STRENGTHENING BUSINESS TECHNOLOGY PATHWAYS

A Case Study about
Houston City College

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Formed in 2014, Workcred is an affiliate of the American National Standards Institute (ANSI). Its mission is to strengthen workforce quality by improving the credentialing system, ensuring its ongoing relevance, and preparing employers, workers, educators, and governments to use it effectively. Workcred's vision is a labor market that relies on the relevance, quality, and value of workforce credentials for opportunities, growth, and development.

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The Houston City College District is an open-admission, public institution of higher education offering a high-quality, affordable education for academic advancement, workforce training, career development, and lifelong learning to prepare individuals in our diverse communities for life and work in a global and technological society.

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About Industry Certification + Certificate/Degree Pathways

The practice of integrating or embedding industry credentials like certifications into certificates or degrees is common at community colleges.[1] Embedding refers to a college's alignment of its degree curriculum with an industry-developed credential, although the approach a college may take varies as it seeks to better serve its students and leverage its existing resources. A study among 149 U.S. colleges and four-year institutions by Lumina Foundation found that the most commonly cited benefit of embedding certifications into academic pathways was that it enabled students to earn valuable industry and academic credentials at the same time.[2] The study also showed that these pathways helped colleges and universities align their curricula with prevailing industry standards.

Certifications are distinct from other credentials because they are awarded after an individual demonstrates acquisition of a set of skills through a standardized assessment (e.g., oral, written, or performance-based). Additionally, certifications must be renewed after a designated period of time and can be revoked for incompetence or unethical behavior. Individuals must meet qualifications such as training and experience that are required prerequisites to take the certification examination. Certifications are awarded and tracked by certification bodies—typically nonprofit organizations, professional associations, industry/trade organizations, or businesses. According to Credential Engine, nearly 7,000 industry-recognized certifications are offered across numerous industry sectors.[3]

About the Project

The alignment between the academic curriculum and the skills employers demand in the labor market is critical to students' ability to successfully transition from their educational program to a career. For this alignment to exist and be maintained, there need to be policies and processes in place. This is especially true when the pathways involve industry certificates or certifications. Workcred partnered with Houston City College (HCC) and Texas Southmost College (TSC) to improve the effectiveness of industry certification + certificate/degree (iC+C/D) pathways in Texas by examining opportunities to align education and workforce stakeholders' processes and policies to better support low-income and first-generation students in completing iC+C/D pathways, earning postsecondary credentials of value, and entering the workforce.

This is one of four case studies, two at both HCC and TSC, that highlight the processes used to create and maintain alignment of iC+C/D pathways. This case study focuses on how HCC aligned their business technology program and its numerous specialization areas to create a pathway that allows students to earn an institutional credential leading to licensure or certification (ICLC) award, progress through various certificate programs (and industry certifications depending on the specialization chosen), and culminate with an associate of applied science (AAS) degree in business technology. The other case studies, as well as a guidebook for community colleges, can be found in the following publications:

- **Aligning Electrician Programs with Industry Demands in the Rio Grande Valley**
- **Integrating Academic Programs, Third-Party Industry Credentials, and Labor Market Skill Needs**
- **Meeting the Need for HVAC Technicians**
- **Powering the Rio Grande Valley's Automotive Workforce**

Growing Demand for Business Technology Careers

The Houston metropolitan area continues to experience robust demand for skilled professionals in business, administrative, and technology-driven occupations. Occupations in this field include medical secretaries and administrative assistants, human resources assistants, legal secretaries and administrative assistants, and first-line supervisors of office and administrative support workers. Figure 1 shows some examples of the region's need for a well-prepared administrative and business workforce.[4]

Figure 1: Examples of Business Technology Job Titles, Average Annual Earnings, and Annual Job Openings

JOB TITLE	AVERAGE ANNUAL EARNINGS	ANNUAL JOB OPENINGS
Medical Secretaries and Administrative Assistants	$43,187	1,753
Human Resources Assistants (except payroll and timekeeping)	$46,950	243
Legal Secretaries and Administrative Assistants	$56,277	370
First-Line Supervisors of Office and Administrative Support Workers	$72,590	4,392

To meet these workforce demands, HCC provides accessible education and workforce training that aligns with regional industry needs, fostering both student success and economic mobility. The business technology department plays a key role in fulfilling this mission through programs such as general office administration, human resources, legal office assistant, medical office specialist, and Microsoft Office technology. These programs equip learners with the technical, communication, and organizational skills necessary to succeed in today's high-demand office and business environments.

