

## APPENDIX A

### QUALIFICATION STANDARDS FOR FDA REVIEWERS

If your expertise is in any of the following areas, use the individual numbered standard below in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions":

OCCUPATION	SERIES NUMBER
Psychology . . . . .	180
Biology . . . . .	401
Microbiology . . . . .	403
Pharmacology . . . . .	405
Physiology . . . . .	413
Toxicology . . . . .	415
General Health Science . . . . .	601
Medical Technology . . . . .	644
Speech Pathology and Audiology . . . . .	665
Physical Science . . . . .	1301
Health Physics . . . . .	1306
Physics . . . . .	1310
Chemistry . . . . .	1320

If your expertise is in any of the following areas, refer to the individual numbered standard below:

OCCUPATION	SERIES NUMBER
Medicine . . . . .	602
Nursing . . . . .	610
Dentistry . . . . .	680
* Engineering . . . . .	800

\* Only those engineering series identified by the Center for Devices and Radiological Health's Office of Device Evaluation are included

## Group Coverage Qualification Standard for Professional and Scientific Positions

This qualification standard covers positions in the General Schedule that involve the performance of two-grade interval professional and scientific work. The specific requirements for entry into each occupation covered by this standard are described in individual occupational requirements on pages V-5 through V-25.

A list of the occupational series covered by this standard is provided on page V-1.

### BASIC REQUIREMENTS FOR ALL GRADES

Applicants who meet the basic requirements described in the individual occupational requirements are fully qualified for the specified entry grade (generally grade GS-5). Applicants who wish to qualify for positions at higher grade levels (generally grade GS-7 and above) must also meet the requirements shown in the table on page V-3, in addition to meeting the basic requirements.

The individual occupational requirements typically provide at least two methods for applicants to meet the basic requirements of the occupations covered by this standard:

- A. Successful completion of a full 4-year course of study in an accredited college or university leading to a bachelor's or higher degree that included a major field of study or specific course requirements generally as stated in paragraph A in the individual occupational requirements.

Where specific course requirements are not indicated in paragraph A, the number of semester hours required to constitute a major field of study is the amount specified by the college or university attended. If this number cannot be obtained, 24 semester hours will be considered as equivalent to a major field of study. The nature and quality of this required course work must have been such that it would serve as a prerequisite for more advanced study in the field or subject-matter area. Related course work generally refers to courses that may be accepted as part of the program major.

OR

- B. Appropriate combination of education and experience that is typically specified in paragraph B of the individual occupational requirements. The "paragraph B" method generally requires that an applicant possess a core of educational credit, such as described in paragraph A above, plus additional education and/or experience. The method of determining the number of semester hours required to constitute a major field of study is the same as described in paragraph A.

The quality of the combination of education and experience must be sufficient to demonstrate that the applicant possesses the knowledge, skills, and abilities required to perform work in the occupation, and is comparable to that normally acquired through the successful completion of a full 4-year course of study with a major in the appropriate field. In addition to courses in the major and related fields, a typical college degree would have included courses that involved analysis, writing, critical thinking, research, etc. These courses would have provided an applicant with skills and abilities sufficient to perform progressively more responsible work in the occupation. Therefore, creditable experience should have demonstrated similarly appropriate skills or abilities needed to perform the work of the occupation.

The individual occupational requirements for some series make no provision for substituting experience for education. Therefore, they do *not* include paragraph B provisions.

For a small number of occupations or positions covered by this standard, applicants may possess certain kinds of experience *in lieu* of education. In such cases, applicants may meet minimum qualification requirements through experience equivalent to a 4-year degree. These situations are generally described in paragraph C of the individual occupational requirements.

Applicants whose experience is used to meet the basic requirements through a paragraph B or C provision may qualify for grades above the entry level if that experience includes 1 year of specialized experience. In such cases, the specialized experience would have to be evaluated to determine if it is at the appropriate grade level in the normal line of progression.

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**ADDITIONAL EXPERIENCE AND EDUCATION REQUIREMENTS FOR GS-7 AND ABOVE**

In addition to meeting the basic entry qualification requirements, applicants must have specialized experience and/or directly related education in the amounts shown in the table below.

GRADE	EDUCATION	OR SPECIALIZED EXPERIENCE
GS-7	1 full year of graduate-level education or superior academic achievement	1 year equivalent to at least GS-5
GS-9	2 full years of progressively higher level graduate education or master's or equivalent graduate degree	1 year equivalent to at least GS-7
GS-11	3 full years of progressively higher level graduate education or Ph.D. or equivalent doctoral degree	1 year equivalent to at least GS-9
GS-12 and above		1 year equivalent to at least next lower grade level
<i>Research Positions</i> GS-11 research positions	Master's or equivalent graduate degree	1 year equivalent to at least GS-9
GS-12 research positions	Ph.D. or equivalent doctoral degree	1 year equivalent to at least GS-11
GS-13 and above research positions		1 year equivalent to at least next lower grade level

*NOTE:* Education and experience may be combined for all grade levels for which both education and experience are acceptable.

While the levels of experience shown for most positions covered by this standard follow the grade level progression pattern outlined in the table,

*Combining Education and Experience:* When combining education with experience, first determine the appli-

cant's total qualifying education as a percentage of the education required for the grade level; then determine the applicant's experience as a percentage of the experience required for the grade level; finally, add the two percentages. The total percentage must equal at least 100 percent to qualify an applicant for that grade level. For example, an applicant for a GS-184, Sociology, position has successfully completed 60 undergraduate semester hours, including 24 semester hours in sociology, and, in addition, has 2 full-time years of appropriate experience that demonstrates that the applicant possesses the necessary analytical and communication skills. The applicant would qualify for GS-5, since the 60 semester hours (the equivalent of 2 years of undergraduate education, or 50 percent of the total requirement) were supplemented by 2 additional years of appropriate experience that provided the remaining 50 percent of the total required education and experience.

*Specialized Experience:* Experience that equipped the applicant with the particular knowledge, skills, and abilities to perform successfully the duties of the position, and that is typically in or related to the work of the position to be filled. To be creditable, specialized experience must have been equivalent to at least the next lower grade level in the normal line of progression for the occupation in the organization.

