May 24, 2021

Andrew Hirshfeld
Performing the functions and duties of the Under Secretary of Commerce for Intellectual Property and Director of the USPTO
P.O. Box 1450
Alexandria VA 22313–1450


Re: Comments On Proposed Changes To The General Requirements For Admission To Sit For The Patent Bar Registration Examination

Dear Commissioner Hirshfeld:


As you know, IPO is an international trade association representing a “big tent” of diverse companies, law firms, service providers, and individuals in all industries and fields of technology that own, or are interested in, intellectual property rights. IPO advocates for effective, affordable, and balanced IP rights and offers a wide array of services, including supporting member interests relating to legislative and international issues; analyzing current IP issues; providing information and educational services; and disseminating information to the public on the importance of intellectual property. IPO’s mission is to promote high quality and enforceable IP rights and predictable legal systems for all industries and technologies. Our vision is the global acceleration of innovation, creativity, and investment necessary to improve lives. IPO has a strategic objective to foster diverse engagement in the innovation ecosystem and to integrate diversity, equity, and inclusion in all its work.

We commend the USPTO for its work to refresh the criteria used to determine whether an individual is eligible to sit for the registration examination and generally agree with the proposals set forth in the RFC. We write to provide additional recommendations regarding these three proposals and the questions set forth in the RFC, and to propose additional recommendations to ensure that only qualified individuals may sit for the registration exam while also ensuring that IPO members can enlist the services of a suitably large and diverse set of patent practitioners.

I. Remarks on Proposal 1/Question 1

IPO supports the proposed expansion of Category A degrees to include certain degrees currently listed under Category B. All the identified degrees are appropriate for inclusion in Category A. We applaud the effort to streamline the application process and improve operating efficiency, while ensuring that applicants are qualified to sit for the registration examination.
However, while including the proposed set of degrees under Category A is an important step toward improving access to the patent bar by individuals having scientific and technical backgrounds, the proposed adjustment does not go far enough. Additional degrees set forth below would increase the likelihood that the patent bar will include practitioners trained in new areas of innovation and technology that patent applicants, including IPO members, now require.

IPO respectfully submits that Category A should be further expanded to include degrees that provide the requisite technical and scientific training to understand and work with some of the most important, and rapidly growing, areas of technological innovation today, such as artificial intelligence and machine learning, climate change, and applied medical care. The following degrees are ones that IPO members routinely seek in their patent practitioner representatives, and IPO submits that these degrees present *prima facie* evidence of an individual’s technical qualifications to sit for the registration examination. If the USPTO determines that it is not appropriate to include any of these suggested degrees, we would be interested in understanding the reasoning. For example, we can imagine that some fields or degrees might lack consistent accreditation requirements or consistent curricula among universities, or that in some fields only a few universities might possess the rigor to create degree programs.

A. The USPTO Should Include Computer Science Under Category A, Without Needing Supplemental Accreditation

IPO suggests amending Category A to include undergraduate and graduate computer science degrees from accredited U.S. colleges, universities, or foreign equivalents without the need for supplemental accreditation. While the USPTO does permit computer science under Category A, it does so under limited circumstances. U.S. colleges and universities are currently accredited by various regional bodies as a matter of course. Regardless, the USPTO requires such institutions to separately pay for and seek supplemental “accreditation” for computer science departments from a third-party organization, CSAB or ABET.1 Putting the burden on an accredited U.S. college, university, or foreign equivalent to seek and pay for supplemental accreditation from a third-party organization for a single degree program so that its graduates can pursue a patent attorney or agent career creates an unnecessary barrier to the profession for these graduates.

For example, Stanford University, Carnegie Mellon University, and the University of California-Berkeley have widely respected computer science programs.2 But none of these programs are accredited by CSAB or ABET. Therefore, computer science graduates from these schools—and countless other U.S. accredited colleges and universities—must jump through additional hoops to qualify under Category B merely because their schools choose not to seek supplemental accreditation by CSAB or ABET. The time for a change is now, especially in light of the need for competent patent attorneys and agents in the software arts.

