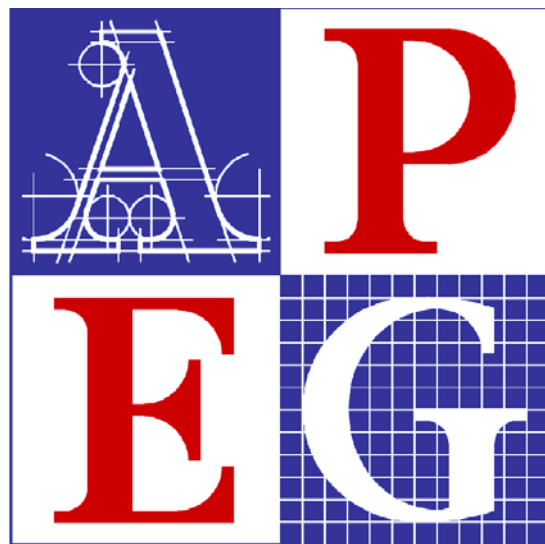


Engineers and Geoscientists
in Training

Program Guide



Professional Engineers
and Geoscientists of BC

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VISION

"To be the innovative leader respected by government, community and members in British Columbia"

MISSION

"To serve the public interest through regulation and leadership of the practice of professional engineering and professional geoscience in British Columbia"

Engineers and Geoscientists In Training Program Guide

◆ The policies and procedures in this Guide are subject to change

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PROFESSIONAL ENGINEERING AND PROFESSIONAL GEOSCIENCE IN BRITISH COLUMBIA

In Canada, the professions fall under the jurisdiction of the provinces and territories. In British Columbia the practices of professional engineering[♦] and geoscience are controlled through an act of the provincial legislature, as are those of other professions such as accounting, architecture, dentistry, forestry, law, medicine, pharmacy, etc. Specifically, engineering and geoscience are covered by the Engineers and Geoscientists Act (the Act), which gives the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC) the responsibility for its administration.

By virtue of the Act, Bylaws and Code of Ethics, APEGBC establishes and regulates standards of admission to membership, disciplines members for incompetent or unethical practice, and enforces the provisions that restrict the practice of engineering and geoscience in British Columbia to APEGBC members and licensees.

APEGBC's legislation defines the **practice of professional engineering** as

the carrying on of chemical, civil, electrical, forest, geological, mechanical, metallurgical, mining or structural engineering, and other disciplines of engineering that may be designated by the council and for which university engineering programs have been accredited by the Canadian Engineering Accreditation Board or by a body which, in the opinion of the council, is its equivalent, and includes reporting on, designing, or directing the construction of any works that require for their design, or the supervision of their construction, or the supervision of their maintenance, such experience and technical knowledge as are required by or under this Act for the admission by examination to membership in the association, and, without limitation, includes reporting on, designing or directing the construction of public utilities, industrial works, railways, bridges, highways, canals, harbour works, river improvements, lighthouses, wet docks, dry docks, floating docks, launch ways, marine ways, steam engines, turbines, pumps, internal combustion engines, airships and airplanes, electrical machinery and apparatus, chemical operations, machinery, and works for the development, transmission or application of power, light and heat, grain elevators, municipal works, irrigation works, sewage disposal works, drainage works, incinerators, hydraulic works, and all other engineering works, and all buildings necessary to the proper housing, installation and operation of the engineering works embraced in this definition;

The **practice of professional geoscience** is similarly defined as

reporting, advising, acquiring, processing, evaluating, interpreting, surveying, sampling or examining related to any activity that

- (a) is directed towards the discovery or development of oil, natural gas, coal, metallic or non-metallic minerals, precious stones, other natural resources or water, or the investigation of surface or sub-surface geological conditions, and*
- (b) requires the professional application of the principles of geology, geophysics or geochemistry;*

[♦] The terms *engineer, engineering, professional engineer, P.Eng., consulting engineer, ingénieur, ing., ingénieur conseil, genie* and *ingenierie* are official marks held by Engineers Canada on behalf of its Constituent Members. (Source: Guideline on Admission to the Practice of Engineering in Canada.)

APEGBC's ROLE

APEGBC's roles include both legislated functions that benefit the public and member services that benefit its members.

Legislated Responsibilities

In discharging its responsibility under the Act to serve and protect the public and the environment in matters relating to professional engineering and professional geoscience, APEGBC is responsible for:

- providing counsel and encouragement to those considering engineering or geoscience as a career
- establishing and maintaining standards of education and qualifications for registration of members and licensees
- registering or licensing those who are qualified to practice professional engineering and professional geoscience
- establishing and maintaining standards of practice to enhance the quality of the practice of professional engineering and professional geoscience by its members
- promoting the professions of engineering and geoscience by educating the public about the roles and responsibilities to society of professional engineers, professional geoscientists, licensees and members in training
- enforcing the provisions of the Act by prosecuting those who attempt to practice without a licence and disciplining members who contravene the Act, Bylaws or Code of Ethics
- prescribing and enforcing standards of ethical conduct
- mediating disputes concerning fees and standards of practice
- promoting continuing education for its members to maintain their competency and to enhance their overall value to society
- enhancing inter-Association mobility of its members through the Engineers Canada and the Canadian Council of Professional Geoscientists agreements
- upholding and protecting the interests of its members in their role of serving and protecting the public and the environment

Member Services

APEGBC's core business of regulating the practice of the professions and safeguarding the public and the environment helps to provide key professional benefits relied upon by members and licensees.