*Superior Academic Achievement:* The superior academic achievement provision is applicable to all occupations covered by this standard. See the "General Policies and Instructions" for specific guidance on applying the superior academic achievement provision.

*Graduate Education:* Completion of graduate level education in the amounts shown in the table, in addition to meeting the basic requirements, is qualifying for positions at grades GS-7 through GS-11, and GS-12 research positions if it provided the knowledge, skills, and abilities necessary to do the work. One year of full-time graduate education is considered to be the number of credit hours that the school attended has determined to represent 1 year of full-time study. If that number cannot be obtained from the school, 18 semester hours should be considered an academic year of graduate study. Part-time graduate education is creditable in

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accordance with its relationship to a year of full-time study at the school attended.

*Research Positions:* Positions that primarily involve scientific inquiry or investigation, or research-type exploratory development of a creative or advanced scientific nature, where the knowledge required to perform the work successfully is typically and primarily acquired through graduate study (master's or equivalent degree for GS-11, Ph.D. or equivalent for GS-12). The work is such that the academic preparation will equip the applicant to perform the full range of professional work of the position after a short orientation period.

1. Qualification on the basis of education—Applicants for such research positions can be considered qualified for GS-11 if they possess an appropriate master's or equivalent graduate degree, and qualified for GS-12 if they possess a Ph.D. or equivalent doctoral degree.
2. Qualification on the basis of experience—Applicants who furnish positive evidence that they have performed highly creative or outstanding research that has led or can lead to major advances in a specific area of research, to a major advance in the discipline or field of science involved, or to major advances in science in general, can be rated under this provision for highly demanding research positions requiring similar abilities. Under these circumstances, applicants can be rated eligible for the next higher grade level above that for which they would normally be rated, provided they have not been rated eligible at this higher grade on the basis of meeting the graduate study requirements described in paragraph 1 above. To receive this rating, the work must have been creative in the sense that it developed a basic principle, product, concept, method, approach, or technique, or provided a body of basic information that opened the way for a major advance in the discipline or field of science involved, or to advances in science in general, by providing a method of solving other problems, opening areas of research, or providing the means of exploiting the application of science in a major area.

Applicants cannot receive an "extra" grade for education, and an additional "extra" grade for appropriate experience.

*Combination of Graduate Education and Professional Experience:* Combinations of successfully completed graduate level education and specialized experience may be used to meet total experience requirements. Only graduate level education in excess of the amount required for the next lower grade level may be combined with experience. For example, an applicant with 6 months of appropriate experience equivalent to GS-7 (50 percent of the experience requirement for GS-9) and 27 semester hours of appropriate graduate education (50 percent of the education requirement for GS-9, in excess of that required for GS-7) would be qualified for a GS-9 position (assuming that there is no evidence that the attended college or university requires more than 18 semester hours as equivalent to a year of graduate study).

### USING SELECTIVE FACTORS FOR POSITIONS COVERED BY THIS STANDARD

There are a variety of situations where agencies would be warranted in limiting consideration to applicants who possess the particular qualifications required to perform the work of positions covered by this standard. For example, an agency may require specific kinds of training appropriate for filling positions concerned with scientific research and development activities, or may require specific educational courses or combinations of courses (where the individual occupational requirements permit applicants to qualify based on several combinations of educational course work) to meet other specialized agency requirements. An agency filling an international economist position may require knowledge of international economics. In this case, since applicants can qualify on the basis of education, the agency may require certain types of educational courses. Similarly, in some cases, consideration may be limited only to those applicants who possess an appropriate license, registration, or certification, if possession of such is determined to be necessary for carrying out the responsibilities of a position and/or required by statute.

## INDIVIDUAL QUALIFICATION REQUIREMENTS

**GS-180**

**Psychology Series**

**GS-180**

*Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."*

*Basic Requirements:*

**Degree:** major or equivalent in psychology for all specializations except clinical psychology and counseling psychology. These two specializations have additional educational requirements, as stated below:

*Clinical psychology*—For positions at grades GS-11 and above, satisfactory completion of all the requirements for the doctoral degree (Ph.D. or equivalent) directly related to full professional work in clinical psychology is required.

*Counseling psychology*—For positions at grades GS-9 and above, satisfactory completion of 2 full academic years of graduate study directly related to professional work in counseling psychology, or satisfactory completion in an accredited educational institution of all the requirements for a master's degree directly related to counseling psychology is required.

**GS-401**

**General Biological Science Series**

**GS-401**

*Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."*

*Basic Requirements:*

A. **Degree:** biological sciences, agriculture, natural resource management, chemistry, or related disciplines appropriate to the position.

OR

B. **Combination of education and experience**—Courses equivalent to a major, as shown in A above, plus appropriate experience or additional education.

Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

*Basic Requirements:*

- A. Degree: microbiology; or biology, chemistry, or basic medical science that included at least 20 semester hours in microbiology and other subjects related to the study of microorganisms, and 20 semester hours in the physical and mathematical sciences combining course work in organic chemistry or biochemistry, physics, and college algebra, or their equivalent.
- OR
- B. Combination of education and experience—courses equivalent to a major in microbiology, biology, chemistry, or basic medical science that included courses as shown in A above, plus appropriate experience or additional education.

*Graduate Education:* Microbiology, or specific area of study such as bacteriology, virology, mycology, algology, protozoology, parasitology, immunology, serology, microbial genetics, or soil microbiology; or specific applied fields of microbiology such as clinical and public health microbiology, food technology, production processes, industrial fermentation, pollution, etc. Graduate study in related fields such as experimental pathology, infectious diseases, epidemiology, biochemistry, animal or plant physiology, genetics, plant pathology, and insect disease control, may also be pertinent, provided it has *direct application* to microbiological work.

*Evaluation of Education:* Microbiology is a broad field of science encompassing a number of scientific disciplines or areas of science, the fields in which this science is applied, and related fields where the work is concerned with or involves microbiology. The scientific disciplines or areas of this science include bacteriology, immunology, serology, algology, mycology, parasitology, protozoology, rickettsiology, tissue culture, virology, and similar disciplines or areas of science. The applied fields include environmental, food, dairy, soil, industrial, public health, clinical, and agricultural microbiology, and similar areas in which microbiology is applied. Related fields include taxonomy and systematics, plant, animal, or human physiology or pathology, infectious diseases, epidemiology, ecology, and similar areas of science where the work is directly related or applies to microbiology. Except where the course work deals with a limited and specific segment of the science, where it might be limited in usefulness, most of the work, including that dealing with the development and use of microbiological methods, procedures, and techniques, is qualifying. In interpreting the substantive value of the course work, credit may be given for courses in related fields, depending on the degree to which the courses are related to microbiological work.