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1 *General Requirements Bulletin for Admission to the Examination for Registration to Practice in Patent Cases before the United States Patent and Trademark Office, USPTO (2020)* (hereinafter “GRB 2020”) at p. 1 (requiring accreditation by the Computer Sciences Accreditation Board (CSAB) or the Accreditation Board for Engineering and Technology (ABET)).

IPO members routinely seek patent attorneys/agents who can represent them before the USPTO to pursue patent protection for software-related technology such as software applications, software simulation, data science, systems programming, computer architecture, artificial intelligence, machine learning, deep learning, cloud technologies, edge computing, Internet of Things (IoT), information security, and cybersecurity, among other technologies. The need for competent patent agents/attorneys in software technology is reflected by the increase in software-related filings at the USPTO. IPWatchdog reports that “[i]n 2019, 61.8% of issued U.S. utility patents were ‘software-related’ (up 21.64% from 2018).”

A computer science degree is an ideal foundation for patent attorneys/agents representing clients pursuing patents in the software arts. Computer science graduates develop “breadth of knowledge across the subject areas of computer science, including their ability to apply the defining processes of computer science theory, abstraction, design, and implementation to solve problems in the discipline. Students take a set of core courses. After learning the essential programming techniques and the mathematical foundations of computer science, students take courses in areas such as programming techniques, automata and complexity theory, systems programming, computer architecture, analysis of algorithms, artificial intelligence, and applications. The program prepares students for careers in government, law, and the corporate sector, and for graduate study.”

B. The USPTO Should Include Mathematics and Statistics Under Category A

IPO suggests amending Category A to include undergraduate and graduate degrees in mathematics and statistics. IPO has witnessed a growth in innovations that rely heavily on these disciplines, such as artificial intelligence and machine learning, robotics, cybersecurity, epidemiology, autonomous and semi-autonomous vehicles, and financial technologies including digital currencies. Some of the relevant technology centers are TC 1600 (Bioinformatics), TC 2120 (AI& Simulation/Modeling), TC 2430/2490 (Cryptography and Security), TC 3680 (Business Cryptography), TC 3690 (Finance/Banking), and TC 3660 (Computerized Vehicle Controls and Navigation, Robotics).

Many of these technologies are multi-disciplinary but require an understanding of complex mathematics and statistics often gained through academic study of these disciplines. These areas are core to emerging technologies. Understanding them gives rise to a deeper understanding of the critical nuances of subject matter eligibility requirements. Additionally, many of these disciplines also have a large representation of women and other underrepresented groups.

Several classes within various art units are dedicated to such technologies. The table below provides some exemplary classes:

<table>
<thead>
<tr>
<th>Class</th>
<th>Class Title</th>
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</thead>
<tbody>
<tr>
<td>380</td>
<td>Cryptography</td>
</tr>
<tr>
<td>726</td>
<td>Information security</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Code</th>
<th>Discipline Description</th>
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</thead>
<tbody>
<tr>
<td>341</td>
<td>Coded Data Generation and Conversion</td>
</tr>
<tr>
<td>700</td>
<td>Data processing: Generic Control Systems or Specific Applications</td>
</tr>
<tr>
<td>701</td>
<td>Data processing: vehicles, navigation, and relative location</td>
</tr>
<tr>
<td>702</td>
<td>Data processing: measuring, calibrating, or testing</td>
</tr>
<tr>
<td>703</td>
<td>Data processing: Structural Design, Modeling, Simulation, and Emulation</td>
</tr>
<tr>
<td>705</td>
<td>Data processing: financial, business practice, management, or cost/price determination</td>
</tr>
<tr>
<td>706</td>
<td>Data processing: Artificial Intelligence</td>
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<tr>
<td>707</td>
<td>Data processing: Database and File Management or Data Structures</td>
</tr>
<tr>
<td>715</td>
<td>Data processing: presentation processing of document, operator interface processing, and screen saver display processing</td>
</tr>
<tr>
<td>717</td>
<td>Data processing: Software Development, Installation, and Management</td>
</tr>
<tr>
<td>726</td>
<td>Information Security</td>
</tr>
</tbody>
</table>

Based on broad discipline classifications used by *U.S. News and World Report* to rank undergraduate and graduate programs, IPO proposes adding at least the following disciplines/specialties:

- Mathematics (including Analysis, Applied Mathematics, Discrete Mathematics and Combinatorics, Financial Mathematics); and
- Statistics.

