelationships, classification, life histories and diseases, development, genetics, and distribution of animals. Conducts experimental studies, using chemicals and various types of scientific equipment. Raises specimens for study and observation or for use in experiments. Prepares collections of preserved specimens or microscopic slides for species identification and study of species development or animal disease. Analyzes characteristics of animals to identify and classify animals. Collects and dissects animal specimens and examines specimens under microscope. Studies animals in their natural habitats, and assesses effects of environment on animals.

19-1031.01 Soil Conservationists Entry – Mid – Senior level position assuming education and experience prerequisite

Plans soil management practices, such as crop rotation, reforestation, permanent vegetation, contour plowing, or terracing, to maintain soil and conserve water. Develops plans for conservation, such as conservation cropping systems, woodlands management, pasture planning and engineering systems. Analyzes results of investigations to determine measures needed to maintain or restore proper soil management. Monitors projects during and after construction to

ensure projects conform to design specifications. Surveys property to mark locations and measurements, using surveying instruments. Revisits land users to view implemented land use practices and plans. Discusses conservation plans, problems, and alternative solutions with land users, applying knowledge of agronomy, soil science, forestry, or agricultural sciences. Computes cost estimates of different conservation practices based on needs of land users, maintenance requirements and life expectancy of practices. Develops or participates in environmental studies. Computes design specification for implementation of conservation practices, using survey and field information technical guides, engineering manuals, and calculator. Conducts surveys and investigations of various land uses, such as rural or urban, agriculture, construction, forestry or mining.

19-1041.00 Epidemiologists Entry – Mid – Senior level position assuming education and experience prerequisite

Plans and directs studies to investigate human or animal disease, preventive methods, and treatments for diseases. Investigates cause, progress, life cycle, or mode of transmission of diseases or parasites. Analyzes data, applying statistical techniques and scientific knowledge, prepares reports, and presents findings. Plans methodological design or research study and arranges for data collection. Consults with and advises physicians, educators, researchers, and others regarding medical applications of sciences such as physics, biology, and chemistry. Confers with health department, industry personnel, physicians, and others to develop health safety standards and programs to improve public health. Teaches principles of medicine and medical and laboratory procedures to physicians, residents, students, and technicians. Supervises activities of clerical and statistical or laboratory personnel. Standardizes drug dosages, methods of immunization, and procedures for manufacture of drugs and medicinal compounds. Prepares and analyzes samples for toxicity, bacteria, or microorganisms or to study cell structure and properties. Examines organs, tissues, cell structures or microorganisms by systematic observation or using microscope. Conducts research to develop methodologies, instrumentation, or identification, diagnosing, and treatment procedures for medical application. Studies effects of drugs, gases, pesticides, parasites, microorganisms, or health and physiological processes of animals and humans.

19-1042.00 Medical Scientists, Except Epidemiologists Entry – Mid – Senior level position assuming education and experience prerequisite

Plans and directs studies to investigate human or animal disease, preventive methods, and treatments for disease. Examines organs, tissues, cell structures, or micro-organisms by systematic observation or using microscope. Prepares and analyzes samples for toxicity, bacteria, or microorganisms or to study cell structure and properties. Consults with and advises physicians, educators, researchers, and others regarding medical applications of sciences, such as physics, biology, and chemistry. Supervises activities of clerical and statistical or laboratory personnel. Teaches principles of medicine and medical and laboratory procedures to physicians, residents, students, and technicians. Standardizes drug dosages, methods of immunization, and procedures for manufacture of drugs and medicinal compounds. Confers with health department, industry personnel, physicians, and others to develop health safety standards and programs to improve public health. Plans methodological design of research study and arranges for data collection. Analyzes data, applying statistical techniques and scientific knowledge, prepares reports, and presents findings. Investigates cause, progress, life cycle, or mode of transmission of diseases or parasites. Conducts research to develop methodologies, instrumentation, or identification, diagnosing, and treatment procedures for medical application. Studies effects of drugs, gases, pesticides, parasites, or micro-organisms, or health and physiological processes of animals and humans.

19-2011.00 Astronomers Entry – Mid – Senior level position assuming education and experience prerequisite

Studies celestial phenomena from ground or above atmosphere, using various optical devices, such as telescopes situated on ground or attached to satellites. Studies history, structure, extent, and evolution of stars, stellar systems, and universe. Calculates orbits and determines sizes, shapes, brightness, and motions of different celestial bodies. Develops mathematical tables giving positions of sun, moon, planets, and stars at given times for use by air and sea navigators. Designs optical, mechanical and electronic instruments for astronomical research. Analyzes wavelengths of radiation from celestial bodies, as observed in all ranges of spectrum. Determines exact time by celestial observations and conducts research into relationships between time and space. Computes positions of sun, moon, planets, stars, nebulae, and galaxies.

19-2012.00 Physicists Entry – Mid – Senior level position assuming education and experience prerequisite

Observes structure and properties of matter and transformation and propagation of energy, using masers, lasers, telescopes and other equipment. Conducts instrumental analyses to determine physical properties of materials. Describes and expresses observations and conclusions in mathematical terms. Analyzes results of experiments designed to detect and measure previously unobserved physical phenomena. Conducts application analysis to determine commercial, industrial, scientific, medical, military, or other uses for electro-optical devices. Designs electronic circuitry and optical components with scientific characteristics to fit within specified mechanical limits and perform according to

specifications. Conducts research pertaining to potential environmental impact of proposed atomic energy related industrial development to determine qualifications for licensing. Consults other scientists regarding innovations to ensure equipment or plant design conforms to health physics standards for protection of personnel. Directs testing and monitoring of contamination of radioactive equipment and recording of personnel and plant area radiation exposure data. Advises authorities in procedures to be followed in radiation incidents or hazards, and assists in civil defense planning. incorporates methods for maintenance and repair of components and designs, and develops test instrumentation and test procedures. Assists with development of manufacturing, assembly, and fabrication processes of lasers, masers, infrared, and other light-emitting and light-sensitive devices. Assists in developing standards of permissible concentrations of radioisotopes in liquids and gases.