The alignment between academic curriculum and employer needs is central to students' ability to transition successfully from the classroom to the workplace. To sustain this alignment, HCC implements policies and processes that integrate industry input, credentialing standards, and continuous program evaluation. This is particularly essential in pathways that incorporate industry certifications alongside academic certificates and degrees.

HCC's Business Technology Pathways

The business technology curricula are designed to provide students an opportunity to develop the knowledge, skills, and abilities required for assuming administrative assistant and other office positions in today's competitive workplace. The curricula are competency-based and organized to teach industry-driven educational outcomes. The business technology pathways combine a variety of academic credentials including an ICLC, level one and two certificates, and an AAS degree (see Figure 2).

Figure 2: Types of Academic Credentials and Progression Through a Business Technology Pathway at HCC

ACADEMIC AWARD	DESCRIPTION	STACKABILITY AND PROGRESSION THROUGH A PATHWAY
ICLC	An ICLC is a series of courses that represent the achievement of identifiable skill proficiency that leads to licensure or certification. ICLCs can be non-credit or for-credit.	An ICIC is the first step in a pathway. It stacks into the corresponding level one certificate or AAS degree (where applicable).
Level One Certificate	A level one certificate is awarded for short-term training, consisting of at least 15, but not more than 42 semester credit hours, and can include an industry certification for upskilling or employment. Students can earn a level one certificate in one business technology specialization area (see Figure 3).	A level one certificate is the second step in a pathway, and it stacks into the corresponding level two certificate or AAS degree (where applicable).
Level Two Certificate	A level two certificate is awarded for short-term training, consisting of at least 30, but not more than 51 semester credit hours. Students can earn a level two certificate for business technology - bilingual (see Figure 3).	A level two certificate is the third step in a pathway, and it stacks into the corresponding AAS degree (where applicable).
AAS Degree	This is a comprehensive 60-credit, two-year degree for entry- to mid-level office and administrative roles. Students can also select an area of specialization (see Figure 3).	The AAS degree serves as the capstone for a pathway. The level one and two certificates and ICLC earned within a specialization stack into the AAS degree.

As Figure 2 shows, each of these credentials has a specific purpose and is designed to seamlessly stack into other credentials, allowing students to progress along a pathway and meet their career goals at the same time. In addition, students enrolled in the business technology programs can select from several specializations, as outlined in Figure 3.

Figure 3: Specialization Options for the Business Technology Programs at HCC in 2025–2026[5]

SPECIALIZATIONS	LEVEL 1 CERTIFICATE	LEVEL 2 CERTIFICATE	AAS DEGREE
Bilingual Business Technology		●	
General Office Administration	●		●
Human Resources / PeopleSoft	●		
Legal Office Assistant	●		●
Medical Office Specialist	●		●
Microsoft Office Technology	●		●
Medical Coding / Transcription Specialist	●		

In addition to the ICLCs, industry certifications are also incorporated in the pathways, either as opportunities for students to validate their skills or for students who already hold professional certifications to get a head start on earning an academic credential. For example, all students in the business technology programs qualify (at different points depending on which specialization is chosen) to take Microsoft Office Technology certification exams at the associate level, which includes certifications on Word, Excel, PowerPoint, and Outlook. In the 2022–2023 academic year (AY), students achieved a 73 percent pass rate on these exams. Another example is through the specialization pathway for medical office specialists, which integrates multiple certifications offered by the American Medical Certification Association (AMCA), including the Medical Administrative Assistant, Electronic Health Record, and Medical Coder and Biller certifications (see Figure 5).