C. The USPTO Should Include Additional Degrees Under Category A

IPO suggests amending Category A to include undergraduate and graduate degrees in other disciplines that cover technology areas that have witnessed a recent increase in innovation, such as biotechnology, clean energy, health care analytics, and controlling the spread of infectious diseases. There is need for competent patent agents/attorneys to represent applicants pursuing patent protection related to such technologies. Many of these technologies no longer rely on traditional engineering and science disciplines or require training in the physical sciences. Additionally, many of these disciplines also have a large representation of women and other underrepresented groups holding undergraduate and graduate degrees.

Based on broad discipline classifications used by *US News and World Report* to rank undergraduate and graduate degree programs, IPO proposes inclusion of the following disciplines/specialties within Category A, in addition to computer science, mathematics, and statistics (as set forth above):

- Natural Sciences: Biological (including Genetics, Genomics, Bioinformatics, Infectious Diseases), Chemistry, Physics, and Earth Sciences (including Geochemistry, Geophysics, Environmental Sciences); and
- Supply Chain/Logistics.
II. Remarks on Proposal 2/Question 2

As noted in the RFC, Category A does not include post-baccalaureate degrees. IPO supports the USPTO’s proposal to update the General Requirements Bulletin (“GRB”) to include possessing a master’s or a doctoral degree in a Category A subject as demonstrating acceptable technical and scientific training to sit for the registration examination. Graduate-level degrees in the Category A subjects present prima facie evidence of the necessary qualifications required of patent practitioners.

Moreover, IPO members often find it more valuable when their representatives possess these graduate degrees than undergraduate degrees in Category A subjects. The inclusion of post-baccalaureate degrees within Category A would not only welcome new practitioners with significant expertise relevant to emerging technologies, but it would also provide opportunities for the patent bar to benefit from the expertise of a wider range of individuals (including women and under-represented groups) who are currently unable to represent applicants before the USPTO. For these reasons, IPO fully endorses this proposal.

III. Remarks on Proposal 3/Question 3

Changes to Category B, Option 4

No appreciable benefit is provided by requiring eight semester hours in “two sequential courses, each containing a lab” over general core science training. We support the USPTO’s proposal to change the requirement under Category B, Option 4 to eight semester hours in a combination of chemistry, physics, and/or biology, with at least one course including a lab. This would maintain the current standard for meeting scientific and technical requirements while also providing flexibility in course selection for applicants. For example, potential patent practitioners who received class credit towards introductory level classes by passing an advanced placement (“AP”) test could more easily demonstrate their eligibility to sit for the examination if the requirement for sequential courses is removed.

Laboratory course work provides additional opportunities for students to develop and consolidate fundamental skills while acquiring key laboratory techniques and reinforcing theory. However, it is not clear that requiring “each course” to have a lab provides a significant increase in the likelihood that a patent practitioner would possess greater scientific and technical training than an

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5 Hannon, Mary T. (2020) “The Patent Bar Gender Gap: Expanding the Eligibility Requirements to Foster Inclusion and Innovation in the U.S. Patent System,” IP THEORY: Vol. 10: Iss. 1, Article 1 (“although women are outnumbered by men in nearly all subjects at the graduate levels – except for psychology, biological sciences, and social sciences – women appear to obtain master’s level graduate degrees at higher rates than their male counterparts.”).