APEGBC also provides exclusive member services in the form of:

- Insurance Programs
 - (Auto, Accident Protection, Disability, Dental, Extended Health, Group Term Life, Home, Home Business, Professional and Secondary Liability).
- Health Services
- Financial Services/Financial Planning
- Fuel Discount
- Family Entertainment
- Accommodation
- Auto Rental
- Airport Parking

- Mobile Phone
- *Connections*, a monthly HTML e-newsletter, delivering relevant news to APEGBC members in a succinct and timely manner
- *Innovation* magazine keeps members informed of the local, provincial and national events affecting the engineering and geoscience professions
- An active public relations program makes P.Engs/P.Geos and their achievements widely known by circulating information internally as well as opening channels for external communications
- A resume posting service to assist members in communicating their availability for employment in the Web Site
- Engineering and Geoscience positions available in the Web Site
- Eligibility for university or APEGBC scholarships

Online Services

A number of secure, online systems for members are available on the APEGBC Web Site. These include:

- An Engineering-in-Training (EIT)/Geoscientist-in-Training (GIT) Experience Reporting and Review System that provides EIT/GITs with on-going feedback on their work experience
- A Continuing Professional Development (CPD) Recording Centre that gives members a convenient, secure place to record their professional development activities
- Registration for Continuing Professional Development courses and seminars
- Member Forums to provide members with a venue to discuss topics of interest to the professions
- Member Surveys and Polling by which members are encouraged through e-mails and surveys to voice their opinions on issues affecting practice sectors and the professions
- The Membership Directory
- Member Contact and Demographic Information Update for members to keep their information current
- Member Fee & Dues Payment that features a secure convenient credit card payment system

GRADES OF MEMBERSHIP

Registered Member

Registered Members are Canadian citizens or permanent residents of Canada who have satisfied the requirements for registration as professional engineers or professional geoscientists.

Non-Resident Licensee

This type of license is given to applicants who are neither Canadian citizens nor permanent residents of Canada, but who possess all other qualifications required for registration as professional engineers or professional geoscientists.

Limited Licensee

The Limited License recognizes and formalizes the fact that certain individuals, whose academic background or experience is not sufficient for them to become registered as professional engineers nor professional geoscientists, can be permitted to practice professional engineering or professional geoscience within a clearly defined scope of practice.

Provisional Member

Provisional Members are individuals who have met all the requirements[♦] for registration as professional engineers or professional geoscientists, but do not have at least one year of experience in a Canadian environment. Provisional Membership is only valid for 1 year from the date of issue but may be extended by the Registrar upon request.

Member in Training

Engineer-in-Training or Geoscientist-in-Training membership may be granted to an individual who has met the academic requirements and who will gain the valid engineering or geoscience experience required for professional registration.

Membership Advantage Program for Students (MAPS)

One of APEGBC's goals is to make it easier for students - aspiring engineers or geoscientists- to launch their career. MAPS is a special class of membership in APEGBC that allows students to begin shaping their future. The MAPS program focuses on:

- Increasing the interaction between students and industry professionals.
- Providing students with the means to gain education, contacts and employment, through access to APEGBC services.
- Elevating the level of knowledge that students have about their future profession.
- Acting as a guide to students in their transition from graduation to EIT or GIT.

Designated Structural Engineer

A Designated Structural Engineer (Struct.Eng.) is a Professional Engineer who has demonstrated six years of structural engineering experience, at least two of which must be in responsible charge

[♦] These requirements include academic requirements, successful completion of the Law & Ethics Seminar, Professional Practice Examination, four years experience, training and development requirement in engineering or geoscience satisfactory to Council.

of significant engineering work; who has completed a technical examination in Structural Engineering and a B.C. Codes & Practice Examination and who has demonstrated a commitment to Continuing Professional Development. A Struct.Eng. is the Professional Engineer responsible for the structural design of a building's primary structural system.

APEC and EMF Register of Professional Engineers

The Canadian Council of Professional Engineers, representing 12 provincial and territorial constituent engineering associations, has established an Asia-Pacific Economic Cooperation (APEC) and Engineering Mobility Forum (EMF) Register of Professional Engineers. This is the first step in developing protocols to allow engineers from the Canadian Registers to practice engineering in other economies.

THE ENGINEER AND GEOSCIENTIST-IN-TRAINING PROGRAM

INTRODUCTION

The EIT/GIT Program (the Program) plays a decisive role in enabling graduates to become part of the engineering and geoscience professions in British Columbia.

One of the main requirements for the success of this internship developmental program is its committed implementation by the employer. It is naturally expected that employers will provide an environment that allows trainees to receive the appropriate guidance, education and work experience to enable them to fulfill the requirements for registration as professionals. This includes gaining an understanding of what the practice of professional engineering and geoscience means with respect to the application of engineering and geoscience principles and with respect to the safe-guarding of life, health, property, economic interests, the public welfare or the environment. APEGBC encourages employers to provide trainees with in-house training, while motivating them to achieve levels of excellence and empowering them with challenging assignments that will encourage them to assume increasing levels of responsibility.

To support trainees in making informed choices as they gain their experience for registration, APEGBC provides:

- The EIT/GIT Online Reporting and Review System that provides experience credits and commentary every six to twelve month period
- Opportunities for networking through the regional branches and committees of APEGBC
- Education for employers of EIT/GIT's regarding APEGBC's registration requirements

PROGRAM OBJECTIVE

APEGBC aims to bridge the gap from university studies to professional registration by monitoring the progress of the trainees, identifying areas for correction and providing timely feedback to the trainees at regular intervals during the program.

Although university programs can expose students to the basic principles involved in a discipline and instil an attitude of lifelong learning, they cannot be realistically expected to teach them everything about practicing engineering or geoscience. The objective of the Program is to support students and graduates as they gain varying experience that will in turn allow them to make reliable professional judgements. It will help the individual trainee understand his or her relationship with the employer/client, the association/ordre, and society. The trainee can contribute to all three of these in different ways and, doing so, the trainee becomes the driving force behind his or her own success.