19-2021.00 Atmospheric and Space Scientists Entry – Mid – Senior level position assuming education and experience prerequisite

Analyzes and interprets meteorological data gathered by surface and upper air stations, satellites, and radar to prepare reports and forecasts. Prepares special forecasts and briefings for air and sea transportation, agriculture, fire prevention, air-pollution control, and school groups. Conducts basic or applied research in meteorology. Broadcasts weather forecast over television or radio. Issues hurricane and other severe weather warnings. Directs forecasting services at weather station, or at radio or television broadcasting facility. Operates computer graphic equipment to produce weather reports and maps for analysis, distribution, or use in televised weather broadcast. Studies and interprets synoptic reports, maps, photographs, and prognostic charts to predict long and short range weather conditions.

19-2031.00 Chemists Entry – Mid – Senior level position assuming education and experience prerequisite

Analyzes organic and inorganic compounds to determine chemical and physical properties, composition, structure, relationships, and reactions, utilizing chromatography, spectroscopy, and spectrophotometry techniques. Develops, improves, and customizes products, equipment, formulas, processes, and analytical methods. Studies effects of various methods of processing, preserving, and packaging on composition and properties of foods. Confers with scientists and engineers to conduct analyses of research projects, interpret test results, or develop nonstandard tests. Prepares test solutions, compounds, and reagents for laboratory personnel to conduct test. Directs, coordinates, and advises personnel in test procedures for analyzing components and physical properties of materials. Writes technical papers and reports and prepares standards and specifications for processes, facilities, products, and tests. Compiles and analyzes test information to determine process or equipment operating efficiency and to diagnose malfunctions. Induces changes in composition of substances by introducing heat, light, energy, and chemical catalysts for quantitative and qualitative analysis.

19-2032.00 Materials Scientists Entry – Mid – Senior level position assuming education and experience prerequisite

Plans laboratory experiments to confirm feasibility of processes and techniques to produce materials having special characteristics. Reports materials study findings for other scientists and requesters. Guides technical staff engaged in developing materials for specific use in projected product or device. Studies structures and properties of materials, such as metals, alloys, polymers, and ceramics to obtain research data.

19-2041.00 Environmental Scientists and Specialists, Including Health Entry – Mid – Senior level position assuming education and experience prerequisite

Plans and develops research models using knowledge of mathematical and statistical concepts. Determines data collection methods to be employed in research projects and surveys. Prepares graphs or charts from data samples and advises enforcement personnel on proper standards and regulations. Collects, identifies and analyzes data to assess sources of pollution, determine their effects, and establish standards.

19-2042.01 Geologists Entry – Mid – Senior level position assuming education and experience prerequisite

Studies, examines, measures, and classifies composition, structure, and history of earth's crust, including rocks, minerals, fossils, soil, and ocean floor. Locates and estimates probable gas and oil deposits, using aerial photographs, charts, and research and survey results. Interprets research data, and recommends further study or action. Tests industrial diamonds and abrasives, soil, or rocks to determine geological characteristics, using optical, x-ray, heat, acid, and precision instruments. Analyzes engineering problems at construction projects, such as dams, tunnels, and large buildings, applying geological knowledge. Develops instruments for geological work, such as diamond tool and dies, jeweled bearings, and grinding laps and wheels. Recommends and prepares reports on foundation design, acquisition, retention, or release of property leases, or areas of further research. Measures characteristics of earth, using seismograph, gravimeter, torsion balance, magnetometer, pendulum devices, and electrical resistivity apparatus. Inspects proposed construction site and

sets up test equipment and drilling machinery. Prepares geological reports, maps, charts, and diagrams. Identifies and determines sequence of processes affecting development of earth.

19-2043.00 Hydrologists Entry – Mid – Senior level position assuming education and experience prerequisite

Studies and analyzes physical aspects of earth, including atmosphere and hydrosphere, and interior structure. Investigates origin and activity of glaciers, volcanoes, and earthquakes. Studies waters of land areas to determine modes of return to ocean and atmosphere. Prepares and issues maps and reports indicating areas of seismic risk to existing or proposed construction or development. Evaluates data in reference to project planning, such as flood and drought control, water power and supply, drainage, irrigation, and inland navigation. Compiles and evaluates data to prepare navigational charts and maps, predict atmospheric conditions, and prepare environmental reports. Studies, measures, and interprets seismic, gravitational, electrical, thermal, and magnetic forces and data affecting the earth. Studies, maps, and charts distribution, disposition, and development of waters of land areas, including form and intensity of precipitation.

19-3011.00 Economists Entry – Mid – Senior level position assuming education and experience prerequisite

Studies economic and statistical data in area of specialization, such as finance, labor, or agriculture. Formulates recommendations, policies, or plans to interpret markets or solve economic problems. Develops economic guidelines and standards and preparing points of view used in forecasting trends and formulating economic policy. Devises methods and procedures for collecting and processing data, using various econometric and sampling techniques. Assigns work to staff. Teaches theories, principles, and methods of economics. Testifies at regulatory or legislative hearings to present recommendations. Provides advice and consultation to business and public and private agencies. Supervises research projects and students' study projects. Compiles data relating to research area, such as employment, productivity, and wages and hours. Reviews and analyzes data to prepare reports, to forecast future marketing trends, and to stay abreast of economic changes. Organizes research data into report format, including graphic illustrations of research findings.

19-3021.00 Market Research Analysts Entry – Mid – Senior level position assuming education and experience prerequisite

Examines and analyzes statistical data to forecast future marketing trends and to identify potential markets. Establishes research methodology and designs format for data gathering, such as surveys, opinion polls, or questionnaires. Gathers data on competitors and analyzes prices, sales, and method of marketing and distribution. Collects data on customer preferences and buying habits. Prepares reports and graphic illustrations of findings. Translates complex numerical data into non-technical, written text. Attends staff conferences to submit findings and proposals to management for consideration. Checks consumer reaction to new or improved products or services.

