**NOMINATION OF ACCOUNTING AND RELATED CIP CODES FOR INCLUSION IN
DHS STEM DESIGNATED DEGREE PROGRAM LIST**

DATE: August 1, 2023
TO: SEVP Response Center via email
SUBJECT: Attention: STEM CIP Code Nomination

On behalf of the American Institute of CPAs (AICPA), and the many organizations enumerated at the end of this letter, we are writing to request that several Classification of Instructional Program (CIP) codes be added to the Department of Homeland Security's (DHS's) STEM Designated Degree Program List.

The accounting profession has evolved substantially into a profession actively driving technological innovations to help businesses compete in an expanding global marketplace. These professionals have acquired new skills to remain competitive, including the development of software, cloud computing and other emerging technology innovation skills.

Critically, and as emerging technology intersects in new ways with business, accountants are routinely contributing to this innovation. Robotic process automation (RPA) is just one example of how accountants are writing scripts and developing bots to improve the operations and financial management of organizations. Many emerging technologies (for example, blockchain and cybersecurity technologies) converge directly with accounting and finance. Professionals in the accounting field are required to understand these technologies and have been instrumental in developing software and other technology to manage them. Further, conducting data and financial analytics is an essential skillset for accountants, requiring digital acumen and the ability to develop technologies to enhance these skills.

While many accounting programs have modified their curricula to reflect the changing environment of accounting and its technological base, these changes have not yet been reflected in the recognition of accounting as a DHS STEM subject. Programs use different CIP codes, and this submission is requesting DHS consider six of these codes to be included on the DHS STEM Designated Degree Program List (rationale for each is presented in the Appendices to this letter). They are:

- **52.0301 – Accounting** (See Appendix A)
- **30.1601 – Accounting and Computer Science** (See Appendix B)
- **52.0304 – Accounting and Finance** (See Appendix C)
- **52.0303 – Auditing** (See Appendix D)
- **43.0405 – Financial Forensics and Fraud Investigation** (See Appendix E)
- **52.1601 – Taxation** (See Appendix F)

It is our strongest belief that accounting, as a field of study and as it is practiced by accounting professionals, should be designated as a STEM field, specifically under the "T" for Technology.

Because CIP codes directly reference fields of study rather than occupations, the justifications provided for each CIP code further clarifies the courses that are taught, particularly at the college/university level, for degrees in these areas. Further, we highlight additional modernization efforts by accounting firms to

ensure both newer entrants to the profession and seasoned professionals – whether they are integrating new innovations into their practices, are advising clients on business enhancement practices, or as part of other areas of practice – possess the skills to meet the needs of the competitive global marketplace.

Accounting Profession Modernization and an Increasing Use of Complex Technology Solutions

To serve the public interest, Certified Public Accountants (CPAs) provide the capital markets with confidence and assurance in financial reporting. The work performed by professionals in public accounting impacts employees, retirees, communities, investors, the capital markets and the global economy. In addition to those serving in public accounting, accounting professionals in business, government, and not-for-profit organizations work to meet the public's, clients' and employers' needs in a technology-driven marketplace.

Across the globe, companies rely on increasingly complex technology systems. To best serve the public interest, accounting professionals are constantly adapting their skills to allow them to properly use and develop cutting-edge technology. These skills allow accountants to manage and analyze data that drives decision-making. Accounting professionals' attention to detail, critical thinking and digital acumen are the foundation for their ability to develop the technology required to assist in problem solving in today's modernized market. Accountants now have skill sets which also include their ability to design and implement analytical dashboards with data visualization software such as Tableau and Spotfire. Additionally, they develop unique data visualizations and real time dashboards to help their employers or client companies understand results and identify important information for decision making. Some accounting professionals also assist their employers and clients with financial planning by developing algorithms to determine appropriate investment strategies for their clients' unique life situations.

Public accounting firms have developed proprietary technologies to improve their handling and analysis of information. Such technologies include programs which allow firms to better and more quickly perform risk assessments (including with AI technology), manage day-to-day audit work, and utilize metrics unique to companies across many market sectors to efficiently review and evaluate transactions. This allows for analysis specific to the types of industries in which these companies operate, for example in healthcare, insurance, real estate, oil and gas, mortgage origination, vehicle production, chemicals production, and many others. Their work provides important data and analysis, utilizing many different technologies, (for example, through the use of SQL, DAX (Power BI), Powerquery, VizQL) which may mean the difference between choosing to move forward with innovation or waiting for a better economic environment.