It is important that an EIT be under the supervision of a P.Eng. and that a GIT be supervised by a P.Geo. Ideally, the supervising P.Eng. or P.Geo. should be employed in the same company as the trainee. If this is not possible, the trainee is encouraged to contact APEGBC's Registration Department for guidance in identifying potential options for professional guidance and supervision. Periods of employment without professional supervision will be assessed on a case-by-case basis.

ROLE OF THE SUPERVISOR

A new graduate will likely lack some of the skills and knowledge required to work effectively. While enrolled in the Program, trainees should engage in the continuing professional development of their non-technical skills as well as technical skills. Non-technical skills are important factors in recruitment and career advancement decisions. Trainees should, in consultation with their supervisors/mentors, develop skills in areas such as business, communication, interpersonal interaction, problem solving, project management and management.

Supervising professionals are also, to an extent, mentors for those who report to them; and as such, they should be prepared to guide both the professional and personal development of trainees. They should expose trainees to a majority of the components of acceptable engineering and geoscience experience and ensure that they are given ample opportunities for progression both in involvement and responsibility over time.

The focus of the training should be to provide experience that will enhance the skills of the trainee in the application of his or her profession while demonstrating the importance of subscribing to the Code of Ethics and practicing to the benefit of the public.

Ideally every trainee should have a supervisor who is a professional engineer/geoscientist. In situations where the trainee's supervisor is not a professional engineer/geoscientist, the employer should ensure, where appropriate, that a professional is taking responsibility for the trainee's work. The trainee's supervisor, as well as the professional who is taking responsibility for the trainee's work (if the supervisor is not a professional), must carry out the assessments of the trainee's experience.

Trainees also need to be reminded that, in Canada, all individuals practicing engineering are required, by law, to be Licensed Professional Engineers/Ingénieurs or working under the supervision of a Professional Engineer (Ingénieur) who takes professional responsibility for the engineering work. In British Columbia, individuals who are practicing geoscience must similarly be either Licensed Professional Geoscientists or working under the supervision of a Professional Geoscientist. Work that cannot be verified by the appropriate professional cannot be used for credit towards eventual professional registration; therefore it is extremely important for the trainee to ensure that there is a professional who is taking responsibility for the work and who will be able to verify that work when the trainee applies for professional registration.

WORK EXPERIENCE REQUIREMENTS

In addition to academic qualification, applicants for registration/licensure must demonstrate their ability to put their engineering/geoscience education into practice for a specified period of time and in a supervised engineering/geoscience environment. A minimum of four years of acceptable engineering/geoscience work experience ('work experience' or 'experience') is required, including at least one year in a Canadian Environment. University studies will not be credited toward fulfilling this one-year requirement. Upon graduation, applicants are encouraged to enrol in the EIT/GIT program while fulfilling their work experience requirements.

General Requirements

All work experience will be evaluated against the criteria for acceptable work experience. All work experience obtained during post-graduate studies, while teaching engineering subjects, sales, consulting, government, or any other experience, will be evaluated against these criteria. Academic experience will be neither automatically granted nor discounted.

Acceptable engineering/geoscience work experience:

- comprises the practice of professional engineering/ geoscience
- is consistent with the field of academic qualification
- is current
- includes the application of engineering theory/knowledge of geoscience principles and practice
- includes exposure to the broad areas of practical engineering and geoscience experience, management, communication, the social implications of engineering/geoscience and sustainability
- demonstrates progression and growth
- is normally obtained following academic qualification (with pre-graduation experience limited to one year)
- is normally obtained under the guidance and supervision of a professional engineer/ geoscientist in the same discipline as that of the academic formation of the applicant
- is recorded and reported to APEGBC
- is in conformance with general and discipline-specific experience guidelines approved by Council and published by APEGBC

It is recognized that the number of occupational specializations within engineering/geoscience continues to increase, matched by an increasing number of specialized university programs. It is important that the academic study be relevant to the experience gained if the trainee is to become registered after the minimum allowable period of experience. The less correlation there is between the academic training and the experience, the longer the qualifying period. Experience must be sufficiently current to be meaningful. APEGBC reserves the right to deny credit for experience gained early in the career of an applicant whose work has since been outside the professions.

A trainee whose experience is in an area markedly different from the field of the degree may be required to have more experience and/or education to qualify; or to complete examinations, or to present a solely authored report to a review panel. Registration through certain disciplines such as computer, environmental, integrated, marine, naval architectural, forest or software engineering requires fulfilment of specific academic and/or experience criteria. Disciplines such as structural engineering may require more than four years of experience and/or additional postgraduate work related to the discipline. For further details please refer to the website (<http://www.apeg.bc.ca>) or contact Registration Staff at register@apeg.bc.ca.

Experience in a Canadian Environment

At least one year of an applicant's engineering or geoscience work experience must be obtained in a Canadian environment to ensure that the applicant is familiar with the applicable Canadian engineering laws, practices, standards, customs, codes, conditions and climates.

The term 'Canadian Environment' is defined as:

- work experience obtained in Canada, supervised by a professional engineer or professional geoscientist, licensed in a Canadian or U.S. jurisdiction; or
- work experience acquired outside Canada where applicants demonstrate a good knowledge of local Canadian engineering laws, practices, standards, customs, codes, conditions, and climates for the practice of professional engineering or professional geoscience in British Columbia.