*Evaluation of Experience:* For positions at GS-9 that involve a substantial amount of work in a specific specialized area or applied field of microbiology, at least 6 months of the experience must either have been in the appropriate area of specialization or applied field of microbiology, or have direct application in the area for which the applicant is being considered. For the GS-11 and higher grade levels of such specialized positions, the experience must have been sufficiently specialized to insure adequate familiarity with the area of specialization or applied field of microbiology, or have direct application in the area for which the applicant is being considered.

*Alternate requirement:* For GS-14 clinical and public health microbiology positions, certification by the American Board of Medical Microbiology/American Board of Medical Laboratory Immunology, or election to Fellowship in the American Academy of Microbiology fully meets the experience requirement for such positions.

GS-405

Pharmacology Series

GS-405

*Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."*

**Basic Requirements:** Degree: major in an appropriate biological, medical, veterinary, or physical science, or in pharmacy that included at least 30 semester hours in chemistry and physiology and 12 semester hours in pharmacology.

**Evaluation of Education:** The positions in this series are multidisciplinary positions, since the work involves the application of a scientific knowledge of biochemistry, physiology, pharmacology, and such related sciences as microbiology, biophysics, genetics, mathematics, and statistics.

Courses in chemistry, organic chemistry, biochemistry, general physiology, and animal, human, microbial, or cellular physiology may be used to meet the 30-semester-hour requirement in chemistry and physiology. Under some circumstances, i.e., where the course work provided additional insight into the biophysical, biochemical, and physiological relationships involved, courses in such subjects as cytology, embryology, cellular or microbial genetics, and biophysics may be used to meet this requirement.

Courses in pharmacology, pharmacodynamics, pharmacotherapeutic, molecular pharmacology, and other similar subjects may be used to meet the 12-semester-hour requirement in pharmacology. Courses dealing intensively with pharmacologically-oriented subjects may also be used to meet this requirement.

GS-413

Physiology Series

GS-413

*Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."*

**Basic Requirements:** Degree: in one of the basic animal sciences or physiology; or a related discipline or field of science that included at least 24 semester hours in the basic animal sciences, of which 10 semester hours were in animal physiology.

**Evaluation of Education:** Courses such as anatomy; cytology; invertebrate and vertebrate zoology; embryology; entomology; animal, dairy, and poultry husbandry; nutrition; genetics; and physiology may be used to meet the 24-semester-hour requirement in the basic animal sciences.

Courses in physiology, animal or human physiology, cellular physiology, or courses that were well oriented toward animal or human physiology, e.g., some advanced courses in biochemistry, are qualifying as animal physiology courses. Courses in related fields such as cytology and microbiology (including microbial physiology) may also be qualifying, *provided* the course work dealt directly with the application of scientific principles underlying animal physiology, or with the methodology and techniques applied in animal physiology work.

GS-415

Toxicology Series

GS-415

*Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."*

**Basic Requirements:** Degree: toxicology; or an appropriate discipline of the biological, medical, or veterinary sciences that included at least 30 semester hours in chemistry, biochemistry, or physiology, and 12 semester hours in toxicology.

**Evaluation of Education:** The positions in this series are multidisciplinary positions because the work may involve the application of a scientific knowledge of anatomy, chemistry, biochemistry, physiology, pathology, toxicology, and related sciences such as microbiology, biophysics, entomology, genetics, mathematics, and statistics.

Applicants may have acquired a knowledge of the methods and techniques applied in performing toxicological work through various fields of scientific inquiry. Traditionally, academic training in toxicology has been given at the graduate level in connection with the work of a school of veterinary medicine or a school of medicine. Students who enter these schools directly after completing their undergraduate programs are usually trained in anatomy, toxicology, pharmacology, biochemistry, or physiology. Many toxicologists enter the field after taking graduate work in anatomy, biochemistry, chemistry, or physiology, and complete their doctoral program in these fields, or get their M.D. or Doctor of Veterinary Medicine. Typically, they then acquire experience or work toward a Ph.D. in toxicology.

Courses in anatomy, chemistry, organic chemistry, biochemistry, biology, histology, and animal, human, microbial, or cellular physiology may be used to meet the 30-semester-hour requirement in chemistry, biochemistry, and physiology. Courses in statistics, bioassay, and test design may also apply to this requirement. Courses in cytology, embryology, cellular or microbial genetics, and biophysics may also be used to meet this requirement in those instances where the course work provided additional insight into the biophysical, biochemical, and physiological relationships involved. Only toxicology courses may be used to meet the requirement for 12 semester hours in toxicology. This may include courses dealing intensively with toxicological search, methods in toxicology, essentials of toxicology, the study and review of toxicological literature, special reading courses, or other toxicologically-oriented subjects.

GS-601

General Health Science Series

GS-601

*Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."*

**Basic Requirements:** Degree: major study in an academic field related to the health sciences or allied sciences appropriate to the work of the position.

**Evaluation of Experience for Grants Administration Positions:** For positions at grades GS-12 and above involved in professional work in grants administration, qualifying experience is considered to be experience in grants administration in areas of science similar or related to the work of the position for which application is made, provided such experience involved professional judgment of a kind and level of difficulty and responsibility essential to successful performance in the position to be filled.



Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."

**Basic Requirements:**

- A. Degree: medical technology, chemistry, or biology that included or was supplemented by at least:
- 16 semester hours of biological science of which one course was in microbiology and one course was in immunology. (NOTE: If there is no mention of immunology or immunobiology in the course title, the requirement for a course in immunology may be met by any course that covers the following topic areas: (1) definition and relationships of antigens and antibodies; (2) host-antigen interactions; (3) bursal and thymic influences on lymphoid cells; and (4) humoral and cellular response mechanisms.) The remaining biology courses must have been in general biology, zoology, or any of the areas listed below under "Evaluation of Education and Experience;"
  - 16 semester hours of chemistry of which one course was in organic or biochemistry. The remaining chemistry courses must have been in general chemistry, qualitative analysis, qualitative chemistry, quantitative chemistry, physical chemistry, analytical chemistry, or any of the areas listed below under "Evaluation of Education and Experience;" and
  - 3 semester hours of college mathematics.