Accounting professionals work alongside Information Technology (IT) professionals to create programs that allow for financial analytics, financial data processing, knowledge management, data visualization, effective decision communication, machine learning for finance, statistical inference, and dynamic modeling on financial data. Accounting professionals often utilize technology skills that are integral to the audit function and other areas of American business, including IT auditing (which demands a high-level of technological knowledge and skills to evaluate the IT infrastructure), artificial intelligence, blockchain, data analytics, and forensic and predictive accounting and cybersecurity, among others. The accounting profession continues to further this knowledge through the development of the Dynamic

Audit Solution (DAS)[1] and accounting firms' proprietary digital technology, which equips audit professionals to be proficient in data science, integration, and analytics. These audit professionals must become experts in the data with which they spend time analyzing. They must further be able to identify and analyze new risks and anomalies, as well as help businesses reengineer systems so that they are able to speak to one another.

As an example, according to Vetter (2018),[2] many accounting firms use blockchain implementations, applications, and assurance services. This allows users to access ledgers in real time, as well as create smart contracts and record transactions. Blockchain technology is growing in use by global corporations such as Walmart, Amazon, Anheuser-Busch, and McDonalds[3] and is changing the way transactions are processed and for how they are accounted. As such, accountants are now performing increasingly complex analyses of financial results.

Regardless of their practice area, whether in business, a CPA firm, academia, the associations, or engaged in the regulatory environment, our economy is demanding more of accountants. It is the accounting profession's duty to push for the requisite technology education while students are in university programs to ensure accounting professionals meet and surpass the demands of our global economy, now and in the future. We strongly believe that recognition of the profession as a STEM (specifically, technology) profession, will help to accomplish that goal.

Evolution of Education to Support Global Markets

Accounting students may not plan to become CPAs; rather they may decide to pursue other positions in finance, computer science or become entrepreneurs. Most accounting programs, however, include coursework and curriculum content to address the specific needs of the CPA profession.

Accounting programs have been updating their curricula in response to the changing landscape for the profession, as evidenced by the CPA Evolution Model Curriculum (CPAEMC)[4] project of the AICPA and National Association of State Boards of Accountancy (NASBA), published in June 2021. This project developed a sample curriculum for programs to consider as they updated their course offerings. An entire section of the sample curriculum is related to Information Systems and Controls. Additionally, CPAEMC includes specific competencies in technology for adaptation in university accounting programs. To illustrate, Appendix G includes selected competencies addressed in the Business Analysis and Reporting section of this curriculum resource. These competencies have been developed by academics currently teaching these topics in courses in the accounting programs at their universities.

The accounting profession has reviewed the competencies and skills needed by accounting students to succeed amid today's rapidly expanding digital world and global demand for advanced analytics. The skills and competencies identified such as enhanced knowledge and ability to manipulate robotic process automation (RPA), natural language processing (NLP) machine learning (ML), artificial

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[1] For more information, see https://www.cpa.com/das and https://blog.aicpa.org/2020/01/a-new-technology-solution-for-data-driven-audits.html#sthash.ZPvdDwAS.1psw8vcP.dpbs

[2] Vetter, A. (2018, May 9). *Blockchain is already changing accounting*. Accounting Today. Retrieved June 29, 2022, from https://www.accountingtoday.com/opinion/blockchain-is-already-changing-accounting

[3] 81 of top 100 companies use Blockchain technology, Blockdata research shows. Retrieved June 30, 2022, from https://forkast.news/81-of-top-100-companies-use-blockchain-technology-blockdata/

[4] CPA Evolution Model Curriculum (2021). AICPA. Available for download at https://thiswaytocpa.com/program/modelCPAcurriculum/

intelligence (AI), among others, align directly with STEM instruction. Accounting programs must have the support and flexibility needed to instruct students to understand, use, and develop technology as the profession evolves. STEM recognition for the CIP codes listed below is a crucial tool in the academic toolbox to ensure such evolution remains in balance with the marketplace.