Within the four-year minimum satisfactory engineering/geoscience work experience requirement, all applicants are required to gain at least one year of satisfactory engineering/geoscience work

experience in a Canadian Environment, under the direct supervision of a Canadian professional engineer/geoscientist from the discipline of engineering/geoscience demonstrated in the experience. Where appropriate, Council in its discretion may accept as equivalent the direct supervision of other supporting referees/references.

This is to ensure that applicants have demonstrated that they have had experience of a satisfactory depth and breadth; and that they are conversant with the applicable laws, practices, standards, customs, codes, conditions and climates specific to the practice of professional engineering/geoscience in Canada.

In exceptional circumstances, a candidate with less than one year of satisfactory engineering/geoscience experience in a Canadian Environment may be deemed, at the discretion of council, to have satisfied the requirement. Each case will be assessed on its own merits.

All applicants must demonstrate that their Canadian Environment experience:

1. is supported by the undergraduate and/or postgraduate academic formation of the applicant;
2. is supported by a minimum of two Canadian professional engineer/geoscientist referees/references from the discipline of engineering/geoscience demonstrated in the experience, and who have detailed knowledge of the work of the applicant; or supporting referees/references that is at Council's discretion to accept as equivalent;
3. is broad-based and at the level of complexity and responsibility that demonstrates that the applicant is ready to accept the full professional responsibility held by registered professional engineers/geoscientists, and has reached the level of professional maturity needed to judge when he/she is out of his/her area of competence. This includes the application of engineering/geoscience principles at a satisfactory level, adhering to APEGBC's Satisfactory Engineering/Geoscience requirement.

Pre-Graduation Experience

Up to a maximum of one year of pre-graduation experience may be accepted, if it is supervised by a professional engineer/geoscientist (or foreign equivalent), and if it otherwise satisfies the work experience criteria. The following conditions apply:

- for graduates of Canadian Engineering Accreditation Board (CEAB) accredited engineering programs or Canadian undergraduate geoscience programs, the pre-graduation experience must have been obtained following the completion of at least one-half of the undergraduate program's coursework;
- for examination candidates, the pre-academic qualification experience must have been obtained following the completion of at least one-half of the examinations assigned;
- for confirmatory engineering examination candidates, the pre-academic qualification experience must have been obtained following the completion of at least one-half of the undergraduate program's coursework; and
- for technologists who subsequently obtain engineering/geoscience degrees, experience obtained prior to academic qualification may be acceptable.

Teaching of Engineering /Geoscience Subjects

Generally, the teaching of engineering/geoscience subjects that include significant engineering science/geoscience and engineering design content (typically third- and fourth-year courses) is considered to be the practice of professional engineering/geoscience, while the teaching of basic mathematics and science courses is not. Teaching first- and second year university courses and

community-college courses is not normally considered to be acceptable engineering/ geoscience work experience.

Acceptable Engineering Work Experience

Work experience is an essential element in determining whether or not an individual is acceptable for professional registration/licensure. The responsibility for providing the proper environment, opportunities, range and progression of activities necessary to meet the work experience requirements rests with the employers of applicants, and the individuals who provide supervision during the internship period. Acceptable engineering work experience must include the application of theory and should provide exposure to, or experience in the broad areas of practical experience, management, communication, sustainability and the social implications of engineering. Assessment of the acceptability of the work experience is based on the extent to which the applicant's experience includes these areas, each of which is outlined in the following sections.

1. Application of Theory

The skilful application of theory is the hallmark of quality engineering work, and an applicant's experience shall include meaningful participation in one or more of the following:

- a. Analysis**
scope and operating conditions, feasibility assessment, safety and environmental issues, technology assessment, and economic assessment, etc.;
- b. Design and Synthesis**
functionality or product specification, component selection, integration of components and subsystems into larger systems, reliability and maintenance factors, human and environmental aspects, and the societal implications of the product or process, etc;
- c. Testing Methods**
devising testing methodology and techniques, functional specification verification, and new product or technology commissioning and assessment, etc.; and
- d. Implementation Methods**
technology application, engineering cost studies, optimization techniques, process flow and time studies, quality assurance implementation, cost/benefit analysis, safety and environmental issues and recommendations, and maintenance and replacement evaluation, etc.

2. Practical Experience

Practical experience allows applicants to understand the practical limitations of real systems. Practical experience should include:

- a. site visits to existing engineering works, with opportunities to see equipment and systems in both operational and maintenance circumstances;
- b. application of equipment as part of the larger system, including, for example, the merits of reliability, the role of computer software, and understanding the end product or engineering work in relationship to the equipment;

- c. opportunities to experience and understand the limitations of practical engineering and related human systems in achieving desired goals, including limitations of production methods, manufacturing tolerances, performance minima, maintenance philosophies, etc.; and
- d. opportunities to experience the significance of time in the engineering process, including workflow, scheduling, equipment wear-out and replacement scheduling, etc.

3. Management of Engineering

Management of engineering works includes the supervision of staff, project management, general exposure to an engineering business environment, and the management of technology.

Engineering management includes:

- a. planning, from conception through to implementation. This includes: needs assessment, concept development, assessment of resources required, and assessment of impacts, including societal and project implementation;
- b. scheduling, from establishing interactions and constraints, developing activity or task schedules, and allocation of resources, through to the assessment of delay impacts and beyond to broader aspects, such as interactions with other projects and the marketplace;
- c. budgeting, including the development of preliminary and detailed budgets, identifying labour, materials and overhead, risk analysis, life-cycle analysis, and tracking;
- d. supervision, including leadership, professional conduct, organization of human resources, team building, and management of technology;
- e. project control, including co-ordination of work phases, tracking and monitoring costs and progress, and implementing changes to reflect actual progress and needs; and
- f. risk-analysis related to operating equipment and system performance, product performance evaluation, and evaluation of societal and environmental impacts.

