

STATE OF SOUTH DAKOTA CLASS SPECIFICATION

Class Title: Chemist

Class Code: 40681

Pay Grade: GH

A. Purpose:

Performs a variety of chemical and physical tests and analyses on samples or specimens to determine the chemical composition of materials or substances; the presence and identification of minerals, organic or inorganic substances and physical properties such as solids content or electrical conductivity; or compliance with regulations or standards.

B. Distinguishing Feature:

The Chemist selects and follows established laboratory methods and procedures that are most appropriate for the test being conducted; guidelines are provided but require the use of judgment in selecting and applying the most appropriate procedures. Examples of tests and measurements include changes in light transmittance, electrode potential, color, temperature, pH, production of gas bubbles, air volume, weight, and chromatographic separations. The Senior Chemist performs detailed laboratory tests on non-routine samples, which may require the modification and validation of test methods. Directs or participates in the development of new laboratory methods; makes changes which impact existing guidelines or laboratory policies; and may serve as a lead worker over other laboratory staff.

C. Functions:

(These are examples only; any one position may not include all of the listed examples nor do the listed examples include all functions which may be found in positions of this class.)

1. Examines a variety of specimens, samples, substances, or materials using chemical, physical, or biochemical analysis procedures and laboratory protocol to determine composition and physical properties.
 - a. Performs standardized qualitative and quantitative chemical analysis.
 - b. Selects and follows established procedures to determine the presence of regulated compounds or substances.
 - c. Collects and documents data for qualitative and quantitative analysis which may include changes in colors, the presence of gases, changes in temperatures or weights, or pH readings.
 - d. Performs quality control practices to ensure accurate results.
 - i. Uses certified standards or adapts others.
 - ii. Runs standard reference samples, spike samples, or replicates.
2. Prepares samples or specimens for analysis or testing taking into consideration state and federal agency guidelines and/or standard laboratory operating procedures to ensure the most accurate test results.
 - a. Receives samples into the laboratory and determines which analyses are appropriate for the sample.
 - b. Performs appropriate sub-sampling and sample preparation.
 - i. Sorts, weighs, measures, and dilutes samples.
 - ii. Dries, mills, grinds, blends, or homogenizes samples.
 - c. Processes samples or specimens through initial tests or extractions to separate constituents.

- d. Performs sample preservation taking into consideration sample matrix, sample stability, or other factors.
3. Operates, calibrates, cleans, and may repair laboratory instruments and equipment to ensure samples and specimens can be prepared, analyzed and tested properly and accurately.
4. Documents data on analytical activities and findings to ensure information is available for studies, presentations, or regulatory and enforcement activities.
 - a. Creates laboratory notes, completes and checks laboratory calculations and projections, formulates and reports conclusions, and prepares charts and graphs on test activities.
 - b. Summarizes test results, printouts and/or instrument data that may lead to suggested remedial measures.
5. May prepare and standardize reagents, compounds, solutions or equipment specific to tests performed to ensure accuracy of test results.
 - a. Follows established methodology and procedures.
 - b. Ensures a sterile laboratory environment is maintained.
6. Performs other work as assigned.

D. Reporting Relationships:

Typically reports to a Health Laboratory Administrator or university faculty member and may provide work direction to students, interns, or other employees.

E. Challenges and Problems:

Challenged to understand, select, and utilize laboratory test procedures. Many variables can affect tests or the analyses of data. Procedures are often very detailed and may be quite varied.

Typical problems include the malfunction of laboratory equipment, equipment calibration, erratic test results, understanding Environmental Protection Agency testing and analysis methods, coordinating space and equipment being used by others, evaluating data and resolving errors, working with outdated equipment, and identifying sources of contamination.

F. Decision-making Authority:

Decisions include selecting the procedures to use in analyzing samples, determining if a test or analysis is in control, scheduling test procedures, maintaining sample and data records, determining precision and accuracy of data, selecting chemicals and glassware necessary to conduct a test, and determining if proper sample submission procedures were followed.

Decisions referred to a superior include deviating from established laboratory methods or procedures, development of new test procedures or methods, equipment repair, if analytical data should be accepted for use in quality control, and priorities of samples and analyses.

G. Contact with Others:

Daily contact with the public/clients to discuss test procedures and test results and with students and other employees to provide training and to set work priorities; and weekly contact

with faculty for technical support and resources and with other agencies to provide information on test results.

H. Working Conditions:

Works with concentrated acids, toxic chemicals, solvents, pressurized gases, radioactive materials, or high temperature equipment; may come in contact with disease-causing microorganisms; and biological hazards.

I. Knowledge, Skills and Abilities:

Knowledge of:

- principles and practices of analytical chemistry and inorganic, organic, or biochemistry as needed for the specific area of work;
- scientific methodology;
- laboratory facilities, methods, equipment, and materials;
- safe laboratory practices.

Ability to:

- use and care for laboratory equipment;
- follow directions, formulas, and charts;
- perform necessary mathematical calculations;
- carry out research projects;
- keep legible, clear, and adequate records of analytical and quality control procedures and maintenance;
- assemble material and present data or findings with scientific accuracy;
- follow standard scientific laboratory methods;
- perform standardized tests or analyses independently;
- maintain effective working relationships with others.