Furthermore, individuals who hold a Certified Administrative Professional or Certified Professional Secretary certification from IAAP (International Association of Accessibility Professionals) and want to enroll in and earn an academic credential at HCC can receive 15 academic credits for these certifications.[6] These students will be awarded credit for the following business technology courses—POFT 1370: Introduction to Office Technology; POFT 2301: Intermediate Keyboarding; ACNT 1303: Introduction to Accounting I; POFT 1325: Business Math and Machine Applications; and POFT 2331: Administrative Systems. By receiving credit for their certification(s), students are able to save money and more quickly progress to earn an academic credential(s).

Enrollment and Demographics

The total unduplicated enrollment in all business technology programs has fluctuated over the past few years from a high of 661 students in AY 2020 to 358 students in AY 2025 (see Figure 4).[7]

Figure 4: HCC Business Technology Programs' Student Enrollment

ACADEMIC YEAR	STUDENT ENROLLMENT (UNDUPLICATED)
2020	661
2021	571
2022	464
2023	438
2024	505
2025	358

According to student demographics for AY 2025, Hispanic students represent the largest group across most business technology programs, with Black students being the other significant demographic group. A majority of students in these programs are female, and about half of all the enrolled students receive federal Pell grants. The students also include both traditional college age and adult learners, with the largest cohort being students between 20-24 years old.

Institutional Infrastructure Supporting Alignment

Ensuring that the business technology pathway programs are aligned with industry skill needs and that this alignment is maintained requires institutional infrastructure. HCC's Workforce Program Research and Development (WPRD) department provides essential infrastructure to support and sustain programmatic alignment. One of WPRD's key functions is to lead the creation, launch, and enhancement of career and technical education (CTE) programs that are offered through HCC's 14 Centers of Excellence. The staff ensure that all programs are industry-driven, faculty-led, and aligned with regional labor market needs.

The department is also responsible for developing and maintaining employer, industry association, and other workforce partnerships that provide information to ensure the CTE programs meet employer needs and promote economic advancement for HCC's students. WPRD staff also actively pursues grant opportunities that support CTE program innovation and workforce alignment, and identifies industry-recognized credentials that can be integrated into the CTE programs. HCC has made workforce alignment a priority and the creation of WRPD is proof of that commitment.

Accreditation

The WPRD department also ensures that accredited programs maintain their accreditation. For example, the HCC business technology programs are accredited by the Accreditation Council for Business Schools and Programs (ACBSP), which affirms the quality, rigor, and continuous improvement of HCC's business technology programs. Through ACBSP accreditation, HCC signals to students, employers, and college and university transfer partners that its business technology curricula are relevant, outcomes-driven, and responsive to industry needs. ACBSP accreditation also underscores HCC's commitment to teaching excellence, student learning assessment, and continuous quality improvement, aligning closely with the institution's mission to deliver affordable, high-quality education that supports regional economic development.

Curriculum Alignment Process at HCC

HCC developed an industry-driven and faculty-facilitated curriculum alignment process that was applied to all CTE programs. Each program, including business technology, utilizes the following processes.

Identify Current Needs

WPRD staff and faculty in the business technology programs research labor market data to determine primary and secondary occupations and whether the occupations are high-skilled, high-wage, and in-demand. This includes identifying occupationally specific, industry-validated competencies with a focus on both technical and employability skills.

Industry Review

The business technology program faculty review the findings with its advisory committee to identify any skill/competency gaps and to validate the skills that they agree are critical for each program. Faculty use the Workforce Education Course Manual (WECM), a statewide inventory of workforce education courses offered for semester credit hours and continuing education units, to identify the approved technical courses in the state of Texas that include the industry-validated competencies.

Curriculum Alignment Mapping

Faculty then work with a curriculum specialist to build or revise the curriculum alignment map. This also includes identifying which skills are introduced, reinforced, and mastered in each course and whether any adjustments need to be made to ensure that all needed skills and competencies are adequately covered. In addition, course sequencing is determined to ensure the proper flow of knowledge as the student progresses through a pathway.

Review

Industry partners, faculty, and advisory committee members review the curriculum map to ensure adequate coverage of all skills and competencies, check for skill redundancies, and examine the course sequencing. As part of this process, the course learning objectives and activities are cross-referenced with the aligned competencies from the curriculum alignment map.