6 See, e.g., Student Score Distributions AP Exams – May 2020, COLLEGE BOARD (2020), https://secure-media.collegeboard.org/digitalServices/pdf/research/2020/Student-Score-Distributions-2020.pdf (In May of 2020, 81,811 high school students received a 3 or higher on their AP Chemistry exam; 77,169 high school students received a 3 or higher on their AP Physics 1 exam; and 161,229 high school students received a 3 or higher on their AP Biology exam).
eligible course lacking a lab. Therefore, IPO also welcomes changing the laboratory requirement from “each course including a lab” to “at least one course including a lab.”

Changes to Category B, Option 2

As noted above, there is no appreciable benefit in requiring eight semester hours “in two sequential courses.” IPO, therefore, further welcomes the USPTO’s proposal to change the requirement under Category B, Option 2 to require at least “eight semester hours in a combination of chemistry and physics, with at least one course including a lab.”

IV. Effects on Diversity and Inclusion

There has been considerable discussion about the gap that women and minorities experience in obtaining patents in the U.S. and abroad. The IDEA Act of 2021, which advanced through the Senate Judiciary Committee on April 29, 2021, attempts to begin the process of addressing some of these concerns by authorizing the USPTO to conduct “collection of demographic information, including gender, race, military or veteran status, and any other demographic category that the Director determines appropriate, related to each inventor listed with an application for patent” on a voluntary basis.

IPO supports the efforts to increase diversity in patenting and to expand the eligibility requirements for patent bar membership. Building on our support the IDEA Act, we suggest that the USPTO begin the voluntary collection of demographic data for patent practitioners. Few studies have been conducted that provide an accurate view of the representation of women and minorities among registered patent practitioners other than the voluntary selection of “Mr.” or “Ms.” when completing the Application for Registration to Practice Before the United States Patent and Trademark Office. The USPTO does not collect any other voluntary demographic information from aspiring practitioners when they apply for membership to the patent bar.

The USPTO is uniquely situated to collect this information as the holder of the authoritative roll of patent practitioners in the United States. A key step in advancing the diversity and inclusion priorities of IPO’s membership is achieving an understanding of whether and to what extent women and minorities are underrepresented in the profession.

V. Comparative Practices in the EPO and Canada

The following practices are consistent with and provide further support to our suggestions, at least under Sections I, II, VI, and VII.

A. Comparative Practices in the EPO

Practitioners in Europe must pass a European Qualifying Examination (EQE) and complete a mandatory practical training to practice before the European Patent Office (EPO). Decisions on

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requisite qualifications are based on Article 11(1)(a) of the Regulation on the European qualifying examination (REE) and Rules 11 to 14 of the Implementing provisions to the REE.⁹

Rule 11¹⁰ states:

**Qualification required**

1. Pursuant to Article 11(1)(a) REE, a candidate shall be considered to have the necessary qualification if he possesses at least a university-level scientific or technical bachelor's degree, or any equivalent academic degree, in one of the subjects defined in Rule 13 or any subjects equivalent to these, from a university, technical university, technical high school, vocational college, higher technical college or institute, school of engineering, or any similar establishment having at least the academic level of the aforementioned establishments in one of the contracting states.

2. The academic degree referred to in paragraph 1 shall have been awarded at the end of a full-time course with a minimum duration of three years. At least 80% of the course hours taken to obtain this degree shall have been devoted to scientific and/or technical subjects.

3. If a candidate's qualification does not fulfil the requirements of paragraphs 1 and 2, Rule 14 shall apply.

Rule 11 does not limit the requisite qualifications to a bachelor’s degree from a recognized university, nor does it add special accreditation requirements. Instead, it includes “university-level scientific or technical bachelor's degree, or any equivalent academic degree... from a university, technical university, technical high school, vocational college, higher technical college or institute, school of engineering, or any similar establishment.” (Emphasis added).

The subject matter required for qualifying for the EQE are provided in Rule 13, which states:

**Qualification subject-matter**

The scientific and/or technical subjects referred to in Rule 11 shall include biology, biochemistry, chemistry, construction technology, electricity, electronics, information technology, mathematics, mechanics, medicine, pharmacology and physics.