Changes to CPA Exam and Academic Programs Underscores the Need for CPAs' Technology Acumen

The Uniform CPA Exam (Exam) is a critical step toward licensing accounting professionals. AICPA and NASBA's joint CPA Evolution initiative ensures future Exam candidates possess the rapidly changing skills and competencies the practice of accounting requires today. Under the CPA Evolution licensure model, all candidates will be required to pass three Core exam sections covering: Auditing and Attestation (AUD); Financial Accounting and Reporting (FAR); and Taxation and Regulation (REG). Each candidate will also choose one Discipline (i.e., Business Analysis and Reporting (BAR), Information Systems and Controls (ISC), or Tax Compliance and Planning (TCP)) to demonstrate knowledge and skills in that discipline.

Beginning in January 2024, the updated Exam content will have a pervasive focus on data and technology throughout all sections of the exam. These updates will assess a candidate's ability to understand how data is structured and how information flows through IT systems and business processes. The Exam also covers aspects of IT infrastructure, from platforms and services, to security, confidentiality, and privacy, as well as to the foundational skills needed to build and develop technology. As the profession changes, so too has the education and credentialing for those entering the profession.

Of importance, the world's leading business school and accounting accreditor – the Association to Advance Collegiate Schools of Business (AACSB) – predicted the increased use of information technology and has mandated that technology knowledge is a *minimum* requirement for entry into the accounting profession. The AACSB now requires all programs seeking accounting program accreditation in addition to business school accreditation to meet this requirement:

> *Standard A5: Consistent with mission, expected outcomes, and supporting strategies, accounting degree programs include learning experiences that develop skills and knowledge related to the integration of information technology in accounting and business. **This includes the ability of both faculty and students to adapt to emerging technologies as well as the mastery of current technology.** [INFORMATION TECHNOLOGY SKILLS, AGILITY AND KNOWLEDGE FOR ACCOUNTING GRADUATES AND FACULTY—RELATED BUSINESS STANDARD 4]*[5]

University programs and the joint initiative through AICPA and NASBA highlight the responsibility entrusted to us to ensure accounting students and Exam candidates fully understand how technology intersects directly with the accounting profession and business community. To promote an environment for advancement of the public interest, the accounting profession is committed to looking at how each field has impacted technology, and further how that technology can be enhanced. We believe it would be a disservice to our nation's future should we fail to provide accounting students with every opportunity to explore and grow the use of emerging technology.
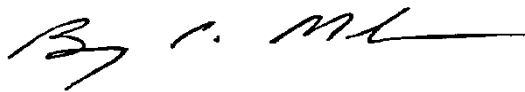
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[5] AACSB 2018 Standards for Accounting Accreditation (Updated July 1, 2021), page 21. Accessed on June 28, 2022, https://www.aacsb.edu/educators/accreditation/accounting-accreditation/aacsb-accounting-accreditation-standards

Conclusion

For each of the CIP codes nominated in this submission (see Appendices A – F), we have included those common courses requiring the integration of technology traditionally taught as part of most universities' curricula for accounting and accounting-related programs (See Table 1 in Appendix A). In that Table, we also provide a sample of the types of technology that students are expected to master in those courses. When different coursework is required for a particular program, we discuss the modification to Table 1 as we address those nominations. Note, too, that many universities offer both undergraduate and graduate degrees in accounting and accounting-related fields; the courses provided in Table 1 of Appendix A may be taught at either level, depending on the individual programs.

We appreciate the opportunity to provide this nomination submission on behalf of the accounting profession. The profession is crucial to protecting the public interest, creating positive change and of enhancing competitiveness for American and global businesses.

Sincerely,

Barry C. Melancon, CPA, CGMA
President & CEO

Susan S. Coffey, CPA, CGMA
Chief Executive Officer – Public Accounting

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About the American Institute of CPAs

The American Institute of CPAs® (AICPA®) is the world's largest member association representing the CPA profession, with more than 421,000 members in the United States and worldwide, and a history of serving the public interest since 1887. AICPA members represent many areas of practice, including business and industry, public practice, government, education and consulting. The AICPA sets ethical standards for its members and U.S. auditing standards for private companies, not-for-profit organizations, and federal, state and local governments. It develops and grades the Uniform CPA Examination, offers specialized credentials, builds the pipeline of future talent and drives continuing education to advance the vitality, relevance and quality of the profession.