Implement and Evaluate

Once the curriculum map has been reviewed and the course alignment is confirmed, any new curriculum can be implemented. And, as part of HCC's continuous quality improvement process, every two years the competencies must be reviewed to ensure the programs are still aligned with industry skill needs. If skill needs have changed, then the curriculum alignment process must be completed again to incorporate the new competencies.

State of Texas Approval Process

In addition to the internal processes described previously, all HCC awards must be approved by THECB prior to institutional delivery, including for the business technology pathway programs.

The process for approving a new certificate or workforce degree begins with institutional planning and internal review.[8] HCC had to identify the need for the program, confirm alignment with local and state workforce demand, and obtain internal approvals from its curriculum and governing committees. Once that is complete, then a formal proposal using THECB templates and submission guidelines can be created and submitted. The proposal includes the program title, CIP code, credential level, curriculum outline, projected enrollments and completions, faculty qualifications, facilities and equipment requirements, a budget analysis, and a labor-market justification. For workforce programs, the curriculum must also align with courses listed in the WECM.[9]

After submission, THECB initiates a 30-day public comment period to notify nearby institutions and allow feedback on program duplication or regional need. Once the comment period closes, THECB staff review the proposal for completeness, alignment with state goals, labor-market validation, and financial feasibility, or request revisions or additional documentation. Proposals accepted as is or needing minor modifications can be approved in as few as 30-60 days, while programs with significant new content may take 60-90 days or more, especially if they require any additional reviews or approvals.

Once approved, THECB issues formal approval and authorizes the institution to implement the new program with a two-year launch window. Once the program has been launched, the institution must notify THECB within 90 days and then include it in ongoing productivity reporting and review cycles to ensure it is meeting minimum enrollment or completion. Throughout the process, HCC must continue to demonstrate strong ties to workforce demand, ensure curriculum integrity and alignment with WECM, and provide data to support the program's contribution to the state's higher education goals.[10]

Texas State Policy Driving Program Alignment with Industry Credentials

During the 89th Texas Legislative session in 2023, HB 8 was passed, which transformed community college funding. HB 8 replaced the existing enrollment-based funding structure for community colleges with a finance model that was based on outcomes and aligned with student success and workforce needs.[11] Specifically, community colleges need to show the following outcomes to receive funding:

- The number of high school students who complete 15 semester credit hours in dual credit or dual enrollment courses;
- The number of community college students who transfer successfully to public four-year universities or complete 15 semester credit hours in a structured co-enrollment program; and
- The number of community college students who earn credentials of value as defined by Texas, which offer purpose in the economy, value in the labor market, and opportunities for good jobs and meaningful careers.

Business Technology Stakeholder Engagement

In addition to the college-wide process of aligning curriculum with industry needs outlined in the previous sections, the business technology programs incorporated feedback from a variety of stakeholders to improve the pathway, as discussed in the following sections.

Employers and Advisory Committees

Employer input is critical to ensuring the programs and pathways remain aligned to current skill needs. One central area of employer involvement is their participation on the business technology advisory committee, which is comprised of CEOs, human resource managers, and representatives from law firms. Some of the major employers represented on the advisory committee include MD Anderson Cancer Center, Memorial Herman Health Center, the city of Houston, Angel Medical Supply, and the Perazim Group.

The business technology program holds advisory committee meetings twice a year to ensure that all of the programs and the curricula remain up-to-date with industry skill needs and are responding to labor market demand. One of the activities that occurs during the meetings is to discuss whether any programs should be retired (i.e., no longer used) based on factors like lack of student enrollment, limited labor market demand, and redundancy with other programs. The advisory committee decided to retire three credentials in the business technology pathways beginning in the 2026-2027 AY—the bilingual level two certificate, the AAS degree with a legal office assistant specialization, and the level one certificate with a legal office assistant specialization.

Creating More Fast-Track Options

Advisory committee members' input is also an important step in reviewing and approving new ICLCs. For example, the advisory committee was asked to approve three new ICLCs for three certifications: Medical Administrative Assistant, Microsoft Office Suite, and Oracle University Fusion Cloud Applications: Human Capital Management Essentials, which were selected due to being in-demand skills that met eligibility requirements set by THECB.