19-3091.01 Anthropologists Entry – Mid – Senior level position assuming education and experience prerequisite

Gathers, analyzes, and reports data on human physique, social customs, and artifacts such as weapons, tools, pottery, and clothing. Studies growth patterns, sexual differences, and aging phenomena of human groups, current and past. Observes and measures bodily variations and physical attributes of existing human types. Formulates general laws of cultural development, general rules of social and cultural behavior, or general value orientations. Studies relationships between language and culture and social linguistic studies, relationship between individual personality and culture, or complex industrialized societies. Applies anthropological concepts to current problems. Applies anthropological data and techniques to solution of problems in human relations. Studies cultures, particularly pre-industrial and non-Western societies, including religion, economics, mythology, and traditions, and intellectual and artistic life. Studies physical and physiological adaptations to differing environments and hereditary characteristics of living populations. Studies museum collections of skeletal remains and human fossils to determine their meaning in terms of long-range human evolution.

19-3091.02 Archeologists Entry – Mid – Senior level position assuming education and experience prerequisite

Studies artifacts, architectural features, and types of structures recovered by excavation in order to determine age and cultural identity. Classifies and interprets artifacts, architectural features, and types of structures recovered by excavation to determine age and cultural identity. Establishes chronological sequence of development of each culture from simpler to more advanced levels.

19-3092.00 Geographers Entry – Mid – Senior level position assuming education and experience prerequisite

Collects data on physical characteristics of specified area, such as geological formation, climate, and vegetation, using surveying or meteorological equipment. Uses surveying equipment to assess geology, physics, and biology within given area. Advises governments and organizations on ethnic and natural boundaries between nation or administrative areas. Prepares environmental impact reports based on results of study. Constructs and interprets maps, graphs, and diagrams. Studies population characteristics within area, such as ethnic distribution and economic activity.

19-3094.00 Political Scientists Entry – Mid – Senior level position assuming education and experience prerequisite

Conducts research into political philosophy and theories of political systems, such as governmental institutions, public laws, and international law. Organizes and conducts public opinion surveys and interprets results. Analyzes and interprets results of studies, and prepares reports detailing findings, recommendations, or conclusions. Consults with government officials, civic bodies, research agencies, and political parties. Recommends programs and policies to institutions and organizations. Prepares reports detailing findings and conclusions.

19-4021.00 Biological Technicians Entry – Mid level position assuming education and experience prerequisite

Sets up laboratory and field equipment to assist research workers. Cleans and maintains laboratory and field equipment and work areas. Plants seeds in specified area, and counts plants that grow, to determine germination rate of seeds. Pricks animals, and collects blood samples for testing, using hand held devices. Records production and test data for evaluation by personnel. Measures or weighs ingredients used in testing or as animal feed. Adjusts testing equipment and prepares culture media, following standard procedures. Waters and feeds rations to livestock and laboratory animals. Examines animals and specimens to determine presence of disease or other problems.

19-4031.00 Chemical Technicians Entry – Mid – Senior level position assuming education and experience prerequisite

Tests and analyzes chemical and physical properties of liquids, solids, gases, radioactive and biological materials, and products such as perfumes. Prepares chemical solutions for products and processes, following standardized formulas or creates experimental formulas. Sets up and calibrates laboratory equipment and instruments used for testing, process control, product development, and research. Documents results of tests and analyses, and writes technical reports or prepares graphs and charts. Directs other workers in compounding and distilling chemicals. Reviews process paperwork for products to ensure compliance to standards and specifications. Cleans and sterilizes laboratory equipment.

19-4051.01 Nuclear Equipment Operation Technicians Entry – Mid level position assuming education and experience prerequisite

Sets control panel switches and activates equipment, such as nuclear reactor, particle accelerator, or gamma radiation equipment, according to specifications. Calculates equipment-operating factors, such as radiation time, dosage, temperature, and pressure, using standard formulas and conversion tables. Monitors instruments, gauges, and recording devices in control room during operation of equipment, under directions of nuclear experimenter. Reviews experiment schedule to determine specifications, such as subatomic particle parameters, radiation time, dosage, and gamma intensity. Positions fuel elements in reactor or environmental chamber, according to specified configuration, using slave manipulators or extension tools. Installs instrumentation leads in reactor core to measure operating temperature and pressure according to mockups, blueprints, and diagrams. Modifies, devises, and maintains equipment used in operations. Disassembles, cleans, and decontaminates hot cells and reactor parts during maintenance shutdown, using slave manipulators, crane, and hand tools. Writes summary of activities or records experiment data in log for further analysis by engineers, scientists, or customers, or for future reference. Communicates with maintenance personnel to ensure readiness of support systems and to warn of radiation hazards. Tests physical, chemical, or metallurgical properties of experimental materials according to standardized procedures, using test equipment and measuring instruments. Withdraws radioactive sample for analysis, fills container with prescribed quantity of material for shipment, or removes spent fuel elements. Sets up and operates machines to saw fuel elements to size or to cut and polish test pieces, following blueprints and other specifications. Transfers experimental materials to and from specified containers and to tube, chamber or tunnel, using slave manipulators or extension tools. Controls laboratory-compounding equipment enclosed in protective hot cell to prepare radioisotopes and other radioactive materials. Adjusts controls of equipment to control particle beam, chain reaction or radiation, according to specifications.