Additional organizations supporting this nomination submission:
Alabama Society of CPAs
Alaska Society of CPAs
American Accounting Association
Arizona Society of CPAs
Arkansas Society of CPAs
ASCEND

Association to Advance Collegiate Schools of Business
Association of Latino Professionals for America
California Society of CPAs
Center for Audit Quality
Colorado Society of CPAs
Connecticut Society of CPAs

Delaware Society of CPAs

Greater Washington Society of CPAs

Diverse Organization of Firms

Florida Institute of CPAs

The Georgia Society of CPAs

Guam Society of CPAs

Hawaii Society of CPAs

Idaho Society of CPAs

Illinois CPA Society

Indiana CPA Society

Iowa Society of CPAs

Kansas Society of CPAs

Kentucky Society of CPAs

LatinoTaxPro

Society of Louisiana CPAs

Maine Society of CPAs

Maryland Association of CPAs

Massachusetts Society of CPAs

Michigan Association of CPAs

Minnesota Society of CPAs

Mississippi Society of CPAs

Missouri Society of CPAs

Montana Society of CPAs

National Association of Black Accountants NAF

National Association of State Boards of Accountancy

National Council of Philippine American Canadian Accountants

Nebraska Society of CPAs

Nevada Society of CPAs

New Hampshire Society of CPAs

New Jersey Society of CPAs

New Mexico Society of CPAs

New York State Society of CPAs

North Carolina Association of CPAs

North Dakota CPA Society

The Ohio Society of CPAs

Oklahoma Society of CPAs

Oregon Society of CPAs

Pennsylvania Institute of CPAs

Puerto Rico Society of CPAs

Rhode Island Society of CPAs

South Carolina Association of CPAs

South Dakota CPA Society

Tennessee Society of CPAs

Texas Society of CPAs

Utah Association of CPAs

Vermont Society of CPAs

Virgin Islands Society of CPAs

Virginia Society of CPAs

Washington Society of CPAs

West Virginia Society of CPAs

Wisconsin Institute of CPAs

Wyoming Society of CPAs

APPENDIX A

Nomination # 1 – 52.0301 – Accounting
Defined by the Department of Education (DoED) as "A program that prepares individuals to practice the profession of accounting and to perform related business functions. Includes instruction in accounting principles and theory, financial accounting, managerial accounting, cost accounting, budget control, tax accounting, legal aspects of accounting, auditing, reporting procedures, statement analysis, planning and consulting, business information systems, accounting research methods, professional standards and ethics, and applications to specific for-profit, public, and non-profit organizations."

Accounting as a profession has evolved significantly over the past 25 years, and the education supporting the preparation of those entering the profession has evolved as well. Most accounting programs now include courses in accounting information systems, auditing, accounting data analytics, financial accounting, managerial accounting, and accounting research (see Table 1). We believe that the mastery of the representative technology taught in these courses noted in Table 1 provides support for the inclusion of 52.0301 (Accounting) in the Department of Homeland Security's (DHS's) Approved List of STEM CIP Codes.

We believe that as a field of study, this program (CIP code 52.0301) will continue to drive technological advancements that meet the requirements of a STEM CIP code. Since each practice described in this definition requires computer-based transactions, it only stands to reason those minimizing inefficiencies and improving the reliability of data processed in accounting systems will be the evolution of the accounting field. Whether it is the goal of the student to learn more about the technology that supports accounting in order to become a more innovative accountant, or it is the goal of the student to improve the technology behind accounting, the curriculum offered by most university accounting programs will effectively meet that goal. (See Table 1 for specific courses and technology traditionally included in those courses today.)

Additionally, as businesses begin to push forward with cryptocurrency, virtual currency, and digital currency transactions, a student who is well-versed in accounting will be able to transition into a business environment and guide their clients into making secure, ethical, and savvy business decisions in this area. According to Ryabova and Henderson (2019)[6], 55% of their students report having no prior knowledge of cryptocurrencies, and 76% of students had not taken classes that introduced the topic prior to completing their coursework in the accounting program. Adding this CIP code to the DHS STEM Designated Degree Program List will allow more students access to this type of education.

Table 1 follows on pages 9-10.