Overall, advisory committees consider the following questions when reviewing and approving ICLCs:

- Does the ICLC align with current job requirements, tools, technologies, or practices in the field?
- Does the ICLC teach applied, industry-valued skills that would benefit current or future employees?
- Is this skillset preferred, recommended, or required by companies or others in the industry sector?
- Would earning this ICLC offer a competitive edge for job seekers, incumbent workers, or those seeking promotion?
- Does the ICLC address a documented labor market need in the region or industry sector?
- Does this ICLC align with other industry-recognized credentials, certifications, or state/national standards?

After this discussion, the advisory committee votes on whether to approve or deny the ICLCs presented. For this case, the advisory committee unanimously approved the creation of the three ICLCs for business technology.

Other Feedback

Employers also use the advisory committee meetings to provide feedback about the skill levels of the students they hire for internships or permanent positions, and whether those students were prepared to work at their company. For example, Memorial Herman Health Center and the Perazim Group expressed their satisfaction with students and new hires from HCC's business technology program and said that candidates who had earned the business technology level one certificate or AAS degree would be more likely to be hired than a candidate who did not have those credentials.

In addition, since both non-credit and in programs benefit from employer insights, a shared governance system for all HCC advisory committees is now in place. This more closely links HCC continuing education programs to their credit counterparts, leveraging industry input to ensure all courses and credentials remain valuable.

Faculty and Administrators

In the fall of 2024, HCC implemented a new college-wide system to review all workforce awards and academic pathways to ensure curricula continues to reflect regional competency needs in a systematic way. Faculty and administrators in each academic pathway play critical roles in ensuring that each program has a system for curriculum review.

Faculty and administrators are involved in this process to ensure that students will be prepared to enter the workforce upon completion of the business technology programs and awards. For example, one of the outcomes of the curriculum mapping process with the advisory committee described previously led to the creation of three new ICLCs for business technology. All three of the ICLCs are considered to be in demand by THCEB, which means that each ICLC needs to be comprised of three courses to meet the requirement of 144 contact hours.

Faculty also work in partnership with employers to discuss changing skill needs, including which skills are less important and what new skills are emerging. Insights from these conversations are used to determine if existing existing credentials need to be modified or deactivated. This is important to ensuring that current credentials maintain alignment with industry needs and that credentials that are no longer needed are deactivated.

Student Involvement

Student feedback and involvement is vital to ensuring that the programs and pathways also meet their needs. Business technology faculty gather student feedback through surveys, focus groups, and discussions or other interactions with faculty. This information provides faculty with critical insights that are used to continuously improve the courses and pathways. Students also have direct interaction with employers, which provides them with opportunities to gain insights about industry trends and employment opportunities.

Secondary Schools

HCC's dual credit department is housed under the college of readiness division, and is led by the associate vice chancellor of college readiness, who is supported by a team that manages the daily operations and administration for dual credit students. They also provide direct contacts to high schools in all the HCC service areas. The following staffing model ensures compliance between HCC and the regional school districts:

- Dean, Dual Credit, Partnerships and Initiatives
- Associate Dean of Dual Credit
- Director of P-16 (6 positions)
- Dual Credit Pathways Advisors (4 positions)

Dual credit offerings for business technology are available at four schools—Jane Long Academy and Sterling High School in the Houston Independent School District, Stafford Early College and Career High School in Stafford, and one charter school, Empowerment High School. For the 2024 AY, there were 47 students enrolled in dual credit programs, with 13 graduates.[12]

Additionally, high school students who live within the HCC taxing district can take dual credit courses at no charge. Students who reside outside of this district do not pay tuition, but they do have to pay out of district fees.[13] However, it should be noted that regulations by state and licensure/certification agencies do not allow minors to pursue certain credentials due to age requirements and contact hour regulations.

