

All Professional Engineering Positions, 0800

Individual Occupational Requirements

Basic Requirements:

A. Degree: engineering or engineering technology. To be acceptable, the curriculum must: (1) lead to a bachelor's degree in engineering or engineering technology from a program that is accredited by the Accreditation Board for Engineering and Technology (ABET)¹; or (2) include differential and integral calculus and courses (more advanced than first-year physics and chemistry) in five of the following seven areas of engineering science or physics: (a) statics, dynamics; (b) strength of materials (stress-strain relationships); (c) fluid mechanics, hydraulics; (d) thermodynamics; (e) electrical fields and circuits; (f) nature and properties of materials (relating particle and aggregate structure to properties); and (g) any other comparable area of fundamental engineering science or physics, such as optics, heat transfer, soil mechanics, or electronics.

OR

- B. Combination of education and experience -- college-level education, training, and/or technical experience that furnished (1) a thorough knowledge of the physical and mathematical sciences underlying engineering, and (2) a good understanding, both theoretical and practical, of the engineering sciences and techniques and their applications to one of the branches of engineering. The adequacy of such background must be demonstrated by one of the following:
- *Professional registration* -- Current registration as an Engineer Intern (EI), Engineer in Training (EIT), or Professional Engineer (PE) by any State, the District of Columbia, Guam, or Puerto Rico. Absent other means of qualifying under this standard, those applicants who achieved such registration by means other than written test (e.g., State grandfather or eminence provisions) are eligible only for positions that are within or closely related to the specialty field of their registration. For example, an applicant who attains registration through a State Board's eminence provision as a manufacturing engineer typically would be rated eligible only for manufacturing engineering positions.
 - *Written Test* -- Evidence of having successfully passed the Fundamentals of Engineering (FE)² examination or any other written test required for professional registration by an engineering licensure board in the various States, the District of Columbia, Guam, and Puerto Rico.

¹ For information about the Accreditation Board for Professional Engineering (ABET), please visit: <http://www.abet.org/>.

² The FE examination is not administered by the U. S. Office of Personnel Management. For more information, please visit the National Society of Professional Engineers at: <http://www.nspe.org/Licensure/HowtoGetLicensed/index.html>.

- *Specified academic courses* – Successful completion of at least 60 semester hours of courses in the physical, mathematical, and engineering sciences and that included the courses specified in the basic requirements under paragraph A. The courses must be fully acceptable toward meeting the requirements of an engineering or engineering technology curriculum as described in paragraph A.
- *Related curriculum* -- Successful completion of a curriculum leading to a bachelor's degree in an appropriate scientific field, e.g., physics, chemistry, architecture, computer science, mathematics, hydrology, or geology, may be accepted in lieu of a bachelor's degree in engineering or engineering technology, provided the applicant has had at least 1 year of professional engineering experience acquired under professional engineering supervision and guidance. Ordinarily there should be either an established plan of intensive training to develop professional engineering competence, or several years of prior professional engineering-type experience, e.g., in interdisciplinary positions. (The above examples of related curricula are not all-inclusive.)

Note: An applicant who meets the basic requirements as specified in A or B above may qualify for positions in any branch of engineering unless selective factors indicate otherwise.

Additional Experience and Training Provisions for Graduates of Engineering or Engineering Technology Curricula:

- a. Superior academic achievement at the baccalaureate level in an engineering or engineering technology curriculum is qualifying for GS-7.
- b. A combination of superior academic achievement and 1 year of appropriate professional experience is qualifying at GS-9.
- c. Applicants with an engineering or engineering technology bachelor's degree who have appropriate experience as a technician equivalent to grade GS-5 or higher may have such experience credited for grade GS-7 only on a month-for-month basis up to a maximum of 12 months.
- d. Successful completion of a 5-year program of study of at least 160 semester hours leading to a bachelor's degree in engineering or engineering technology is qualifying at GS-7. Completion of such a program and 1 year of appropriate professional experience is qualifying at grade GS-9.

Definition of Professional Engineering Experience: The professional engineering experience required for grades GS-7 and above is defined as non-routine engineering work that required and was characterized by (1) professional knowledge of engineering; (2) professional ability to apply such knowledge to engineering problems; and (3) positive and continuing development of professional knowledge and ability.

Professional knowledge of engineering is defined as the comprehensive, in-depth knowledge of mathematical, physical, and engineering sciences applicable to a specialty field of engineering that characterizes a full 4-year engineering or engineering technology curriculum leading to a bachelor's degree, or the equivalent.