OR

- B. A full 4-year course of study that included or was supplemented by at least 12 months in a college or hospital-based medical technology program or medical technology school approved by a recognized accrediting organization. The professional medical technology curriculum may have consisted of a 1-year post-baccalaureate certificate program or the last 1 or 2 years of a 4-year program of study culminating in a bachelor's in medical technology.

OR

- C. A combination of (1) at least 35 semester hours of biological science, chemistry, and mathematics as described in paragraph A above and (2) additional appropriate education and/or experience totaling 4 years. This combination of education and experience must have provided knowledge of the theories, principles, and practices of medical technology equivalent to that provided by the full 4-year course of study described in A or B above. All science and mathematics courses must have been acceptable for credit toward meeting the requirements for a science major at an accredited college or university. Acceptable experience is responsible professional or technician experience in a hospital laboratory, health agency, industrial medical laboratory, or pharmaceutical house; or teaching, test development, or medical research program experience that provided an understanding of the methods and techniques applied in performing professional clinical laboratory work. Certification/licensure as a medical technologist (generalist) obtained through written examination by a nationally recognized credentialing agency or State licensing body is a good indication that the quality of experience is acceptable.

Candidates for positions involving highly technical research, development, or similarly complex scientific functions must have completed the full 4-year course of study described in A or B above.

*Evaluation of Education and Experience:* The four major areas of clinical laboratory science are microbiology, clinical chemistry, hematology, and immunohematology (blood banking). Qualifying course work in these areas includes bacteriology, mycology, mycobacteriology, tissue culture, virology, parasitology, endocrinology, enzymology, toxicology, urinalysis, coagulation, hemostasis, cell morphology, immunology, serology, immunoserology, immuno-deficiency, hemolysis, histocompatibility, cytogenetics, and similar disciplines or areas of laboratory practice.

## GS-644 (Continued)

Related fields include physiology, anatomy, molecular biology, cell biology, embryology, pathology, genetics, pharmacology, histology, cytology, nuclear medicine, epidemiology, biostatistics, infection control, physics, statistics, and similar areas of science *where the work is directly related to the position to be filled.*

For positions above grade GS-5, experience or graduate education must have been in (1) the general field of medical technology, (2) one of the disciplines or specialized areas of medical technology, or (3) a field directly related and applicable to medical technology or the position to be filled.

Work study experience in a clinical laboratory as a student medical technologist in a CAHEA-accredited education program may be credited on a month-for-month basis toward meeting the GS-7 specialized experience requirement. (NOTE: A typical program comprises 12 consecutive months of professional study, including didactic and practical instruction. Approximately 6 to 7 months are devoted to lectures, laboratory study, demonstrations, and seminars covering theory and technique in clinical laboratory science. The other 5 to 6 months are devoted to clinical laboratory rotations. It is the latter, i.e., the period(s) of supervised work experience in a service laboratory that may be credited as work study experience.

## GS-665                      Speech Pathology and Audiology Series                      GS-665

*Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."*

**Basic Requirements: Degree:** For speech pathologist positions, master's degree that included 18 semester hours in the field of speech pathology with approved clinical practice. For audiologist positions, master's degree that included 18 semester hours in the field of audiology with approved clinical practice. Applicants for positions with both speech pathologist and audiologist duties must have successfully completed all the requirements for a master's degree with 18 semester hours in one of the fields with approved clinical practice and, in addition, must have either completed a minor in the other field or must have had at least 1 year of professional experience in the other field.

Applicants who meet the basic requirements fully qualify for GS-9.

**Evaluation of Experience:** Experience must have demonstrated breadth and level of knowledge of the principles and theories of speech pathology and/or audiology; skill in analyzing and interpreting test results in the evaluation of communicative disorders; ability to plan and conduct a program of therapy independently; ability to communicate effectively, orally and in writing; and ability to establish and maintain effective relationships with individuals and groups in evaluating and resolving problems in hearing, voice, language, or speech. Applicants for the speech pathologist/audiologist combined positions must have had sufficient professional experience in both speech pathology and audiology to demonstrate their competence to perform the duties involved. The following are examples of qualifying professional experience that may have been obtained in a hospital, special treatment center for the disabled, university or community clinic, or industrial or educational institution:

- Investigating and studying the underlying causes, precipitating factors, symptomatic behavior, and the emotional and practical effect upon the patient of a particular impaired speech pattern; resolving speech impairments; and counseling patients and/or families in the adjustment to the speech impairment (for speech pathologist positions).
- Assessing, evaluating, analyzing, and treating communicative handicaps resulting from hearing impairments (for audiologist positions).
- Investigating methods to improve the clinical management of communicative disorders and to increase the basic scientific understanding of communicative processes and other factors causing their disruption.
- Providing instruction in the principles and bases of communication including clinical techniques and methods of assessment, evaluation, and treatment to audiologists, speech pathologists, and specialists in related fields (such as medical residents in otolaryngology).
- Teaching audiology or speech pathology at the graduate level.

GS-1301

**General Physical Science Series**

GS-1301

*Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."*

*Basic Requirements:*

A. Degree: physical science, engineering, or mathematics that included 24 semester hours in physical science and/or related engineering science such as mechanics, dynamics, properties of materials, and electronics.

OR

B. Combination of education and experience—education equivalent to one of the majors shown in A above that included at least 24 semester hours in physical science and/or related engineering science, plus appropriate experience or additional education.

GS-1306

**Health Physics Series**

GS-1306

*Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."*

*Basic Requirements:*

A. Degree: natural science or engineering that included at least 30 semester hours in health physics, engineering, radiological science, chemistry, physics, biology, mathematics, and/or calculus.

OR

B. Combination of education and experience—courses as shown in A above, plus appropriate experience or other education; or certification as a health physicist by the American Board of Health Physics, plus appropriate experience and other education that provided an understanding of sciences applicable to health physics comparable to that described in paragraph A.