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[6] Ryabova, T.S. & Henderson, S. (2019). Integrating Cryptocurrency into Intermediate Accounting curriculum: A case study. *Journal of Accounting and Finance, 19*(6). DOI: https://doi.org/10.33423/jaf.v19i6.2322

APPENDIX A, continued

Table 1: Relevant Technology Taught in Accounting Curricula

Representative Accounting Course Title	Representative Technology Taught in the Course
Accounting Information Systems	**Record Data Using Cryptography:** Blockchain – cryptography technology to store data in a shared immutable ledger. **Protect Data Using Cybersecurity:** Technology used to protect financial and other sensitive data. **Organize Corporate Data into Relational Databases:** Access (Microsoft)– Relational Database Management System Software to organize and store data in a scalable way.
Auditing (Internal and External)	**Evaluate Risk by Examining Accounting Transactions:** IDEA – software tool used to assess risk, analyze financial statement data. **Prepare Data for Analysis:** Alteryx – software tool used to perform ETL (extract, transform and load) procedures to prepare audit data for analysis. **Employ Robotic Process Automation (RPA) Techniques to Evaluate Anomalies and Outliers:** UiPath is a software tool used to perform Robotic Process Automation (RPA) to consistently evaluate data for anomalies/outliers.
Accounting Data Analytics	**Write Computer Scripts to Extract Relevant Data:** SQL (Structured Query Language) used to extract relevant data from larger database for further analysis. **Produce Data Visualizations to Evaluate Data and Communicate Findings:** Power BI and Tableau are software tools used to produce and evaluate data visualizations. **Analyze Data Using Wide Diversity of Data Analytics Techniques to Address Decision Maker Questions:** SPSS/Stata are software tools used to analyze data (regression, correlation, hypothesis testing, variance analysis).
Financial Accounting	**Transmit Financial Data Using XML Technology:** XBRL (XML - Extensible Markup Language) – technology to electronically communicate financial statement data and other relevant business information. XBRL tags financial data for use in analysis programs. **Support Estimates and Assumptions Using Prescriptive Analytics:** Financial accounting requires a host of estimates and assumptions that require sensitivity analysis to support the resulting financial statements.
Accounting Research	**Search Standards and Databases for Professional Guidance:** Use of various searching procedures to find pertinent application of accounting procedures (GAAP: Generally Accepted Accounting Principles) and auditing techniques (accounting standards).

Representative Accounting Course Title	Representative Technology Taught in the Course
Taxation (and Tax Planning)	**Use of Time Series and Regression Analytics for Tax Planning Purposes:** techniques used to forecast future taxable income as part of tax planning. **Manage Tax Data:** Organize tax data using data warehouses, data marts and data cubes to have data ready for use in analysis and as support for uncertain tax positions. **Prepare U.S. Tax Returns:** Utilize tax preparation software to prepare a hypothetical tax return. **Research Tax Issues:** Use databases (e.g., RIA Checkpoint, CCH, LexisNexis) to research client tax issues. **Determine Implications of Tax Policy Revisions:** Incorporate visualization software to assess the impact on taxes from policy revisions. **Compare IRS Statistics of Income to Client Hypothetical Return:** Perform comparative study using data analytics and visualization software.
Forensic Accounting	**Identify Red Flags by Examining Accounting Transactions:** IDEA – software tool used to assess risk, analyze financial statement data. For example, transactions that occur outside normal business hours, or that do not follow Benford's law distributions may be indicative of fraud. **Identify Transactions that do not follow Prescribed Policies using Process Mining Technology:** Celonis, UIPath, etc can help identify transactions that bypassed standard authorization procedures.
Cost/Management Accounting	**Perform Predictive and Prescriptive Analytics to Address Relevant Management Questions:** Various technology tools to perform predictive and prescriptive analytics techniques including Optimization, What-if Scenario Analysis, What-If Sensitivity Analysis, Goal-seek Analysis, Cash Flow Analysis (NPV, IRR, etc.).

APPENDIX B

Nomination #2 – 30.1601 – Accounting and Computer Science
Defined by the DoED as "A program that combines accounting with computer science and/or computer studies."

Computer Science (CIP code 11.0701) is defined by the DoED as "A program that focuses on computer theory, computing problems and solutions, and the design of computer systems and user interfaces from a scientific perspective. Includes instruction in the principles of computational science, computer development and programming, and applications to a variety of end-use situations."