4. Communication Skills

Developing and practicing communication skills is an essential experience requirement. This applies to all areas of the work environment including communication with superiors, colleagues, regulators, clients, and the public.

Applicants should have regular and progressive opportunities to participate in:

- a. preparation of written work, including day-to-day correspondence, record-keeping, and report writing;
- b. making oral reports or presentations to colleagues, supervisors, senior management, and an exposure to, or participation in, reports to clients and regulators; and
- c. making public presentations.

5. Social Implications of Engineering

The overriding objective of the “social implications of engineering” requirement is to provide experiences which increase awareness of an engineer's professional responsibility, to guard against conditions dangerous or threatening to life, limb, property, or the environment, and to call any such conditions to the attention of those responsible.

The social implications of engineering are an important aspect of the practice of engineering. The work environment should provide opportunities for applicants to heighten their awareness of the potential consequences of engineering work. This should include:

- a. a recognition of the value and benefits of the engineering work to the public;
- b. an understanding of the safeguards required to protect the public and methods of mitigating adverse impacts;
- c. an understanding of the relationship between the engineering activity and the public;
- d. a demonstrated interest and involvement in the broader social implications of engineering;
- e. an appreciation of the role of regulatory bodies on the practice of engineering; and
- f. an understanding of the provincial health and safety of the workplace legislation.

6. Sustainability

The Association of Professional Engineers and Geoscientists of British Columbia is committed to integrating sustainability principles and practices into engineering and geoscience professions in the province of B.C.

All Engineers-in-Training are expected to:

- a. maintain a basic awareness of the principles of sustainability. The Association's web site contains several sources of information on this subject.
- b. an awareness of any specific sustainability clauses that have been added to practice guidelines that apply to their area.
- c. to the extent possible, recognizing their position of influence, consider how sustainability principles could be applied and promoted in their specific work.
- d. support opportunities to form partnerships with others, such as government and public bodies, educational institutions and other professional associations, to expand the global networks that seek to embed sustainability concepts in society as a whole.

7. Sponsorship

Referees provide confirmation of the EIT's experience. References are required from practicing professional engineers familiar with details of the EIT's work during the internship. Present and past direct supervisors are the most suitable referees. If a candidate claims experience from several positions, extra references may be required.

All EITs are asked to obtain four or more Canadian and/or U.S. referees. All should be professional engineers with first-hand knowledge of the EIT's work. At least two of the referees should have directly supervised the EIT and at least one professional engineer familiar with the EIT's work from outside his or her company should be nominated if possible. Professional engineers with indirect knowledge of the EIT's work may be used if absolutely necessary. If experience outside Canada must be verified, additional referees are required. It is recognized that these international referees may not be professional engineers. The EIT should aim to cover his or her entire work history with a least one reference for each period of time. A separate letter is required to explain if the EIT cannot nominate the required referees. Please refer to the reference forms for more information.

Referee Roles & Responsibilities

Referees are a critical element in the licensure process. Referees must have first hand knowledge on the applicant's work and the applicant must have been under suitable professional supervision throughout. Referees are urged to consider their assessment carefully and to provide as much input and guidance as possible concerning the readiness of the applicant for registration as a Professional Engineer. Referees are asked to comment on the character of the applicant, his/her ability to communicate effectively, professional knowledge and judgment, details of work performed, and its judgment of its level and quality.

Referees must ensure that each period that is certified qualifies as true engineering experience, within the context of the Satisfactory Engineering Experience Guidelines, and that the referee is familiar with the details of the engineering work, either through direct supervision or ongoing direct contact with the applicant.

Number, Coverage, Eligibility

The number of references combined with the type of engineering work claimed by the Candidate should verify that the criteria of for satisfactory engineering experience are met.

Candidates are required to nominate at least four referees to verify experience which cover as much of the work history as possible, with a minimum of four years.

Referees must be Professional Engineers, registered in Canada or the United States, or equivalent in the country in which the experience has been gained, and with first hand knowledge of the Candidate's work.

- At least two of the referees should have directly supervised the candidate
- At least one referee must be familiar with the Candidate's work from outside his/her company if possible
- Engineers with indirect knowledge on the Candidate's work can be nominated, if necessary.

If the referee is not a Professional Engineer, the referee will be asked to provide a resume to establish professional equivalency.

Additional referees must be nominated if experience outside Canada or the United States must be verified

Acceptable Geoscience Work Experience

The following criteria are designed to provide guidance to GITs, employers and supervisors with respect to the level of experience expected of a GIT applying for professional registration or licensure.

1. Application of the Knowledge of Geoscience Principles and Practice

The skilful application of geoscience knowledge is essential to earning a professional registration or licensure. To be accepted, a candidate's experience must include active and responsible participation in several aspects of geoscience:

- a. geoscience training and familiarisation;
- b. technical geoscience experience;
- c. development of geologic concepts: preparation of reports concerning deposits of rocks, minerals or other naturally-occurring earth materials;
- d. mapping and systematic geoscience evaluation (with specific reference to bedrock, unconsolidated earth materials and/or snow, ice, groundwater, surface water and constituents thereof);
- e. acquisition of sufficient field and other applied knowledge to gain a thorough appreciation of the natural variability of geological materials and the constraints imposed by data collection; and
- f. identification of geologic hazards and risk to the public and the environment.

2. Management

Management in Geoscience includes supervision of staff, planning, scheduling, project leadership and control, budgeting, risk assessment and the socially responsible application of geoscientific principles and practices. GITs must be able to document reasonable progression toward increasing management involvement and responsibility over time.