GS-1310

**Physics Series**

GS-1310

*Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."*

*Basic Requirements:*

A. Degree: physics; or related degree that included at least 24 semester hours in physics.

OR

B. Combination of education and experience—courses equivalent to a major in physics totaling at least 24 semester hours, plus appropriate experience or additional education.

In either A or B above, the courses must have included a fundamental course in general physics and, in addition, courses in any two of the following: electricity and magnetism, heat, light, mechanics, modern physics, and sound.

GS-1320

Chemistry Series

GS-1320

*Use these individual occupational requirements in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions."*

*Basic Requirements:*

A. Degree: physical sciences, life sciences, or engineering that included 30 semester hours in chemistry, supplemented by course work in mathematics through differential and integral calculus, and at least 6 semester hours of physics.

OR

B. Combination of education and experience—course work equivalent to a major as shown in A above, including at least 30 semester hours in chemistry, supplemented by mathematics through differential and integral calculus, and at least 6 semester hours of physics, plus appropriate experience or additional education.

*This is an individual qualification standard.*

**Basic Requirements:**

**Degree:** Doctor of Medicine or Doctor of Osteopathy from a school in the United States or Canada approved by a recognized accrediting body in the year of the applicant's graduation. [A Doctor of Medicine or equivalent degree from a foreign medical school that provided education and medical knowledge substantially equivalent to accredited schools in the United States may be demonstrated by permanent certification by the Educational Commission for Foreign Medical Graduates (ECFMG) (or a fifth pathway certificate for Americans who completed premedical education in the United States and graduate education in a foreign country).]

**Graduate Training:** Subsequent to obtaining a Doctor of Medicine or Doctor of Osteopathy degree, a candidate must have had at least 1 year of supervised experience providing direct service in a clinical setting, i.e., a 1-year internship or the first year of a residency program in an institution accredited for such training. (This 1 year of supervised experience may be waived for research or administrative positions not requiring direct patient care.) For purposes of this standard, graduate training programs include only those internship, residency, and fellowship programs that are approved by accrediting bodies recognized within the United States or Canada. Listings of accredited programs are published yearly in the *Directory of Residency Training Programs* and the *Yearbook and Directory of Osteopathic Physicians*.

- *An internship program* involves broadly based clinical practice in which physicians acquire experience in treating a variety of medical problems under supervision (e.g., internal medicine, surgery, general practice, obstetrics-gynecology, and pediatrics). Such programs are in hospitals or other institutions accredited for internship training by a recognized body of the American Osteopathic Association (AOA).
- *A residency program* involves training in a specialized field of medicine in an institution accredited for training in the specialty by a recognized body of the American Medical Association (AMA) or AOA.
- *A fellowship program* involves advanced training (beyond residency training) in a given medical specialty in either a clinical or research setting in a hospital or other institution accredited in the United States for such training.

**Licensure:** For positions involving patient care, candidates must have a permanent, full, and unrestricted license to practice medicine in a State, District of Columbia, the Commonwealth of Puerto Rico, or a territory of the United States. Applications will be accepted from physicians who are not currently licensed; however, if selected for appointment, they must (a) obtain a license before entering on duty, or (b) meet one of the following provisions:

- *Waiver of Licensure Requirement:* An agency may waive the licensure requirement for positions not involving direct patient care, e.g., positions performing disability evaluations, positions performing solely research, or administrative program managers. If the agency does not waive the license requirement for these kinds of positions, candidates may be appointed subject to obtaining a license within 1 year.
- *Appointments Pending Meeting Licensure Requirement:* Individual circumstances may warrant appointments pending meeting the licensure requirement (e.g., when a candidate has a temporary license to practice until the next regular session of the licensing board). Persons appointed pending licensure may not be retained beyond 1 year of appointment if they do not obtain the license.

Applicants who meet the basic requirements qualify for GS-11 positions.

## GS-602 (Continued)

### Additional Requirements for Grades GS-12 and Above:

The requirements below are grouped according to types of programs—clinical and training, aviation medical, occupational health, disability evaluation, maternal and child health, and research.

- **Clinical and Training Programs**—Within Federal clinical and training programs, a distinction is made between general practice and specialist positions. General practitioners must be skilled in recognizing various medical pathologies that require referral to specialists for diagnostic and treatment procedures. Graduate training and experience must, therefore, be well rounded. Specialist positions require graduate training and experience related to the specialty and subspecialty of the position to be filled. Experience may not be substituted for training essential for performing specialized duties. The length and content of residency programs depends upon the specialization and requirements of recognized accrediting American medical specialty boards. These boards are authorized to conduct examinations to determine the competence of physicians in the specialty, to issue certificates of qualification, to participate in evaluating the quality of residency programs, and to determine the requirements for certification.

### General Practice positions

*For GS-12*—2 years of graduate training or equivalent experience and training.

*For GS-13*—3 years of graduate training or equivalent experience and training.

*For GS-14 and above*—In addition to the requirements for GS-13, 1 year of appropriate experience equivalent to at least the next lower grade level.

### Specialist positions

*For GS-13*—3 years of residency training in the specialty of the position to be filled or equivalent experience and training.

*For GS-14*—4 years of residency training in the specialty of the position to be filled or equivalent experience and training.

*For GS-15*—5 years of residency training in the specialty of the position to be filled or equivalent experience and training.

- **Disability Evaluation Programs**—The knowledge, skills and abilities required for most disability evaluation positions may have been obtained in the primary care field. However, when positions involve evaluating specialized medical cases or developing specialized guides and require training and experience in a specific area of medicine (e.g., general surgery, psychiatry, neurology), the requirements shown above for Specialist positions should be applied.

*For GS-12*—2 years of graduate training or equivalent training and experience that provided knowledge, skills, and abilities for the work of the position to be filled.

*For GS-13 and above*—3 years of graduate training or equivalent training and experience that included at least 1 year of experience in a disability evaluation program in government or industry equivalent to at least the next lower grade level.

- **Aviation Medical Programs**—In addition to a residency in aerospace medicine, knowledge, skills, and abilities for work in this program area may have been acquired in fields such as internal medicine, pulmonary disease, cardiovascular disease, family practice, preventive medicine, occupational health, or public health.