19-4051.02 Nuclear Monitoring Technicians Entry – Mid level position assuming education and experience prerequisite

Measures intensity and identifies type of radiation in work areas, equipment, and materials, using radiation detectors and other instruments. Collects samples of air, water, gases and solids to determine radioactivity levels of contamination. Assists in setting up equipment that automatically detects area radiation deviations and tests detection equipment to ensure accuracy. Calculates safe radiation exposure time for personnel, using plant contamination readings and prescribed safe levels of radiation. Scans photographic emulsions exposed to direct radiation to compute track properties from standard formulas, using microscope with scales and protractors. Calibrates and maintains chemical instrumentation sensing elements and sampling system equipment, using calibrations instruments and hand tools. Monitors personnel for length and intensity of exposure to radiation for health and safety purposes. Places radioactive waste, such as sweepings and broken sample bottles, into containers for disposal. Decontaminates objects by cleaning with soap or solvents or by



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abrading, using wire brush, buffing wheel or sandblasting machine. Enters data into computer to record characteristics of nuclear events and locating coordinates of particles. Weighs and mixes decontamination chemical solutions in tank and immerses objects in solution for specified time, using hoist. Determines or recommends radioactive decontamination procedures, according to size and nature of equipment and degree of contamination. Instructs personnel in radiation safety procedures and demonstrates use of protective clothing and equipment. Confers with scientist directing project to determine significant events to watch for during test. Prepares reports on contamination tests, material and equipment decontaminated, methods used in decontamination process. Informs supervisors to take action when individual exposures or area radiation levels approach maximum permissible limits. Observes projected photographs to locate particle tracks and events and compiles lists of events from particle detectors.

25-1021.00 Computer Science Teachers, Postsecondary Entry – Mid – Senior level position assuming education and experience prerequisite

Prepares and delivers lectures to students. Directs research of other teachers or graduate students working for advanced academic degrees. Advises students on academic and vocational curricula. Conducts research in particular field of knowledge and publishes findings in professional journals. Serves on faculty committee providing professional consulting services to government and industry. Acts as adviser to student organizations. Compiles, administers, and grades examinations, or assigns this work to others. Stimulates class discussions. Compiles bibliographies of specialized materials for outside reading assignments.

25-1022.00 Mathematical Science Teachers, Postsecondary Entry – Mid – Senior level position assuming education and experience prerequisite

Prepares and delivers lectures to students. Compiles bibliographies of specialized materials for outside reading assignments. Advises students on academic and vocational curricula. Conducts research in particular field of knowledge and publishes findings in professional journals. Serves on faculty committee providing professional consulting services to government and industry. Acts as adviser to student organizations. Directs research of other teachers or graduate students working for advanced academic degrees. Compiles, administers, and grades examinations, or assigns this work to others. Stimulates class discussions.

25-1032.00 Engineering Teachers, Postsecondary Entry – Mid – Senior level position assuming education and experience prerequisite

Prepares and delivers lectures to students. Advises students on academic and vocational curricula. Conducts research in particular field of knowledge and publishes findings in professional journals. Directs research of other teachers or graduate students working for advanced academic degrees. Acts as adviser to student organizations. Serves on faculty committee providing professional consulting services to government and industry. Compiles, administers, and grades examinations, or assigns this work to others. Stimulates class discussions. Compiles bibliographies of specialized materials for outside reading assignments.

25-1042.00 Biological Science Teachers, Postsecondary Entry – Mid – Senior level position assuming education and experience prerequisite

Prepares and delivers lectures to students. Compiles, administers, and grades examinations, or assigns this work to others. Directs research of other teachers or graduate students working for advanced academic degrees. Acts as adviser to student organizations. Serves on faculty committee providing professional consulting services to government and industry. Conducts research in particular field of knowledge and publishes findings in professional journals. Advises students on academic and vocational curricula. Stimulates class discussions. Compiles bibliographies of specialized materials for outside reading assignments.

25-1051.00 Atmospheric, Earth, Marine, and Space Sciences Teachers, Postsecondary Entry – Mid – Senior level position assuming education and experience prerequisite

Teach courses in the physical sciences, except chemistry and physics.

25-1052.00 Chemistry Teachers, Postsecondary Entry – Mid – Senior level position assuming education and experience prerequisite

Prepares and delivers lectures to students. Directs research of other teachers or graduate students working for advanced academic degrees. Conducts research in particular field of knowledge and publishes findings in professional journals. Advises students on academic and vocational curricula. Serves on faculty committee providing professional consulting services to government and industry. Acts as adviser to student organizations. Compiles bibliographies of specialized materials for outside reading assignments. Stimulates class discussions. Compiles, administers, and grades examinations, or assigns this work to others.



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25-1054.00 Physics Teachers, Postsecondary Entry – Mid – Senior level position assuming education and experience prerequisite

Prepares and delivers lectures to students. Advises students on academic and vocational curricula. Conducts research in particular field of knowledge and publishes findings in professional journals. Directs research of other teachers or graduate students working for advanced academic degrees. Acts as adviser to student organizations. Serves on faculty committee providing professional consulting services to government and industry. Compiles bibliographies of specialized materials for outside reading assignments. Stimulates class discussions. Compiles, administers, and grades examinations, or assigns this work to others.

25-1061.00 Anthropology and Archeology Teachers, Postsecondary Entry – Mid – Senior level position assuming education and experience prerequisite

Prepares and delivers lectures to students. Directs research of other teachers or graduate students working for advanced academic degrees. Serves on faculty committee providing professional consulting services to government and industry. Acts as adviser to student organizations. Conducts research in particular field of knowledge and publishes findings in professional journals. Advises students on academic and vocational curricula. Stimulates class discussions. Compiles bibliographies of specialized materials for outside reading assignments. Compiles, administers, and grades examinations, or assigns this work to others.

25-1062.00 Area, Ethnic, and Cultural Studies Teachers, Postsecondary Entry – Mid – Senior level position assuming education and experience prerequisite

Prepares and delivers lectures to students. Conducts research in particular field of knowledge and publishes findings in professional journals. Acts as adviser to student organizations. Serves on faculty committee providing professional consulting services to government and industry. Directs research of other teachers or graduate students working for advanced academic degrees. Compiles, administers, and grades examinations, or assigns this work to others. Compiles bibliographies of specialized materials for outside reading assignments. Advises students on academic and vocational curricula. Stimulates class discussions.