3. Communication Skills

During the training period, GITs should be required to communicate effectively with superiors, co-workers, government regulators, clients and the general public. They should become proficient in the written and oral presentation of geoscience from daily record keeping to major reports.

4. Social Implications of Geoscience

The practice of geoscience has significant impact on the public in the fields of public and environmental safety, industry, finance and education. GITs should become aware of the professional geoscientist's role in society and the social impact of projects in which they are involved. They should understand the role of the professional geoscientist from these points of view, including environmental, economic and the advancement of knowledge. The objective is to foster an awareness of the professional geoscientist's professional responsibility to guard against conditions that threaten life, property or the environment and to call such conditions to the attention of those responsible.

5. Sustainability

The Association of Professional Engineers and Geoscientists of British Columbia is committed to integrating sustainability principles and practices into engineering and geoscience professions in the province of B.C.

All Geoscientist-in-Training are expected to:

- a. Maintain a basic awareness of the principles of sustainability. The Association's web site contains several sources of information on this subject.
- b. Be aware of any specific sustainability clauses that have been added to practice guidelines that apply to their area.
- c. To the extent possible, recognizing their position of influence, consider how sustainability principles could be applied and promoted in their specific work.
- d. Support opportunities to form partnerships with others, such as government and public bodies, educational institutions and other professional associations, to expand the global networks that seek to embed sustainability concepts in society as a whole.

6. Sponsorship

Referees provide confirmation of the GIT's experience. References are required from practicing professional geoscientists familiar with details of the GIT's work during the internship. Present and past direct supervisors are the most suitable referees. If a candidate claims experience from several positions, extra references may be required.

All GIT's are asked to obtain four or more Canadian and/or US referees. All should be professional geoscientists with first-hand knowledge of the GIT's work. At least two of the referees should have directly supervised the GIT and at least one professional geoscientist

from outside the company, who is familiar with his or her work, should be nominated if possible. Professional Geoscientists with indirect knowledge of the candidate's work may be used if absolutely necessary. If experience outside Canada/United States must be verified, additional referees are required. It is recognized that these international referees may not be professional geoscientists. The GIT should aim to cover his or her entire work history with at least one reference for each period of time. A separate letter is required to explain if the candidate cannot nominate the required referees. Please refer to the reference forms for more information.

Referee Roles & Responsibilities

Referees are a critical element in the licensure process. Referees must have first hand knowledge on the applicant's work and the applicant must have been under suitable professional supervision throughout. Referees are urged to consider their assessment carefully and to provide as much input and guidance as possible concerning the readiness of the applicant for registration as a Professional Geoscientist. Referees are asked to comment on the character of the applicant, his/her ability to communicate effectively, professional knowledge and judgment, details of work performed, and its judgment of its level and quality.

Referees must ensure that each period that is certified qualifies as true engineering experience, within the context of the Satisfactory Geoscience Experience Guidelines, and that the referee is familiar with the details of the geoscience work, either through direct supervision or ongoing direct contact with the applicant.

Number, Coverage, Eligibility

The number of references combined with the type of engineering work claimed by the Candidate should verify that the criteria of for satisfactory geoscience experience are met.

Candidates are required to nominate at least four referees to verify experience that cover as much of the work history as possible, with a minimum of four years.

Referees must be Professional Geoscientists, registered in Canada or the United States, or equivalent in the country in which the experience has been gained, and with first hand knowledge of the Candidate's work.

- At least two of the referees should have directly supervised the candidate
- At least one referee must be familiar with the Candidate's work from outside his/her company if possible
- Geoscientists with indirect knowledge on the Candidate's work can be nominated, if necessary.

If the referee is not a Professional Geoscientist, the referee will be asked to provide a resume to establish professional equivalency.

Additional referees must be nominated if experience outside Canada or the United States must be verified

Work Environment

The work environment of the trainee should provide an opportunity to develop an understanding and observe the application of the laws and regulations governing the practice of

engineering/geoscience in the jurisdiction of practice, and to gain an appreciation of business and social ethics in a professional engineering/geoscience work environment. This will enable the trainee to understand:

- A need to develop a social and environmental awareness.
- The role of the Profession in society.
- And apply the concepts of professionalism with respect to protecting the public interest.
- The need to support the association in return for the privilege of practising in a self-regulated profession.
- And observe the importance of working at all times within the limits of personal training and experience.
- Responsibility/accountability and liability.
- The laws and regulations governing the practice of the profession in the jurisdiction.

