

RESEARCH ASSOCIATE SERIES CONCEPT

The Research Associate series is a broad series encompassing disciplines and specialties in the natural, computer, physical, biological and social sciences, as well as engineering and veterinary medicine. Work requires participation in research or scholarly endeavors in any one of a number of disciplines or specialties such as, but not limited to: meteorology, oceanography, geography, chemistry, physics, computer software/hardware analysis and engineering, remote sensing/geographic information systems, medicine, psychology, biology, botany, ecology, natural resources, forestry, range science, cultural resources, environmental planning, astronomy, agriculture, sociology, anthropology, history, architecture, or education. Other branches of science and engineering and fields of application may be included, when equivalent technical knowledge and skills are required or are recognized as distinct occupations. Research Associates perform and/or supervise the performance of laboratory and/or field experimental procedures; design, perform, and/or supervise long-term applied research and/or technical support in natural and cultural resource management, perform and/or supervise the analysis, design, and development of computer software/hardware, laboratory and experimental facilities, equipment, and instrument systems; supervise and/or coordinate the construction, assembly, testing and implementation of computer software codes, laboratory and experimental facilities, equipment, and instrument systems; and perform other related duties as required. Positions in this series are also characterized by the application of theoretical and/or mathematical approaches in determining the feasibility of computer and engineering designs with consideration of such factors as system effectiveness, reliability, configuration, and cost.

Research Associates participate in professional, scientific activities at several levels of difficulty and responsibility described in the Class Concepts. They typically are assigned responsibility for the coordination of various aspects of research projects involving the design, construction, assembly, and test of experimental equipment and instrument systems as well as computer software programs and hardware systems; provide information and advice to principal investigators and/or other faculty and research personnel with administrative responsibility for the research program or teaching facility; act as scientific or technical liaisons to investigators, shop personnel, vendors, extramural funding agencies, and external clientele including commodity and industry organizations; design or supervise the design of electrical, mechanical, electronic, and/or optical instruments and of computer-

associated systems and equipment; supervise or perform the recording and reduction of test data for instrument design and evaluation purposes; and assemble and evaluate information and prepare reports with respect to feasibility, engineering design criteria, and performance of instrument systems. Research Associates at the highest levels make significant innovative contributions to the design and conduct of scientific and research methodology to a degree that typically changes the course of the investigation, and/or direct a broad range of programs.

In addition to describing the titles and the requirements associated with appointments to the titles, this document outlines expectations of individuals holding the various titles and broad criteria for performance evaluations and promotions. It should be recognized that career advancement for a given position may not proceed through the entire career track without significant new responsibilities or skills. It should also be recognized that the guidelines discussed in this document for qualifications of degree and years of experience associated with given levels apply to normal expectations. Exceptional cases, with demonstrated merit and rationale, may be considered for an "accelerated" placement in the career track.

Current University positions described as "Coordinators" that are directly related to tasks and responsibilities associated with the Research Associate series will be redefined appropriately and subsumed into this series.

CLASS CONCEPTS

Research Associate I

Qualifications: This is the entry-level position for individuals with less than 3 years of professional, post-baccalaureate (or equivalent) experience. Individuals holding this title are to be formally evaluated within the first 3 years of service for promotion to the level of Research Associate II. Incumbents work in a collaborative, support role and, with close supervision, use standard research methods and equipment to perform designated tasks.

Knowledge: Incumbents possess knowledge of basic principles, concepts, and methodology of a professional or scientific position, and skill in applying this knowledge in carrying out assignments, operations, or procedures. Incumbents also possess practical and/or technical knowledge to perform assignments such as carrying out limited projects that involve use of specialized, complicated techniques. Work involves some knowledge of the practical and potential values of research and experimentation in the field involved.

Supervisory Duties: Supervisory responsibilities are minimal.

Complexity: Work consists of tasks that are clear-cut and directly related. Decision-making is limited and well defined.

Scope and Effect: The work involves the performance of specific, routine operations that include a few separate tasks or procedures. The work product or service is required to facilitate the work of others and has little impact beyond the immediate organizational unit or beyond limited services to others.

Illustrative Examples of Work:

- Makes design calculations and cost of material estimates.
- Assembles and calibrates equipment and instruments.
- Sets up a variety of test samples and runs routine tests
- Collects and reduces experimental data and analyzes results of tests.
- Participates in preparation of technical reports.
- Demonstrates techniques and procedures to new technical staff members and/or graduate students.
- Performs elemental scientific research support work such as:
 - Preparation of samples for chemical analysis.