We assert that any program that fully integrates accounting (as defined in Appendix A) and computer science studies will, by definition, meet the requirements of a STEM CIP code.

According to Jasim & Raewf (2020)[7], studying Computer Science and Technology as these fields relate to the accounting field to further acceleration of system information production, reducing statistical error, and faster performance and purchasing abilities. Additionally, the authors discuss the ever-growing need for accountants to understand the strategic goals of a company and the ability to use technology to help in accomplishing those tasks. Adding this CIP code to the DHS STEM Designated Degree Program List will allow for further enhancements to these specific computing tasks.

Table 2 summarizes computer programming elements included in accounting curricula. To get access to pertinent data, analyze data and communicate findings increasingly requires programming skills. These are taught in accounting data analytics and accounting information systems courses, and often a dedicated programming course specific to addressing accounting questions.

Table 2: Representative Computer Programming Elements included in Accounting Curricula

SQL (Structured Query Language): Scripts written to extract relevant accounting data from large databases.
Macros, DAX Code: Power BI - Popular analytics software tool used by accountants requires knowledge of DAX Code.
Python, R: Accounting curricula are Increasingly including courses in Python and/or R, particularly to perform data analytics.

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[7] Jasim, Y.A., & Raewf, M. (2020, June). Information Technology's Impact on the Accounting System. *Cihan University-Erbil Journal of Humanities and Social Sciences*.

APPENDIX C

Nomination #3 – 52.0304 – Accounting and Finance
Defined by the DoED as "An integrated or combined program in accounting and finance that prepares individuals to function as accountants and financial managers or analysts."

As noted in the January 2022 Federal Register Notice, DHS approved and added CIP code 30.7104 – Financial Analytics to its STEM list. We believe that this 30.7104 and 52.0304 are integral to one another and argue that 52.0304 will only serve to further enhance technology through both accounting and finance. Technology and finance are intertwined in significant ways, and these two fields are some of the most prominent driving forces of today's global economy. Both of these areas of study are rapidly changing, resulting in a need to offer technological developments as well.

Finance is a central pillar of economic development in the 21st century, and the driving force of economic developments are usually technological in nature. These technologies have and continue to revolutionize the industry. Adding this CIP code to the DHS STEM Designated Degree Program List only serves to continue driving these changes.

While the technology taught in specific accounting courses is detailed in Table 1, technology taught in finance-specific courses might include explicit discussions on artificial intelligence, machine learning and deep learning, as well as blockchain technology and cryptocurrencies. Table 3 provides a summary of these finance-specific courses that would emphasize financial technology (aka fintech).

Table 3: Representative Technology Taught Specifically in Finance Courses and/or Fintech Courses

Artificial Intelligence, Machine Learning and Deep Learning: How these technologies work and how they address finance-related opportunities and challenges.
Blockchain Technology and Cryptocurrency: Innovations in Blockchain Technology give rise to opportunities (including BitCoin, NFTs, Smart Contracts, etc.).

APPENDIX D

Nomination #4 – 52.0303 – Auditing
The DoED defines Auditing as "A program that prepares individuals, including certified accountants, to perform independent internal and external appraisals to evaluate organizational financial and operational activities, ensure compliance with laws and policies, safeguard assets, and promote effective planning and resource allocation. Includes instruction in advanced accounting, audit tools and techniques, sampling, risk and control, audit planning, audit function management, law and regulations, environmental auditing, information technology applications, professional standards and ethics, and specific industry and service sector problems."

While education in accounting is needed to be an auditor, an auditor also must develop professional skepticism and judgment to determine that the information presented is fair and within appropriate guidelines. Creating the technology to audit in complex business environments is one such necessary skill for audit professionals. University courses focus on the process behind auditing financial statements, the regulatory and legal liability environments, and professional standards and conduct required of an auditor, as well as the technology used by many practicing auditors (see discussion of DAS and accounting firm proprietary digital technology on page 4 of this submission).

As the implementation of the metaverse, blockchain, and web3 technologies has moved forward, the fundamental principles of accounting and auditing have not changed, however, due primarily to technology innovations, the increase to the auditing capacities of professionals in the field has been significant, leading to continued enhancement in audit quality. Mastery of these technologies and the ability to manipulate them, therefore, is essential. With this understanding, the education in the accounting and auditing fields has changed as the profession continue to drive technological advancements.