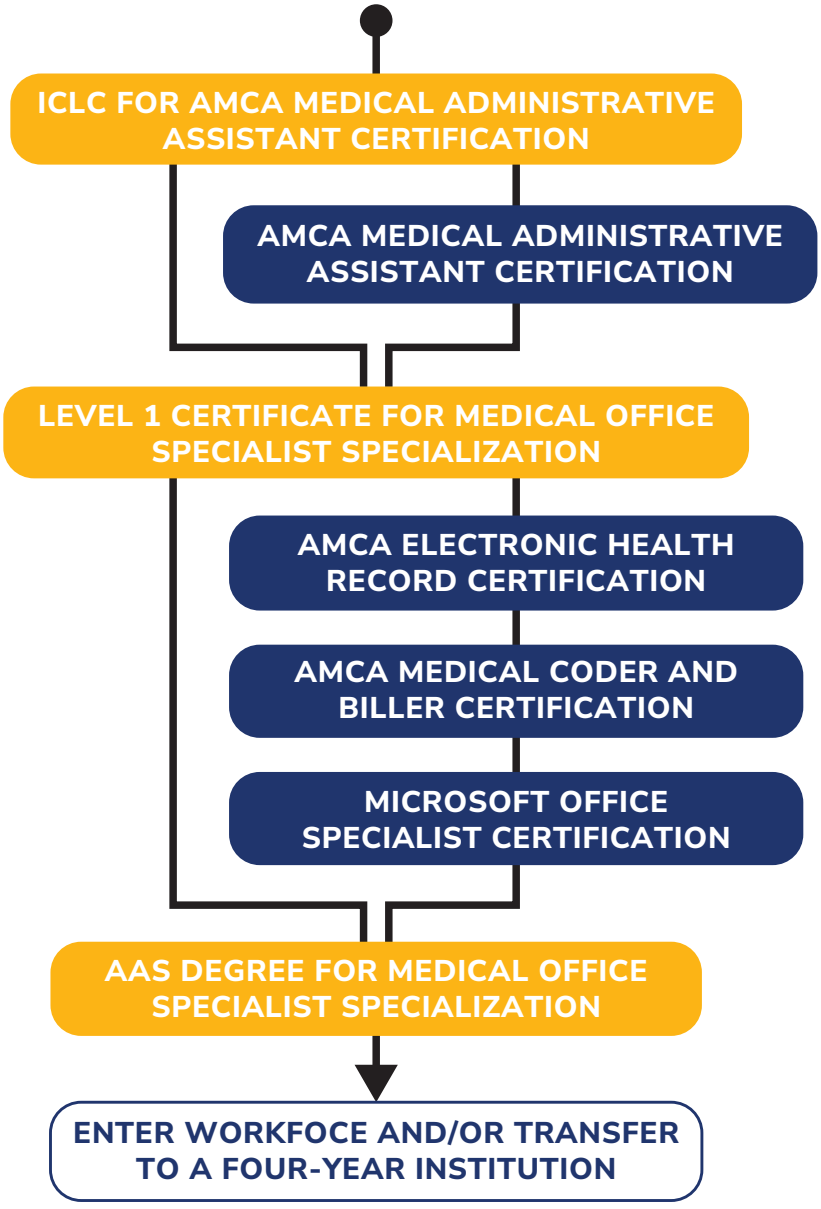
> *"Students believe certifications are "well worth the time" and are "crucial" for their careers, helping them get employed faster and secure higher positions than a degree alone."*
>
> *—Feedback from a survey of business technology students*

Outcomes of the Alignment Process for the Business Technology Pathways

Creation of Comprehensive Pathways

As part of the review process, each course in a pathway is crosswalked to determine how it supports progression from entry-level to advanced skills, and remove any overlaps. The business technology department developed career pathway maps that clearly show how students can progress along the pathway in each specialization area, and provide information students need to select the appropriate credential(s) that will prepare them for their career goals. For example, Figure 5 shows how a student would progress along the pathway for the medical office specialist.

Figure 5: HCC Business Technology Medical Office Specialist Pathway



Access to Certifications

The business technology faculty worked with the WPRD staff to identify certifications that are valued by employers in the Texas Gulf Coast region and aligned with the academic programs. Faculty developed and distributed marketing materials for students to make them aware of the importance of certifications for success in their careers.