- Routine analysis of samples using instruments.
- Recording results of analysis; preparing compilation of sample analysis for reports.
- Proofreading and editing manuscripts, literature research in libraries; ordering and maintaining research supplies; washing and sterilizing glassware; preparation of slides and laboratory equipment.
- Breeding animals and supervising their care.
- Collecting samples from experimental agricultural plots, charting growth measurement; preparing graphs and charts to depict scientific data.
- Growth and maintenance of various tissue cultures.
- Collecting and compiling field data.
- Identifying excavated prehistoric and historic artifacts.
- Digitizing maps; collecting and processing attribute data.
- Monitors experimental apparatus; enters and receives computer data; prepares graphic designs and drawings for publications.
- Writes and debugs simple computer software codes or scripts; participates in the development of larger software projects under direct supervision.
- Assists in the purchase, setup, and maintenance of computer hardware and software.

Research Associate II

Incumbents work in a collaborative role with the principal investigator and other research group members and, with supervision, draws upon appropriate research methods and equipment to performs designated tasks.

Qualifications: Research Associate II is the position to which a Research Associate I would be promoted after a maximum of 3 years. It is also the position to which an individual with a Bachelors degree and more than 3 years of relevant professional experience or a recent Masters degree and no other significant professional experience could be appointed upon joining CSU.

Knowledge: Incumbents possess knowledge of the principles, concepts, and methodologies described for Level I that has been either: (a) supplemented by skills gained through job experience to permit independent performance of recurring assignments, or (b) supplemented by additional professional or administrative knowledge.

Supervisory Duties: Supervisory responsibility is minimal.

Complexity: The work consists of duties that involve related steps, processes, or methods. Decisions require the employee to recognize the existence of and differences among a few easily recognizable situations. Actions to be taken or responses to be made differ in such things as the source of information, kinds of transactions or entries, or other differences of a factual nature.

Scope and Effect: The work involves the execution of specific rules, regulations, or procedures and typically comprises a complete segment of an assignment or project of broader scope. The work product or services affects the accuracy, reliability, and/or acceptability of further processes or services.

Illustrative Examples of Work:

Under general supervision, incumbents:

- Design and prepare engineering plans and specifications for novel equipment and instruments; coordinate construction, assembly, and testing of equipment and instruments; and participate in the engineering, mathematical, and statistical analysis of experimental data or in the mathematical solution of physical and engineering problems. Assignments at this level are expected to be of moderate difficulty and responsibility, with work subject to checking and review.
- Perform scientific data reductions and analyses involving procedures characterized by the need for use of independent judgment or for a background and experience in mathematics or a related technical field.
- Operate laboratory and experimental testing equipment and apparatus such as microtomes, ultramicrotomes, microscopes, electron microscopes, spectrophotometers, centrifuges, analytical balances, pH meters, chromatographs, spectrometers, and related equipment.
- Conduct laboratory work requiring the performance of standard and non-routine tests, working knowledge of the principles of the research field involved.
- Conduct library searches; write procedures; prepare charts and graphs; perform statistical analyses of data.
- Conduct psychology, sociology, language, or education experiments and studies involving human subjects; compile data and make preliminary analyses.
- Interview program participants and administer tests to obtain raw data; assist in design and modification of questionnaires and tests for research purposes.

- Collect, classify, catalog, and process specimens from animals, plants, archeological sites, and hospitals.
- Responsible for revision control and quality control of computer software codes on medium-sized software projects.
- Independently evaluate and solve simple computer hardware and software problems.
- Conduct field work requiring the performance of standard and non-routine tasks and the use and understanding of instrumentation such as porometers, pressure chambers, global positioning systems (GIS), etc.
- Execute the use of complex GIS software.
- Organize workshops and conferences.
- Assist in preparing proposals and budget requirements.

Research Associate III

This is the fully professional level at which incumbents are expected to operate rather independently in a specialized phase of a research effort. Occasionally, incumbents may work as part of a research team. Supervision over such positions is usually exercised by a more senior Research Associate or a faculty investigator.

Qualifications: Research Associate III is the level to which a Research Associate II is promoted, as appropriate, or to which individuals with a Bachelors degree and 5 years of work-related experience or a Masters degree with at least 2 years experience may join CSU. Individuals with a PhD who have no additional experience may also be appointed to this position upon joining CSU if it is appropriate for their role in CSU research.