As summarized in Table 1, most audit-relevant technology is taught in three courses in the accounting curricula: accounting information systems, audit, and accounting data analytics.

APPENDIX E

Nomination #5 – 43.0405 – Financial Forensics and Fraud Investigation
Defined by the DoED as "A program focusing on the principles and techniques of conducting investigations into financial crime, terrorist activity, and the analysis and use of accounting data as evidence. Includes instruction in the principles of accounting, investigative auditing, computer investigations, accounting system documents and software, business corruption, criminal and terrorist financial networks, international money markets and movement, net worth analysis, financial fraud, exposing concealed assets, records seizure, fraud and money laundering statutes, fraud case initiation, case management, and case presentation. Examples: [Fraud and Money-Laundering], [International Banking and Money-Laundering], [Terrorist Finance], [Asset Forfeiture], [Economic Crime Investigation], [Investigative and Forensic Accounting]"

Since the entire description for this CIP code is based in information that must be gathered using technology, we believe that adding it to the DHS STEM Designated Degree Program List is also essential. Further, because more crime is being committed online today than at any previous time[8], this course of study, in particular, is necessary for continuing to safeguard individuals, businesses, organizations, and even governments from financial disaster due to fraud, waste and abuse. This field is only possible through the use and development of technology and programs necessary for analyzing data that is collected virtually.

Students concentrating in this field learn existing and emerging technologies used in the detection and prevention of illegal activity. Modes of attacks evolve, and technology solutions allow firms to predict and identify patterns in illicit behavior. Advanced software, robotics, artificial intelligence, and algorithms are used to mitigate risk, identify anomalies and outliers, and detect potential fraud in large data. Students learn how to create analytical models that yield clean, accurate data that provide useful information and insight. Students may receive instruction in specific technologies like optical character recognition (OCR), natural language processing (NLP) and text mining, and learn the processes involved in digital forensics.

Table 4 summarizes (on page 15) technology taught in a forensic accounting course. In addition to other technology taught in other accounting courses taken by students preparing for forensic accounting careers (see Table 1), forensic accounting incorporates a wide variety of technology.

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[8] Insurance Information Institute. *Facts + Statistics: Identity theft and cybercrime*. Retrieved July 27, 2022, from https://www.iii.org/fact-statistic/facts-statistics-identity-theft-and-cybercrime#:~:text=According%20to%20the%20FBI's%20Internet,7%20percent%20increase%20from%202020.

Table 4: Representative Technology Included in the Forensic Accounting Course

> **Identify Red Flags by Examining Accounting Transactions:** IDEA and other advanced software tools analyze financial statement data, find anomalies/outliers, and assess risk. For example, transactions that occur outside normal business hours, or that do not follow Benford's law distributions may be indicative of fraud.
>
> **Identify Transactions that do not follow Prescribed Policies using Process Mining Technology and Robotic Process Automation:** Celonis, UIPath, etc can help identify transactions that bypassed standard authorization procedures.
>
> **Practice with the Underlying Digital Forensic Tools:** Specific technologies like optical character recognition (OCR), natural language processing (NLP) and text mining, and the processes involved in digital forensics.

APPENDIX F

Nomination #6 – 52.1601 – Taxation

The DoED defines the Taxation CIP code as "A program that prepares individuals to provide tax advice and management services to individuals and corporations. Includes instruction in tax law and regulations, tax record systems, individual and corporate income taxation, tax planning, partnerships and fiduciary relationships, estates and trusts, property depreciation, capital gains and losses, dispositions, transfers, liquidity, valuation, and applications to specific tax problems."

The majority of tax related functions are now completed online, or in an application designed specifically for the purpose of preparing, reporting, or paying taxes. Including this CIP code in the DHS STEM Designated Degree Program List is long overdue. Taxation professionals today should not only learn the appropriate manner to file taxes using the appropriate programs but are taught the types of programs that will be used to audit those reports. This course requires students to not only understand the fundamentals of taxation, but also requires them to apply that knowledge using a variety of technology platforms. Further, students majoring in this discipline are often required to understand the interfaces between and among a variety of technological applications, allowing them to convert future client data into an appropriate taxation digital platform.