*Id.* As indicated, instead of enumerating specific degrees, Rule 13 lists broad disciplines. In particular, the disciplines include “information technology,” which would broadly encompass aspects of computer science (not covered by “electronics”), and other programs that train individuals in the field of information technology. Similarly, “mathematics” is specifically enumerated as a qualifying discipline.

Rule 14 goes further and recognizes that candidates may not qualify under Rules 11-13, but may “nevertheless be considered to possess an equivalent level of scientific and/or technical knowledge” if they satisfy an appropriate level of practical experience. *Id.*

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B. Comparative Practices in Canada

Practitioners in Canada are required to pass the Canadian Intellectual Property Office’s Patent Agent Examination. To be eligible to take the Patent Agent Examination, a person must have worked 24 months (i) on the examining staff of the Patent Office, (ii) in Canada in the field of Canadian patent law, or (iii) in the field of patent law, at least 12 months of which were in Canada, and the rest of which were in a country where the person was authorized to work as a patent agent. Specifically, the eligibility requirements for the Patent Agent Examination are defined as follows:

11 Register of Patent Agents
Eligibility for qualifying examination

19 A person is eligible to sit for a paper of the qualifying examination for patent agents if the person meets the following requirements:

(a) on the day of that paper, the person resides in Canada and
(i) has been employed for at least 24 months on the examining staff of the Patent Office,

(ii) has worked in Canada in the area of Canadian patent law and practice, including the preparation and prosecution of applications for a patent, for at least 24 months, or

(iii) has worked in the area of patent law and practice, including the preparation and prosecution of applications for a patent, for at least 24 months, at least 12 of which were worked in Canada and the rest of which were worked in another country where the person was authorized to act as a patent agent under the law of that country; and

(b) not later than two months after the day on which the notice referred to in subsection 21(2) is published, the person

(i) notifies the Commissioner in writing of their intention to sit for that paper,

(ii) pays the fee set out in item 2 of Schedule 2 for that paper, and

(iii) furnishes the Commissioner with a statement indicating that they will meet the requirements set out in paragraph (a), along with supporting justifications.

The eligibility requirements for Canada’s Patent Agent Examination do not include specific degree requirements but focus instead on practical work experience in patent law. Subsection 19(b)(iii)’s requirement to furnish evidence of meeting requirements specified in subsection 19(a) can be

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satisfied by submission of an affidavit or a statutory declaration or letter of attestation signed by the candidate's employer or a registered patent agent.12

VI. Alternatives to Degree-Based Qualification

People are increasingly pursuing alternative paths to gain technical competence in patentable technologies. Many have developed technical competence without receiving an undergraduate degree in a Category A discipline. Patent applicants and society would benefit from allowing these individuals to sit for the registration exam.

A. Credentials Analogous to the FE Exam

The USPTO has recognized one longstanding alternative path via Category C eligibility for those who have passed the Fundamentals of Engineering (FE) examination. We suggest that the USPTO expand Category C to other analogous credentials that are similarly rigorous and similarly indicative of technical competence. Many of these credentials have been earned by people who do not have an undergraduate degree in a Category A discipline and are currently ineligible for admission to the USPTO registration exam.

For example, the IT industry is well-known for embracing alternative paths to technical competence. Highly respected credentials such as the Cisco Certified Network Professional (CCNP) and the CompTIA Security+ are recognized in the industry as high-quality indicators of competence in computer networking technologies. The preparation, requisite experience, and technical knowledge required to pass these credentialing exams rival and sometimes exceed the FE. Professionals holding a CCNP, Security+, or other similar credential clearly possess the technical qualifications necessary to render applicants valuable service13 as evidenced by wide industry acceptance of those credentials as indicators of competence. Many industries are growing more open to alternative paths and credentials, making the present a particularly advantageous time for the USPTO to reevaluate the eligibility of those credentials.