Knowledge: Incumbents possess knowledge of a wide range of concepts, principles, and practices such as would be gained through extended graduate study or experience, and applies this knowledge to difficult and complex work assignments. Incumbents also possess a comprehensive, intensive, practical knowledge of a technical field and skill, and applies this knowledge to the development of new methods, approaches, or procedures.

Supervisory Duties: Position may have supervisory responsibilities. Incumbents may set the pace of work for the group and show other workers in the group how to perform assigned tasks. Commonly perform the same

work as the group, in addition to lead duties. Can at times be called group or team leader.

Complexity: The work includes various duties involving different and unrelated processes and methods. Decision making depends on the analysis of the subject, phase, or issues involved in each assignment; the chosen course of action may need to be selected from many alternatives. The work involves conditions and elements that must be identified and analyzed to discern interrelationships.

Scope and Effect: The work involves treating a variety of conventional problems, questions, or situations in conformance with established criteria. The work product or service affects the design or operation of systems, programs, or equipment; the adequacy of such activities as field investigations, testing operations, or research conclusions; or the social, physical, and economic well-being of persons.

Illustrative Examples of Work:

Under direction, incumbents:

- Perform all or many of the duties indicated for the series under the Series Concept.
- Perform complex scientific data reduction requiring use of independent judgment based on relevant technical experience.
- Do laboratory and field tests and analyses requiring the use of judgment in determining the procedures to be used in interpreting results.
- Prepare complex scientific and mathematical problems for programming and solutions on a computer.
- Participate in library and computer searches for research data, related information, and other technical data.
- Perform autopsies and surgical procedures on research animals, and participate in the care and feeding of laboratory animals.
- Evaluate various types of agricultural or horticultural crops feasibility studies as to commercial potentials; conduct studies on plant diseases and their control.
- Analyze data and write reports on research progress and results.
- Contribute to the design and implementation of computer software projects.
- Evaluate computer systems/network-wide requirements, solicits proposals from vendors, and determines optimum purchases.
- Contribute to the design and implementation of software projects.
- Model simple systems.
- Contribute to interagency projects.

- Evaluate management documents and their application of state and federal laws and regulations.
- Contribute to integrated planning and resource management documents.
- Contribute to and develop GIS/Remote Sensing projects.
- Develop databases and maintain database accuracy and quality.
- Evaluate computer systems/network-wide requirements, solicit proposals from vendors, and determine optimum purchases.

Research Associate IV

This is a senior level professional and technical position in a research support capacity.

Incumbents are responsible for major aspects of a research project. A Research Associate IV uses a broad knowledge of the appropriate research techniques and equipment with little supervision to complete designated tasks that may include supervision of other personnel. On most matters, incumbents work independently, but on very highly specialized and complex assignments, work methods and progress are reviewed by a professionally and technically competent superior.

Qualifications: Research Associate IV is the level to which a Research Associate III is promoted, as appropriate, or to which individuals with a Bachelors degree and 10 years of work-related experience, or a Masters degree with more than 5 years of experience may join CSU. Individuals holding a PhD who have at least 2 years experience may also be appointed to this position upon joining CSU if it is appropriate for their role in CSU research.

Knowledge: Incumbents possess mastery of a professional or scientific field to apply experimental theories and new developments to problems not susceptible to treatment by accepted methods; or make decisions or recommendations that significantly change, interpret, or develop important policies or programs.

Supervisory Duties: Assignments at this level of difficulty may be supervisory or non-supervisory. Incumbents in supervisory positions direct staff through face-to-face meetings. Organizational structure is not complex and internal and administrative procedures are simple. Performing the same work as subordinates is not the principal duty.

Complexity: The work typically includes varied duties requiring many different and unrelated processes and methods such as those relating to

well-established aspects of a scientific or professional field. Decisions include the assessment of unusual circumstances, variations in approach, and handling of incomplete or conflicting data. Position requires making many decisions concerning such things as the interpreting of considerable amount of data, planning the work, or refining methods and techniques.

Scope and Effect: The work involves establishing criteria; formulating projects; assessing program effectiveness; and/or investigating or analyzing a variety of unusual conditions, problems, or questions. The work product or service affects a wide range of establishment activities, major activities of industrial concerns, or the operation of other organizations.