25-1126.00 Philosophy and Religion Teachers, Postsecondary Entry – Mid – Senior level position assuming education and experience prerequisite

Teach courses in philosophy, religion, and theology.

25-1191.00 Graduate Teaching Assistants Entry level position assuming education and experience prerequisite

Develops teaching materials, such as syllabi and visual aids. Assists faculty member or staff with student conferences. Teaches lower-level courses. Assists library staff in maintaining library collection. Assists faculty member or staff with laboratory or field research. Prepares and gives examinations. Grades examinations and papers.

27-1011.00 Art Directors Mid – Senior level position assuming education and experience prerequisite

Assigns and directs staff members to develop design concepts into art layouts or prepare layouts for printing. Formulates basic layout design or presentation approach, and conceives material details, such as style and size of type, photographs, graphics, and arrangement. Reviews and approves art and copy materials developed by staff, and proofs of printed copy. Reviews illustrative material and confers with client concerning objectives, budget, background information, and presentation approaches, styles, and techniques. Writes typography instructions, such as margin widths and type sizes, and submits for typesetting or printing. Draws custom illustrations for project. Marks up, pastes, and completes layouts to prepare for printing. Prepares detailed storyboard showing sequence and timing of story development for television production. Presents final layouts to client for approval. Confers with creative, art, copy writing, or production department heads to discuss client requirements, outline presentation concepts, and coordinate creative activities.

27-1013.01 Painters and Illustrators Entry – Mid – Senior level position assuming education and experience prerequisite

Renders drawings, illustrations, and sketches of buildings, manufactured products, or models, working from sketches, blueprints, memory, or reference materials. Paints scenic backgrounds, murals, and portraiture for motion picture and television production sets, glass artworks, and exhibits. Develops drawings, paintings, diagrams, and models of medical or biological subjects for use in publications, exhibits, consultations, research, and teaching. Etches, carves, paints, or draws artwork on material, such as stone, glass, canvas, wood, and linoleum. Confers with professional personnel or client to discuss objectives of artwork, develop illustration ideas, and theme to be portrayed. Performs tests to determine factors, such as age, structure, pigment stability, and probable reaction to various cleaning agents and solvents. Applies select solvents and cleaning agents to clean surface of painting and remove accretions, discolorations, and deteriorated

varnish. Assembles, leads, and solders finished glass to fabricate stained glass article. Installs finished stained glass in window or doorframe. Examines surfaces of paintings and proofs of artwork, using magnifying device, to determine method of restoration or needed corrections. Removes painting from frame or paint layer from canvas to restore artwork, following specified technique and equipment. Studies style, techniques, colors, textures, and materials used by artist to maintain consistency in reconstruction or retouching procedures. Brushes or sprays protective or decorative finish on completed background panels, informational legends, exhibit accessories, or finished painting. Integrates and develops visual elements, such as line, space, mass, color, and perspective to produce desired effect.

27-1013.04 Sculptors Entry – Mid – Senior level position assuming education and experience prerequisite

Carves objects from stone, concrete, plaster, wood, or other material, using abrasives and tools, such as chisels, gouges, and mall. Constructs artistic forms from metal or stone, using metalworking, welding, or masonry tools and equipment. Cuts, bends, laminates, arranges, and fastens individual or mixed raw and manufactured materials and products to form works of art. Models substances, such as clay or wax, using fingers and small hand tools to form objects.

27-1014.00 Multi-Media Artists and Animators Entry – Mid – Senior level position assuming education and experience prerequisite

Create special effects, animation, or other visual images using film, video, computers, or other electronic tools and media for use in products or creations, such as computer games, movies, music videos, and commercials.

27-1021.00 Commercial and Industrial Designers Entry – Mid – Senior level position assuming education and experience prerequisite

Confers with engineering, marketing, production, or sales department, or customer to establish design concepts for manufactured products. Prepares detailed drawings, illustrations, artwork, or blueprints, using drawing instruments or paints and brushes. Integrates findings and concepts and sketches design ideas. Designs packaging and containers for products, such as foods, beverages, toiletries, or medicines. Creates and designs graphic material for use as ornamentation, illustration, or advertising on manufactured materials and packaging. Modifies design to conform with customer specifications, production limitations, or changes in design trends. Directs and coordinates preparation of detailed drawings from sketches or fabrication of models or samples. Reads publications, attends showings, and studies traditional, period, and contemporary design styles and motifs to obtain perspective and design concepts. Prepares itemized production requirements to produce item. Fabricates model or sample in paper, wood, glass, fabric, plastic, or metal, using hand and power tools. Presents design to customer or design committee for approval and discusses need for modification. Evaluates design ideas for feasibility based on factors, such as appearance, function, serviceability, budget, production costs/methods, and market characteristics.

27-1022.00 Fashion Designers Entry – Mid – Senior level position assuming education and experience prerequisite

Designs custom garments for clients. Integrates findings of analysis and discussion, and personal tastes and knowledge of design, to originate design ideas. Draws pattern for article designed, cuts pattern, and cuts material according to pattern, using measuring and drawing instruments, and scissors. Attends fashion shows and reviews garment magazines and manuals to analyze fashion trends, predictions, and consumer preferences. Sews together sections to form mockup or sample of garment or article, using sewing equipment. Directs and coordinates workers who draw and cut patterns, and construct sample or finished garment. Arranges for showing of sample garments at sales meetings or fashion shows. Confers with sales and management executives, or clients regarding design ideas. Examines sample garment on and off model, and modifies design to achieve desired effect. Sketches rough and detailed drawings of apparel or accessories, and writes specifications, such as color scheme, construction, or material type.