Professional ability to apply engineering knowledge is defined as the ability to (a) apply fundamental and diversified professional engineering concepts, theories, and practices to achieve engineering objectives with versatility, judgment, and perception; (b) adapt and apply methods and techniques of related scientific disciplines; and (c) organize, analyze, interpret, and evaluate scientific data in the solution of engineering problems.

Graduate Education:

1. Regardless of the field of undergraduate study, completion of the requirements for a master's or higher degree in engineering or engineering technology is fully qualifying for the grade indicated, provided the applicant's total background, i.e., education and any experience, demonstrates evidence of knowledge, skills, and abilities that are substantially equivalent to those acquired through the successful completion of the courses specified in paragraph A.
2. With a bachelor's degree in engineering or engineering technology, graduate education in a related field is acceptable in lieu of graduate study in engineering for appropriate types of positions. For example, a B.S. in engineering plus a master's degree in business administration would be qualifying for Industrial Engineer, GS-9, but not for GS-9 laboratory positions in research and development. The key consideration in determining if such graduate education should be credited is whether or not the education provided the knowledge, skills, and abilities necessary to perform the work of the position being filled.

Special Competence in Particular Areas of Engineering: Many engineering positions demand specific competence in a particular function or area. For such positions, agencies may use selective factors to identify those applicants whose records show evidence of the required capabilities. This may include limiting consideration to fields of study that provide the specific KSAs/competencies for a particular position when considering the qualifications of individuals applying on the basis of education. Such selective factors can be used for positions at all grade levels covered by this standard. Please note selective factors must meet the requirements outlined in the General Schedule Qualification Policies, available at: <http://www.opm.gov/policy-data-oversight/classification-qualifications/general-schedule-qualification-policies/>.

Engineering Registration: Registration as a professional engineer is an appropriate selective factor for appointment to certain, typically high-level, engineering positions. The key consideration is that registration must be *essential* for acceptable performance of the work of the position to be filled. Accordingly, it is an appropriate requirement for positions with duties and responsibilities that satisfy one of the following criteria:

- Responsibility for final approval of designs of major structures and facilities involving public safety where such compliance with State laws meets an essential need of the engineering organization to provide objective evidence to agency management and the public that the work is performed by engineers of proven competence.
- Responsibility for engineering determinations concerning contract awards or other major aspects of design and construction work to be performed by engineers in the private

sector, where registration is essential to have their full confidence and respect to achieve cooperation on critical engineering issues.

When an engineering position has duties and responsibilities that would support a requirement for registration and a requirement is established, the position description should clearly document the basis for the requirement. It would be inappropriate to require that applicants be registered for positions with less responsibility than that indicated above, for positions that involve responsibilities and functions such as research and development, or for the sole purpose of improving the "image" of engineers in the Federal service. For those positions where registration is an appropriate requirement, such positions have been characteristically filled by registered professional engineers. If a currently filled position is newly identified as requiring a professional engineer, the requirement for registration should be waived for the duration of the employee's incumbency.

College Teaching: College-level teaching of engineering may be considered as professional experience in engineering. In accepting and evaluating teaching experience, all specific qualification requirements pertaining to the evaluation of professional experience such as grade level, responsibility, scope, specialization, and knowledge required are also applicable to the evaluation of teaching experience. Teaching experience that is accompanied by a significant amount of research, direction of research, investigative, or similar work may be credited at full value in meeting a specific requirement for research, investigative, or similar experience.

Occupations and Series Covered by the 0800 Individual Occupational Requirements

Occupation Title	Series Number
General Engineering and Architecture Series	GS-0801
Safety Engineering Series	GS-0803
Fire Protection Engineering Series	GS-0804
Materials Engineering Series	GS-0806
Civil Engineering Series	GS-0810
Environmental Engineering Series	GS-0819
Mechanical Engineering Series	GS-0830
Nuclear Engineering Series	GS-0840
Electrical Engineering Series	GS-0850
Computer Engineering Series	GS-0854
Electronics Engineering Series	GS-0855
Bioengineering and Biomedical Engineering Series	GS-0858
Aerospace Engineering Series	GS-0861
Naval Architecture Series	GS-0871
Mining Engineering Series	GS-0880
Petroleum Engineering Series	GS-0881
Agricultural Engineering Series	GS-0890

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Occupation Title	Series Number
Chemical Engineering Series	GS-0893
Industrial Engineering Series	GS-0896