Illustrative Examples of Work:

Under direction, incumbents:

- Assist a campus or research facility administrator, principal investigator, or a more senior Research Associate, in planning, organizing, supervising, and/or performing the work of a professional Research Associate staff engaged in a specialized phase of a teaching and/or research program; represent the University administrative unit to whom they are responsible at meetings and conferences involving campus, University, and extramural funding agency in matters related to design considerations and financial requirements; and carry major responsibility for accomplishment of research objectives in relationships with investigators, manufacturers, contractors and University staff members, as a senior assistant to the Principal Investigator or faculty investigator in charge.
- Perform complex scientific data reduction requiring use of independent judgment based on relevant technical experience.
- Perform complex laboratory or field work with responsibility for the independent development of methods and procedures.
- Operate complex scientific equipment with responsibility for the independent development of methods and procedures.
- Do laboratory or field tests and analyses requiring the use of judgment in determining the procedures to be used in interpreting results.
- Prepare complex scientific and mathematical problems for programming and solutions on a computer.
- Develop models of complex systems.
- Manage extensive databases; develop specific applications
- Act as lead consultant during interagency discussions.
- Act as lead program manager in the development of integrated resources and planning documents, such as NEPA, EA, other natural/cultural resources documents.
- Supervise and/or participate in library and computer searches for research data, related information, and other technical data.

- Make all administrative and technical arrangements for a major research experiment or project for a faculty researcher.
- Perform autopsies and surgical procedures on research animals; supervise the care and feeding of laboratory animals.
- Evaluate various types of agricultural or horticultural crops for feasibility studies as to commercial potentials; conduct studies on plant diseases and their control.
- Analyze data and write reports on research progress and results.
- Are responsible for the design, development, and implementation of large computer software projects.
- Are responsible for the management of a department-level subnet for a computerized LAN and for providing innovative solutions to requirements from large numbers of system users.

Examples of assignments allocated to this level of difficulty and responsibility are:

- Technical lead for a major research project involving a team of software analysts and developers to design, develop and deliver computer application programs, algorithms, or techniques for either R&D or operational use.
- Supervisor of one of the engineering specialty functions (electrical, electronic, mechanical, or industrial) of the engineering staff of a major research program, in which two or more engineering specialties are required and recognized.
- Supervisor of the professional and technical support staff of a teaching and/or research facility, providing services to faculty members and investigators, with responsibility for specialized personnel, and successful achievements within time and financial constraints.
- Specialist, advisor, and consultant on program design problems in highly specialized fields of application, with responsibility for planning and designing large and/or novel systems.

Senior Research Associate-level assignments typically carry responsibility for the supervision of other Research Associates as well as technical and support personnel. Non-supervisory assignments at the senior level are reserved for specialists, who are widely recognized and consulted by University staff members for their expert knowledge of their specialty field and/or field of

application. The criterion for allocation of a non-supervisory assignment to the senior level may be met by one of the following:

1. Successful application of technical knowledge and skills in a specialty field to a variety of research efforts, involving the integration of substantial scientific subject matter knowledge and technical expertise.
2. Successful application of technical knowledge and skills in more than one specialty field to a highly specialized field of application, involving the integration of substantial scientific subject matter knowledge and expertise.
3. Responsible for large software project design and implementation.
4. Responsible for managing a department subnet and able to come up with innovative solutions to meet the needs of large numbers of system users.

Senior Research Associate

This is the most senior position of a professional and technical support staff providing services for major research projects, including coordination of scheduling commitments with experimental objectives and technical design criteria, and successful technical achievements within time and financial constraints. Assignments at this level of difficulty may be supervisory or non-supervisory. Non-supervisory assignments at this level typically require sustained, frequent contributions of (a) original ideas of major importance in the prosecution of laboratory and/or field phases of research and/or (b) interpretation of data yielded by new/original method(s) used or developed in the course of laboratory and/or field phases of research. Co-authorship of scientific journal articles may indicate the level of innovational contribution publicly acknowledged, but it is not a necessary requirement for allocation of such positions.

Qualifications: Senior Research Associate is the level to which a qualified Research Associate IV is promoted, as appropriate, or to which individuals with extensive post-baccalaureate experience or a Masters degree and significant professional experience may join CSU. Individuals with a PhD with at least 5 years of experience may also be appointed to this position upon joining CSU if it is appropriate for their role in CSU research. The Senior Research Associate must have demonstrated group leadership activities. Supervisory assignments typically carry scientific management

responsibility covering many departmental specialties engaged, which necessitates the effective integration of numerous subsystems and fields. With minimal supervision, a Senior Research Associate uses a broad knowledge of and experience with diverse research principles, techniques, and equipment to engage in extremely difficult and complex projects, making important original contributions pertaining to their respective fields of endeavor.