27-1024.00 Graphic Designers Entry – Mid – Senior level position assuming education and experience prerequisite

Draws sample of finished layout and presents sample to art director for approval. Produces still and animated graphic formats for on-air and taped portions of television news broadcasts, using electronic video equipment. Prepares illustrations or rough sketches of material according to instructions of client or supervisor. Develops negatives and prints, using negative and print developing equipment and tools and work aids to produce layout photographs. Prepares notes and instructions for workers who assemble and prepare final layouts for printing. Photographs layouts, using camera, to make layout prints for supervisor or client. Confers with client regarding layout design. Prepares series of drawings to illustrate sequence and timing of story development for television production. Reviews final layout and suggests improvements as needed. Studies illustrations and photographs to plan presentation of material, product, or service. Draws and prints charts, graphs, illustrations, and other artwork, using computer. Marks up, pastes, and assembles final layouts to prepare layouts for printer. Keys information into computer equipment to create layouts for client or supervisor.

Determines size and arrangement of illustrative material and copy, and selects style and size of type. Arranges layout based upon available space, knowledge of layout principles, and esthetic design concepts.

27-1025.00 Interior Designers Entry – Mid – Senior level position assuming education and experience prerequisite

Formulates environmental plan to be practical, esthetic, and conducive to intended purposes, such as raising productivity or selling merchandise. Confers with client to determine factors affecting planning interior environments, such as budget, architectural preferences, and purpose and function. Advises client on interior design factors, such as space planning, layout and utilization of furnishings and equipment, and color coordination. Estimates material requirements and costs, and presents design to client for approval. Renders design ideas in form of paste-ups or drawings. Subcontracts fabrication, installation, and arrangement of carpeting, fixtures, accessories, draperies, paint and wall coverings, artwork, furniture, and related items. Plans and designs interior environments for boats, planes, buses, trains, and other enclosed spaces. Selects or designs and purchases furnishings, art works, and accessories.

27-2041.01 Music Directors Entry – Mid – Senior level position assuming education and experience prerequisite

Directs group at rehearsals and live or recorded performances to achieve desired effects, such as tonal and harmonic balance dynamics, rhythm, and tempo. Issues assignments and reviews work of staff in such areas as scoring, arranging, and copying music, lyric and vocal coaching. Positions members within group to obtain balance among instrumental sections. Auditions and selects vocal and instrumental groups for musical presentations. Engages services of composer to write score. Transcribes musical compositions and melodic lines to adapt them to or create particular style for group. Selects vocal, instrumental, and recorded music suitable to type of performance requirements to accommodate ability of group.

27-2041.02 Music Arrangers and Orchestrators Entry – Mid – Senior level position assuming education and experience prerequisite

Composes musical scores for orchestra, band, choral group, or individual instrumentalist or vocalist, using knowledge of music theory and instrumental and vocal capabilities. Transposes music from one voice or instrument to another to accommodate particular musician in musical group. Transcribes musical parts from score written by arranger or orchestrator for each instrument or voice, using knowledge of music composition. Copies parts from score for individual performers. Determines voice, instrument, harmonic structure, rhythm, tempo, and tone balance to achieve desired effect. Adapts musical composition for orchestra, band, choral group, or individual to style for which it was not originally written.

27-2041.03 Composers Entry – Mid – Senior level position assuming education and experience prerequisite

Creates original musical form or writes within circumscribed musical form, such as sonata, symphony, or opera. Transcribes or records musical ideas into notes on scored music paper. Develops pattern of harmony, applying knowledge of music theory. Creates musical and tonal structure, applying elements of music theory, such as instrumental and vocal capabilities. Determines basic pattern of melody, applying knowledge of music theory. Synthesizes ideas for melody of musical scores for choral group, or band.

27-2042.01 Singers Entry – Mid – Senior level position assuming education and experience prerequisite

Sings before audience or recipient of message as soloist, or in a group, as member of vocal ensemble. Practices songs and routines to maintain and improve vocal skills. Observes choral leader or prompter for cues or directions in vocal presentation. Sings a cappella or with musical accompaniment. Memorizes musical selections and routines, or sings following printed text, musical notation, or customer instructions. Interprets or modifies music, applying knowledge of harmony, melody, rhythm, and voice production, to individualize presentation and maintain audience interest.

27-2042.02 Musicians, Instrumental Entry – Mid – Senior level position assuming education and experience prerequisite

Plays musical instrument as soloist or as member of musical group, such as orchestra or band, to entertain audience. Transposes music to play in alternate key, or to fit individual style or purposes. Teaches music for specific instruments. Composes new musical scores. Directs band/orchestra. Memorizes musical scores. Plays from memory or by following score. Studies and rehearses music to learn and interpret score. Practices performance on musical instrument to maintain and improve skills. Improvises music during performance.

27-4014.00 Sound Engineering Technicians Entry – Mid level position assuming education and experience prerequisite

Records speech, music, and other sounds on recording media, using recording equipment. Synchronizes and equalizes prerecorded dialog, music, and sound effects with visual action of motion picture or television production, using control console. Reproduces and duplicates sound recordings from original recording media, using sound editing and duplication

equipment. Mixes and edits voices, music, and taped sound effects, during stage performances, using sound mixing board. Regulates volume level and quality of sound during motion picture, phonograph, television, or radio production recording sessions, using control console. Keeps log of recordings. Maintains recording equipment. Sets up, adjusts, and tests recording equipment to prepare for recording session.

27-4021.01 Professional Photographers Entry – Mid – Senior level position assuming education and experience prerequisite

Frames subject matter and background in lens to capture desired image. Arranges subject material in desired position. Directs activities of workers assisting in setting up photograph. Selects and assembles equipment and required background properties, according to subject, materials, and conditions. Focuses camera and adjusts settings based on lighting, subject material, distance, and film speed. Estimates or measures light level, distance, and number of exposures needed, using measuring devices and formulas.

27-4021.02 Photographers, Scientific Entry – Mid – Senior level position assuming education and experience prerequisite

Photographs variety of subject material to illustrate or record scientific or medical data or phenomena, related to an area of interest. Plans methods and procedures for photographing subject material and set-up of required equipment. Removes exposed film and develops film, using chemicals, touch up tools, and equipment. Sets up, mounts, or installs photographic equipment and cameras. Engages in research to develop new photographic procedure, materials, and scientific data. Observes and arranges subject material to desired position. Sights and focuses camera to take picture of subject material to illustrate or record scientific or medical data or phenomena.