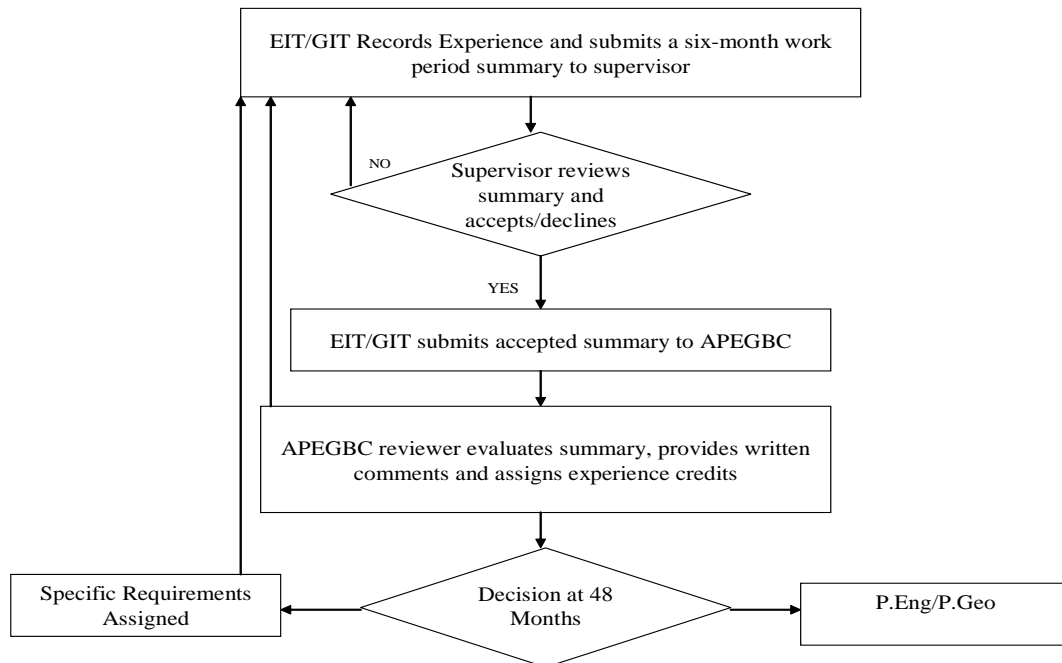
Reporting and Review of Work Experience

An online experience reporting system is available to EITs/GITs to get feedback on experience from P.Eng./P.Geo. members prior to their applying for P.Eng./P.Geo. registration. Through this system, trainees and senior student members of APEGBC (MAPS) can report their experience online in six or twelve month time periods so that experience credits and feedback can be accumulated during the pre and post graduation periods as part of the 48-month experience requirement to apply for P.Eng./PGeo.

Trainees get the most value from this system by using it early in their work experience so that they can be given feedback in terms of experience credits (in months) and comments from experience reviewers. Experience can be recorded retroactively, starting from any experience the trainee or MAPS member may have gained after second year of university studies in engineering/geoscience. MAPS members can gain up to twelve months of credit for work experience completed after their second year of studies and before they are granted their degree.

When a trainee decides to begin to report work experience using the online system in six or twelve month work summary time periods, he/she should first verify that his/her P.Eng./P.Geo. supervisor is available and willing to use this system to approve the work summaries. It is a requirement of the system that work experience be reported chronologically, once the oldest experience is given comment and credit, the next work summary can be sent to the online reviewer for comment and credit. The online system user will receive notification via e-mail that their work summary has been reviewed. Generally the review process can take up to 30 days to be completed.

The following flowchart depicts a typical six-month reporting cycle:



Once a trainee has received 42 months of credit, he or she will be asked to submit the final work summary using the online system.

At this time the EIT/GIT member will be asked to submit a P.Eng./P.Geo. application for membership and arrange to have completed reference forms sent directly to APEGBC. These forms are available on the APEGBC website.

Once the completed application form and references are received by APEGBC the final review process will begin. This process generally takes up to eight weeks to complete. Typical results will include registration as a P.Eng/P.Geo, an invitation to attend an interview to discuss the trainee's experience, or an assignment of specific experience and/or training.

GOOD CHARACTER AND REPUTATION

EIT/GITs must demonstrate good character and reputation. The underlying objectives of this requirement are public protection, the maintenance of high professional standards, and the maintenance of public confidence in the engineering/geoscience professions.

An applicant may not meet the definition of good character when he or she:

- obtains or attempts to obtain registration/ licensure by fraudulent means. This may involve providing forged/fraudulent documentation, cheating on examinations, or making or causing to be made false statement(s) in the application processes, etc;
- has committed an act or acts that are inconsistent with the Code of Ethics and has not been rehabilitated or has not made adequate reparation; or
- has been convicted in Canada or elsewhere of an offence that, if committed in British Columbia, would be an offence under an enactment of the Province or of Canada , and

that the nature or circumstances of the offence render the person unsuitable for registration or licensing.

Good character connotes moral and ethical strength and includes integrity, candor, honesty and trustworthiness. Good character is assessed through self-disclosure questions in the application form, direct contact during the application process, and the comments of referees.

LANGUAGE REQUIREMENT

An applicant must be able to communicate effectively in English with the public, colleagues, employers, and others. Communication should be clear and professional, both orally and in writing. English language skills are assessed through various means such as the written documentation submitted by the applicant, the applicant's performance in the Professional Practice Examination, and the comments received from the applicant's references.

THE PROFESSIONAL PRACTICE EXAMINATION

The examination is designed to ensure that trainees are aware of the principles of professional practice, have a general understanding of Canadian law as it applies to P.Eng./P.Geo's and understand the laws and regulations governing the practice of engineering and geoscience in British Columbia. Approximately one-half of the examination tests the applicant's understanding of professionalism; while the remaining one-half tests the applicant's knowledge of engineering/geoscience law and familiarity with various statutes, rules and regulations.

Although it is recognized that engineering/geoscience practice is not always distinct from engineering/geoscience law, the subject matter to be covered by the professional practice examination has been broadly categorized under the headings of "professionalism" and "engineering/geoscience law".

The Professional Practice Examination is currently composed of two sections: multiple choice (2 hrs) and essay question (1 hr). Both sections must be passed to pass the examination. A failure of one section requires that a candidate repeat the section failed and not the entire examination. The Professional Practice Examination can be attempted after the applicant has submitted a completed application for registration, paid the required application fee and submitted a detailed summary of at least 24 self-assessed months of post-bachelors engineering or geoscience experience.

Professionalism

Topics covered by the examination in the general areas of engineering/geoscience practice and ethics include, but are not limited to: the definition of professional engineering/geoscience; the role of APEGBC and the responsibilities associated with self-governance; professional accountability, conduct and ethics, the P.Eng./P.Geo.'s responsibility to the public and duty to report illegal or unethical engineering/geoscience practice; the ethical use of the P.Eng./P.Geo.'s seal; continuing competence; and the social and environmental impacts of engineering/geoscience on society.