However, one of the potential barriers to students earning certifications is the additional cost of the certification exam. To ensure that all students have equitable access to the certifications, the business technology department covers the cost of the exams through Carl D. Perkins career and technical education grants or other department funds.

Creation of New ICLCs

Students, particularly adult learners, expressed an interest in having a fast-track option that allows them to earn a credential and enter the workforce more quickly. This is particularly important because many students have an immediate need to enter the workforce. Creating the for-credit ICLCs for the business technology pathways provides students with a way to earn an industry certification while also providing them with options to continue to pursue additional education. However, it is important to note that some industry certifications are not eligible for HCC to create an ICLC, such as the AMCA Electronic Health Record and Medical Biller and Coder certifications, because they do not meet the 144 contact-hour requirements. Students interested in pursuing those certifications will need to meet the prerequisites to take the certification exams on their own.

Another goal of ICLCs is to provide options for incumbent workers to earn an industry certification or license to meet a requirement, help them improve job performance, or move to another role. ICLCs also provide another entry point to the business technology pathways, which allows learners the flexibility to move from the workforce to academia and vice versa at times that work best for them.

By creating ICLCs, HCC provides opportunities for students to earn a credential to immediately enter the workforce or to upskill to a different career, while also providing the first step for students to begin or continue their education and earn other academic credentials.

Maintaining Program Information and Credential Databases

The business technology program staff, along with all other instructional programs, update HCC's central credential database yearly to ensure information on course alignment, location, labor market information, current status, etc. remains accurate. The data can be viewed internally on HCC's intranet.

Additionally, HCC is collaborating with Credential Engine to enhance credential transparency and pathway data by publishing information about all of its awards – more than 2,100 course offerings, 400 credentials, and 25 total pathways – in Credential Finder through the Texas Credential Library.[14] The Texas Credential Library is a partnership among Credential Engine, the Texas Education Agency, THECB, and the Texas Workforce Commission to provide information to all Texans about all credentials that are issued by postsecondary institutions in the state.

Data to Improve Program Accountability

The business technology pathway receives quarterly labor market information which can be used to understand the demand for business technology occupations, changing skill needs, and provide insights to determine whether new programs should be added or existing programs deactivated. This information is validated with employers on the advisory committee so that any discrepancies can be addressed. This information is used to improve the business technology pathways, program accountability, and ultimately student outcomes. Data is also used to provide transparency to business technology students about pass rates on industry certification exams.

External Partnerships

HCC continues to engage is external partnerships that can strengthen the business technology pathways. For example, HCC is collaborating with Educate Texas to incorporate work-based learning into AAS degrees. Building on the work completed in this project, the business technology department is using the gathered, essential data and improved employer connections to begin including either internships or a form of cooperative education so that learners have opportunities to apply the knowledge they are learning before they complete a program(s).

Professional Development

Supporting faculty professional development is also very important to this process. HCC offers $2,000 annually for faculty and staff professional development, which business technology faculty may use to earn or renew their own industry certifications. When faculty earn a certification, it provides them with a better understanding of the certification exam process that their students will experience. This is important since some students may not have taken a standardized exam for a long time or may have text anxiety. It also helps them better understand the skills that are needed in the business technology industry.

Conclusion

HCC successfully realigned its business technology programs to create pathways that prioritize industry certification and align academic credentials for workforce relevance. Ensuring that the business technology pathways maintain alignment with employer input, HCC guarantees curricula and programs accurately reflect competencies and credentials needed by industry. The program also undergoes regular program review, supports faculty professional development, and creates and sustains partnerships to maintain alignment to industry needs, enhance credential transparency, and better support the diverse learners pursuing careers in this rapidly growing field in the Houston metropolitan area.

Endnotes

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5 Author's Note: Beginning in the 2026–2027 academic year, HCC will retire three specialization awards—the level one certificate and AAS degree for a legal office assistant specialization, and the bilingual level two certificate.

6 Author's Note: IAAP's Certified Professional Secretary designation has been phased out and replaced with the Certified Administrative Professional (CAP) Certification: **https://www.iaap-hq.org/page/learn**.

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