Knowledge: Incumbents possess mastery of a professional field to generate and develop new hypotheses and theories. Work requires familiarity with a wide range of work situations and techniques common to the particular field of research. Thorough knowledge of research reporting form and style, and knowledge of research costs and administration are required.

Supervisory Duties: Incumbents in supervisory positions direct staff through several subordinate supervisory levels and several subdivisions at each level. Internal procedures and administrative controls are formal. Organizational structure is complex and is divided into subordinate groups that may differ from each other in subject matter and function. Programs are usually interlocked on a direct and continuing basis with other organizational segments, requiring constant attention to extensive formal coordination, clearances, and procedural controls. The professional Research Associate staff supervised typically includes three or more Research Associates, including one or more at the Senior Research Associate level. Incumbents in non-supervisory positions perform state-of-the-art, complex research projects, making significant, original contributions to research methods, including authorship or co-authorship of published findings. These incumbents contribute significant original/innovative ideas of major methodological significance to the research; exercise independent judgment and discretion, initiative, and resourcefulness in making decisions about the research; and write articles for publication in scientific journals or for presentations at conferences or symposiums.

Complexity: The work includes varied duties requiring many different and unrelated processes and methods applied to a broad range of activities or substantial depth of analysis typical for a scientific or professional field. Assignments are characterized by breadth and intensity of effort and involve several phases being pursued concurrently or sequentially with the support of others within or outside of the organization. Decisions include major areas of uncertainty in approach, methodology, or interpretation and evaluation processes resulting from such elements as continuing changes in program, technological developments, unknown phenomena, or conflicting requirements. The work requires originating new techniques, establishing criteria, or developing new information. Incumbent must be capable of

exercising considerable independent judgment as he/she may be the only representative of a certain technical specialty on or supporting a research team.

Scope and Effect: The work involves isolating and defining unknown conditions, resolving critical problems, developing new theories along with the overall planning, developing, and execution of vital administrative or scientific programs. The programs are essential to the missions of the overall organization or affect large numbers of people on a long-term or continuing basis.

Illustrative Examples of Work:

Incumbents:

- Serve as operations manager of major projects entailing the design, development, and administration of an entire project.
- Direct, coordinate and supervise scientific data reduction and analysis for a complete research project, requiring the use of computers and considerable independent interpretation or research data.
- Direct multi-disciplinary, multi-regional programs.
- Provide expert environmental risk assessment analysis.
- Are responsible for the overall management of research projects involving the design and development of complex computerized analysis and prediction models, including the application of algorithms, physical parameterization routines, and visualization techniques for operational forecasting.
- Perform, supervise and direct complex laboratory work with responsibility for the independent development of methods and procedures.
- Supervise the operation of complex scientific equipment with responsibility for the development of critical research data.
- Design sophisticated research equipment.
- Supervise and train other professional research personnel and evaluate research progress.
- Design and assist in designing research projects; prepare research proposals; write final reports for publication.
- Direct all research activities including data collection, evaluation, and analysis for a segment of a research project.
- Are responsible for the management of large computer software projects; supervise the design, analysis, development, implementation, and quality control for these projects; synthesize information regarding new tools and techniques to train other research personnel and software programmers.
- Coordinate and manage the networking of department-level LANs.

- Serve on national and international scientific panels to address environmental issues affecting the Nation and the international communities.
- Provide reviews of scholarly work and research proposals from internal and external sources.
- Are responsible to a principal investigator or research facility administrator for planning, organizing, and supervising the work of professional engineering and support staffs engaged in design, construction, and test of laboratory facilities, equipment and instrument systems; represent the officer or researcher to whom they are responsible at meetings and conferences involving campus, University, and extramural funding agency levels in matters related to design considerations and financial requirements; and carry major responsibility for accomplishment of research objectives in relationships with investigators, manufacturers, contractors, and University staff members, as a principal assistant to the faculty investigator or research administrator in charge.

Examples of assignments allocated to this level of difficulty and responsibility are:

- Supervision of the professional and technical support staff of a research and development laboratory facility, providing biomedical engineering services to teaching and research units in the health sciences, with responsibility for all engineering specialties engaged, activities of technical and shop personnel, and successful fiscal management of the enterprise.
- Responsibility for large software project management—supervision of design, analysis, development, implementation, and quality control. Synthesis of information on new tools and techniques in order to train other research personnel and programmers.
- Coordination on the management and networking for a large or several small subnets.