*For GS-12*—2 years of residency training or equivalent training, education, and experience that provided the skills and knowledge required to perform the work of the position to be filled.

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## GS-602 (Continued)

*For GS-13*—3 years of residency training in aerospace medicine or equivalent training, education, and/or experience that included at least 1 year of experience in aviation medical programs.

*For GS-14*—1 year of appropriate graduate training or experience in aviation or aerospace medical programs equivalent to at least the GS-13 level.

*For GS-15*—1 year of work experience equivalent to at least the GS-14 level in aviation or aerospace medical programs.

- **Occupational Health Programs**—In addition to a residency program in occupational medicine, knowledge, skills, and abilities for work in this program area may have been acquired in family practice, internal medicine, surgery, pathology, dermatology, radiology, physical medicine and rehabilitation, public health, aerospace medicine, and general preventive medicine.

*For GS-12*—2 years of residency training or equivalent training, education, and experience that provided the skills and knowledge required to perform the work of the position to be filled.

*For GS-13*—3 years of residency training in occupational medicine or equivalent training, education, and experience that included at least 1 year of experience in an occupational health program in an industrial or office-type establishment.

*For GS-14 and above*—1 year of appropriate graduate training or experience in occupational health programs equivalent to at least the next lower grade level.

- **Maternal and Child Health Programs**—Medical fields that provide the basic knowledge, skills, and abilities for maternal and child health work include pediatrics, obstetrics-gynecology, family practice, and subspecialties of preventive medicine.

*For GS-12*—2 years of graduate training, education, or appropriate experience that provided the skills and knowledge required to perform the work of the position to be filled.

*For GS-13*—3 years of graduate training, or equivalent training, education, and experience in an appropriate field of medicine.

*For GS-14 and above*—1 year of appropriate experience in maternal and child health programs equivalent to at least the next lower grade level.

- **Research Programs**—If medical officers in this program area conduct research *and* have patient care responsibility, they must meet the licensure requirement and the experience and training requirements described in the applicable program area above.

*For GS-11*—In addition to meeting the minimum educational requirement, applicants must show demonstrated interest in and aptitude for medical research work, e.g., activities in medical school, residency, training and fellowships that provided opportunities to demonstrate interest in research.

*For GS-12*—1 year of medical research experience; or 1 year of graduate training in which the applicant demonstrated interest in and aptitude for medical research; or 1 year of graduate study in an accredited college or university in a field of science (e.g., pathology, pharmacology, physiology, microbiology, biochemistry, zoology) closely related to the work of the position to be filled.

*For GS-13*—An earned doctorate, e.g., Ph.D. or Sc.D. (in addition to the Doctor of Medicine or Doctor of Osteopathy degree) from an accredited college or university in a field of science directly related to medicine and closely allied to the position to be filled; or, in addition to meeting the requirements for GS-12, 2 years of graduate training or medical research experience that demonstrated ability to do independent major medical research.

*For GS-14 and above*—One year of experience equivalent to at least the next lower grade level that demonstrated ability to do significant medical research in a particular medical field.

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## GS-602 (Continued)

### EVALUATION OF CANDIDATES

1. *Interviews:* Applicants may be interviewed to assure that they possess the degree of skill in interpersonal relationships required for satisfactory performance of the duties of the position to be filled.

2. *Substitution of Experience for Residency Training:* Experience may not be substituted for residency training that is essential for the performance of specialized duties. For example, specialists such as psychiatrists and surgeons must complete the number of years of accredited residency training required in their respective specialties. An exception may be made when a peer panel of physicians (subject-matter experts) determines and documents that the knowledge, skills, and abilities acquired in professional medical practice are equivalent to those acquired during the same period of time in a graduate training program.

3. *Teaching Experience:* Graduate teaching experience as a member of the faculty in a school of medicine or school of public health may be credited for training positions or as appropriate for specialist positions. (Teaching undertaken as a part of a residency or fellowship training does not satisfy this requirement.)

4. *Grade Credit for Creative Research Contributions:* For positions involving substantial clinical investigations or basic or applied research, extra grade credit may be given for positive evidence or personally performed highly creative or outstanding research leading to major advances in a specific area of research, e.g., development of a basic principle, concept, method, approach, technique, or body of basic information that opened the way for major advancements, breakthroughs, or new applications. In such cases, candidates who meet the requirements for GS-13 or GS-14 may be rated eligible for the next higher grade.



*This is an individual qualification standard.*

**Basic Requirements:**

**Education:** Degree or diploma from a professional nursing program approved by the legally designated State accrediting agency at the time the program was completed by the applicant. (One year of nursing experience as a military corpsman that has been accepted by a State licensing body may be accepted in lieu of education at the GS-4 level.)

**Registration:** Applicants must have active, current registration as a professional nurse in a State, District of Columbia, the Commonwealth of Puerto Rico, or a territory of the United States. An applicant who has graduated from an approved nursing educational program within the past 12 months may be appointed pending State registration as a professional nurse within 6 months of appointment. No person appointed pending registration may be retained beyond 6 months, or promoted, if registration has not been attained.

The following table shows the amounts of education and/or experience required to qualify for positions covered by this standard.

GRADE	EDUCATION	AND/OR	EXPERIENCE
GS-4	Completion of a program of less than 30 months' duration or associate degree	or	1 year of nursing experience as a military corpsman
GS-5	Completion of a program of less than 30 months' duration or associate degree	and	1 year of professional nursing, or of at least GS-4 level practical nurse or nursing assistant experience under the supervision of a professional nurse
	Completion of a program of at least 30 months' duration or 4 academic years above high school-or bachelor's degree		None
GS-7	Completion of a professional nursing program	and	1 year of experience equivalent to at least the GS-5 level
	1 full year of graduate education or bachelor's degree with superior academic achievement		None
GS-9	2 full years of progressively higher level graduate education or a master's or equivalent degree	or	1 year of experience equivalent to at least the GS-7 level
GS-11	Completion of all requirements for a doctoral degree (Ph.D. or equivalent) or 3 full years of progressively higher level graduate education	or	1 year of experience equivalent to at least the GS-9 level
GS-12 and above	None		1 year of experience equivalent to at least the next lower grade level

Equivalent combinations of education and experience are qualifying for all grade levels and positions for which both education and experience are acceptable.