Engineering/Geoscience Law

Topics covered by the examination in the area of the law as it relates to P.Eng./P.Geo's and to the practice of engineering/geoscience include, but are not limited to: the basic structure of the

Canadian legal system, common law, statute law and the provincial court system; tort law, liability and liability issues; business organizations; contract law, specifications and tendering, discharge and breach of contract, bonding, estoppel and construction lien legislation; intellectual property, patents, technology transfer, copyrights, trademarks, industrial designs and trade secrets; fiduciary responsibility; professional advertising, unfair competition and merchandising rights; dispute resolution, negotiation and arbitration; litigation and the engineer as expert witness; the Canadian Human Rights Act; environmental legislation; worker's compensation and occupational health and safety legislation.

THE LAW AND ETHICS SEMINAR

All applicants for registration as professional engineers, professional geoscientists or limited licence in British Columbia must complete the Law and Ethics Seminar at any time after applying for registration. This can be done in one of two ways:

1. by attending the two-day seminar in person; or
2. by purchasing and viewing the CD version of the seminar. Upon completion, the candidate must sign a declaration that he or she has viewed the contents of the CD set in their entirety.

The Law Session

Practical Law for P.Eng./P.Geo's

This session reviews a variety of legal practices pertaining to engineering and geoscience. It gives information about Contract Law, Tort Law, Liability, and Dispute Resolution.

Occupational Health and Safety

This topic covers Occupational Health and Safety Regulations and gives information on codes, standards and legislation that govern workers and workplaces in BC.

Employment Law

This topic covers Employer and Employee duties as well as the laws that govern the rights of individuals in the workplace. Emphasis is placed on Common Law, the Employment Standards Act, the Human Rights Code, and the Labour Relations Code.

The Ethics Session

The Professions - Engineering and Geoscience

APEGBC, Engineers Canada and the Canadian Council of Professional Geoscientists (CCPG) play a key role in the practice of P.Eng./P.Geo's. This session examines the activities and responsibilities of these three organizations.

Professional Practice and Ethics

Professional Practice and Ethics are important cornerstones in the practice of P.Eng/P.Geo's. This session addresses issues such as quality management, practice review, discipline and enforcement with active participation from the audience.

A Case Study

The audience will participate in discussions regarding the ethical issues and disciplinary processes of this case study.

Discipline Hearings

This section reviews the investigation and discipline process when a member's conduct is questioned.

PROFESSIONAL DEVELOPMENT

An EIT/GIT's professional development activities are considered by APEGBC as part of the experience, training, and development requirements of the EIT/GIT program. Professional development should include non-technical skills as well as technical skills. The key non-technical skills that have taken on increased importance are skills required to ensure the effectiveness of a team and include:

- Communication
- Interpersonal Skills
- Project Management
- Problem Solving
- Management
- Business

Trainees are responsible for acquiring technical skills; they may require some supplementary technical training in specialized areas, such as dangerous/hazardous materials management, environmental regulations, codes and standards and regulatory compliance. Also, technical training may be required to bridge the gap for those who practice outside their disciplines of study. It is expected that, in most cases, the employer will provide any specialized training required by the trainee. Some means through which professional developmental may be pursued are:

Formal Methods

Formal activities are those provided as a structured course or program: often for credit, occasionally with an evaluation process. Delivery methods might include traditional classroom settings, and remote techniques such as written correspondence, video, or interactive electronic exchange. Formal activities could include:

- Courses provided through universities, technical institutes and colleges
- Industry sponsored courses, programs and seminars
- Employer training programs and structured on-the-job training
- Short courses, technical sessions, seminars and workshops provided by technical societies or educational institutions

Informal Methods

These are activities not normally offered by an educational institution or other non-structured course, but which nevertheless expand your knowledge, skills or judgement. They include:

- Self-directed study
- Instructing/ lecturing for courses or seminars
- Writing technical or professional papers
- Attendance at conferences and industry trade shows
- Attendance at meetings of technical, professional or managerial associations or societies
- Structured discussion of technical or professional issues with one's peers

Participation-Related Development

Activities that promote peer interaction and provide exposure to new ideas and technologies both enhance the profession and serve the public interest by ensuring that the trainee develops into a professional who is a well-rounded member of the community. The trainee's participation-related development should allow for:

- An appreciation of the importance of volunteer service to, and on behalf of, the engineering/geoscience profession and contribution to the profession by the trainee.
- The development of interpersonal and other personal skills, such as organizational, teamwork and delegation skills.
- An improved awareness of contributions of professional engineer/geoscience to society as well as contributions to society by the trainee.

The following are examples of activities in these areas

- Mentoring/ tutoring others
- Private reading, including current publications
- Networking with other professionals outside work (i.e. through committees)
- Serving on a board or committee in an engineering/geoscience capacity
- Community/professional activities

Presentations

Technical or professional presentations that you prepare and present outside your normal job functions. Presentations might occur at:

- A conference, workshop or seminar
- An event sponsored by a technical or professional association
- Career days or careers symposiums

Contributions to Knowledge

This category includes activities that expand or develop the technical knowledge base in the discipline of engineering or geoscience. These activities include:

- Development of published codes and standards
- Patents
- Publications of paper or articles
- Reviewing articles or editing publications for a paper.

APEGBC supports a searchable database of both technical and non-technical Continuing Professional Development (CPD) opportunities for its members. Please check the website at www.apeg.bc.ca/prodev/index for further information on programs and offerings.

For more information on the EIT/GIT Program, please contact:

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Published: June 2008