29-1021.00 Dentists, General Entry – Mid – Senior level position assuming education and experience prerequisite

Fills, extracts, and replaces teeth, using rotary and hand instruments, dental appliances, medications, and surgical implements. Applies fluoride and sealants to teeth. Treats exposure of pulp by pulp capping, removal of pulp from pulp chamber, or root canal, using dental instruments. Fills pulp chamber and canal with endodontic materials. Examines teeth, gums, and related tissues to determine condition, using dental instruments, x-ray, and other diagnostic equipment. Eliminates irritating margins of fillings and corrects occlusions, using dental instruments. Plans, organizes, and maintains dental health programs. Produces and evaluates dental health educational materials. Fits and adjusts prosthodontic appliances in patient's mouth. Fabricates prosthodontic appliances, such as space maintainers, bridges, dentures, and obturating appliances. Counsels and advises patients about growth and development of dental problems and preventive oral health care services. Analyzes and evaluates dental needs to determine changes and trends in patterns of dental disease. Restores natural color of teeth by bleaching, cleaning, and polishing. Removes pathologic tissue or diseased tissue using surgical instruments. Formulates plan of treatment for patient's teeth and mouth tissue. Treats infected root canal and related tissues.

29-1022.00 Oral and Maxillofacial Surgeons Entry – Mid – Senior level position assuming education and experience prerequisite

Executes difficult and multiple extraction of teeth. Removes tumors and other abnormal growths using surgical instruments. Performs preprosthetic surgery to prepare mouth for insertion of dental prosthesis. Corrects abnormal jaw relations by mandibular or maxillary revision. Administers general and local anesthetics. Treats fractures of jaws.

29-1023.00 Orthodontists Entry – Mid – Senior level position assuming education and experience prerequisite

Diagnoses teeth and jaw or other dental-facial abnormalities. Plans treatment, using cephalometric, height, and weight records, dental x-rays and front and lateral dental photographs. Examines patient's mouth to determine position of teeth, and jaw development. Fits dental appliances in patient's mouth to alter position and relationship of teeth and jaws and to realign teeth. Designs and fabricates appliances, such as space maintainers, retainers, and labial and lingual arch wires. Adjusts dental appliances periodically to produce and maintain normal function.

29-1024.00 Prosthodontists Entry – Mid – Senior level position assuming education and experience prerequisite

Designs and fabricates dental prostheses. Corrects natural and acquired deformation of mouth and jaws through use of prosthetic appliances. Replaces missing teeth and associated oral structures with artificial teeth to improve chewing, speech, and appearance. Adjusts prostheses to fit patient. Records physiologic position of jaws to determine shape and size of dental prostheses, using face bows, dental articulators, and recording devices.

29-1041.00 Optometrists Entry – Mid – Senior level position assuming education and experience prerequisite

Prescribes eyeglasses, contact lenses, and other vision aids or therapeutic procedures to correct or conserve vision. Consults with and refers patients to ophthalmologist or other health care practitioner if additional medical treatment is

determined necessary. Prescribes medications to treat eye diseases if state laws permit. Examines eyes to determine visual acuity and perception and to diagnose diseases and other abnormalities, such as glaucoma and color blindness.

29-1061.00 Anesthesiologists Entry – Mid – Senior level position assuming education and experience prerequisite

Administers anesthetic or sedation during medical procedures, using local, intravenous, spinal, or caudal methods. Monitors patient before, during, and after anesthesia and counteracts adverse reactions or complications. Examines patient to determine risk during surgical, obstetrical, and other medical procedures. Records type and amount of anesthesia and patient condition throughout procedure. Informs students and staff of types and methods of anesthesia administration, signs of complications, and emergency methods to counteract reactions. Positions patient on operating table to maximize patient comfort and surgical accessibility. Confers with medical professional to determine type and method of anesthetic or sedation to render patient insensible to pain.

29-1062.00 Family and General Practitioners Entry – Mid – Senior level position assuming education and experience prerequisite

Examines or conducts tests on patient to provide information on medical condition. Advises patients and community concerning diet, activity, hygiene, and disease prevention. Refers patient to medical specialist or other practitioner when necessary. Conducts research to study anatomy and develop or test medications, treatments, or procedures to prevent, or control disease or injury. Prepares reports for government or management of birth, death, and disease statistics, workforce evaluations, or medical status of individuals. Directs and coordinates activities of nurses, students, assistants, specialists, therapists, and other medical staff. Plans, implements, or administers health programs or standards in hospital, business, or community for information, prevention, or treatment of injury or illness. Analyzes records, reports, test results, or examination information to diagnose medical condition of patient. Explains procedures and discusses test results on prescribed treatments with patients. Operates on patients to remove, repair, or improve functioning of diseased or injured body parts and systems and delivers babies. Collects, records, and maintains patient information, such as medical history, reports, and examination results. Prescribes or administers treatment, therapy, medication, vaccination, and other specialized medical care to treat or prevent illness, disease, or injury.

29-1063.00 Internists, General Entry level position assuming education and experience prerequisite

Examines or conducts tests on patient to provide information on medical condition. Prescribes or administers treatment, therapy, medication, vaccination, and other specialized medical care to treat or prevent illness, disease, or injury. Operates on patients to remove, repair, or improve functioning of diseased or injured body parts and systems and delivers babies. Refers patient to medical specialist or other practitioner when necessary. Plans, implements, or administers health programs or standards in hospital, business, or community for information, prevention, or treatment of injury or illness. Prepares reports for government or management of birth, death, and disease statistics, workforce evaluations, or medical status of individuals. Conducts research to study anatomy and develop or test medications, treatments, or procedures to prevent, or control disease or injury. Directs and coordinates activities of nurses, students, assistants, specialists, therapists, and other medical staff. Advises patients and community concerning diet, activity, hygiene, and disease prevention. Collects, records, and maintains patient information, such as medical history, reports, and examination results. Explains procedures and discusses test results on prescribed treatments with patients. Analyzes records, reports, test results, or examination information to diagnose medical condition of patient. Monitors patients' condition and progress and re-evaluates treatments as necessary.