**Evaluation of Education:** At the GS-5 level, successfully completed undergraduate course work in nursing; the behavioral, physical, or biological sciences related to nursing; nutrition; public health; and maternal and child health in excess of that required for completion of an associate degree may be substituted for professional nursing experience at the rate of 1 academic year for 9 months of experience. Applicants for Community Health Nurse positions at GS-5 and above must have graduated from a baccalaureate or higher degree nursing program.

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### GS-610 (Continued)

Graduate-level education must have been in nursing with a concentration in a field of nursing (e.g., teaching, a clinical specialty, research, administration, etc.) or in a closely related non-nursing field directly applicable to the requirements of the position to be filled. Applicants for nurse anesthetist positions at GS-9 and above must have graduated from a course of study for nurses in anesthesia of at least 18 month's duration that was accredited by the American Association of Nurse Anesthetists for the year of their graduation. Applicants for nurse midwife positions must have completed an organized program of study and clinical experience recognized by the American College of Nurse Midwives.

*Evaluation of Experience:* Experience must have equipped the applicant with the particular knowledge, skills, and abilities to perform successfully the duties of the position. At GS-9 and above, many positions require experience in a specialty area of nursing.

*This is an individual qualification standard.*

**Basic Requirements:**

**Education:** Degree in dental surgery (D.D.S.) or dental medicine (D.M.D.) from a school approved by the Council on Dental Education, American Dental Association (ADA); or other dental school, provided the education and knowledge acquired was substantially equivalent to that of graduates from an ADA-approved school.

**Licensure:** Applicants must be currently licensed to practice dentistry in a State, the District of Columbia, or Puerto Rico.

Applicants who meet the basic requirements qualify for GS-11.

**Additional Requirements for Grades GS 12 and Above:**

For purposes of this standard, the following terms are defined.

- *Approved internship; approved residency*—Training in a hospital dental internship or residency approved by the Council on Dental Education of the American Dental Association.
- *Graduate-level study*—Either dental graduate study leading to an advanced degree such as Master of Science, or postgraduate (nondegree) dental school study involving a level of instruction comparable to that provided in a graduated degree program.
- *National certifying board*—An examining board in a special area of dental practice recognized by the Council on Dental Education of the American Dental Association.
- *Board eligibility*—Qualification for examination by a national certifying board as a result of having met the advanced training program requirements for a dental specialty.

Experience and/or training must be one of the following types:

- Post-licensure professional experience in the general practice of dentistry.
- Approved internship training.
- Approved residency training.
- Graduate-level study in an accredited dental school.
- Post-licensure professional experience in a specialized area of practice.
- Other advanced study or training (outside a dental school or hospital) creditable towards satisfaction of training program requirements for Board eligibility.

For specialist positions, experience and/or training must clearly establish the applicant's status as a specialist. Agencies should review the applicant's experience to determine the types and difficulty of the cases dealt with, the level of knowledge and understanding of the specialization regularly required, the degree of diagnostic skills and treatment planning ability involved, and the pertinent graduate study acquired.

*For GS-12:* Two years of professional dentistry experience and/or training; or superior academic ability defined as that demonstrated by an intern, who on the basis of an evaluation of all interns who have completed training in the same hospital or in the same kind of internship program over the past 5 years, would fall into the upper half of the group.

*For GS-13:* Three years of professional dentistry experience and/or training equivalent to at least that of a Board eligible.

*For GS-14:* One year of professional dentistry experience equivalent to at least the GS-13 grade level. For specialist positions, certification as a diplomate by a national certifying board for a specialized area of practice meets the requirements.

*For GS-15:* One year of professional dentistry experience equivalent to at least the GS-14 level.

**MEDICAL REQUIREMENTS**

Applicants must be able to distinguish shades of color.

Use these individual occupational requirements for all professional engineering series in conjunction with the "Group Coverage Qualification Standard for Professional and Scientific Positions." The following occupations are included:

General Engineering Series . . . . .	GS-801
Safety Engineering Series . . . . .	GS-803
Fire Protection Engineering Series . . . . .	GS-804
Materials Engineering Series . . . . .	GS-806
Civil Engineering Series . . . . .	GS-810
Environmental Engineering Series . . . . .	GS-819
Mechanical Engineering Series . . . . .	GS-830
Nuclear Engineering Series . . . . .	GS-840
Electrical Engineering Series . . . . .	GS-850
Computer Engineering Series . . . . .	GS-854
Electronics Engineering Series . . . . .	GS-855
Biomedical Engineering Series . . . . .	GS-858
Aerospace Engineering Series . . . . .	GS-861
Naval Architecture Series . . . . .	GS-871
Mining Engineering Series . . . . .	GS-880
Petroleum Engineering Series . . . . .	GS-881
Agricultural Engineering Series . . . . .	GS-890
Ceramic Engineering Series . . . . .	GS-892
Chemical Engineering Series . . . . .	GS-893
Welding Engineering Series . . . . .	GS-894
Industrial Engineering Series . . . . .	GS-896

**Basic Requirements:**

A. Degree: professional engineering. To be acceptable, the curriculum must: (1) be in a school of engineering with at least one curriculum accredited by the Accreditation Board for Engineering and Technology (ABET) as a professional engineering curriculum; 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 professional 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:

1. *Professional registration*—Current registration as a professional engineer 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. E-37

## GS-800 (Continued)

2. *Written test* Evidence of having successfully passed the Engineer-in-Training (EIT) examination, or the written test required for professional registration, which is administered by the Boards of Engineering Examiners in the various States, the District of Columbia, Guam, and Puerto Rico.

Applicants who have passed the EIT examination and have completed all the requirements for either (a) a bachelor's degree in engineering technology (BET) from an accredited college or university that included 60 semester hours of courses in the physical, mathematical, and engineering sciences, or (b) a BET from a program accredited by the Accreditation Board for Engineering and Technology (ABET) may be rated eligible for certain engineering positions at GS-5. Eligibility is limited to positions that are within or closely related to the specialty field of the engineering technology program. Applicants for positions that involve highly technical research, development, or similar functions requiring an advanced level of competence in basic science must meet the basic requirements in paragraph A.