B. Apprenticeship as a Qualification Path

Apprenticeship programs are increasing in popularity among US employers.14 The USPTO could increase diversity and equity among patent practitioners by implementing a path for apprentices with hands-on scientific and technical training to be admitted to sit for the registration examination. We suggest that the USPTO reinstate an apprentice model as an additional path to patent bar eligibility. Potential applicants would gain practical experience under the supervision of registered patent practitioners and could be eligible to sit for the patent bar regardless of their educational (and income) backgrounds.

13 See 37 CFR 11.7(a)(2)(ii).
Categories A through C of “Section III. Scientific and Technical Training Requirements for Admission to the Examination” necessitate an individual to have the means to attend college if they want to join the patent bar.\textsuperscript{15} As a result, an individual who cannot afford to obtain a college education is automatically excluded from the applicant pool. By offering a more vocational path, the USPTO could expand the pool to include individuals with appropriate hands-on scientific and technical experience who can prove completion of sufficiently meaningful mentorships (e.g., demonstrate years of apprenticeship, establish the hours and type of work, etc.).

In terminating the apprentice option in 1934, the USPTO explained that a lack of objective standards in reviewing affidavits of applicants and supervising attorneys was a factor, with the Commissioner specifically citing weaknesses of friendships between attorneys and applicants.\textsuperscript{16} IPO does not seek to prescribe the meets and bounds of an apprentice model. However, tracking hours and work product to determine if an applicant can demonstrate sufficient scientific and technical training is much easier today, especially in light of digital means for tracking and reporting workflows.\textsuperscript{17}

\textbf{VII. Future-Proofing}

IPO understands that the qualification criteria are designed for use by the Office of Enrollment and Discipline (OED) to determine whether candidates possess the “legal, scientific, and technical qualifications necessary for him or her to render applicants valuable service.”\textsuperscript{18} Earning a degree listed in Category A is one way to establish scientific and technical qualifications. Proving a body of coursework under Category B is another, more time-consuming way.

The current review of the qualification criteria has been a long time coming, and the degrees in Category A have not kept pace with developing new technologies. The USPTO might consider systematically reviewing the qualification criteria at regular intervals, such as every two years. The USPTO should also consider moving away from listing specific acceptable degrees to instead listing generalized degree requirements (e.g., all science, technology, engineering, and mathematics degrees (STEM)) to minimize the need for frequent updates. The USPTO should also consider allowing applicants who do not possess a degree listed in Category A to apply based on a combination of qualifying education and experience, which could be supported with a written statement from an employer. As indicated previously, the Canadian Intellectual Property Office requires only a short affidavit by the candidate’s employer that the candidate possesses the requisite skills.\textsuperscript{19}

Notably, the USPTO already requires its practitioners to “provide competent representation to a client,” which includes the requisite “technical knowledge . . . reasonably necessary for the representation.” 37 C.F.R. Sec. 11.101. Updating eligible degrees or generalized requirements to

\textsuperscript{15} See GRB 2020, supra note 1.
\textsuperscript{17} See, e.g., ApprentiScope, https://www.apprentiscope.com/.
\textsuperscript{18} Premysler v. Lehman, 71 F.3d 387, 389-90 (Fed. Cir. 1995); 37 CFR § 11.7(a)(2)(ii).
expand the patent bar to include patent agents and attorneys with competence in emerging technologies is important for the USPTO to maintain pace with its patent applicants.

Allowing candidates with degrees not in Category A to sit for the patent bar with the recommendation of an employer would also not be inconsistent with the path patent examiners may take to practicing. Currently, former patent examiners are allowed to waive taking the patent bar exam and be fully registered to practice after working for four years as an examiner. A much broader range of degree programs is recognized as acceptable for a qualified patent examiner than just those in Category A.

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Thank you for considering IPO’s comments. As one of the primary organizations representing IP owners, IPO would welcome the opportunity for additional dialogue regarding this important topic.

Sincerely,

Daniel Staudt
President