Finally, many accounting programs offer graduate degrees in Taxation and these programs also require students to engage in data modeling (including tax planning) with financial information (to assist clients in making financial decisions), to conduct tax research on digital platforms, and to apply prescriptive data analytics to find the most favorable application of tax law to their clients' needs.

Table 5: Representative Technology Included in the Taxation Course of Study

Use of Time Series and Regression Analytics for Tax Planning Purposes: techniques used to forecast future taxable income as part of tax planning.
Manage Tax Data: Organize tax data using data warehouses, data marts and data cubes to have data ready for use in analysis and as support for uncertain tax positions.
Predict, validate, and substantiate tax positions: Artificial intelligence (e.g., BlueJ) can be utilized to assess the risk associated with controversial tax positions.[9]

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[9] Nickell, E. & Chambers, V. (2022). Integrating technology into accounting curriculum as CPA Exam evolves. *The Tax Advisor* (February 1). Retrieved July 1, 2022 from https://www.thetaxadviser.com/issues/2022/feb/integrating-technology-into-accounting-curriculum-cpa-exam-evolves.html

APPENDIX G

This Appendix provides segments of the AICPA and NASBA's CPA Evolution Model Curriculum[10] from the Business Analysis and Reporting Section.

Topic	Learning Objectives
Topic 2 Advanced Logical Thinking	1. Apply relational logic concepts to answer questions.
	2. Interpret conditional logic statements.
	3. Create a condition statement.
	4. Understand alternative accounting information system models, such as the resources, events, and agents (REA) model, and create the appropriate model.
	5. Apply relational concepts.
	6. Create program code using proper syntax.
Topic 3 Advanced Data Concepts	1. Apply appropriate joins to analyze data.
	2. Explain and apply principles of Extract, Transform, and Load (ETL).
	3. Design and implement controls used to ensure completeness, accuracy, and validity of data.
	4. Extract data from a raw data file.
	5. Construct a data set.
	6. Apply data cleaning techniques.
	7. Apply data transformation techniques.
	8. Describe and evaluate relational, dimensional, and big data models.
	9. Explain and implement data loading processes.
	10. Identify the capabilities needed in tools that support data modeling and analysis.
Topic 4 Advanced Data Mining	1. Apply data mining techniques to a data set.

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[10] CPA Evolution Model Curriculum (2021). AICPA. Available for download at
https://thiswaytocpa.com/program/modelCPAcurriculum/

Topic	Learning Objectives
Topic 5 Advanced Data Analysis	1. Determine/interpret appropriate predictive analysis, (e.g., regression, time series, forecasting).
	2. Determine/interpret appropriate prescriptive, (e.g., optimization modeling, Monte Carlo simulation).
Topic 6 Advanced Data Visualization	1. Compare and contrast data visualization methods.
	2. Apply data visualization methods to specific data sets and circumstances.
	3. Create appropriate dashboards and scorecards.
Topic 7 Communicating results on Advanced Data Analytics	1. Design a KPI dashboard based on business user roles.
	2. Interpret the results of a KPI and provide recommended response.
	3. Apply what-if analysis to assumptions.
	4. Design analytic with built in controls for completeness, accuracy, and validity.
Topic 8 Advanced Data Ethics	1. Identify and critique a misleading visual.
	2. Identify common design principles to avoid misleading visuals.
	3. Evaluate data models for appropriate checks and balances.
	4. Evaluate the impact of Artificial Intelligence (AI) on data analysis and processing.
Topic 9 Advanced Data Management and Relationships	1. Describe considerations associated with loading data into the final target database (e.g., operational data store, data warehouse or data lake) including the constraints that apply (e.g., uniqueness, referential integrity, mandatory fields), the types of loading (initial, incremental, full refresh) and load verification.
	2. Define the attributes of a data repository such as its relevance, elements to be included or excluded, relationships between those elements and characteristics used to determine its validity, completeness, and accuracy.
	3. Determine methods to transform raw data (structured and unstructured) to make it useful for decision-making by correcting or removing data in the data set that is incorrect, inaccurate, incomplete, improperly formatted or duplicated and to convert, aggregate, merge, replace, validate, format, and split data.