

INSTRUMENT MAKER TITLE SERIES DEFINITIONS

I. DEFINITIONS

INSTRUMENT MAKER - ENTRY

Under limited, progressing to general supervision, performs as a highly-skilled and independent machinist or tool and die-maker in the design and creation of unique, highly intricate and precise scientific equipment. Recommends and aids in the layout, design and construction of research instruments utilizing his or her knowledge of materials, methods, and machine tools to fabricate the required item. Receives direction in the form of blueprints, sketches, and oral descriptions, which may only give details of specific components, with the remainder of the instrument design left to the initiative of the person assigned the project.

INSTRUMENT MAKER - JOURNEY

There are two allocation patterns for this job title. (1) Under general supervision performs work similar to Instrument Maker-Entry positions. However, the Instrument Maker-Journey position functions more independently and with greater efficiency. This type of independence and efficiency is generally gained through one to two years of experience as an Instrument Maker or other comparable experience in machinist or tool and die work. (2) Maintains instructional and research laboratories, which includes providing technical maintenance and upkeep of highly specialized testing equipment. Prepare instructional laboratories for classes. Instruct students in the proper use of the research equipment and in the design, modification, and maintenance of instructional and research equipment. Set up and operate a variety of equipment, such as digital scanners, X-Y plotters, oscillographs and oscilloscopes. Perform routine servicing of equipment and maintain different types of machinery, such as concrete mixers, cutoff saws, electric lifts, fork lifts, and welders. Oversee student working crews ensuring proper safety measures are taken. Set up and conduct lab demonstrations.

INSTRUMENT MAKER - ADVANCED

This is advanced level Instrument Maker work. The work performed is similar to the journey-level except that employees at this level are significantly more involved in the design phase of highly specialized parts, machinery and instruments. Advanced instrument makers are in constant contact with the user or client, usually graduate students, professors and researchers, functioning as a consultant to them. In addition, advanced level instrument makers are often responsible for coordinating, assembling and testing projects. The projects may last six months to a couple of years and require thousands of individual parts. Also, employees at this level are considered experts (i.e., they have advanced knowledge, skills and experience) in a specialized area, such as, but not limited to, high vacuum welding, Computer Aided Design (CAD)/Computer Aided Manufacturing (CAM)/Computer Numerically Controlled (CNC) equipment, complex project coordination or student machine shop coordination with an emphasis on providing instruments for advanced scientific research. Employees, who are considered experts, spend a majority of their time in that particular area of expertise.

Examples of Work Performed

INSTRUMENT MAKER - ENTRY & - JOURNEY

- 1) Produce and assemble unique scientific parts using lathes, milling machines, boring mills, drill presses and other related machines and equipment.
- 2) Assist in the designing and building of jigs, fixtures and tools by performing machining operations that cannot be accomplished by conventional methods.
- 3) Repair and maintain laboratory instruments.
- 4) Design and construct laboratory, teaching and related equipment.
- 5) Performs standard welding using a variety of materials including steels, stainless steels, aluminum and other non-standard alloy metals used in the fabrication of parts and equipment.
- 6) Set up and operate machine tools for machining task at hand using standard and exotic materials and maintaining tolerances.

INSTRUMENT MAKER - ADVANCED

With greater independence, knowledge, skill and latitude in the initiation of action, may perform any of the duties and responsibilities assigned to the Instrument Maker-Entry or -Journey, and in addition may:

- 1) Design, construct and refine sophisticated laboratory instrumentation for ultra-high vacuum, optical, particle beam and surface research.
- 2) Procure construction and supply materials for projects.
- 3) Supervise graduate students in the design and construction of specialized research instrumentation.
- 4) Design, construct and install complex mechanical systems; select materials to use; fabricate equipment and redesign projects.
- 5) Schedule work, maintain and calibrate machines, and manage tool, fastener and material inventories.
- 6) Design and construct highly specialized, complex instrumentation in the prototype phase.
- 7) Coordinate machining, welding, assembling and testing of assemblies.
- 8) Travel to facilities as required for final assembly, inspection and testing.
- 9) Direct machining and assembly work performed by other staff such as Instrument Maker-Entry and Journey positions, Mechanics or graduate students.
- 10) Oversee and manage a department machine shop, wood shop and hydraulics laboratory.
- 11) Perform advanced design, development, construction, final assembly and testing of sophisticated equipment and precision instruments for research and instruction in the field and laboratory.
- 12) Program, set-up and execute instrument-making projects using advanced techniques and equipment including: CAD, CAM, and CNC machining centers.

II. QUALIFICATIONS

The qualifications required for these positions will be determined at the time of recruitment.

III. RELATED TITLES

Instrument Shop Managers, Maintenance Mechanic, Automotive Mechanic, Facilities Repair Worker