29-1064.00 Obstetricians and Gynecologists Entry – Mid – Senior level position assuming education and experience prerequisite

Monitors patients' condition and progress and re-evaluates treatments as necessary. Examines or conducts tests on patient to provide information on medical condition. Refers patient to medical specialist or other practitioner when necessary. Plans, implements, or administers health programs or standards in hospital, business, or community for information, prevention, or treatment of injury or illness. Advises patients and community concerning diet, activity, hygiene, and disease prevention. Conducts research to study anatomy and develop or test medications, treatments, or procedures to prevent, or control disease or injury. Prepares reports for government or management of birth, death, and disease statistics, workforce evaluations, or medical status of individuals. Directs and coordinates activities of nurses, students, assistants, specialists, therapists, and other medical staff. Collects, records and maintains patient information such as medical history, reports, and examination results. Analyzes records, reports, test results, or examination information to diagnose medical condition of patient. Prescribes or administers treatment, therapy, medication, vaccination, and other specialized medical care to treat or prevent illness, disease, or injury. Operates on patients to remove, repair, or improve functioning of diseased or injured body parts and systems and delivers babies. Explains procedures and discusses test results on prescribed treatments with patients.

29-1067.00 Surgeons Entry – Mid – Senior level position assuming education and experience prerequisite

Operates on patient to correct deformities, repair injuries, prevent diseases, or improve or restore patient's functions. Analyzes patient's medical history, medication allergies, physical condition, and examination results to verify operation's necessity and to determine best procedure. Examines patient to provide information on medical condition and patient's surgical risk. Conducts research to develop and test surgical techniques to improve operating procedures and outcomes. Directs and coordinates activities of nurses, assistants, specialists, and other medical staff. Examines instruments, equipment, and operating room to ensure sterility. Refers patient to medical specialist or other practitioners when necessary.

29-1081.00 Podiatrists Entry – Mid – Senior level position assuming education and experience prerequisite

Diagnoses ailments, such as tumors, ulcers, fractures, skin or nail diseases, and deformities, utilizing urinalysis, blood tests, and x-rays. Corrects deformities by means of plaster casts and strapping. Treats conditions, such as corns, calluses, ingrown nails, tumors, shortened tendons, bunions, cysts, and abscesses by surgical methods. Treats bone, muscle, and joint disorders. Prescribes corrective footwear. Makes and fits prosthetic appliances. Advises patients concerning continued treatment of disorders and foot care to prevent recurrence of disorders. Performs surgery. Refers patients to physician when symptoms indicative of systemic disorders, such as arthritis or diabetes, are observed in feet and legs. Prescribes drugs. Treats deformities by mechanical and electrical methods, such as whirlpool or paraffin baths and short wave and low voltage currents.

29-1131.00 Veterinarians Entry – Mid – Senior level position assuming education and experience prerequisite

Examines animal to detect and determine nature of disease or injury and treats animal surgically or medically. Inspects and tests horses, sheep, poultry flocks, and other animals for diseases and inoculates animals against various diseases, including rabies. Establishes and conducts quarantine and testing procedures to prevent spread of disease and compliance with governmental regulations. Participates in research projects, plans procedures, and selects animals for scientific research based on knowledge of species and research principles. Oversees activities concerned with feeding, care, and maintenance of animal quarters to ensure compliance with laboratory regulations. Ensures compliance with regulations governing humane and ethical treatment of animals used in scientific research. Exchanges information with zoos and aquariums concerning care, transfer, sale, or trade of animals to maintain all-species nationwide inventory. Trains personnel in handling and care of animals. Participates in planning and executing nutrition and reproduction programs for animals. Inspects housing and advises animal owners regarding sanitary measures, feeding, and general care to promote health of animals. Conducts postmortem studies and analysis results to determine cause of death.

53-6051.01 Aviation Inspectors Mid – Senior level position assuming education and experience prerequisite

Inspects aircraft and components to identify damage or defects and to determine structural and mechanical airworthiness using hand tools and test instruments. Examines maintenance record and flight log to determine if service and maintenance checks and overhauls were performed at prescribed intervals. Examines access plates and doors for security. Starts aircraft and observes gauges, meters, and other instruments to detect evidence of malfunction. Conducts flight test program to test equipment, instruments, and systems under various conditions including adverse weather, using both manual and automatic controls. Recommends purchase, repair, or modification of equipment. Schedules and coordinates in-flight testing program with ground crews and air traffic control to assure ground tracking, equipment monitoring, and related services. Prepares reports to document flight activities Approves or disapproves issuance of certificate of airworthiness. Investigates air accidents to determine cause. Analyzes training program and conducts examinations to assure competency of persons operating, installing, and repairing equipment.

53-6051.02 Public Transportation Inspectors Entry – Mid – Senior level position assuming education and experience prerequisite

Observes employees performing assigned duties to note their deportment, treatment of passengers, and adherence to company regulations and schedules. Observes and records time required to load and unload passengers or freight volume of traffic on vehicle and at stops. Investigates schedule delays, accidents, and complaints. Inspects company vehicles and other property for evidence of abuse, damage, and mechanical malfunction and directs repair. Determines need for changes in service, such as additional vehicles, route changes, and revised schedules to improve service and efficiency. Drives automobile along route to detect conditions hazardous to equipment and passengers and negotiates with local governments to eliminate hazards. Submits written reports to management with recommendations for improving service. Reports disruptions to service. Assists in dispatching equipment when necessary. Recommends promotions and disciplinary actions involving transportation personnel.