Because of the diversity in kind and quality of BET programs, graduates of other BET programs are required to complete at least 1 year of additional education or highly technical work experience of such nature as to provide reasonable assurance of the possession of the knowledge, skills, and abilities required for professional engineering competence. The adequacy of this background must be demonstrated by passing the EIT examination.

3. *Specified academic courses*—Successful completion of at least 60 semester hours of courses in the physical, mathematical, and engineering sciences and in engineering that included the courses specified in the basic requirements. The courses must be fully acceptable toward meeting the requirements of a professional engineering curriculum as described in paragraph A.
4. *Related curriculum*—Successful completion of a curriculum leading to a bachelor's degree in engineering technology or in an appropriate professional field, e.g., physics, chemistry, architecture, computer science, mathematics, hydrology, or geology, may be accepted in lieu of a degree in engineering, 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, or unless he/she qualifies under the provisions of B.2 related to the EIT examination or BET degree.

### *Additional Experience and Training Provisions for Graduates of Professional Engineering Curricula:*

- a. Superior academic achievement at the baccalaureate level in a professional engineering curriculum is qualifying for GS-7.
- b. Individuals can be converted noncompetitively to a GS-7 position if they complete all the requirements of a Federal baccalaureate level student-trainee program, including 1040 hours of work experience, 320 hours of which was at the GS-5 level.

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## GS-800 (Continued)

- c. A combination of superior academic achievement and 1 year of appropriate professional experience is qualifying at GS-9.
- d. Applicants with an engineering 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.
- e. Successful completion of a 5-year program of study of at least 160 semester hours leading to a bachelor's degree in engineering 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 nonroutine 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, indepth knowledge of mathematical, physical, and engineering sciences applicable to a specialty field of engineering that characterizes a full 4-year professional engineering 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.

Professional work in engineering, like that in other professions, is marked by continuing personal effort to keep abreast of the advancing and changing discipline. Continuing education in engineering and related fields is an important element of full professional competence as an engineer that should be considered in evaluating the qualifications of applicants for professional engineering positions.

In some situations, experience may be creditable even if it is not clearly professional engineering work. In such cases, the experience must have been preceded by prior responsible professional engineering experience and must contribute directly and significantly to the applicant's engineering competence. For example, an engineer might be assigned to a management-type position in preparation for assumption of higher-level responsibilities in engineering project or program management.

### *Graduate Education:*

1. Individuals can be converted noncompetitively to a GS-9 position if they complete all the requirements of a Federal graduate-level student-trainee program, including completion of a master's degree in engineering and completion of 640 hours of work experience, 320 hours of which was at GS-7.

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## GS-800 (Continued)

2. Regardless of the field of undergraduate study, completion of the requirements for a master's or higher degree in engineering 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.
3. With a bachelor's degree in engineering, 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. Such selective factors can be used for positions at all grade levels covered by this standard.

*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.

*The Engineer-in-Training Test:* The Engineer-in-Training (EIT) test is the first part of the professional registration examination for engineers in the various States. The EIT test is a test of engineering fundamentals generally taken by engineering school seniors or recent graduates. Those who pass are certified as Engineer-in-Training. The second part of the registration examination, covering practice in a branch of engineering, is taken after a specified period of experience required for registration as a professional engineer.

## GS-800 (Continued)

The EIT test is used under this standard to determine whether competitors without a degree in engineering or other qualifying education have a knowledge and understanding of mathematical, physical, and engineering sciences required to perform professional engineering work in a specialty field of engineering. This test is not to be considered as being in lieu of the requirement of at least 4 years of experience and/or education that might be regarded as providing such knowledge.

The EIT test is developed and administered by the State Board of Engineering Examiners in each State or comparable jurisdiction. The test is not administered by the U. S. Office of Personnel Management. Persons who desire to take the Engineer-in-Training test should direct their inquiries to the Secretaries of the appropriate State Boards.

*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.

*Guide for the Evaluation of Engineering Curricula:* The Accreditation Board for Engineering and Technology (formerly the Engineers' Council for Professional Development) accredits specific engineering and engineering technology curricula; it does not accredit institutions. Thus, an accredited college may have (1) ABET-accredited professional engineering curricula; (2) professional engineering curricula that are not ABET-accredited; and (3) 4-year curricula in engineering technology that may or may not be ABET-accredited.

The Accreditation Board for Engineering and Technology publishes two bulletins: "Accredited Curricula Leading to First Degrees in Engineering" and "Accredited Curricula Leading to First Degrees in Engineering Technology." Those wishing to obtain copies of these bulletins should contact the Accreditation Board for Engineering and Technology, 345 East 47th Street, New York, N.Y. 10017. A summary of ABET-accredited engineering programs also appears periodically in the *Journal of Engineering Education*.

Some engineering curricula are acceptable as meeting the basic requirements even though such curricula are not specifically accredited by the Accreditation Board for Engineering and Technology. As a general rule, any professional engineering curriculum in an engineering school that has one or more of its curricula accredited by ABET may be accepted. It should be noted, however, that some universities have curricula identified as engineering curricula outside the engineering school, e.g., in the school of architecture or forestry. Such curricula need to be reviewed to see if they comply with the requirements of paragraph A.(2) of the basic requirements.



**GS-801**                                    **General Engineering Series**                                    **GS-801**  
*Use the GS-800 individual occupational requirements for Professional Engineering Positions.*

**GS-806**                                    **Materials Engineering Series**                                    **GS-806**  
*Use the GS-800 individual occupational requirements for Professional Engineering Positions.*

**GS-830**                                    **Mechanical Engineering Series**                                    **GS-830**  
*Use the GS-800 individual occupational requirements for Professional Engineering Positions.*

**GS-850**                                    **Electrical Engineering Series**                                    **GS-850**  
*Use the GS-800 individual occupational requirements for Professional Engineering Positions.*

**GS-855**                                    **Electronics Engineering Series**                                    **GS-855**  
*Use the GS-800 individual occupational requirements for Professional Engineering Positions.*

**GS-858**                                    **Biomedical Engineering Series**                                    **GS-858**  
*Use the GS-800 individual occupational requirements for Professional Engineering Positions.*

**GS-893**                                    **Chemical Engineering Series**                                    **GS-893**  
*Use the GS-800 individual occupational requirements for Professional Engineering Positions.*